Diligence to the effort, dedication to the handling, devotion to the field.
Celebrate 30 years of forensic science at ISHI

The International Symposium on Human Identification has been elevating the field of forensics for three decades.

Join thought leaders from across the globe in Palm Springs, California this September to learn about the latest developments in the field of forensic DNA. Network with other forensic scientists, learn about new technologies and meet vendors demonstrating the tools to make your job easier.

Consider sharing your expertise by presenting a scientific talk or interesting case: Deadline June 9.

Learn more at: ishinews.com
Dear AAFS Annual Meeting Attendees,

On behalf of the AAFS staff and the numerous volunteers who have worked on this event, I would like to welcome you to the 71st AAFS Annual Scientific Meeting and look forward to providing you with a memorable experience.

For your scientific and philosophy of law enjoyment, numerous workshops and special sessions have been selected. In addition, the Plenary and Interdisciplinary Symposium will provide discussions to contemplate and formulate new perspectives for forensic science in the future. Much of the week is filled with presentations that will enthrall and possibly overwhelm those who choose to take advantage of the complete program. For those seeking the latest in available technology, equipment, and literature, the vendor area will be available to satisfy your desire to explore.

All of this will be at your fingertips along with the excitement that Baltimore has to offer. When time allows, explore the area. The AAFS four contracted hotels are conveniently located within walking distance of a variety of popular restaurants and local attractions.

If you need anything during the AAFS Annual Scientific meeting, the AAFS staff will be pleased to assist you. Just stop by the registration desk and they will try to accommodate your request.

I sincerely thank you for joining us in this educational event and hope that you have a memorable and pleasant experience.

Warmly,
Susan Ballou
2018-2019 AAFS President
# TABLE OF CONTENTS

About the AAFS ............................................................... 4  
Officers & Officials ........................................................... 5  
General Information .......................................................... 9  
2019 R.B.H. Gradwohl Laureate ............................................. 10  
2019 Distinguished Fellow ....................................................... 11  
Awards ............................................................................. 12  
Section Business Meetings ................................................... 15  
Receptions .......................................................................... 15  
Continuing Education .......................................................... 16  
Financial Contributors .......................................................... 19  
Guidebook Mobile App .......................................................... 20  
Student Academy .................................................................. 21  
Interdisciplinary Symposium ................................................... 22  
Young Forensic Scientists Forum Special Session ..................... 24  
Forensic Science Education Programs Accreditation Commission Session ......................................................... 27  
Evening Session .................................................................... 28  
Academy Cup ......................................................................... 29  
Plenary Session .................................................................... 30  
Breakfast Seminars .................................................................. 32  
Luncheon Seminar .................................................................. 42  
Workshops ............................................................................ 43  
American Society of Forensic Odontology .................................. 94  
National Institute of Justice .................................................... 95  

Scientific Sessions
Anthropology ........................................................................ 101  
Criminalistics ....................................................................... 116  
Digital & Multimedia Sciences ................................................. 139  
Engineering Sciences .............................................................. 144  
General ............................................................................... 149  
Jurisprudence ....................................................................... 161  
Odontology ............................................................................ 167  
Pathology/Biology .................................................................. 172  
Psychiatry & Behavioral Science .............................................. 191  
Questioned Documents ............................................................ 196  
Toxicology ............................................................................ 200  
Last Word Society .................................................................. 210  
YFSF Posters .......................................................................... 211  

Program Committee Financial Disclosure ................................... 213  
Presenting Author Financial Disclosure ..................................... 217  
Key Word Index ..................................................................... 239  
Presenting Author Index ........................................................... 254
ABOUT THE AAFS

For 71 years, the American Academy of Forensic Sciences (AAFS) has served a distinguished and diverse membership. Its 6,500+ members are divided into 11 sections spanning the forensic enterprise. Included among the Academy’s members are physicians, attorneys, dentists, toxicologists, anthropologists, document examiners, digital evidence experts, psychiatrists, engineers, physicists, chemists, criminalists, educators, and others. Representing all 50 United States, Canada, and 70 other countries worldwide, they actively practice forensic science and, in many cases, teach and conduct research in the field as well. Each section provides opportunities for professional development, personal contacts, awards, and recognition. Many sections publish AAFS Newsfeed articles that keep their members abreast of activities and developments in their fields.

As a professional society dedicated to the application of science to the law, the AAFS is committed to the promotion of education and the elevation of accuracy, precision, and specificity in the forensic sciences. It does so via the Journal of Forensic Sciences (its internationally recognized scientific journal), the AAFS Newsfeed, its annual scientific meeting, the conduct of seminars and meetings, and the initiation of actions and reactions to various issues of concern. For its members and affiliates, AAFS provides expert witness referrals, job opportunity listings, as well as scientific reference studies. As the world’s most prestigious forensic science organization, the AAFS represents its membership to the public and serves as the focal point for public information concerning the forensic science profession. Founded in 1948, the AAFS is headquartered in Colorado Springs, CO.

AAFS Annual Scientific Meeting

Each February, the AAFS scientific meeting gathers together approximately 4,000 world-renowned professionals to present the most current information, research, and updates in their fields. More than 900 scientific papers, seminars, workshops, and other special sessions are presented. In addition, approximately 150 exhibitors showcase the cutting-edge technology and services of this ever-changing profession.

Future Annual Meetings

<table>
<thead>
<tr>
<th>Year</th>
<th>Meeting</th>
<th>Dates</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>AAFS</td>
<td>February 17-22, 2020</td>
<td>Anaheim Convention Center, Anaheim, CA</td>
</tr>
<tr>
<td>2021</td>
<td>AAFS</td>
<td>February 15-20, 2021</td>
<td>George R. Brown Convention Center, Houston, TX</td>
</tr>
<tr>
<td>2022</td>
<td>AAFS</td>
<td>February 21-26, 2022</td>
<td>Washington State Convention Center, Seattle, WA</td>
</tr>
<tr>
<td>2023</td>
<td>AAFS</td>
<td>February 13-18, 2023</td>
<td>Rosen Shingle Creek, Orlando, FL</td>
</tr>
<tr>
<td>2024</td>
<td>AAFS</td>
<td>February 19-24, 2024</td>
<td>Denver Convention Center, Denver, CO</td>
</tr>
</tbody>
</table>

410 North 21st Street
Colorado Springs, CO 80904
Phone: (719) 636-1100
Fax: (719) 636-1993
Email: membership@aafs.org
Website: www.aafs.org

Anne Warren, Executive Director
OFFICERS & OFFICIALS

Officers

President: Susan M. Ballou, MS
President-Elect: Zeno J. Geradts, PhD
Past President: Betty Layne DesPortes, JD, MS
Vice President: Laura C. Fulginiti, PhD
Vice President: Ruth E. Winecker, PhD
Secretary: Jeri D. Ropero-Miller, PhD
Treasurer: Carl R. McClary, BA

Directors

Anthropology: Eric J. Bartelink, PhD
Criminalistics: Anjali A. Ranadive, JD
Digital & Multimedia Sciences: Douglas S. Lacey, BS
Engineering Sciences: Mark I. Marpet, PhD, PE
General: Paul E. Kish, MS
Jurisprudence: Paul Messner, JD
Odontology: John P. Kenney, DDS, MS
Pathology/Biology: Andrew M. Baker, MD
Psychiatry & Behavioral Science: Karen B. Rosenbaum, MD
Questioned Documents: Thomas W. Vastrick, BS
Toxicology: Sarah Kerrigan, PhD

2019 Annual Scientific Meeting Program Committee

Program Chair: Lucy A. Davis, BHS
Program Co-Chair: Richard Vorder Bruegge, PhD
Plenary Session: James J.C.U. Downs, MD; C. Ken Williams, MS, JD
Poster Sessions: Kristen Hartnett-McCann, PhD; Darren Franck, MSME
Workshops: Claire E. Shepard, MS; Adam J. Freeman, DDS
Breakfast Seminars: Sarah Kerrigan, PhD; Joanna L. Collins, MFS
Luncheon Seminars: Marla E. Carroll, BS; Dean M. De Crisce, MD
Last Word Society: Kenneth E. Melson, JD; Paula C. Brumit, DDS
Bring Your Own Slides: Michael M. Baden, MD; Joseph A. Prahow, MD
Student Academy: Julie A. Howe, MBA; Marilyn T. Miller, EdD
Interdisciplinary Symposium: Karen B. Rosenbaum, MD; Jan Seaman Kelly, BA
Local Arrangements: Mark Profilli, MS
Academy Cup: Laura L. Liptai, PhD; Carla Miller Noziglia, MS; Matthew R. Wood, PhD;
Winona J. Agbabiaka, JD

Anthropology: Kristen Hartnett-McCann, PhD; Marin A. Pilloud, PhD
Criminalistics: Noelle J. Umback, PhD; Sandra B. Sachs, PhD
Digital & Multimedia Sciences: Mary F. Horvath, MFS; Douglas R. White, MS
Engineering Sciences: Sarah V. Hainsworth, PhD
General: Gina Londino-Smolar, MS; Brian L. Janysek, MFS
Jurisprudence: Robert M. Sanger, JD; Virginia Barron, JD
Odontology: Robin A. Ainsworth, DDS
Pathology/Biology: Carl J. Schmidt, MD
Psychiatry & Behavioral Science: Sebastien S. Prat, MD; Emily D. Gottfried, PhD
Questioned Documents: Kevin P. Kulbacki, MSFS; Carolyn Bayer-Broring, MFS
Toxicology: Sherri L. Kacinko, PhD; Sabra R. Botch-Jones, MS, MA
Past Presidents

*R.B.H. Gradwohl, MD .............................................. 1949-51
*S.A. Levinson, MD, PhD .................................. 1951-52
*R.N. Harger, PhD ............................................. 1952-53
*Louis P. Regan, MD, LLB ................................. 1953-54
*A.W. Freireich, MD ........................................... 1954-55
*Fred E. Inbau, BS, LLB, LLM ............................ 1955-56
*Alan R. Moritz, MD .......................................... 1956-57
*Val B. Satterfield, MD ...................................... 1957-58
*John F. Williams, BS ......................................... 1958-59
*Ordway Hilton, MA ............................................ 1959-60
*Russel S. Fisher, MD ......................................... 1960-61
*S.R. Gerber, MD, LLB ....................................... 1961-62
*Milton Helpern, MD .......................................... 1962-63
*Oliver C. Schroeder, Jr., JD ............................... 1963-64
*Dwight M. Palmer, MD ....................................... 1964-65
*Robert B. Forney, PhD ...................................... 1965-66
*Jack L. Sachs, JD ................................................ 1966-67
*Charles S. Petty, MD .......................................... 1967-68
*Maier I. Tuchler, MD ........................................... 1968-69
*James W. Osterburg, MPA .................................. 1969-70
*Edwin C. Conrad, JD, PhD ................................ 1970-71
*Cyril H. Wecht, MD ........................................... 1971-72
*Douglas M. Lucas, MSc, DSc .............................. 1972-73
*Morton F. Mason, PhD ....................................... 1973-74
*David A. Crown, D.Crim .................................... 1974-75
*Robert J. Joling, JD ............................................ 1975-76
*James T. Weston, MD ......................................... 1976-77
*B. Edward Whittaker, BS .................................. 1977-78
*Kurt M. Dubowski, PhD ..................................... 1978-79
*June K. Jones, MS, MS ....................................... 1979-80
*Lowell J. Levine, DDS ....................................... 1980-81
*Joseph H. Davis, MD ......................................... 1981-82
*Anthony Longhetti, BA .................................... 1982-83
*George E. Gantner, MD ..................................... 1983-84

Maureen Casey Owens, AB .................................. 1984-85
*Arthur D. Goldman, DMD .................................. 1985-86
*Don Harper Mills, JD, MD ................................ 1986-87
*Yale H. Caplan, PhD ......................................... 1987-88
*Richard S. Frank, BS ......................................... 1988-89
*Richard C. Froede, MD ..................................... 1989-90
*Ellis R. Kerley, PhD .......................................... 1990-91
*Homer R. Campbell, Jr., DDS ............................. 1991-92
Marina Stajić, PhD ............................................. 1992-93
*Enrico N. Togneri, BA ....................................... 1993-94
*Steven C. Batterman, PhD .................................. 1994-95
*Haskell M. Pitluck, JD ....................................... 1995-96
*Richard Rosner, MD .......................................... 1996-97
*Michael A. Peat, PhD ....................................... 1997-98
Barry A.J. Fisher, MS, MBA ................................. 1998-99
Patricia J. McFeeley, MD ..................................... 1999-00
John D. McDowell, DDS, MS ............................... 2000-01
Mary Fran Ernst, BLS .......................................... 2001-02
Graham R. Jones, PhD ........................................ 2002-03
Kenneth E. Melson, JD ....................................... 2003-04
Ronald L. Singer, MS ......................................... 2004-05
Edmund R. Donoghue, MD .................................. 2005-06
James G. Young, MD .......................................... 2006-07
Bruce A. Goldberger, PhD ................................... 2007-08
Carol E. Henderson, JD ....................................... 2008-09
Thomas L. Bohan, PhD, JD .................................. 2009-10
Joseph P. Bono, MA ............................................ 2010-11
Douglas H. Ubelaker, PhD .................................. 2011-12
Robert E. Barsley, DDS, JD ................................. 2012-13
Barry K. Logan, PhD ........................................... 2013-14
Daniel A. Martell, PhD ....................................... 2014-15
Victor W. Weedn, MD, JD .................................... 2015-16
John E. Gerns, MFS ............................................ 2016-17
Betty Layne DesPortes, JD, MS ............................. 2017-18

* Deceased
Section Officers

Anthropology  
**Chair:** Jennifer C. Love, PhD  
**Secretary:** Paul D. Emanovsky, PhD

Criminalistics  
**Chair:** Kristy Kadash, PhD  
**Secretary:** Patrick Buzzini, PhD

Digital & Multimedia Sciences  
**Chair:** Marla E. Carroll, BS  
**Secretary:** Jason M. Paroff, JD

Engineering Sciences  
**Chair:** Darren Franck, MSME  
**Secretary:** David Pienkowski, PhD

General  
**Chair:** Joanna L. Collins, MFS  
**Secretary:** Steven C. Clark, PhD

Jurisprudence  
**Chair:** Pamela A.W. King, JD  
**Secretary:** Christine Funk, JD

---

R.B.H. Gradwohl Laureates

<table>
<thead>
<tr>
<th>Laureate</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milton Helpern, MD</td>
<td>1978</td>
</tr>
<tr>
<td>Rolla N. Harger, PhD</td>
<td>1979</td>
</tr>
<tr>
<td>James T. Weston, MD</td>
<td>1984</td>
</tr>
<tr>
<td>Oliver C. Schroeder, Jr., JD</td>
<td>1987</td>
</tr>
<tr>
<td>Abel M. Dominguez, PhD</td>
<td>1993</td>
</tr>
<tr>
<td>Douglas M. Lucas, MSc, DSc</td>
<td>1995</td>
</tr>
<tr>
<td>Kenneth S. Field, MBA</td>
<td>1997</td>
</tr>
<tr>
<td>Sidney Kaye, PhD</td>
<td>1998</td>
</tr>
<tr>
<td>Richard C. Froede, MD</td>
<td>2002</td>
</tr>
<tr>
<td>Joseph H. Davis, MD</td>
<td>2005</td>
</tr>
<tr>
<td>Barry A.J. Fisher, MS, MBA</td>
<td>2008</td>
</tr>
<tr>
<td>Kurt M. Dubowski, PhD</td>
<td>2011</td>
</tr>
<tr>
<td>James E. Starrs, LLM</td>
<td>2012</td>
</tr>
<tr>
<td>Thomas T. Noguchi, MD</td>
<td>2015</td>
</tr>
<tr>
<td>Robert E. Gaensslen, PhD</td>
<td>2017</td>
</tr>
<tr>
<td>Yale H. Caplan, PhD</td>
<td>2019</td>
</tr>
</tbody>
</table>

* Deceased

---

Douglas M. Lucas Medalists

<table>
<thead>
<tr>
<th>Laureate</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sir Alec J. Jeffreys, DPhil</td>
<td>1999</td>
</tr>
<tr>
<td>Alan S. Curry, PhD</td>
<td>2002</td>
</tr>
<tr>
<td>Joseph Almog, PhD</td>
<td>2005</td>
</tr>
<tr>
<td>Clyde C. Snow, PhD</td>
<td>2008</td>
</tr>
<tr>
<td>Pierre A. J.-L. Margot, PhD</td>
<td>2011</td>
</tr>
<tr>
<td>Duarte N. Vieira, PhD, MD</td>
<td>2014</td>
</tr>
<tr>
<td>Douglas H. Ubelaker, PhD</td>
<td>2017</td>
</tr>
</tbody>
</table>

Sir Alec J. Jeffreys, DPhil ................................. 1999
*Alan S. Curry, PhD ........................................ 2002
Joseph Almog, PhD ................................. 2005
*Clyde C. Snow, PhD ......................... 2008
Pierre A. J.-L. Margot, PhD .............. 2011
Duarte N. Vieira, PhD, MD .................. 2014
Douglas H. Ubelaker, PhD .................. 2017
OFFICERS & OFFICIALS

Distinguished Fellows

Abel M. Dominguez, PhD ........................................ 1990
*Kenneth S. Field, MBA .................................... 1990
*Ordway Hilton, MA ........................................ 1990
Douglas M. Lucas, MSc, DSc ............................. 1990
*Irwin N. Perr, MD, JD .................................. 1990
*Kurt M. Dubowski, PhD ................................. 1991
*June K. Jones, MS ....................................... 1991
*Oliver C. Schroeder, Jr., JD ............................ 1991
*Clyde C. Snow, PhD .................................. 1991
*Robert H. Cravey, BS .................................. 1992
*Richard C. Froede, MD ................................ 1992
*Emanuel Tanay, MD ..................................... 1992
*Joseph H. Davis, MD .................................. 1993
*Anthony Longhetti, BA ................................ 1993
*Don Harper Mills, JD, MD ............................... 1993
William M. Bass III, PhD ............................... 1994
Henry C. Lee, PhD ......................................... 1994
*David J. Purtell, PhD ................................... 1994
*Charles J. Stahl III, MD ................................. 1995
*Irving Sunshine, PhD .................................. 1995
Yale H. Caplan, PhD ...................................... 1996
James E. Starrs, LL.M .................................... 1996
*Homer R. Campbell, Jr., DDS .......................... 1998
John J. Harris, BS .......................................... 1998
Norman D. Sperber, DDS ................................. 1998
*James V.P. Conway ...................................... 2000
Robert E. Gaensslen, PhD ............................... 2000
Steven C. Batterman, PhD ............................... 2001
*B.G. Brogdon, MD ....................................... 2001
Barry A.J. Fisher, MS, MBA ............................. 2001

Robert B. J. Dorion, DDS .................................. 2002
Richard S. Frank, BS ....................................... 2002
Carla M. Noziglia, MS ................................... 2003
*James L. Frost, MD ...................................... 2004
*Gerald L. Vale, DDS, JD ............................... 2004
Michael Finnegem, PhD .................................. 2005
Andrei A. Moensens, JD, LLM .......................... 2005
Michael A. Peat, PhD ..................................... 2006
Thomas T. Noguchi, MD ................................. 2007
Kenneth E. Melson, JD .................................. 2008
Joseph L. Peterson, D.Crim ............................. 2008
Randy L. Hanzlick, MD .................................. 2009
*Jay A. Siegel, PhD ....................................... 2009
Ronald L. Singer, MS .................................... 2010
*Robert Thibault, MFS .................................. 2010
Mary Fran Ernst, BLS ..................................... 2011
Patricia J. McFeeley, MD ................................ 2011
Richard Rosner, MD ...................................... 2011
*James W. Osterburg, MPA ............................. 2012
Haskell M. Pitluck, JD .................................... 2012
John D. McDowell, DDS, MS ........................... 2013
Marina Stajić, PhD ......................................... 2013
Edmund R. Donoghue, MD ............................. 2014
Graham R. Jones, PhD .................................... 2014
Marilyn A. Huestis, PhD ................................ 2015
Douglas H. Ubelaker, PhD ............................... 2016
Peter R. De Forest, D.Crim ............................. 2017
Virginia A. Lynch, MSN ................................ 2018
Carol E. Henderson, JD .................................. 2019

* Deceased

AAFS Outstanding Early Career Achievement in Forensic Science Award Recipients

Cliff Akiyama, MPH, MA ..................................... 2016
Kristina L. Hoffman, PSM ............................... 2017

Lavina Iancu, PhD .......................................... 2018
Daniel E. Mabel, MS ....................................... 2019
GENERAL INFORMATION

Registration Desk Hours

*Baltimore Convention Center*

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>February 17</td>
<td>1:00 p.m.</td>
<td>5:00 p.m.</td>
</tr>
<tr>
<td>Monday</td>
<td>February 18</td>
<td>6:45 a.m.</td>
<td>5:00 p.m.</td>
</tr>
<tr>
<td>Tuesday</td>
<td>February 19</td>
<td>6:45 a.m.</td>
<td>6:00 p.m.</td>
</tr>
<tr>
<td>Wednesday</td>
<td>February 20</td>
<td>6:45 a.m.</td>
<td>5:00 p.m.</td>
</tr>
<tr>
<td>Thursday</td>
<td>February 21</td>
<td>6:45 a.m.</td>
<td>5:00 p.m.</td>
</tr>
<tr>
<td>Friday</td>
<td>February 22</td>
<td>6:45 a.m.</td>
<td>4:00 p.m.</td>
</tr>
<tr>
<td>Saturday</td>
<td>February 23</td>
<td>7:30 a.m.</td>
<td>12:00 p.m.</td>
</tr>
</tbody>
</table>

Exhibit Hall Hours

*Baltimore Convention Center - Exhibit Hall A*

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>February 20</td>
<td>11:30 a.m.</td>
<td>4:00 p.m.</td>
</tr>
<tr>
<td>Thursday</td>
<td>February 21</td>
<td>9:00 a.m.</td>
<td>2:00 p.m.</td>
</tr>
<tr>
<td>AAFS Reception</td>
<td>(Exhibits Open)</td>
<td>6:00 p.m.</td>
<td>8:00 p.m.</td>
</tr>
<tr>
<td>Friday</td>
<td>February 22</td>
<td>8:00 a.m.</td>
<td>12:00 p.m.</td>
</tr>
</tbody>
</table>

Attention Meeting Presenters

The *Journal of Forensic Sciences* encourages authors to submit previously unpublished reports and papers presented at the AAFS annual meeting.

For full instructions on manuscript preparation, consult the Information for Authors available at: https://www.aafs.org/resources/journal-of-forensic-sciences/information-for-authors/.

**Manuscripts must be submitted electronically via the Journal of Forensic Sciences Manuscript Central site:** http://mc.manuscriptcentral.com/jofs. For questions, please contact: jfs.editor@att.net.

Video and/or audio recording of any session(s) or parts thereof is not permitted without prior approval from the American Academy of Forensic Sciences.

English is the official language of the AAFS and its meetings; neither oral nor written translations will be provided.

Although precautions are taken to prevent schedule changes, speakers and program schedules may change due to unforeseen circumstances.

*As a courtesy to others, please silence your cell phone when attending the sessions.*
The R.B.H. Gradwohl Medallion is the Academy's highest honor to be bestowed on one who has made an exceptional contribution to the field of forensic science. Dr. Yale H. Caplan will be honored with the Gradwohl Medallion during the 2019 Annual Business Meeting on Wednesday, February 20, in Baltimore. Dr. Caplan has served the American Academy of Forensic Sciences and the forensic science profession for more than 50 years, and he is considered to be one of the most highly regarded experts in the field of Forensic Toxicology.

Dr. Caplan received his bachelor's degree in Pharmacy and PhD degree in Medicinal Chemistry from the University of Maryland at Baltimore (School of Pharmacy). He was elected into AAFS membership in the Toxicology Section in 1973, was promoted to Member in 1975, and to Fellow in 1976. He served as AAFS President in 1987–1988, previously holding numerous offices and committee appointments, including Toxicology Section Secretary and Chair, AAFS Treasurer, Nominating Committee, FSF Board of Trustees, AAFS Ethics Committee, Awards Committee, Bylaws Committee, and Long Term Planning Committee. Dr. Caplan served on the Journal of Forensic Sciences Editorial Board from 1984 through 2009. Dr. Caplan was the recipient of the Toxicology Section's Rolla N. Harger Award in 1989 for outstanding contributions to forensic toxicology, and he was named AAFS Distinguished Fellow in 1996 for a lifetime of service to the forensic sciences profession.

Dr. Caplan came to the State of Maryland Office of the Chief Medical Examiner as an Assistant Toxicologist in 1969 and served as Chief Toxicologist and Scientific Director of the State of Maryland's Alcohol Testing Program from 1974 to 1991. He was Director of Toxicology and Forensic Toxicology for Quest Diagnostics, Incorporated (formerly Maryland Medical Laboratory) in Baltimore from 1977 to 1999. He then served as Laboratory Director for the State of Maryland, Division of Parole and Probation (1999–2012).

Dr. Caplan was also an active educator. He directed a graduate program in forensic toxicology at the University of Maryland Baltimore and mentored 17 masters and doctoral students. Two of Dr. Caplan's doctoral students, Marina Stajic and Bruce Goldberger, went on to become AAFS Presidents. Dr. Caplan also trained hundreds of medical review officers responsible for reviewing federal drug tests as well as hundreds of alcohol breath test operators in Maryland.

Dr. Caplan is currently a consulting forensic toxicologist. He is Adjunct Professor in the Department of Pharmaceutical Sciences of the University of Maryland School of Pharmacy and a consultant for the U.S. Department of Health and Human Services Division of Workplace Programs. He is a member of the Forensic Laboratory Accreditation Committee for the State of Maryland appointed by the State's Governor.

Dr. Caplan's professional activities and awards include: President of the Forensic Specialties Accreditation Board (2008–2012); President of the American Board of Forensic Toxicology (1988–2008) and recipient of ABFT's Distinguished Service Award; President of the Society of Forensic Toxicologists (1981); Chairman (1991–1993) of the National Safety Council's Committee on Alcohol and Other Drugs (now Alcohol and Drug Impairment Division) and the recipient of the Council's Robert F. Borkenstein Award (2000); Chairman of the Maryland Section of the American Chemical Society (1973) and recipient of the 1994 Maryland Chemist Award. He is Emeritus Associate Editor of the Journal of Analytical Toxicology. He serves as an advisor to attorneys and companies regarding alcohol and drug testing issues.

Congratulations to the Academy's 16th R.B.H. Gradwohl Laureate, Dr. Yale Caplan!
Carol E. Henderson, AAFS Past President and Jurisprudence Section Fellow, has been named “Distinguished Fellow” by the AAFS Board of Directors. Ms. Henderson will be honored with the Distinguished Fellow Award during the 2019 Annual Business Meeting on Wednesday, February 20, in Baltimore.

Ms. Henderson was elected into membership in the Jurisprudence Section in 1984 and was promoted to Fellow in 1990. As a Provisional Member (now Associate Member), she immediately became involved in committee activities within the section and Academy-wide. Ms. Henderson served on the AAFS Membership Committee, the Nominating Committee, the Board of Directors and Executive Committee, the Good Forensic Practice Guidelines Committee, the Accreditation & Certification Task Force, the Journal of Forensic Sciences Editorial Board, the Long Term Planning Committee, and the Mission and Vision Task Force. In addition to her extensive committee service, Ms. Henderson served in a variety of meeting program positions for an unprecedented six annual meetings leading up to her election as Vice President, Secretary, and ultimately President-Elect. She served as AAFS President in 2008-09. During her term, Ms. Henderson took the Forensic Sciences Foundation, Inc. (FSF) Silent Auction to a new level by personally soliciting more than 75 donations from the AAFS membership. Proceeds from the FSF Silent Auction funds scholarships and grants through the FSF Endowment Fund.

In recognition for her service to the Jurisprudence Section, Ms. Henderson was honored with the Harold A. Feder Award in 1999.

Ms. Henderson began her criminal justice career with the Federal Bureau of Prisons (BOP), working in a federal prison for male offenders in Miami, FL, and later as a researcher at the BOP headquarters in Washington, DC. She began her legal career as an Assistant United States Attorney in Washington, DC. She most recently served as a tenured professor at Stetson University College of Law.

Ms. Henderson is a consultant in scientific evidence and law. She is the founding director of the award-winning National Clearinghouse for Science, Technology and the Law, an interdisciplinary resource that provides education and information to scientists, legal professionals, law enforcement, academics, and the public worldwide. Ms. Henderson has presented more than 300 lectures, webinars and workshops on scientific evidence and courtroom testimony on six continents. She has authored or edited more than 100 books, articles, and encyclopedias, including Future Focus for Forensic Science, a special issue of The SciTech Lawyer (2017).

Ms. Henderson has appeared in the national media as a legal analyst and testified before the United States Congress. She presently serves on the American Bar Association (ABA) Science & Technology Law Section Council, the ABA Judicial Division Forensic Science Committee, and as faculty for the National Judicial College. She also serves as an editorial board member for WIREs Forensic Science journal and The SciTech Lawyer magazine.

Please offer your congratulations to Carol E. Henderson, AAFS Distinguished Fellow!
AWARDS

The R.B.H. Gradwohl Laureate Medallion, the Distinguished Fellow Award, and the Outstanding Early Career Achievement in Forensic Science Award will be presented on Wednesday, February 20, during the AAFS Annual Business Meeting. Join us in acknowledging your most distinguished colleagues as they are presented with these prestigious awards.

R.B.H. Gradwohl Laureate Medallion

Yale H. Caplan, PhD

Distinguished Fellow

Carol E. Henderson, JD

Outstanding Early Career Achievement in Forensic Science Award

Daniel E. Mabel, MS

2019 Section Award Honorees

Section Awards will be presented during Section Business Meetings, also on Wednesday, February 20 (see Section Business Meeting start times on page 15). The Section Award recipients will be acknowledged again before the entire membership during the AAFS Annual Business Meeting, along with the presentation of the R.B.H. Gradwohl Medallion, Distinguished Fellow Award, and the Outstanding Early Career Achievement in Forensic Science Award.

Anthropology Section's
T. Dale Stewart Award
J. Lawrence Angel Award
Ellis R. Kerley Research Award
Service Award

Elizabeth A. Murray, PhD
Caitlin C.M. Vogelsberg, MS
Eric J. Bartelink, PhD
Bradley J. Adams, PhD
Hugh E. Berryman, PhD
Madeleine J. Hinkes, PhD
J. Stanley Rhine, PhD
Kate Spradley, PhD
P. Willey, PhD

Criminalistics Section's
Paul L. Kirk Award
Mary E. Cowan Outstanding Service Award
Meritorious Service Award

John Ballantyne, PhD
Dragan Primorac, MD, PhD
David A. Green, BS

Digital & Multimedia Sciences Section's
Outstanding Case Study Award
Carrie Morgan Whitcomb Service Award

Joseph Levi White, MS
Mark M. Pollitt, PhD

Engineering Sciences Section's
Founders Award
Andrew H. Payne, Jr., Special Achievement Award

James Millette, PhD
Carole E. Chaski, PhD
### Awards

| General Section’s | Kimberly Sue Moran, MSc  
|                  | Sharon K. Moses, PhD |
| Odontology Section’s | Gregory S. Golden, DDS (*posthumous*) |
| Pathology/Biology Section’s | Patrick E. Lantz, MD  
|                        | Jeffrey K. Tomberlin, PhD |
| Questioned Documents Section’s | Linton Mohammed, PhD |
| Toxicology Section’s | Ruth E. Winecker, PhD  
|                       | Amanda L.A. Mohr, MSFS  
|                     | Courtney K. McGowan, BS |

The FSF Jan S. Bashinski Criminalistics Graduate Thesis Assistance Grant will be presented on Wednesday, February 20, during the Criminalistics Section Business Meeting

**FSF Jan S. Bashinski Criminalistics Graduate Thesis Assistance Grant**

*Amanda J. Gonzalez, BA*

The following awards will be presented on Wednesday, February 20, during the AAFS Annual Business Meeting. You’ll want to be present to congratulate the recipients:

**Humanitarian and Human Rights Resource Center’s Clyde Snow Award**

*Jørgen Lange Thomsen, MD, DmSc, DMJ, FRCPath*

**Ambassador of Forensic Science Award**

*The Laura and John Arnold Foundation*

**FSF Emerging Forensic Scientist Award**

*Michelle K. Gordon, MS and Emily R. Parchuke, BS*

**FSF Henry C. Lee Scholarship**

*Maria Corazon Abogado De Ungria, PhD*
AWARDS

FSF Warren-Young Scholarship

Gustavo Rodriguez, BS, MEd

FSF CRC Press Student Travel Grant and Book Prize

Vienna C. Lam, MA

FSF CRC Press Student Travel Grant

Meghan Fogerty, MS
Shelby Garza, BS
Rebecca L. George, MA
Sierra Kaszubinski, BS
Mariah E. Moe, BS
Christian T. Pascual, PhD
Carrie Polston, BA
Karin E. Wells, BA

AAFS Regional Awards

Mid-Atlantic Association of Forensic Scientists: Keena Heise, BA, MS
Northeastern Association of Forensic Scientists: Andrew J. Schweighardt, PhD

Attend the Annual Business Meeting of Fellows and Members to Win a Complimentary Meeting Registration!

The Annual Business Meeting of the Fellows and Members of the AAFS will be held Wednesday, February 20, 2019, at 4:15 p.m., at the Baltimore Convention Center in Baltimore, MD. It is essential that all Fellows and Members attend this very important meeting in order to reach a quorum for the voting process. Agenda items include the election of 2019-20 Officers, consideration of bylaw amendments, presentation of the Gradwohl Medallion, Distinguished Fellow, and Outstanding Early Career Achievement in Forensic Science Awards, and recognition of all Members being promoted to Fellow status. You also will be briefed on AAFS activities during the past year and plans for the future.

As an incentive to attend, all Fellows and Members present will automatically be entered in a drawing for a complimentary meeting registration to attend the 2020 AAFS Annual Scientific Meeting in Anaheim, CA.
The Sections

The Sections of the American Academy of Forensic Sciences will hold their annual business meetings on Wednesday, February 20, 2019. Some of the sections will hold a luncheon prior to the start of the business meeting. **All Section Luncheons required pre-registration.** This is your opportunity to participate! Please attend and contribute to your section’s future plans. Specific times are noted below:

<table>
<thead>
<tr>
<th>Section</th>
<th>Luncheon</th>
<th>Business Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Criminalistics *</td>
<td>1:05 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Digital &amp; Multimedia Sciences **</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Engineering Sciences</td>
<td>1:45 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>General **</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Jurisprudence **</td>
<td>1:45 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Odontology</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Pathology/Biology **</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Psychiatry &amp; Behavioral Science **</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Questioned Documents</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
<tr>
<td>Toxicology **</td>
<td>2:00 p.m. - 3:45 p.m.</td>
<td></td>
</tr>
</tbody>
</table>

* This luncheon required pre-registration and is open only to members of the Criminalistics Section.

** These luncheons required pre-registration.

RECEPTIONS

**Welcoming Reception — Tuesday, February 19 — 6:00 p.m. - 8:00 p.m. — BCC Ballrooms III-IV**

This opening event is your opportunity to meet old friends and to make new acquaintances. Snacks and cash bars will be available.

**AAFS 71st Annual Wine & Cheese Reception — Thursday, February 21 — 6:00 p.m. - 8:00 p.m. — Exhibit Halls A-B**

The AAFS Wine & Cheese Reception will be held to celebrate what promises to be an excellent 2019 program and to toast your return to the Academy’s 72nd Annual Scientific Meeting in 2020 (Anaheim, CA)!
All meeting sessions are lectures with one or more speakers. Continuing professional education credits will be offered for physicians, dentists, and attorneys. Continuing education credit applications have been submitted for physicians and dentists. Attorneys may request CLE credit; please see the "Legal" section on page 18. Nurses may use the AAFS CME Credit Reporting Forms for filing CERP hours with their state accreditation agency. Please check with your state agency for details. In addition, AAFS offers a general CE certificate which may be used for purposes not outlined above.

To register for continuing education credit, please complete the appropriate section on the meeting Registration Form. An individual must be a registrant to obtain continuing education credit. Fees charged for continuing education credits are based on projected costs of providing the various types of continuing education credit. The AAFS has adopted a user-pay approach so that those individuals who benefit from the specific continuing education program are responsible for the costs incurred.

In order to be in compliance with accrediting organizations, introductions, breaks, and lunches have been deducted from the total hours. Please note that continuing education credit is not available for all sessions. All continuing education credit recipients will receive documentation regarding the number of continuing education hours awarded. Attendance reports are filed with the appropriate state or national agency, as required.

Learning Objectives of the AAFS Continuing Education Program

- Recognize the perspectives and roles of the various forensic science disciplines
- Assess current concepts and practices
- Discuss relevant forensic science issues related to science, evidence and the law
- Identify strategies for researching descriptive studies, technology and methods, diagnostics, interpretation and testimony
- Review administrative functions performed by forensic scientists

Faculty Disclosure Policy

As a sponsor of continuing education, the American Academy of Forensic Sciences must insure balance, independence, objectivity, and scientific rigor in all its educational activities. All faculty participating in a sponsoring activity are expected to disclose any significant financial interest or other relationship: (1) with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services discussed in an educational presentation; and, (2) with any commercial supporters of the activity. (Significant financial interest or other relationship can include such things as grants or research support, employee, consultant, major stockholder, member of speaker's bureaus, etc.) AAFS has an established policy regarding conflicts of interest that includes decisions the Program Committee members may make in selecting content for the Annual Scientific Meeting Program. By serving on the committee, regardless of role, each member has agreed to comply with Section 1.4.7. of the AAFS Policy and Procedure Manual.

To serve on the 2018-19 Program Committees, it is required that AAFS staff members, program committee members, and reviewers complete a Conflict of Interest form before they are provided access to review submissions for the program. For continuing education accreditation purposes, the disclosed relationships are published below so that learners are aware of the nature of any relationships that may impact the selection of presentations for the program. If a committee member failed to provide complete disclosure of a relevant financial interest or relationship, the committee member or reviewer was not allowed to serve. The executed Faculty Conflict of Interest forms are on file in the AAFS Office.
CONTINUING EDUCATION

American Board of Criminalists Approval

The American Academy of Forensic Sciences (AAFS) is approved by the American Board of Criminalistics (ABC) to offer continuing education points for approved workshops for criminalists and forensic scientists. The ABC maintains responsibility for the program, and credit may be awarded to ABC Fellows, Diplomates, and Affiliates.

Overall Purpose and Overview Statements for Major Aspects of AAFS Programs

Workshops and Special Sessions
Purpose: To provide an opportunity for experts to present material and to lead discussion and practical exercises related to forensic science methods, procedures, diagnosis, investigation, professional relations and practices, communication, administration, and professional development.

Learning Overview: Detailed individually in each workshop and special session announcement and description.

CE Credit: Varies from 1.5 credit hours to 16 credit hours.

Breakfast/Luncheon Seminars
Purpose: To provide an opportunity for presentation and discussion of relevant historical and current topics of forensic science interest related to specific case investigations, or general or specific investigative needs and procedures, methodologies, and testimony.

Learning Overview: Detailed individually in each breakfast/luncheon seminar announcement and description.

CE Credit: Designated for a maximum of .75 credit hour for Breakfast Seminars and 1.0 credit hour for Luncheon Seminars.

Plenary Session
Purpose: To provide a multidisciplinary presentation and discussion of issues related to the forensic science profession.

Learning Overview: Attendees will be able to: a) identify the challenges the forensic science profession has faced and will continue to face in terms of ensuring quality; b) identify ways to deal with the variances each challenge presents; and, c) identify the entities which have influence over setting the quality standards in the field of forensic science.

CE Credit: Designated for a maximum of 2.0 credit hours.

Oral and Poster Section Scientific Sessions
Purpose: To provide an opportunity for presentation and discussion of case reports, descriptive studies, review presentations, research, administrative issues, and investigative/diagnostic methods regarding topics and issues of importance to a primary discipline among the forensic sciences.

Learning Overview: To meet the educational objectives stated by each presenter for his/her presentation.

CE Credit: Varies according to the individual's session attendance. Designated for a maximum of 25.0 credit hours.

Last Word Society
Purpose: To provide a retrospective forensic analysis of historical events and to provide education about the history and evolution of forensic sciences as well as the modern methods and technologies used to re-examine past events of forensic science interest. Emphasis is placed on the evaluation of the original opinions and case outcome and on the development of newer hypotheses based on the re-analysis.

Learning Overview: To meet the educational objectives stated by each presenter for his/her presentation.

CE Credit: Designated for a maximum of 2.0 credit hours.
CONTINUING EDUCATION

Guidelines For Claiming Credit

As the sponsor of Continuing Education Credit, the AAFS recognizes that the forensic science disciplines are inextricably linked and that interdisciplinary knowledge is critical to promote competence in forensic practice. As a result, the claiming of credit for various continuing education activities related to medicine, dentistry, law, and other forensic disciplines need not be limited to one's primary professional specialty. For example, a forensic pathologist from the Pathology/Biology Section may gain very useful and relevant information by attending a presentation in the Anthropology Section scientific session. It is appropriate to claim continuing medical education credit for that session. Many other examples exist where the claiming of continuing education credit is appropriate for attending sessions that cover material related to, but which lay outside of, one's primary professional area of expertise.

It is the conference attendee's responsibility to document which program sessions were attended and to determine those sessions for which continuing education credit may be claimed. The AAFS operates under the assumption that meeting attendees will, in general, be unlikely to attend sessions that will not be beneficial to their professional practice and that the claim for continuing education credit is justified if a session contains scientific or practice-related information that may bring new knowledge, may affirm current knowledge, or may provide information that could possibly modify one's professional practices.

Those who wish to receive continuing education credit must register and pay the Continuing Education Credit fee on the meeting Registration Form. CE Credit Request Forms will be available at the registration desk. The completed forms must be returned to AAFS by the designated deadline.

Dental

This continuing education activity has been planned and implemented in accordance with the standards of the ADA Continuing Education Recognition Program (ADA CERP) through joint providership efforts between Postgraduate Institute for Medicine and the American Academy of Forensic Sciences.

Postgraduate Institute for Medicine is an ADA CERP Recognized Provider. ADA CERP is a service of the American Dental Association to assist dental professionals in identifying quality providers of continuing dental education. ADA CERP does not approve or endorse individual courses or instructors, nor does it imply acceptance of the credit hours by boards of dentistry. Concerns or complaints about a CE Provider may be directed to the provider or to ADA CERP at www.ada.org/cerp.

Legal

Continuing legal education credit will be awarded on an hour-for-hour basis. Attorneys may file the AAFS-issued CLE certificate with their respective state bars.

Medical

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of Postgraduate Institute for Medicine and the American Academy of Forensic Sciences. The Postgraduate Institute for Medicine is accredited by the ACCME to provide continuing medical education for physicians. The Postgraduate Institute for Medicine designates this live activity for a maximum of 44.75 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

General

General continuing education credit is offered for those practicing the various forensic science disciplines not represented in the aforementioned list.
The American Academy of Forensic Sciences would like to thank the following supporters for their contributions to the 2019 AAFS 71st Annual Scientific Meeting:

Agilent Technologies, Inc.
Anthropology Section
Biotage
Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation
Criminalistics Section
Divers Alert Network
Ellis R. Kerley Forensic Sciences Foundation
John Wiley & Sons Ltd.
Jurisprudence Section
Lemos Toxicology Services LLC
Lipomed, Inc.
NMS Labs
Pathology/Biology Section
Price-Hansen & Associates, LLC
Psychiatry & Behavioral Science Section
RTI International
UCT
UTAK Laboratories, Inc.
Get the most up-to-date meeting information. Download the AAFS 2019 Guidebook Mobile App

Schedules, Maps, Exhibitor information, and more are available on your mobile device - completely free.

Download Guidebook on the Apple App Store or Android Marketplace, or visit: https://guidebook.com/g/aafs2019/.
Pre-registration was required.

Tuesday
February 19, 2019     9:00 a.m. - 2:00 p.m.

The purpose of the Student Academy of Forensic Sciences is to bring to the attention of local area high school and college students the vital importance of the application of scientific principles to the administration of justice. It acquaints the participants with the role of the forensic science disciplines in the legal system as well as the education and training required for the career in each discipline. All high school and college-age students are welcome to attend.

Chair:
Julie A. Howe, MBA
Saint Louis University
St. Louis, MO

Co-Chair:
Marilyn T. Miller, EdD
Virginia Commonwealth University
Richmond, VA

Faculty:
Anthropology:
Ginessa A. Lest, PhD
Louisiana State University
Baton Rouge, LA

Criminalistics:
Lynn A. Schneeweis, MS
Massachusetts State Police Crime Laboratory
Maynard, MA

Digital & Multimedia Sciences:
Richard Vorder Bruegge, PhD
Federal Bureau of Investigation
Quantico, VA

Engineering Sciences:
Roy Crawford, BSME
RR Crawford Engineering, Inc
Whitesburg, KY

General:
Brian S. Clark, MFS
Federal Bureau of Investigation
Chicago, IL

T.L. Williams, MFS
Fredericksburg, VA

Jurisprudence:
Pamela A.W. King, JD
Minnesota State Public Defender Office
Rochester, MN

Odontology:
Lillian A., Nawrocki, DDS
Office of the Medical Examiner
Suffolk County, NY

Pathology/Biology:
James J.C.U. Downs, MD
forensiX, LLC
Savannah, GA

Psychiatry & Behavioral Science:
Eleanor B. Vo, MD
OmaDesala Psychiatric Services
Ewing, NJ

Questioned Documents:
Jennifer Furman, MFS
TIGTA Forensic Science Laboratory
Beltsville, MD

Jason V. Le, MFS
TIGTA Forensic Science Laboratory
Beltsville, MD

Toxicology:
George F. Jackson, PhD
Armed Forces Medical Examiner System
Willingboro, NJ

Ashraf Mozayani, PhD
Texas Southern University
Houston, TX
S1  Insane or Just Bad? The Anatomy of the Not Guilty by Reason of Insanity (NGRI) Defense

Tuesday
February 19, 2019  8:30 a.m. – 12:30 p.m.  3.75 CE Hours

Chair:
Karen B. Rosenbaum, MD*
New York, NY

Co-Chair:
Jan Seaman Kelly, BA
Forensic Dynamics LLC
Las Vegas, NV

Faculty:
Stephanie Domitrovich, JD, PhD*
Sixth Judicial District of Pennsylvania
Erie, PA

Jennifer Piel, MD*
Seattle, WA

Daniel A. Martell, PhD*
Park Dietz & Associates
Newport Beach, CA

Christopher R. Thompson, MD*
Los Angeles, CA

Susan Hatters-Friedman, MD*
University of Auckland
Auckland, NEW ZEALAND

Evan Van Leer Greenberg, JD*
Van Leer & Greenberg
New York, NY

Valerie Van Leer Greenberg, JD*
Van Leer & Greenberg
New York, NY

*Presenting Author

Learning Overview: Attendees will have a greater understanding of what it means to establish a Not Guilty by Reason of Insanity (NGRI) defense, the risks and benefits of the defense, and a greater appreciation for issues facing the mentally ill in the criminal justice system.

Impact on the Forensic Science Community: The NGRI defense is not widely understood. This presentation will impact the forensic science community by helping to demystify the history and present state of the defense in the United States.

Program Description: This program will focus on a broad explanation and discussion of criminal responsibility and the NGRI defense. Discussion will be from the perspective of attorneys, judges, juries, and mental health professionals. The discussion will include the history of the defense, the current state of the defense, the "diligence, dedication, and devotion" that goes into the preparation of this defense (which is often unsuccessful), and the meaning of testifying on either side. This presentation will illustrate these points by utilizing at least one specific case example.

The theme for the 2019 American Academy of Forensic Sciences meeting is Diligence, Dedication, and Devotion. To illustrate this, the 2019 Interdisciplinary Symposium focuses on the diligence, dedication, and devotion that goes into presenting or opposing an NGRI defense. Recently, there has been more attention paid to the problem of mentally ill patients being treated in the criminal justice system. The symptoms and impairments most mentally ill defendants demonstrate do not make them an insanity defense. Even when the insanity defense is appropriately claimed, there is usually still controversy around its use.

The insanity defense is often misunderstood by the public because of misinformation and inaccurate media portrayals of the defense. Even within the court system, there is misunderstanding among judges, defense attorneys, and prosecutors as to what the defense means and when it is appropriate to use it, or even why the defense exists at all. This symposium will explain the history of the defense and will illustrate many aspects of the defense from the point of view of different court personnel and clinicians. Panelists will also...
**INTERDISCIPLINARY SYMPOSIUM**

*On-site registration is available — $75*

**S1 Insane or Just Bad? The Anatomy of the Not Guilty by Reason of Insanity (NGRI) Defense**

Program Description cont.:

discuss: criminal responsibility of juveniles, the role of neuropsychological testing, jury instructions, and the jury's perspective. Additionally, two experienced attorneys will provide their perspective on a recent high-profile case in New York City that took five-and-a-half years of intense diligence, dedication, and devotion to prepare for and try. A sitting judge (and member of the Jurisprudence Section) will speak on her experiences with this defense in Pennsylvania, and a forensic psychiatrist who has lived and practiced in New Zealand for many years will provide an international perspective via her experiences with the insanity defense and with high-profile cases.

A question-and-answer discussion session at the end of the symposium will enable attendees to ask questions of the speakers and for the speakers to ask questions of their fellow panelists. The goal of the panel is to educate attendees on questions of criminal responsibility as they pertain to people with significant mental health issues at the time of the crime and on juveniles, primarily by focusing on the NGRI defense.

**Program:**

8:30 a.m. -  8:45 a.m.  Opening Remarks and a Brief History of the Insanity Defense  
*Karen B. Rosenbaum, MD*

8:45 a.m. -  9:05 a.m.  Criminal Responsibility in Juveniles  
*Christopher R. Thompson, MD*

9:05 a.m. -  9:40 a.m.  Neuropsychological Testing in NGRI/Testifying for the Prosecution  
*Daniel A. Martell, PhD*

9:40 a.m. -  10:35 a.m.  The Role of the Defense Attorney Putting on the Insanity Defense—A Case Example  
*Evan Van Leer Greenberg, JD; Valerie Van Leer Greenberg, JD*

10:35 a.m. -  10:50 a.m.  Break

10:50 a.m. -  11:15 a.m.  Jury Instructions for NGRI in the United States  
*Jennifer Piel, MD*

11:15 a.m. -  11:45 a.m.  The Role of the Judge in NGRI and Other Cases of Diminished Criminal Responsibility in Pennsylvania  
*Stephanie Domitrovich, JD, PhD*

11:45 a.m. -  12:15 p.m.  The Insanity Defense in New Zealand  
*Susan Hatters-Friedman, MD*

12:15 p.m. -  12:30 p.m.  Questions and Answers

*Presenting Author*
S2 Transitioning Young Scientists: Diligence, Dedication, and Devotion for Research and Casework Applications

Tuesday

February 19, 2019  8:30 a.m. – 5:00 p.m.  4.75 CE Hours

YFSF Chair:
Alex J. Krotulski, MS*
Center for Forensic Science Research & Education
Willow Grove, PA

YFSF Committee Members:
Brittany N. Beyer, MS
Houston Forensic Science Center
Houston, TX

Zain Bhaloo, MSc
Canada Border Services Agency
Ottawa, ON, CANADA

Program Chair:
Amanda R. Hale, MA*
North Carolina State University
Raleigh, NC

Program Co-Chair:
Elisa N. Shoff, BS*
Miami-Dade Medical Examiner Department
Miami, FL

Learning Overview: After attending this presentation, young scientists will better understand the disciplines contained within the American Academy of Forensic Sciences (AAFS) and the work being conducted within the respective fields. In addition, attendees will also learn about the importance of standards, innovative research, and casework in the continued development of each discipline.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by educating young and aspiring scientists on the steps needed to succeed as a forensic scientist and the importance of the work contained in each discipline. By providing attendees with a wide range of discussions from senior members of the forensic science community, young scientists will feel better prepared to succeed in the field of their choice and will be given the opportunity to interact with these speakers.

Program Description: This year, the Young Forensic Scientists Forum (YFSF) has been restructured to better fit the needs and interests of both young scientists and the AAFS. This day-long session will focus on the foundation of forensic science and the commitment and qualities needed to pursue a successful career in most of the AAFS disciplines. Senior forensic scientists, spanning all disciplines, including current section chairs, will speak on topics including ethics, case studies, academia, novel research, etc. By compiling this unique group of presentations, we hope to appeal to young scientists from all disciplines, helping them integrate into the AAFS and beginning their journeys in forensic science.

At the end of the session, a résumé review will be conducted, giving young professionals an opportunity to seek one-on-one advice from prominent forensic scientists and representatives in their potential discipline. This time will also serve as a chance to network with peers and professionals and to develop valuable connections.

The YFSF will continue the tradition of hosting poster presentations as well as joining to the AAFS Bring Your Own Slides (BYOS) Session. The YFSF poster presentations will be held in conjunction with the AAFS Academy-wide poster sessions on Wednesday, Thursday, and Friday, with a special designation in the program for those presenting on behalf of the YFSF. The BYOS Session will be integrated into the AAFS BYOS session and will focus on interesting and unique case reports from young scientists in the field. If you are interested in presenting during the BYOS Session, please complete the abstract form in your welcome bag.

The YFSF looks forward to hosting all of these exciting and educational upcoming events. Our mission is to encourage education and career development through presentations and mentoring of young scientists, including young professionals and graduate or undergraduate students.

*Presenting Author
S2 Transitioning Young Scientists: Diligence, Dedication, and Devotion for Research and Casework Applications

Speakers

Jose R. Almirall, PhD*
Florida International University
Department of Chemistry
Miami, FL

M. Eric Benbow, PhD*
Michigan State University
Departments of Entomology & Osteopathic Medical Specialties
East Lansing, MI

Sabra R. Botch-Jones, MS
Boston University School of Medicine
Biomedical Forensic Sciences
Boston, MA

Rudy J. Castellani, MD*
Center for Neuropathology
Kalamazoo, MI

Dean Michael De Crisce, MD*
Special Treatment Unit
Avenel, NJ

Christine Funk, JD*
Saint Paul, MN

Pamela M. Hofsass, MS*
Contra Costa County Sheriff’s Crime Laboratory
Forensic Services Division
Martinez, CA

Cheryl D. Hunter*
American Academy of Forensic Sciences
Colorado Springs, CO

Nikolas P. Lemos, PhD*
University of California - San Francisco
Palm Springs, CA

Jennifer C. Love, PhD*
Office of Chief Medical Examiner
Washington, DC

Marcus Rogers, PhD*
Purdue University
West Lafayette, IN

Thomas W. Vastrick, BS*
Apopka, FL

Rebecca A. Waxse, JD*
Hugo, MN

Program:

8:30 a.m. - 8:35 a.m. Introduction
Alex J. Krotulski, MS

8:35 a.m. - 8:50 a.m. Membership in AAFS
Cheryl D. Hunter

8:50 a.m. - 9:15 a.m. Balancing Research, Consulting, Education, and Service: The Forensic Scientist's Conundrum
Marcus Rogers, PhD

9:15 a.m. - 9:40 a.m. Ethics in Forensic Science
Nikolas P. Lemos, PhD

9:40 a.m. - 10:05 a.m. Advancing Your Career: Tips From an "Old Timer"
Thomas W. Vastrick, BS

*Presenting Author
### S2 Transitioning Young Scientists: Diligence, Dedication, and Devotion for Research and Casework Applications

<table>
<thead>
<tr>
<th>Time</th>
<th>Duration</th>
<th>Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:05 a.m. - 10:20 a.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:20 a.m. - 10:45 a.m.</td>
<td>Navigating and Networking Academia and Forensic Science in the Emergence of Using Microbiomes in Death Investigation</td>
<td>M. Eric Benbow, PhD</td>
</tr>
<tr>
<td>10:45 a.m. - 11:10 a.m.</td>
<td>The Increasing Impact of Chronic Traumatic Encephalopathy on Forensic Medical Science</td>
<td>Rudy J. Castellani, MD</td>
</tr>
<tr>
<td>11:10 a.m. - 11:35 a.m.</td>
<td>Standards Development Within the Chemistry and Instrumental Analysis of the Organization of Scientific Area Committees (OSAC) of Forensic Science</td>
<td>Jose R. Almirall, PhD</td>
</tr>
<tr>
<td>11:35 a.m. - 12:00 p.m.</td>
<td>The Murder of Lisa Valdez: How Dedication and Devotion Helped Close the Case</td>
<td>Pamela M. Hofsass, MS</td>
</tr>
<tr>
<td>12:00 p.m. - 1:30 p.m.</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1:30 p.m. - 1:55 p.m.</td>
<td>How Diligence, Dedication, and Devotion Can Help You Avoid a Contentious Cross Examination</td>
<td>Rebecca A. Waxse, JD; Christine Funk, JD</td>
</tr>
<tr>
<td>1:55 p.m. - 2:20 p.m.</td>
<td>Criminality, Culpability, Capacity, and Competency: Forensic Psychiatry, Mental Health, and the Courts</td>
<td>Dean Michael De Crisce, MD</td>
</tr>
<tr>
<td>2:20 p.m. - 2:45 p.m.</td>
<td>Transitions in a Career in Forensic Toxicology: A Journey From Practitioner to Professor</td>
<td>Sabra R. Botch-Jones, MS</td>
</tr>
<tr>
<td>2:45 p.m. - 3:10 p.m.</td>
<td>A Career in Forensic Anthropology: Embracing the Rewards and Facing the Challenges</td>
<td>Jennifer C. Love, PhD</td>
</tr>
<tr>
<td>3:10 p.m. - 3:20 p.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:20 p.m. - 4:50 p.m.</td>
<td>Résumé Review</td>
<td></td>
</tr>
<tr>
<td>4:50 p.m. - 5:00 p.m.</td>
<td>Closing Remarks</td>
<td>Amanda R. Hale, MA; Elisa N. Shoff, BS</td>
</tr>
</tbody>
</table>
Pre-registration not required — Open to all meeting attendees

Accreditation of Forensic Science Academic Programs Through the FEPAC

Tuesday

February 19, 2019 8:30 a.m. – 12:45 p.m.

FEPAC Commissioners:
Jeffrey K. Tomberlin, PhD
Texas A&M University
College Station, TX

Michael J. Salyards, PhD
Compass Scientific Consulting LLC
Sharpsburg, GA

Jason L. Schroeder, MS
Harris County Institute of Forensic Science
Houston, TX

Learning Overview: Upon completion of this session, the participant should be able to understand the process of accreditation through the AAFS FEPAC mechanism and be able to participate in the process as a reviewer of academic programs. Attendees from academic programs will also learn about the process of accreditation from different perspectives.

Program Description: This session has been developed to assist academic institutions offering undergraduate and graduate degree programs in forensic science and forensic digital evidence to prepare for the accreditation process through the FEPAC. This session will also assist future on-site evaluators (academic and practitioners) to prepare for on-site evaluations of academic programs. Successful completion of this one-day session will qualify participants for consideration to serve as on-site evaluators for FEPAC in the future (please note that participants must still meet other FEPAC requirements, such as membership in the AAFS and designation as either a practitioner or academician).

The FEPAC is a standing committee of the AAFS with a membership that includes five educators, five forensic laboratory directors, and a public member as voting members. The mission of the FEPAC is to maintain and enhance the quality of forensic science education through a formal evaluation and recognition of college-level academic programs. The primary function of the committee is to develop and maintain standards and to administer an accreditation program that recognizes and distinguishes high-quality undergraduate and graduate forensic science programs. Forty academic programs have successfully completed the accreditation process since 2003. Additional information on FEPAC can be found on the FEPAC website: http://fepac-edu.org.

Program:

8:30 a.m. - 9:00 a.m.  Introduction and Welcoming Remarks
Module 1: Accreditation, Mission, and History of FEPAC
Michael J. Salyards, PhD

9:00 a.m. - 9:30 a.m.  Module 2: An Overview of FEPAC Process, Policies, and Procedures
Michael J. Salyards, PhD

9:30 a.m. - 10:00 a.m.  Module 3: A Review of Undergraduate Standards
Jeffrey K. Tomberlin, PhD

10:00 a.m. - 10:15 a.m.  Break

10:15 a.m. - 10:45 a.m.  Module 4: A Review of Graduate Standards
Jason L. Schroeder, MS

10:45 a.m. - 11:15 a.m.  Module 5: Questions and Answers
Michael J. Salyards, PhD; Jeffrey K. Tomberlin, PhD; Jason L. Schroeder, MS

11:15 a.m. - 11:45 a.m.  Module 6: The Role of the On-Site Evaluator
Jeffrey K. Tomberlin, PhD

11:45 a.m. - 12:15 p.m.  Module 7: Scenario and Evaluation
Michael J. Salyards, PhD; Jeffrey K. Tomberlin, PhD; Jason L. Schroeder, MS

12:15 p.m. - 12:45 p.m.  Questions and Answers
FEPAC Commissioners and Development and Outreach Coordinator
ES1  Adding Forensic Relevance to the Pediatric Autopsy With Defined Preautopsy Goals and Practical Techniques Using a Case-Based Approach

Tuesday
February 19, 2019     8:00 p.m. – 10:00 p.m.

Speakers:

Michael J. Caplan, MD*  Amy T. Sheil, MD*
Suffolk County Office of the Medical Examiner  Waukesha County Medical Examiner's Office
Hauppauge, NY  Waukesha, WI

Learning Overview: After attending this presentation, attendees will be able to: (1) describe the purpose of the autopsy in the evaluation of sudden unexplained or unexpected deaths in the setting of pediatric cardiac conditions (including therapeutic interventions and their complications); (2) highlight the added benefits of an autopsy when accompanied by ancillary studies in the evaluation of sudden unexplained deaths in infants and children with undiagnosed infectious diseases or metabolic or genetic disorders; (3) identify mimics of child maltreatment (abuse and neglect) revealed by postmortem examination; (4) describe and guide an approach to a pediatric autopsy in a death during or following (and potentially related to) a therapeutic procedure; (5) effectively communicate the value of the negative findings in a pediatric autopsy (“negative autopsy”) to clinicians and families; (6) improve their own institution's autopsy practices through learning points gleaned by exposure to case-based examples; and (7) gain experience and proficiency with particular techniques relevant to the pediatric autopsy through use of a supplementary tutorial of specialized autopsy procedures and dissections.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by improving attitudes and practices regarding autopsies and by making the pediatric autopsy a more useful and serviceable tool for the consumers of the information imparted by the autopsy. The two primary goals of the presentation are to: (1) provide an initiative to enhance the practical value (diagnostic and educational yield) of a pediatric autopsy; and (2) apply the lessons gleaned from the autopsy to improve patient outcomes and reduce risks of recurrence of adverse outcomes.

Autopsy training in pathology residency varies greatly among teaching institutions, and resources including case material and faculty time are unevenly distributed. With diminishing numbers of hospital autopsies, including pediatric and perinatal autopsies, the opportunity for pediatric pathologists to gain proficiency and competence in performing autopsies has become more limited. Many pathologists in practice perform too few autopsies to maintain optimal skills and practices. Increasing reliance upon pathologists' assistants to conduct gross examinations further restricts the experience of practicing pathologists. There exists a real risk among pediatric pathologists of insufficient ongoing experience with pediatric autopsies. There is also a tendency to include data in the body of the autopsy report that has limited clinical significance or that is incompletely addressed. All of these factors conspire to undermine the potential value and utility of the pediatric autopsy in clinical practice. These issues illustrate gaps in practice experience and current knowledge. There exists a definite need to provide education for practicing pediatric pathologists to enhance the clinical usefulness and relevance of autopsy reports. Forensic pathologists are in a potentially advantageous position to help pediatric pathologists with this challenge because, since autopsies are the mainstay of their primary activities, they understand the practical importance of delivering meaning and relevance to individuals to whom they need to present their findings in various medicolegal settings. The ultimate goal of this presentation is to facilitate communication and crosstalk between forensic and pediatric pathologists in order to achieve optimal benefits of pediatric autopsy results.
ACADEMY CUP

Pre-registration not required — Open to all meeting attendees

Wednesday

February 20, 2019     8:00 a.m. – 8:45 a.m.

Come and Play!

A Quiz Game to Test Your Knowledge of Forensics and AAFS

The AAFS 2019 Academy Cup will take place on Wednesday, February 20, before the Plenary Session. Teams meet at 8:00 a.m., an hour before the Plenary Session, for instructions and team strategy. The game consists of multiple-choice and true-or-false questions projected onto a screen to test each section's knowledge. Every section is out to win it big this year.

Each section's team is comprised of Past President(s), Past Vice President(s), Board Member(s) and/or Section Officer(s), Chair, Secretary, Young Forensic Scientists Forum (YFSF) volunteers, as well as the section leader's other strategic choices. The YFSF volunteers will be assigned to sections on Tuesday during the YFSF Special Session. Teams will have 30-40 minutes to answer questions. The YFSF volunteers are at the center of each team as they point out the correct answer to each question. At the end, the YFSF volunteer will tally the team's total.

The winning team will be announced and the coveted Academy Cup trophy presented at the AAFS Annual Business Meeting at 4:15 p.m. Teams should be present at the Annual Business Meeting to discover who won. The winning team will have its photo taken at the conclusion of the Annual Business Meeting.

If you just want to test your knowledge, the room is open for all attendees. Feel free to join your section behind your flag to cheer them on!

Academy Cup Committee:

Chair: Laura L. Liptai, PhD, Engineering Sciences
       (liptai@biomedicalforensics.com)
Co-Chair: Carla Miller Noziglia, MS, Criminalistics
Co-Chair: Matthew R. Wood, PhD, Criminalistics
Co-Chair: Winona J. Agbabiaka, JD, Jurisprudence

Academy Cup Team Leaders:

Anthropology: Jennifer C. Love, PhD; Paul D. Emanovsky, PhD
Criminalistics: Kristy Kadash, PhD; Patrick Buzzini, PhD
Digital & Multimedia Sciences: Marla E. Carroll, BS; Jason M. Paroff, JD
Engineering Sciences: Darren Franck, MSME; David Pienkowski, PhD
General: Joanna L. Collins, MFS; Steven C. Clark, PhD
Jurisprudence: Pamela A.W. King, JD; Christine Funk, JD
Odontology: Adam J. Freeman, DDS; Roger D. Metcalf, DDS, JD
Pathology/Biology: David O. Carter, PhD; Chris Milroy, MD, LLB
Psychiatry & Behavioral Science: Dean Michael De Crisce, MD; Sebastien S. Prat, MD
Questioned Documents: Jan Seaman Kelly, BA; Karen J. Nobles, BA
Toxicology: Nikolas P. Lemos, PhD; William R. Johnson, BA

Program:

8:00 a.m. Instructions, Introductions of Team Leaders, and Team Strategizing
8:05 a.m. PowerPoint® Questions and Team Answer Sheet Turned In After the Game
8:45 a.m. Conclusion of Competition
PLENARY SESSION

Pre-registration not required — Open to all meeting attendees

Wednesday

February 20, 2019 9:00 a.m. – 11:30 a.m. 2.25 CE Hours

Welcoming Remarks

Diligence, Dedication, and Devotion

Susan M. Ballou, MS

President
American Academy of Forensic Sciences
Gaithersburg, MD

Plenary Session Chair:
James J.C.U. Downs, MD
forensX, LLC
Savannah, GA

Plenary Session Co-Chair:
C. Ken Williams, MS, JD
New Jersey State Police Office of Forensic Sciences
Central Regional Laboratory
Hamilton, NJ

Speakers

Bonnie Armstrong, BS
The Shaken Baby Alliance
Fort Worth, TX

Ted R. Hunt, JD
United States Department of Justice
Washington, DC

John F. Sattler, BS
United States Naval Academy
Annapolis, MD

Overview:

“Whether our members are applying new technology to existing techniques or challenging The Federal Rules of Evidence, the desire to improve our profession is evident. These attributes represent our Diligence to the effort, our Dedication to handling the details, and our Devotion to the field.” — Sue Ballou, AAFS President

Why? Why do Forensic Specialists from all disciplines have the commitment to public service despite subjecting themselves to adversarial scorn, interminable bureaucracy, and less-than-optimal resources? How do they show such loyalty and enthusiasm while maintaining objective scientific neutrality in the face of legal and public scrutiny? What drives the careful persistence while the scientific underpinnings of the various specialties are challenged? Who would work in such a system while lives are literally on the line? What could they be thinking? The answers come down to a very fundamental principle: serving the cause of justice and striving to do so every single time.

Consider: practitioners do it because it is the right thing to do.
Diligence, Dedication, and Devotion

Overview cont:

The scientist working with tenacity on a case despite crushing backlogs. The physician, anthropologist, and entomologist laboring on a child abuse case despite the anticipated cross examination. The prosecutor seeking conviction in a complex and convoluted anthropology cold case. The criminal defense attorney attempting to present a scientifically and medically informed defense despite limited resources. For the forensic professional, the “it never hurts to say ‘I can’t say’ ” aphorism is only valid if the answer is truly unknowable based on available information. If there is an answer to be found, the dedicated practitioner will seek the facts with dogged determination. Ideally, all share one common purpose—seeking justice in an imperfect world. Justice for the victim(s), justice for society, and justice for the accused.

Hopefully, few know what it is like to be a real victim. That is, to personally be victimized. Wrongful convictions do occur, and good folks go to extraordinary means to seek to have these overturned. Others have suffered and continue to suffer by proxy. Family and friends of crime victims relive the traumas with flawed investigations, challenged witnesses, retrials, etc. Conscientious forensics personnel want to do what they do better and faster. As evidenced by the current epidemic of opioid-associated deaths and many other examples, the federal government is trying to provide tools to the forensics community. Ultimately, forensic specialists labor every day—not for the headlines but for the sense of team and loyalty in pursuit of truth—day in and day out doing the tedious work that helps serve the common good and doing so with dedication, devotion, and diligence.

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 a.m.</td>
<td>Welcoming Remarks</td>
<td>Susan M. Ballou, MS</td>
</tr>
<tr>
<td>9:10 a.m.</td>
<td>Fighting Back: Victimization—And What to Do About It</td>
<td>Bonnie Armstrong, BS</td>
</tr>
<tr>
<td>9:40 a.m.</td>
<td>Rededication to a Common Cause: The Search for Truth in the Name of Justice</td>
<td>Ted R. Hunt, JD</td>
</tr>
<tr>
<td>10:20 a.m.</td>
<td>Diligence, Dedication, and Devotion—In the Real World</td>
<td>John F. Sattler, BS</td>
</tr>
<tr>
<td>11:10 a.m.</td>
<td>Panel Discussion</td>
<td>Susan M. Ballou, MS; John F. Sattler, BS; Ted R. Hunt, JD; Bonnie Armstrong, BS</td>
</tr>
</tbody>
</table>
BS1    Checklists and the Scientific Method: Will Lawyers Make You Eat Your Checklists for Breakfast?

Monday, February 18, 2019    7:00 a.m. – 8:30 a.m.         .75 CE Hour

Terry-Dawn Hewitt, LLM*    Wayne J. McKenna, LLB*
McKenna Hewitt             McKenna Hewitt
Denver, CO                 Denver, CO

Learning Overview: The purpose of this presentation is to stimulate thought and discussion among attendees regarding the pros and cons for experts who use checklists to help them investigate or analyze issues that may end up in court. Attendees will learn some of the benefits for those experts who develop and utilize checklists as an aid in applying the scientific method. Attendees will also be introduced to some of the risks to such experts from litigation strategies employed by opposing lawyers who obtain access to these checklists. The goal of this presentation is to demonstrate that the benefits of checklists can outweigh the litigation risks, which can be managed and may be inevitable in any event.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by helping those involved with civil or criminal cases develop strategies for dealing with checklists in litigation. This presentation will explain why checklist development by trial lawyers for the purposes of challenging forensic experts is to be expected, using examples from the field of fire investigation. With this perspective, members of each forensic science discipline are encouraged to take steps to begin the thoughtful development and implementation of checklists based on their industry standards. In this way, they can begin obtaining the benefits of such checklists while implementing measures to manage the litigation risks.

In 2017, the National Commission on Forensic Science approved a Views Document on the Use of Checklists in Forensic Science, indicating that it may be beneficial to pursue scientific studies into the employment of checklists in various aspects of the forensic sciences. This Views Document cites examples of the successful use of checklists in the fields of health care and aviation, as well as in the criminal justice system. It also hypothesizes that when properly structured, checklists can help certain forensic science applications by reducing human error and bias.

While scientific studies into the pros and cons of using checklists, as suggested by the Commission, is a sound idea, the issue is whether forensic experts should hold off on utilizing checklists until the results of any such scientific studies are published. Alternatively, should experts consider immediately exploring the use of checklists in their fields? Why? Because lawyers are already developing and using checklists to challenge expert witnesses.

The proliferation of consensus standards in each forensic discipline empowers lawyers (with the help of their own experts) to develop checklists based on these standards. These checklists can simplify an attorney’s task of finding shortcomings or bias in the work of forensic experts. Therefore, in this world of increasing standardization, the strategy of failing or refusing to develop or use checklists will not shield experts from having competent counsel use checklists to test the expert on his or her competence, thoroughness, or bias. By being checklist-adverse, experts cannot avoid the associated litigation risks. Conversely, they may fail to experience the benefits checklists have to offer. It is reasonable for experts to be concerned about criticisms that can arise from items on checklists that go unaddressed. However, by planning ahead, strategies are available to counter such attacks.

Experts and their organizations will ultimately have to conduct their own risk-benefit analysis concerning the use of checklists. Assuming checklist development by trial attorneys is likely, members of each forensic science discipline can get ahead of this curve in three ways. First, by taking steps to determine the best application of checklists in their practice. Next, by getting plans underway to develop and revise checklists based on industry standards. Finally, by being mindful of litigation challenges that can be based on these checklists, with a view to including risk management training and tactics for the experts who use them.

Reference(s):
BREAKFAST SEMINARS

Pre-registration was required.

BS2  Voir Dire: Is It Science or Is It “Bull”—A Historical Perspective and Comparative Analysis

Monday, February 18, 2019  7:00 a.m. – 8:30 a.m.  .75 CE Hour

Patricia C. Smith, MSL*
Harris County District Attorney’s Office
Houston, TX

Randall Smith, BSME
Houston, TX

Patricia Williams, MS, RN
Cambria, CA

Learning Overview: The goal of this presentation is to encourage dialogue about voir dire and explore what the scientific and legal communities can do to ensure an unbiased jury.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by reaching out to other disciplines to promote jury service and encourage a fair and unbiased jury selection process through enhanced research, testing, and analysis.

The United States Constitution ensures the Defendant’s right to a jury trial. The United States is not the only country that engages in jury trials. Great Britain, Canada, Australia, New Zealand, and more than 40 other nations employ juries of citizens drawn from the general population who decide cases collectively.

Scotland, Wales, and Canada do not give the right to a jury trial to defendants “ … for which the prescribed punishment is less than two years in prison.” However, 80% of all jury trials worldwide take place in the United States.

The makeup of a jury consists of judges, lay persons, citizens, and experts who are utilized in other countries depending on the type of case. Historically, jury selection excludes those new to the area, non-citizens, advanced age, poor health, non-voters, and non-drivers. Some people are automatically excluded (for example, Los Angeles County Probation Officers are excused from jury duty once they fill out the jury service survey).

A jury’s role is to render a verdict based on evidence presented at trial. Each juror is to be convinced beyond a reasonable doubt. There is no clear definition of reasonable doubt and many legal scholars, judges, and lawyers will not attempt to define it. Some legal reactionaries have opined a preponderance of the evidence is loosely quantifiable as >=51% and beyond a reasonable doubt is more than that. How can a jury render a fair and unbiased verdict if the jury does not know or understand what reasonable doubt is? Unfortunately, it is this lack of clarity that opens the door for jury misconduct.

Our Founding Fathers were very familiar “with a long list of government abuses from English history … [where] the English monarchy had punished, tortured, and killed people for everything from disagreeing with the king to choosing a different religious path from the government’s approved denomination;” a practice that resulted in an increase in jury misconduct. Therefore, is society picking “the lesser of two evils” and should reaching a jury verdict supersede the attempt of perfect justice?

The Lord Mansfield’s Rule from 1785 said “jurors could not impeach their verdict by making affidavits or otherwise testifying as to their own misconduct.” However, in 1905, the Texas Legislature allowed jurors to testify during hearings based on jury misconduct. The idea of cases overturned because of a juror’s misconduct or allegations of a juror’s misconduct has fueled the notion for the need of criminal justice reform. More specifically, the need for scientific jury selection or professional jurors may be the solution.
Impact on the Forensic Science Community cont.:

People have become desensitized after decades of watching television shows and movies about police officers, lawyers, and doctors. Is it possible professional jurors already exist? Are jurors more likely created by clever lawyers and jury consultants? The following is a list of cases, television shows, and movies involving jury misconduct that may have been prevented through carefully constructed voir dire or utilizing trial consultants differently:

- People of the State of California v. Orenthal James Simpson
- Lloyd v. Johnson & Johnson
- State of Florida v. John Goodman
- Television show, Bull
- Motion picture, Runaway Jury
- 12 Angry Men (1957) and Twelve Angry Men (1997)

Ultimately, there has been little to no research determining that utilizing consultants directly or indirectly adversely affected voir dire or jury verdicts.

Reference(s):
1. 6th Amendment, United States Constitution.

*Presenting Author
BS3  Digging Up New Standards for Forensics: An Update on Standards Developing Organizations (SDOs)

Tuesday, February 19, 2019  7:00 a.m. – 8:30 a.m.  .75 CE Hour

Teresa Ambrosius*  
American Academy of Forensic Sciences  
Colorado Springs, CO

Karen Reczek, MLS*  
National Institute of Standards and Technology  
Gaithersburg, MD

Learning Overview: After attending this presentation, attendees will: (1) learn about advances in forensic science standardization from United States SDOs, including the American Academy of Forensic Sciences (AAFS) Standards Board (ASB), the American Society for Testing and Materials (ASTM) International, the American Dental Association (ADA), and the National Fire Protection Association (NFPA), as well as international SDOs, and the International Organization for Standardization (ISO); and (2) gain a better understanding of the progress of documentary standards development in different forensic science disciplines, including fire debris, seized drugs, biology, digital evidence, toxicology, friction ridge, blood stain pattern, footwear/tire tread, crime scene investigation, and fire investigation.

Impact on the Forensic Science Community: The 2009 Report by the National Research Council stressed the lack of standardization in forensics.1 The advent of the Organization of Scientific Area Committees (OSAC) for Forensic Science, administered by the National Institute of Standards and Technology (NIST), has resulted in several years of concerted efforts to identify gaps in standards and begin their development using the voluntary consensus standards development process. This presentation will impact the forensic science community by making attendees aware of new and emerging standards in the various forensic science disciplines and how they can be implemented in the laboratory setting, incorporated into quality manuals, be applied to accreditation scopes, and can assist in further validation of methods and techniques in interlaboratory studies.

Presenters will provide an overview of recent progress in standards development in forensic sciences. In 2009, the National Research Council Report, *Strengthening Forensic Science in the United States: A Path Forward*, summarized the challenges facing the forensic science community and the lack of mandatory standardization, certification, and accreditation.3 From this Report, the Department of Justice (DOJ) and the NIST signed a Memorandum of Understanding which led to the establishment of the National Commission on Forensic Science (NCFS) and the NIST-administered OSAC for Forensic Science. OSAC has been working closely with various SDOs to bring the community together to define requirements for the various disciplines for submission to the standards development process.

Learn about standards currently in development, soon to be published, and new standards from various SDOs, such as ASB, ASTM International, ISO, the American Dental Association (ADA), and the NFPA. New standards include interdisciplinary topics, such as evidence collection and labeling, interpretation, and reporting, and discipline-specific standards in the areas of criminalistics, digital evidence, facial recognition, photography, biology, pattern evidence, and crime and fire scene investigation, with a focus on terminology, measurement uncertainty, measurement traceability, quality assurance, and calibration.

Reference(s):

*Presenting Author
BS4  The American Academy of Forensic Sciences (AAFS) Responds to the Opioid Crisis

Wednesday, February 20, 2019    7:00 a.m. – 8:30 a.m.         .75 CE Hour

Bruce A. Goldberger, PhD*
University of Florida College of Medicine
Department of Pathology
Gainesville, FL

Barry K. Logan, PhD*
NMS Labs/Center for Forensic Science Research & Education
Willow Grove, PA

Michael F. Rieders, PhD*
NMS Labs
Willow Grove, PA

Victor W. Weedn, MD, JD*
George Washington University
Washington, DC

Agnes D. Winokur, MS*
Drug Enforcement Administration/Southeast Laboratory
Miami, FL

*Presenting Author

Learning Overview: After attending this presentation, attendees will be able to describe how the AAFS responded to the impact of the ongoing opioid crisis on the forensic sciences by creating a presidential committee to align the efforts of the AAFS sections impacted by the workload, resulting in the increase in forensic examinations related to the investigation of opioid-related crimes and fatalities.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating a key role for the AAFS in coordinating the community's response to external events that impact the profession. Specifically, this presentation will demonstrate that AAFS members and the organization have played a role in developing and implementing strategies designed to counter the effects of the opioid crisis on the practice of forensic science.

The AAFS Ad Hoc Committee on Synthetic Opioids was established in 2017 in an effort to evaluate the multidisciplinary effects of the opioid crisis on the forensic sciences. The members of the committee represent the most impacted disciplines and their unique perspectives are used to increase awareness and better our understanding of the opioid crisis in the fields of criminalistics, forensic pathology, toxicology, and pharmacology.

In the past year, synthetic opioid-related non-fatal and fatal overdoses have continued to increase, specifically those associated with fentanyl analogs. This fentanyl threat is multi-faceted and requires the collaborative efforts of various forensic disciplines, including chemistry, pathology, and toxicology. In a collective effort, the AAFS Ad Hoc Committee on Synthetic Opioids has created four subcommittees to gather diverse resources and focus them in a coordinated and targeted approach. Experts will provide an update on the four subcommittees as well as share their experiences and perspectives. The subcommittees are: (1) the Advocacy Subcommittee which tracks congressional legislation and budget proposals that would influence the forensic sciences related to the opioid crisis; (2) the Information-Sharing Subcommittee which acts as a clearinghouse for the activities of various allied professional organizations, including the Association of Public Health Laboratories (APHL), the American Industrial Hygiene Association (AIHA), the Centers for Disease Control and Prevention (CDC), the Consortium of Forensic Science Organizations (CFSO), the American Association of Crime Lab Directors (ASCLD), and others; (3) the AAFS-Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) Resource Landing Page Subcommittee which works to identify and list valuable resources that can be linked to the AAFS-SWGDRUG Landing Page and used by the forensic community in their efforts to combat the opioid epidemic in the United States; and (4) the American Society for Testing and Materials (ASTM) Standard Practice Subcommittee which has identified a need for standards that would help forensic practitioners (federal, state, local, and private) overcome the analytical challenges associated with the detection, identification, and reporting of novel and emerging opioids. The group seeks to work with ASTM and other organizations in creating standards that provide guidelines for the analysis of opioids, as well as a standard for naming these novel and emerging substances.

This breakfast session will highlight the activities of the AAFS Ad Hoc Committee on Synthetic Opioids with a focus on sharing identified resources, solutions, and best practices with the AAFS membership.
**BREAKFAST SEMINARS**

*Pre-registration was required.*

### BS5  Dining With DNA: Extracting Usable Profiles From Burned Bone

**Thursday, February 21, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>.75 CE Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 a.m. – 8:30 a.m.</td>
<td>.75 CE Hour</td>
</tr>
</tbody>
</table>

**Katelyn L. Bolhofner, PhD**  
Arizona State University  
Tempe, AZ  

**Laura C. Fulginiti, PhD**  
Forensic Science Center  
Phoenix, AZ  

**Jane E. Buikstra, PhD**  
Arizona State University  
Tempe, AZ  

**Ann Stone, PhD**  
School of Human Evolution and Social Change  
Tempe, AZ  

**Matthew V. Emery, PhD**  
Arizona State University  
Tempe, AZ  

**Learning Overview:** The major goal of this presentation is to offer best-practice procedures for the recovery of samples from burned skeletal remains for the purpose of recovering DNA for identification purposes.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing a predictive model for determining which samples from incinerated skeletal remains are likely to produce the best results for Short Tandem Repeat (STR) testing (expanded Combined DNA Index System (CODIS) loci with miniSTRs), for mitochondrial Genome (mtGenome) sequencing, and for genome-wide Single Nucleotide Polymorphism (SNP) analysis given the extent of charring and other visible signs reflecting the level of burning.

Individuals who die before or during a fire often are quite difficult to identify due to the obliteration of typical characteristics useful for scientific identification. While DNA analyses have become central to forensic science, with applications ranging from unidentified decedents to trace evidence, burned bone analysis remains elusive. Extracting DNA from these samples presents a special challenge to medicolegal investigations. Fire and heat cause major alterations in soft tissue and bone, with cremation or near cremation producing unusable samples for DNA profiling. Or so it was previously thought! New methods for ancient DNA extraction, DNA library construction, and targeted enrichment developed during the last two to five years have great promise for such forensic applications. In ancient contexts, these methods have been applied to: (1) conserve (and effectively immortalize) DNA from small and/or degraded samples, enabling multiple analyses without exhausting the sample and allowing additional analyses to be performed in the future; and (2) target a large genome region or number of SNPs (such as the complete mtGenome or genome-wide SNPs) for subsequent Next Generation Sequencing (NGS). This seminar will highlight the utility of applying this methodology to modern forensic samples with the express intent of increasing scientific identifications.

Over a period of two years, this study obtained and documented 80 samples from 27 fire death and cremation cases. Samples were chosen with the goal of obtaining statistically significant results from different skeletal tissues showing different levels of burning. From these, DNA was successfully extracted from 68 samples (including blanks) using two different DNA extraction protocols: one currently used to obtain DNA from ancient remains and another used in forensic DNA analysis. This presentation will report the success of this sampling strategy, noting the degree to which visible markers upon thermally or otherwise altered human remains (here, bones and teeth) can be used to predict DNA preservation, and thus inform project design for sample selection. This presentation will discuss this process, offering the first evidence for optimal extraction practices for burned skeletal remains recovered from fire-related forensic contexts.

Using modern forensic cases to illustrate, this seminar will offer evidence-based best practice procedures for the analysis of human remains with burned DNA, answering the call of the National Research Council of the National Academies 2009 Report, *Strengthening Forensic Science in the United States: A Path Forward*, to develop reliable and accurate scientific methods. Further, this presentation will encourage collaborations between academic institutions and medical examiner/coroner offices nationally and internationally.

*Presenting Author*
BS6 Undetermined: The Devil Is in the Details

Thursday, February 21, 2019  7:00 a.m. – 8:30 a.m.  .75 CE Hour

James J.C.U. Downs, MD*  Andrew M. Baker, MD
forensX, LLC  Hennepin County Medical Examiner
Savannah, GA  Minneapolis, MN

Learning Overview: The goal of this presentation is to familiarize attendees with the necessity of considering medical history and scene investigation in determining cause and manner of death and/or in evaluating injuries. After attending this presentation, attendees will understand that better investigation can provide additional answers, but that not all cases are solvable.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by suggesting ways to improve forensic pathology analysis of case materials while recognizing that sometimes not all answers are forthcoming.

The art and science of determining cause and manner of death is a challenge for the forensic pathologist—both the novice and veteran practitioner. The five established universal manners of death include “undetermined” to reflect that an answer is not always possible to a reasonable degree of certainty. As many as five percent of all medical examiner cases are eventually classified as “undetermined.” Some embrace the diagnosis, arguing that “you can’t be wrong with undetermined.” In such situations, resistance and frustration are common, since interested parties may feel that the physician “took the easy way out” by not having an opinion. This may be, in part, due to misunderstanding what message is being conveyed by the term. Confusion may be further compounded when the cause of death is also not readily apparent.

The designation “undetermined” applies not only as a cause and manner of death but can also apply when determining how events happened when such questions arise. In medically evaluating death and/or injury, context can be critical. The circumstances are provided by the history and the scene. Failure to find and/or fully appreciate the answer(s) tends to occur in situations in which there is insufficient investigation, scene evaluation, or medical history. Thus, for a medical examiner, scrutinizing the crime scene (not necessarily just a death scene) can be invaluable.

Frustrations may arise because two equally qualified physicians may interpret case materials differently and arrive at different answers. In reality, different experiences and different qualifications may lead to alternate theories, diagnoses, and opinions. Forensic pathology is medicine at its core—not a bench science. Medicine applies various scientific disciplines to a biological context—the individual patient. A statue of the medical practice is history, which provides essential context for case evaluation, culminating in a medical diagnosis. The essential nature of medical history is illustrated by the need for federal legislation (the Health Insurance Portability and Accountability Act) attempting to ensure medical records access and privacy. Medically, the scene circumstances and injury are a big part of that history.

Through a review of several cases involving deceased and living patients, this presentation will point out where a different and/or a second point of view has proved valuable in clarifying how injuries occurred, allowing a more definitive conclusion regarding the nature of sudden unexpected death and/or injury. Practitioners should accept that there will always be cases that end up as undetermined despite lengthy investigation and innumerable analyses, but the “there's no harm in calling it undetermined” philosophy should be rejected as the fallacy that it is.

Reference(s):

*Presenting Author
BS7  The Exoneration of Kirstin Blaise Lobato

Friday, February 22, 2019  7:00 a.m. – 8:30 a.m.  .75 CE Hour

Andrew M. Baker, MD*  Jane Pucher, JD*
Hennepin County Medical Examiner  Innocence Project
Minneapolis, MN  New York, NY
Vanessa Potkin, JD*  Jeffery K. Tomberlin, PhD*
Innocence Project  Texas A&M University
New York, NY  Department of Entomology
College Station, TX

Learning Overview: The goals of this presentation are to help attendees: (1) understand the factors that lead to wrongful conviction; (2) describe the features used to estimate time of death; and (3) understand the role of forensic entomology in narrowing time-of-death estimations.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by highlighting the numerous factors that led to the wrongful conviction of a young woman and years of imprisonment for a murder she did not commit. Attendees will appreciate the advantages of a second opinion in cases in which time of death may be an issue and the importance of considering another forensic science that was not considered at the time of original trial.

In most death investigations, time of death is not a critical issue in court. However, for those accused of homicide—especially those who have an alibi for a specified time period—the ability to narrow the time frame in which death likely occurred can mean the difference between exculpation and wrongful imprisonment. Oftentimes medical examiners may be unaware that time of death is of particular significance in a case, unless or until a lawyer informs them.

On the night of July 8, 2001, around 10:00 p.m., a man's body was discovered covered with trash beside a dumpster in a parking lot in Las Vegas, NV. The victim had been mutilated: his teeth were knocked out, he suffered numerous stab wounds, his skull was fractured, and his penis had been severed from his body. Police investigation ultimately turned to Kirstin Blaise Lobato ("Blaise"), a slight eighteen-year-old girl from a town several hours from Las Vegas. Blaise had no connection to the victim; rather, she was implicated solely based on rumors that she had cut a different man's groin when he tried to attack her in a motel parking lot; however, that attack occurred several weeks before this July 8 homicide.

Blaise had an alibi for the majority of July 8—it was undisputed she was in her hometown, several hours from Las Vegas, after 11:00 a.m. and for the rest of that day. Under the State's theory at trial, Blaise killed the victim during the early morning hours of July 8. This meant that the victim's body laid undiscovered in the daytime summer heat for more than 12 hours, from the early morning (when Blaise allegedly killed him) until his body was found at 10:00 p.m. The State relied heavily on a medical examiner's time-of-death estimation that the victim could have died up to 24 hours before he was pronounced dead at 3:50 a.m. on July 9, meaning at approximately 4:00 a.m. on July 8. The State argued that this put the victim's death at a time when Blaise was not accounted for by her alibi witnesses, and the jury convicted her.

During Blaise's post-conviction litigation, this time-of-death estimate was revisited. A consulting pathologist noted that the decedent was initially examined and found to be in full rigor mortis at 3:50 a.m. Rigor mortis had disappeared by the time the autopsy commenced at noon, eight hours later. Given the rapidity with which the decedent went out of full rigor, and given the outdoor temperatures in Las Vegas in July, the pathologist estimated that the decedent most likely died within several hours of 8:00 p.m. on July 8—long after Blaise had left Las Vegas. Three renowned forensic entomologists independently reviewed the crime scene and autopsy evidence and found an absence of blow fly activity. Blow flies are early colonizers of dead bodies, and the conditions in which the victim's body was found were ideal for rapid colonization: outdoors, in a hot climate, surrounded by garbage. All three entomologists independently concluded that, based on the absence of blow fly colonization, the victim was likely killed after 8:00 p.m. on July 8, 2001, during which time Blaise was, as even the State conceded at trial, hours away from Las Vegas.

Based on these findings, as presented during an evidentiary hearing, the presiding judge vacated Blaise's conviction. The judge found that her trial attorneys provided ineffective assistance of counsel in failing to consult with a forensic pathologist as well as with a forensic entomologist, whose consult would have narrowed the time-of-death estimate to a time frame during which Blaise could not possibly have committed the crime.

*Presenting Author
BS8  The National Institute of Justice (NIJ) Cold Case Working Group and Its Best Practices Guide for Implementing and Sustaining a Cold Case Unit in Police Agencies: A Path Forward to Solving the Cold Case Crisis

Friday, February 22, 2019  7:00 a.m. – 8:30 a.m.         .75 CE Hour

James M. Adcock, PhD*
Collierville, TN

Charles M. Heurich, MFS*
National Institute of Justice
Department of Justice, Office of Justice Programs
Washington, DC

Thomas C. McAndrew, MA*
Pennsylvania State Police
Orefield, PA

Learning Overview: After attending this presentation, attendees will better understand the status of cold case investigations in the United States and be more familiar with the recommendations found in the newly published NIJ Best Practices guide for implementing and sustaining a cold case unit in police agencies. Attendees will also be aware of how these guidelines will affect ongoing homicide and cold case investigations and will be presented with a novel approach, utilizing experience and donated funds, along with the NIJ guide's recommendations, to help these police agencies implement and sustain the process, furthering the intent of the NIJ cold case guide.

Impact on the Forensic Science Community: This presentation will impact the forensic science community primarily by outlining recommendations that will help police agencies better address the cold case crisis in America. Attendees will see research-supported concepts along with application guidelines on how to create, implement, and sustain a proper cold case unit. This process, coupled with the efforts of a community-based non-profit corporation, will produce maximum effectiveness through the solving of more cold cases while at the same time increasing the clearances of other homicides. The example given should be an incentive for other communities to follow.

From 1980 to 2016, the United States accumulated more than 242,000 cold cases or unresolved homicides. Then, in 2016, the Federal Bureau of Investigation (FBI) Uniform Crime Reports (UCR) reported our national clearance rate of homicides at 59.4%, the lowest in our history, while many cities saw a significant rise in homicide incidents. These unsolved homicides have, for the most part, just been added to the cold case status that is rising by the thousands each year.

In 2015, the NIJ started the Cold Case Working Group with the intent of formulating a “best practices” guide for the implementation and sustainment of a cold case unit in police departments. (At this writing, the NIJ document is scheduled to be published in the fall of 2018.) For many years prior to this working group, NIJ had funded millions of dollars for agencies to work cold cases through their (NIJ) DNA Cold Case Grants. While they were productive, it became clear that more research and work was needed to make the system better; therefore, the working group.

While there are approximately 50 recommendations in this manual, this presentation will only highlight certain ones that appear to have the most impact on police decision-making regarding their attempts to solve cold cases. The latest draft of the guide explicitly states that we are in a “cold case crisis”; that agencies must conduct a complete inventory of all unresolved cases along with associated evidence; that only a “dedicated” unit will provide maximum effectiveness with increased clearances; that the use of “vetted” outside sources are important to saving time and manpower; and, as a path forward, that sustaining the unit over time is critical to the solving of homicides and cold cases on a regular basis.

Many police agencies suffer from manpower losses and insufficient funds to even consider implementing a sustainable cold case unit. These are all obstacles for the police supervisors to overcome. The first and foremost decision must be a commitment to have a
“dedicated” cold case unit. Then, if the guide is to be a productive document, how does an agency get over the hump regarding manpower and funding and manage to sustain a viable unit? Hopefully, the funding from NIJ for cold cases will be reinstituted, but experience has shown that many times after the funds are depleted (one to two years), the cold case unit is dismantled, which defeats the “sustainment” intent of the process.

Detectives spend approximately 60% of their time conducting administrative duties. That, coupled with manpower shortages, can be partially resolved through the “vetting” of outside sources, such as retired detectives, professors, other professionals from the community, and grad students. These sources should come from the community at large and, when vetted by the police agency, can accomplish most of the administrative tasks that detectives would normally perform, leaving them to do what they do best—investigate.

Lastly, a community-based non-profit such as the Mid-South Cold Case Initiative could be a partial solution to the sustainment concern by funding the cold case unit over time. This corporation was specifically designed to raise funds in the mid-south that are earmarked specifically for police agencies to fund a dedicated cold case unit.

In conclusion, the design of the best practices guide is geared to help police agencies to not only grasp the concept of investigating cold cases for justice, families, and the safety of our communities, but to also prevent some communities from having a crisis that will drain their resources to the limits. The process of investigating cold cases is an intricate part of the equation to solving homicides while attacking the issue from both ends of the spectrum simultaneously, hot and cold.

Reference(s):

Forensic Sciences Without Borders: Forensic Sciences Services in Brazil

**Thursday**

February 21, 2019  
12:00 p.m. – 1:30 p.m.  
1.00 CE Hour

Joao Carlos L. Ambrosio, MSc*  
Brazilian Federal Police  
Brasilia, Distrito Federal, BRAZIL

Taís R. Fiorentin, PhD  
Center for Forensic Science Research & Education  
Willow Grove, PA

Heather E. McKiernan, MSFS*  
Center for Forensic Science Research & Education  
Willow Grove, PA

Barry K. Logan, PhD*  
NMS Labs  
The Center for Forensic Science Research and Education  
Willow Grove, PA

**Learning Overview:** After attending this presentation, attendees will better understand how forensic and investigative science services are delivered in Brazil as well as the challenges faced by forensic scientists working in a developing country. Attendees will also gain an understanding of the differences between judicial perspectives on forensic science between Brazil and the United States and will better appreciate opportunities for collaborative scientific exchange.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing insight into the cultural and particular needs of Brazil's forensic and investigative science institutions, the challenges they face, and the opportunities for stronger working relationships, which would allow for growth of the field in both countries.

The 2019 American Academy of Forensic Sciences (AAFS) International Educational Outreach Program (IEOP) will visit Brazil to solidify the relationships that have been established with the mutual recognition between the Brazilian Academy of Forensic Sciences (BAFS) and the AAFS. Brazil is a country whose economy is ranked in the top ten largest in the world; however, its forensic and investigative services are still developing. Contemporary practice has made major strides toward advancement; however, Brazil still faces a number of challenges, including funding, awareness/education, and training that must be overcome to continue to improve best practices.

This session, designed to provide attendees with an orientation to the structure and delivery of forensic and investigative sciences in Brazil, is part of an ongoing initiative of the BAFS and the AAFS to recognize forensic science as a field without borders, providing a platform for international collaboration. The BAFS is the first association academy recognized by the AAFS. It was founded in 2012 with the goal of contributing to the development of forensic sciences in the country, guaranteeing justice and human rights.

In addition to examining the current state and organization of forensic science services in Brazil, Brazilian judicial perspectives on forensic science will be discussed. Ongoing and future opportunities for collaborations, such as scientist exchanges, Standard Operating Procedure (SOP) sharing, training prospects, and joint research collaborations, will be highlighted. Speaker presentations will conclude with an open question-and-answer session where attendees will be able to interact with the speakers to gain additional information.

*Presenting Author*
W1 What’s Trauma and Stress Got To Do With It? Recognizing the Impact of Trauma on Forensic Professionals and Taking Steps to Mitigate It

Monday
February 18, 2019 8:30 a.m. – 12:00 p.m. 3.0 CE Hours

Learning Overview: After attending this session, attendees will understand and recognize how stress and trauma are tied to the forensic professions, including in the form of vicarious trauma, and how exposure to trauma and stress impacts the employee's personal and professional performance. Attendees will be more aware of the various types of trauma that investigators and investigative personnel routinely encounter and the potential impacts this may have, not only on the individual, but on the investigation and/or service provision after attending this workshop. Paths forward and the development of Evidence-Based Policy (EBP) will also be addressed, so attendees can examine what policies and assistance are available in their own agencies or to be able to aid in policy development.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with the understanding that the human experience is variable, and trauma exposure and symptoms even more so, leading to behavior patterns that can be complex and abstract. By recognizing the manifestations of a variety of psychological—both behavioral and cognitive—impacts as a reaction to trauma and stress exposure on the job, as well as identifying whether an agency is trauma-informed and what resources are available to employees, the attendees will be better equipped to understand the short- and potentially long-term impacts of trauma, as well as how to adapt investigative approaches and provide resources that will lead to increased chances of not only a positive work environment but likely a more efficient and cost-effective solution to maintaining employee health and well-being to avoid burn-out and decreased cognitive abilities that may impact service provision and job performance.

Chair:
Amanda L. Farrell, PhD
Marymount University
School of Education and Human Services
Arlington, VA

Co-Chair:
Lurena A. Huffman, BS
EMDC Forensics, LLC
Hampton, VA

Faculty:
Timothy J. Ainger, PhD
University of Kentucky
Lexington, KY

Christopher J. Scallon, MS
Norfolk Police Department
Norfolk, VA

Targeted Audience: All disciplines
Knowledge Level Required: Basic (little to no knowledge of subject presented)
Expected Handout Length: 30 Pages

This workshop will use many cases, videos, and discussion points to illustrate the conceptual and applied understanding of how trauma and its impacts manifest. Given the nature of the material, this workshop is not recommended for those persons who are sensitive and/or in some form of crisis.
W1 What’s Trauma and Stress Got To Do With It? Recognizing the Impact of Trauma on Forensic Professionals and Taking Steps to Mitigate It

**Program Description:** In seeking to serve our communities as investigators or forensic professionals, many of us are exposed to things that the average citizen cannot understand—from violent crime scenes, to death investigations and autopsies, to exposure risks related to fentanyl and fentanyl analogs, to reviewing materials in indecent images and child exploitation investigations, and so forth—and sometimes these experiences stay with us. Recognizing that certain trends, such as the opioid crisis, can exacerbate the existing levels of stress and trauma faced by various personnel, best practices suggest that an agency that is trauma-informed and has made preparations for employees will have better success in terms of keeping employees happy, healthy, and productive.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.-8:40 a.m.</td>
<td>Welcome</td>
<td>Amanda L. Farrell, PhD; Lurena A. Huffman, BS</td>
</tr>
<tr>
<td>8:40 a.m.-9:00 a.m.</td>
<td>Introduction: Context, Approach, and Panel</td>
<td>Amanda L. Farrell, PhD</td>
</tr>
<tr>
<td>9:00 a.m.-10:00 a.m.</td>
<td>Stress, Trauma, and Their Impact on Forensic Professionals</td>
<td>Amanda L. Farrell, PhD; Timothy J. Ainger, PhD; Christopher J. Scallon, MS</td>
</tr>
<tr>
<td>10:00 a.m.-10:15 a.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:15 a.m.-11:00 a.m.</td>
<td>Cognitive and Long-Term Impacts of Trauma</td>
<td>Timothy J. Ainger, PhD</td>
</tr>
<tr>
<td>11:00 a.m.-11:45 a.m.</td>
<td>Addressing Vicarious Trauma and Becoming a Trauma-Informed Agency</td>
<td>Christopher J. Scallon, MS</td>
</tr>
<tr>
<td>11:45 a.m.-12:00 p.m.</td>
<td>Questions and Answers</td>
<td>Lurena A. Huffman, BS</td>
</tr>
</tbody>
</table>

**Reference(s):**


*Presenting Author*
**WORKSHOPS**

*Pre-registration was required.*

**W2**  “Will This Leave a Mark?” A Multidisciplinary Approach to Autoerotic Asphyxiation (AeA) Fatalities

**Monday**

**February 18, 2019**  
**8:30 a.m. – 12:30 p.m.**  
**3.5 CE Hours**

**Learning Overview:** After attending this presentation, attendees will more comprehensively understand Autoerotic Asphyxiation (AeA) deaths. This multidisciplinary approach will review the literature on circumstances preceding AeA deaths, discuss a practical approach to medicolegal death scene investigation, the certification of cause and manner of death, intentionality versus unintentionality AeA death case reviews, etiological factors, and psychological manifestations of practitioners as well as stigmatic concerns families face over the loss of loved ones.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by demonstrating techniques in AeA investigations. This is a multidisciplinary process involving medical and non-medical professionals for the correct certification of manner and cause of death in suspected AeA cases.

**Chair:**
Sharon L. Plotkin, MS*  
Miami Dade College  
Miami, FL

**Co-Chair:**
Teresa A. White, MA*  
Missoula, MT

**Faculty:**
Tim Gallagher, MD*  
Office of the Medical Examiner  
Pensacola, FL

Katherine Ramsland, PhD*  
DeSales University  
Center Valley, PA

**Targeted Audience:** Anthropology, Criminalistics, General, Jurisprudence, Pathology/Biology, Psychiatry & Behavioral Science

**Knowledge Level Required:** Intermediate (some knowledge of subject presented)

**Expected Handout Length:** 10 pages

---

*Presenting Author*
**Program Description:** Through the presentation of several case studies, attendees will better understand the current paradigm shift in AEA death investigations that will lead to less rhetoric and stigmatic prejudice for both the practitioner and the surviving loved ones. Autoerotic asphyxial practitioners engage in this mostly singular, private activity for the intention of sexual gratification, and therefore expect autonomy and a reasonable expectation of their right to privacy. When death occurs as a result of this activity, these individuals ought to expect the same dignity that other decedents receive from those professionals who are involved in the death investigation.

**Program:**

- **8:30 a.m. - 8:45 a.m.** Opening Remarks and Introduction  
  *Sharon L. Plotkin, MS*

- **8:45 a.m. - 9:30 a.m.** Autoerotic Asphyxiation Literature Review  
  *Teresa A. White, MA*

- **9:30 a.m. - 10:15 a.m.** A Case Study/Background  
  *Tim Gallagher, MD*

- **10:15 a.m. - 10:30 a.m.** Break

- **10:30 a.m. - 11:00 a.m.** A Case Study  
  *Sharon L. Plotkin, MS*

- **11:00 a.m. - 11:45 a.m.** A Case Study  
  *Katherine Ramsland, PhD*

- **11:45 a.m. - 12:15 p.m.** A Case Study  
  *Tim Gallagher, MD*

- **12:15 p.m. - 12:30 p.m.** Panel Discussion  
  *Sharon L. Plotkin, MS; Teresa A. White, MA; Tim Gallagher, MD; Katherine Ramsland, PhD*
Pre-registration was required.

W3 Child Murder by Parents: Psychiatry, Pediatrics, and Pathology

Monday
February 18, 2019 8:30 a.m. – 12:30 p.m. 3.5 CE Hours

Learning Overview: After attending this presentation, attendees will understand child murder by parent cases from psychiatric, pediatric, and pathology perspectives. The discussion will include an understanding of parental motives and common factors behind child murder; diligently searching for the explanation and mechanism of the suspected inflicted injury; and courtroom testimony when understanding biases. The panel will include forensic psychiatrists (including perinatal psychiatry subspecialty), a child protection pediatrician, and a forensic pathologist. Case examples will be provided.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by increasing competence in understanding the phenomenon of child murder by parents, effectively evaluating alleged perpetrators and the medical evaluation of such cases. This should lead to more scientific and less biased evaluations.

Chair:
Carl Wigren, MD*
Wigren Forensic PLLC
Seattle, WA

Faculty:
Josh Friedman, MD, PhD*
Cleveland, OH

Susan Hatters-Friedman, MD*
University of Auckland
Auckland, NEW ZEALAND

Co-Chair:
J. Paul Fedoroff, MD
Royal Ottawa Hospital
Ottawa, ON, CANADA

Renee Sorrentino, MD*
Institute for Sexual Wellness
Weymouth, MA

Targeted Audience: General, Jurisprudence, Pathology/Biology, Psychiatry & Behavioral Science
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 40 Pages
**WORKSHOPS**

*Pre-registration was required.*

## W3  Child Murder by Parents: Psychiatry, Pediatrics, and Pathology

**Program Description:** Forensic psychiatry, child protection pediatrics, and forensic pathology may all be involved in cases of suspected child murder by parents. This multidisciplinary presentation will focus on fully describing the phenomenon of child murder by the parent and potential controversies and biases.

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>Opening Remarks&lt;br&gt;<strong>Carl Wigren, MD</strong></td>
</tr>
<tr>
<td>8:40 a.m.</td>
<td>Child Murder by Mothers and Fathers: Psychiatric Research Findings&lt;br&gt;<strong>Susan Hatters-Friedman, MD</strong></td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>Insanity and Mitigation Evaluations in Cases of Child Murder by Parent&lt;br&gt;<strong>Renee Sorrentino, MD</strong></td>
</tr>
<tr>
<td>10:10 a.m.</td>
<td>Break</td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td>Child Protection and Pediatric Evaluations in Fatal Child Abuse Cases&lt;br&gt;<strong>Josh Friedman, MD, PhD</strong></td>
</tr>
<tr>
<td>11:10 a.m.</td>
<td>Forensic Pathology in Cases of Child Murder and Equivocal Findings&lt;br&gt;<strong>Carl Wigren, MD</strong></td>
</tr>
<tr>
<td>11:50 a.m.</td>
<td>Faculty Discussion&lt;br&gt;<strong>Carl Wigren, MD; Susan Hatters-Friedman, MD; Renee Sorrentino, MD; Josh Friedman, MD, PhD</strong></td>
</tr>
</tbody>
</table>
W4       The Medicolegal Investigation of Recreational Diving Fatalities

Monday

February 18, 2019       8:30 a.m. – 12:30 p.m.       3.75 CE Hours

Learning Overview: After attending this presentation, attendees will: (1) have a basic understanding of the special physiology and specialized equipment associated with scuba diving; (2) appreciate the epidemiology of deaths associated with recreational diving, including geographic distribution, common causes of death, and contributing factors to these fatalities; (3) be able to adequately investigate and interpret the historical events and circumstantial evidence associated with diving fatalities; (4) understand the recommended approach to the autopsy of persons who died while diving and be able to interpret the anatomical findings in the context of the historical events; and (5) have handout material and points of contact for future reference to competently investigate a diving-related death.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing the training and resources needed to forensic pathologists and medicolegal death investigators so they may competently and confidently investigate recreational (scuba) diving-related deaths.

Chair:       Co-Chair:
James Louis Caruso, MD*               Michael D. Bell, MD*
Office of the Medical Examiner          Palm Beach Medical Examiner’s Office
Denver, CO                                West Palm Beach, FL

Targeted Audience: Criminalistics, General, Jurisprudence, Pathology/Biology
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 65 Pages
Supported By: Divers Alert Network

*Presenting Author
**Program Description:** This workshop is intended to provide a complete overview of diving physiology and pathophysiology so investigators and pathologists leave the workshop armed with a general approach to investigating recreational diving fatalities. The epidemiology and scenarios of fatal diving mishaps will be presented using illustrative cases. Specific topics include gathering pertinent history, familiarization with dive equipment, modification of autopsy protocol with interpretation of the findings, and, from pertinent data gathered, determination of the most likely cause of death. A hands-on familiarization with diving equipment and resources for assistance in investigating these cases will be provided.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
</table>
| 8:30 a.m. - 9:30 a.m. | Diving Physiology, Pathophysiology, and Death by Drowning  
*James Louis Caruso, MD* |
| 9:30 a.m. - 9:45 a.m. | Recreational Diving Fatalities: Epidemiology and Overview  
*James Louis Caruso, MD* |
| 9:45 a.m. - 10:00 a.m. | Case Presentations: Introduction/Basic  
*Michael D. Bell, MD; James Louis Caruso, MD* |
| 10:00 a.m. - 10:30 a.m. | Medicolegal Investigation of a Recreational Diving Fatality  
*Michael D. Bell, MD* |
| 10:30 a.m. - 10:45 a.m. | Break |
| 10:45 a.m. - 11:15 a.m. | Dive Equipment: Demonstration/Hands-On  
*James Louis Caruso, MD; Michael D. Bell, MD* |
| 11:15 a.m. - 11:45 a.m. | Related Topics: Hazardous Marine Animals, Environmental Factors, and Natural Disease  
*Michael D. Bell, MD; James Louis Caruso, MD* |
| 11:45 a.m. - 12:15 p.m. | The Autopsy: Procedures and Interpretation of the Findings  
*Michael D. Bell, MD* |
| 12:15 p.m. - 12:30 p.m. | Case Presentations: Advanced/Resources and Consultations  
*Michael D. Bell, MD; James Louis Caruso, MD* |
W5 Novel Psychoactive Substance (NPS) Surveillance, Detection, and Intelligence for Use by Forensic Laboratories, Public Health, and Public Safety

Monday
February 18, 2019 8:30 a.m. – 4:00 p.m.
5.5 CE Hours

Learning Overview: After attending this presentation, attendees will be able to: (1) understand approaches for the surveillance and initial detection of NPS; (2) describe methods for the analysis of case evidence for characterization of emerging or unknown NPS; (3) assess analytical and clinical findings of NPS in casework and intoxications; and (4) demonstrate manners for which data can be used to track or monitor trends and overall NPS intelligence.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing real-time information on NPS detection and emergence, the opioid epidemic, clinical treatment strategies, and large data dissemination tactics. Presentations will cover a variety of NPS classes, with specific focus on fentanyl analogues and novel opioids, detected and identified in recent casework. Additionally, the presentations in this workshop will showcase the multidisciplinary efforts being conducted to detect NPS and report their presence in seized materials or biological fluids.

Chair:
Alex J. Krotulski, MS*
Center for Forensic Science Research & Education
Willow Grove, PA

Faculty:
Jason A. Bordelon*
Drug Enforcement Agency
Springfield, VA

Jae W. Chung, BS*
Drug Enforcement Agency
Springfield, VA

Francis X. Diamond, BS*
Willow Grove, PA

Rudolph C. Johnson, PhD*
Centers for Disease Control and Prevention
Atlanta, GA

Jeffrey Lai, MD*
University of Massachusetts Medical School
Worcester, MA

Donna M. Papsun, MS*
NMS Labs
Willow Grove, PA

Co-Chair:
Barry K. Logan, PhD*
NMS Labs/Center for Forensic Science Research & Education
Willow Grove, PA

Adam Polhemus, BA*
New Jersey State Police
West Trenton, NJ

Andrew Stolbach, MD*
The Johns Hopkins University Medical School
Baltimore, MD

Roland Suliveras*
Customs and Border Protection
Washington, DC

Eric D. Wish, PhD*
Center for Substance Abuse Research
University of Maryland
College Park, MD

Elizabeth Young Laanemets, MSc*
Canada Border Services Agency
Ottawa, ON, CANADA

Targeted Audience: Criminalistics, General, Pathology/Biology, Toxicology
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 300 pages
Supported By: Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation

*Presenting Author
**Program Description:** This workshop will focus on the emergence and proliferation of NPS and novel opioids, showcasing multidisciplinary approaches to combating current analytical, clinical, law enforcement, and safety issues. This presentation will provide information regarding the sale and acquisition of NPS, trends associated with surveillance, characterization of unknown species, detection methods and tools for NPS discovery, workflows for the analysis of case evidence, clinical approaches to treatment and monitoring, as well as strategies for the analysis of large data for distribution and dissemination.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
</tr>
</thead>
</table>
| 8:30 a.m. - 8:40 a.m. | Welcome and Introduction  
*Alex J. Krotulski, MS; Barry K. Logan, PhD* |
| 8:40 a.m. - 9:05 a.m. | Internet Investigations of NPS Sales and Trafficking  
*Jae W. Chung, BS* |
| 9:05 a.m. - 9:30 a.m. | NPS Interdiction at the Border Between Canada and the United States  
*Elizabeth Young Laanemets, MSc* |
| 9:30 a.m. - 9:55 a.m. | Use of Multiple Data Intelligence Streams for Disruption of NPS Importation and Distribution  
*Roland Suliveras* |
| 9:55 a.m. - 10:15 a.m. | Break |
| 10:15 a.m. - 10:40 a.m. | User-Contributed Mass Spectral Libraries in the Analysis of Unknown Drug Samples  
*Jason A. Bordelon* |
| 10:40 a.m. - 11:05 a.m. | Analytical Strategies for the Identification of Emerging NPS in Port-of-Entry Drug Seizures  
*Francis X. Diamond, BS* |
| 11:05 a.m. - 11:30 a.m. | Analytical Workflows for the Real-Time Detection of NPS in Forensic Toxicology Casework  
*Alex J. Krotulski, MS* |
| 11:30 a.m. - 11:55 a.m. | Retrospective Data-Mining of Toxicology Data as a Tool for NPS Identification  
*Donna M. Papsun, MS* |
| 11:55 a.m. - 1:15 p.m. | Lunch |
| 1:15 p.m. - 1:40 p.m. | Analytical Testing for NPS to Support Diagnosis of Patients Presenting After Near-Fatal Overdoses  
*Jeffrey Lai, MD* |
| 1:40 p.m. - 2:05 p.m. | Collaborating to Develop Fentanyl Testing Capability in Public Health Laboratories  
*Rudolph C. Johnson, PhD* |
| 2:05 p.m. - 2:30 p.m. | Novel Psychoactive Substances: From the Database to the Bedside  
*Andrew Stolbach, MD* |
| 2:30 p.m. - 2:45 p.m. | Break |
| 2:45 p.m. - 3:10 p.m. | Strategies for Timely Identification of Emerging NPS Drugs to Support Drug Early Warning Systems  
*Barry K. Logan, PhD* |
| 3:10 p.m. - 3:35 p.m. | The New Jersey Drug Monitoring Initiative (NJ-DMI)—Interagency Collaboration in Collection and Sharing of NPS Data  
*Adam Polhemus, BA* |
| 3:35 p.m. - 4:00 p.m. | Urinalysis Results for Uncovering Emerging Drug Problems: Drug Use Forecasting (DUF)/Arrestee Drug Abuse Monitoring (ADAM) Through Drug Outbreak Testing Service (DOTS)  
*Eric D. Wish, PhD* |
WORKSHOPS

Pre-registration was required.

W6 The Impact of Emerging Technologies on Digital & Multimedia Forensics

Monday

February 18, 2019 8:30 a.m. – 4:40 p.m. 6.5 CE Hours

Learning Overview: The goals of this presentation are to: (1) inform participants of emerging technologies affecting digital forensic science today; (2) identify technologies on the horizon that will be impacting the world of forensics science; (3) learn practical techniques for addressing new technology questions in their field of practice; (4) network with other interested researchers, academics, and practitioners to affect their thinking on new and emerging technology issues; and (5) learn of real-world implications as case studies are presented across a wide variety of topics throughout the workshop.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by raising awareness of current emerging and horizon technologies impacting the world of forensic science today. This presentation will stimulate research among the participants and their organizations and provide opportunity for participants of varying interests to identify like-minded individuals to collaborate on research ideas. Finally, this presentation will continue to establish the American Academy of Forensic Sciences as a leader in the world of digital forensic science through forward-looking preparation of the digital forensics community for the challenges that are coming.

Chair:
Steven B. Watson, BA*
VTO Labs
Broomfield, CO

Co-Chair:
Marla E. Carroll, BS
Forensic Video & Audio Associates, Inc
Plantation, FL

Faculty:
James Darnell, BS*
United States Secret Service
University of Tulsa, Fisher Hall
Tulsa, OK

Jessica Hyde, MS*
Magnet Forensics
Herndon, VA

Matthew Domanic, BA*
VTO Labs
Broomfield, CO

Ben LeMere, BA*
Berla
Crownsville, MD

Boyd Hamilton*
Fidelis K9
Tulsa, OK

Jeff M. Smith, MS*
University of Colorado–Denver
National Center for Media Forensics
Denver, CO

Mary F. Horvath, MFS*
Ft. Myers, FL

Targeted Audience: Criminalistics, Digital & Multimedia Sciences, Engineering Sciences, General

Knowledge Level Required: Basic (little to no knowledge of subject presented)

Expected Handout Length: 225 Pages

*Presenting Author
**WORKSHOPS**

*Pre-registration was required.*

**W6 The Impact of Emerging Technologies on Digital & Multimedia Forensics**

**Program Description:** This workshop on the impact of emerging technologies on digital and multimedia forensics will examine the new and emerging technologies affecting digital and multimedia forensics today and over the coming decades. The information shared during the workshop is from academics, researchers, and practitioners currently working and researching in these new technology areas. Participants will be informed and persuaded to initiate research on the technology areas affecting our discipline. This workshop assembles an experienced group of people impacting the world of digital forensics on a variety of topics. This workshop will be a lecture format with a broad coverage of topics throughout the day.

**Program:**

- **8:30 a.m. - 9:00 a.m.** Introduction to Emerging Technologies  
  *Steven B. Watson, BA*

- **9:00 a.m. - 9:45 a.m.** Artificial Intelligence  
  *Jeff M. Smith, MS*

- **9:45 a.m. - 10:00 a.m.** Break

- **10:00 a.m. - 10:50 a.m.** Drone Forensics  
  *Steven B. Watson, BA*

- **10:50 a.m. - 11:40 a.m.** Process and Tool Development for Technology Challenges  
  *James Darnell, BS*

- **11:40 a.m. - 12:00 p.m.** Electronics Detection with Canines  
  *Boyd Hamilton*

- **12:00 p.m. - 1:00 p.m.** Lunch

- **1:00 p.m. - 1:50 p.m.** Bitcoin and Other Cryptocurrencies  
  *Mary F. Horvath, MFS*

- **1:50 p.m. - 2:40 p.m.** Dark Web  
  *Matthew Domanic, BA*

- **2:40 p.m. - 3:00 p.m.** Break

- **3:00 p.m. - 3:50 p.m.** Internet of Things Forensics  
  *Jessica Hyde, MS*

- **3:50 p.m. - 4:40 p.m.** Vehicle Forensics  
  *Ben LeMere, BA*
W7  A Multidisciplinary Approach for Cardiovascular Deaths: Breakthrough Technologies and Their Applications

Monday
February 18, 2019  8:30 a.m. – 4:45 p.m.  6.5 CE Hours

Learning Overview: After attending this presentation, attendees will better understand the use of modern technologies by immunohistochemistry, metabolomics, genetics, and imaging introduced recently in postmortem evaluation of cardiovascular pathologies, not only for natural cases but also for traumatic and post-cardiac surgery cases involving medical liability. Participants will understand the advantages and limitations as well the possible pitfalls of these methods.

Impact on the Forensic Science Community: This workshop will impact the forensic science community by presenting new technologies (immunochemistry, genetics, and imaging) and their current role and prospective. By including discussion with participants, the usefulness of these methods will be clearer to the forensic science community.

Chair:
Katarzyna Michaud, MD*
Centre Universitaire Romand de Medecine Legale
Lausanne, SWITZERLAND

Co-Chair:
Fabrice Dedouit, MD, PhD*
Centre Universitaire Romand de Medecine Legale
Lausanne, SWITZERLAND

Faculty:
Silke Grabherr, PhD*
Centre Universitaire Romand de Medecine Legale
Lausanne, SWITZERLAND

Sara Sabatasso, MD*
Geneva, SWITZERLAND

Targeted Audience: General, Pathology/Biology
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 20 Pages

Program Description: This session will provide an overview and a comprehensive update of the latest methods useful in investigations of autopsy cases presenting cardiovascular pathologies or injuries. The advantages and limitations of each method will be discussed. The teamwork with clinicians (geneticists, radiologists, and cardiologists) will be discussed. Presentation of autopsy cases of sudden cardiac and violent deaths will help attendees understand the applications in routine practice; some post-surgery cases will be evaluated. The teaching and the future directions will be discussed.
WORKSHOPS

Pre-registration was required.

W7 A Multidisciplinary Approach for Cardiovascular Deaths: Breakthrough Technologies and Their Applications

Program:

8:30 a.m. - 9:15 a.m.  Sudden Cardiovascular Deaths: A General Overview
                      Katarzyna Michaud, MD

9:15 a.m. - 10:00 a.m. Forensic Imaging—Modern Techniques
                      Fabrice Dedouit, MD, PhD

10:00 a.m. - 10:30 a.m. The Size of the Heart in Postmortem Imaging
                        Katarzyna Michaud, MD

10:30 a.m. - 10:45 a.m. Break

10:45 a.m. - 11:45 a.m. Practical Applications of Imaging Techniques in Investigations of Death Following Surgery
                        Silke Grabherr, PhD

11:45 a.m. - 1:00 p.m. Lunch

1:00 p.m. - 1:30 p.m.  Forensic Radiographer and the Teaching of Postmortem Imaging
                        Silke Grabherr, PhD

1:30 p.m. - 2:15 p.m.  The Detection of Early Myocardial Ischaemia—Immunohistochemistry
                        Sara Sabatasso, MD

2:15 p.m. - 3:00 p.m.  The Detection of Early Myocardial Ischaemia—Advanced Molecular and Radiological Technologies
                        Sara Sabatasso, MD

3:00 p.m. - 3:15 p.m.  Break

3:15 p.m. - 4:00 p.m.  Postmortem Genetic Testing
                        Katarzyna Michaud, MD

4:00 p.m. - 4:30 p.m.  Panel Discussion
                        Katarzyna Michaud, MD; Fabrice Dedouit, MD, PhD; Silke Grabherr, PhD; Sara Sabatasso, MD

4:30 p.m. - 4:45 p.m.  Closing Remarks
                        Katarzyna Michaud, MD
WORKSHOPS

Pre-registration was required.


Monday
February 18, 2019  8:30 a.m. – 5:00 p.m.  6.75 CE Hours

Learning Overview: After attending this presentation, attendees will be better able to consider differing interpretations of data specific to the presented case as well as apply principles to the broader arena of the forensic sciences in general. The goal of this presentation is to help individuals to better understand the forensic practitioner’s role in evaluating the evidence and the propriety of the final outcome and to evaluate the analyst’s role on the overall totality of the case. Ultimately, the forensic analyst, regardless of discipline, should understand his/her duty to the truth and objectivity above all else.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with the knowledge to allow them to better understand and articulate the nature of their role in forensic cases and to apply that comprehension, whatever the overall outcome of a case. In addition, attendees will be better positioned to effect positive change to ensure that impartial, objective scientific and medical analyses are employed in casework and testimony.

Chair:
James J.C.U. Downs, MD*
forensX, LLC
Savannah, GA

Co-Chair:
Anjali A. Ranadive, JD*
SciLawForensics, Ltd
Brookings, SD

Faculty:
Linda Kenney Baden, JD*
New York, NY

Henry C. Lee, PhD*
University of New Haven
West Haven, CT

Jan C. Garavaglia, MD*
Burlington, WA

Barry K. Logan, PhD*
NMS Labs/Center for Forensic Science Research & Education
Willow Grove, PA

Bruce A. Goldberger, PhD*
University of Florida College of Medicine
Department of Pathology
Gainesville, FL

Haskell M. Pitluck, JD*
Crystal Lake, IL

Neal H. Haskell, PhD*
Rensselaer, IN

Steven A. Symes, PhD*
Mississippi Medical Examiner’s Office
Mississippi Crime Laboratory
Pearl, MS

Targeted Audience: Anthropology, Criminalistics, General, Jurisprudence, Pathology/Biology, Psychiatry & Behavioral Science, Toxicology

Knowledge Level Required: Basic (little to no knowledge of subject presented)

Expected Handout Length: 100 Pages

Proceeds from this workshop will benefit the Forensic Sciences Foundation, Inc.

*Presenting Author
**Program Description:** The high-profile death of a toddler a decade ago was followed by the then “trial of the century,” which ended in an acquittal on capital murder charges and garnered many questions regarding the validity of various forensic sciences (e.g., what is and is not science—especially in novel and/or controversial areas) and forensic science experts (e.g., what are their roles and who determines that an expert is, in fact, an “expert”). This workshop will provide a multidisciplinary group of speakers to present differing perspectives on the case and its final outcome.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m. - 8:45 a.m.</td>
<td>Introduction and Opening Remarks</td>
<td><em>James J.C.U. Downs, MD</em></td>
</tr>
<tr>
<td>8:45 a.m. - 9:45 a.m.</td>
<td>Case Overview—The Defense</td>
<td><em>Linda Kenney Baden, JD</em></td>
</tr>
<tr>
<td>9:45 a.m. - 10:30 a.m.</td>
<td>Toxicology</td>
<td><em>Barry K. Logan, PhD; Bruce A. Goldberger, PhD</em></td>
</tr>
<tr>
<td>10:30 a.m. - 10:45 a.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:45 a.m. - 11:45 a.m.</td>
<td>Criminalistics</td>
<td><em>Henry C. Lee, PhD</em></td>
</tr>
<tr>
<td>11:45 a.m. - 12:00 p.m.</td>
<td>Questions and Answers</td>
<td><em>James J.C.U. Downs, MD</em></td>
</tr>
<tr>
<td>12:00 p.m. - 1:00 p.m.</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1:00 p.m. - 1:45 p.m.</td>
<td>Anthropology</td>
<td><em>Steven A. Symes, PhD</em></td>
</tr>
<tr>
<td>1:45 p.m. - 2:30 p.m.</td>
<td>Entomology</td>
<td><em>Neal H. Haskell, PhD</em></td>
</tr>
<tr>
<td>2:30 p.m. - 3:15 p.m.</td>
<td>Expert Testimony</td>
<td><em>Haskell M. Pitluck, JD</em></td>
</tr>
<tr>
<td>3:15 p.m. - 3:45 p.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:45 p.m. - 4:45 p.m.</td>
<td>The Remains: Pathology and Anthropology</td>
<td><em>Jan C. Garavaglia, MD</em></td>
</tr>
<tr>
<td>4:45 p.m. - 5:00 p.m.</td>
<td>Questions and Answers</td>
<td><em>Anjali A. Ranadive, JD</em></td>
</tr>
</tbody>
</table>
WORKSHOPS

Pre-registration was required.

W9 Deciphering Complex Electrostatic Detection Device (EDD) Impressions

Monday

February 18, 2019 8:30 a.m. – 5:00 p.m. 7.0 CE Hours

Learning Overview: The goals of this workshop are to provide attendees with the knowledge, skills, and abilities to create layered images for the decipherment of complex impressions developed by EDD using commonly available digital imaging software. These skills will be demonstrated on multiple and widely varied examples of real-world problems that benefit from this method.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing a methodology that will increase the accuracy of interpretation of impressions developed by EDD and a reduction in the cost of these examinations in material and time.

Chair: Mark Goff, BA*
Michigan State Police Lansing Laboratory
Lansing, MI

Co-Chair: Jennifer Furman, MFS
Springfield, VA

Targeted Audience: Criminalistics, Digital & Multimedia Sciences, General, Questioned Documents

Knowledge Level Required: Basic (little to no knowledge of subject presented)

Expected Handout Length: 24 Pages

Workshop participants should bring a computer with Adobe® Photoshop® CS3 and Bridge CS3, or higher, installed to complete the hands-on examples, but this is not required for attendance.

*Presenting Author
Program Description: This workshop will teach a modern approach to the transparency method for tracking sourced impressions using Adobe® Photoshop® layers. A demonstration will be given explaining how creating layer masks of available writing, and common sourced impressions, can be used to account for impressions from multiple documents, show their orientation when created, reveal unsourced impressions in documents containing complex impressions, and associate documents containing impressions from a common source.

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.  - 9:15 a.m.</td>
<td>Introduction</td>
<td>Mark Goff, BA</td>
</tr>
<tr>
<td>9:15 a.m.  - 10:00 a.m.</td>
<td>Imaging and Sourcing</td>
<td>Mark Goff, BA</td>
</tr>
<tr>
<td>10:00 a.m. - 10:15 a.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:15 a.m. - 11:15 a.m.</td>
<td>Accounting for Impressions of Visible Writing/Pencil Writing</td>
<td>Mark Goff, BA</td>
</tr>
<tr>
<td>11:15 a.m. - 12:00 p.m.</td>
<td>Removing Obscuring Indentations</td>
<td>Mark Goff, BA</td>
</tr>
<tr>
<td>12:00 p.m. - 1:00 p.m.</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>1:00 p.m.  - 2:00 p.m.</td>
<td>Common Source Impressions</td>
<td>Mark Goff, BA</td>
</tr>
<tr>
<td>2:00 p.m.  - 3:00 p.m.</td>
<td>Non-Contemporaneous Entries</td>
<td>Mark Goff, BA</td>
</tr>
<tr>
<td>3:00 p.m.  - 3:15 p.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:15 p.m.  - 5:00 p.m.</td>
<td>Complex Impressions</td>
<td>Mark Goff, BA</td>
</tr>
</tbody>
</table>
W10 DNA Mixture Interpretation Principles: Observations From a National Institute of Standards and Technology (NIST) Scientific Foundation Review

Monday

February 18, 2019  8:30 a.m. – 5:00 p.m.  6.75 CE Hours

Learning Overview: After attending this presentation, participants will better understand the principles involved with DNA mixture interpretation, knowledge of core foundational literature supporting these principles, and approaches to establishing interpretation guidelines for DNA mixtures, including approaches that involve probabilistic genotyping software.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by discussing the importance of having documented research and validation studies to support measurement and interpretation claims in forensic science.

Chair:
John M. Butler, PhD*
National Institute of Standards and Technology
Gaithersburg, MD

Faculty:
Jack Ballantyne, PhD*
University of Central Florida
Department of Chemistry
Orlando, FL

Robin W. Cotton, PhD*
Boston University School of Medicine
Biomedical Forensic Sciences
Boston, MA

Roger Frappier, MSc*
The Centre of Forensic Sciences
Toronto, ON, CANADA

Jennifer Gombos Breaux, MFS*
Clarksburg, MD

Bruce J. Heidebrecht*
Maryland State Police, Forensic Sciences Division
Pikesville, MD

Keith Inman, MCrin*
Department of Criminal Justice Administration
Hayward, CA

Hariharan Iyer, PhD*
Gaithersburg, MD

Eugene Y. Lien, MS*
New York City Office of Chief Medical Examiner
Department of Forensic Biology
New York, NY

Targeted Audience: Criminalistics, Jurisprudence
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 150 Pages

Co-Chair:
Sheila Willis, PhD*
National Institute of Standards and Technology
Gaithersburg, MD

Tamyra R. Moretti, PhD*
Federal Bureau of Investigation Laboratory
DNA Support Unit
Quantico, VA

Rich Press, MEd*
National Institute of Standards and Technology
Gaithersburg, MD

Lisa C. Schiermeier-Wood, MS*
Virginia Department of Forensic Science
Richmond, VA

Joel D. Sutton, MSFS*
United States Army Criminal Investigation Laboratory
Forest Park, GA

Melissa K. Taylor, BA*
Gaithersburg, MD

Peter M. Vallone, PhD*
National Institute of Standards and Technology
Gaithersburg, MD

Ray Wickenheiser, MBA*
New York State Police Crime Laboratory System
Albany, NY

Charlotte J. Word, PhD*
North Chesterfield, VA

*Presenting Author
W10  DNA Mixture Interpretation Principles: Observations From a National Institute of Standards and Technology (NIST) Scientific Foundation Review

Program Description: Presenters will share observations from a scientific foundation review conducted this past year by a NIST review team with input from a resource group of practitioners and technical leaders.

Program:
8:30 a.m. - 9:00 a.m.  Introductions, Background, and Historical Overview
John M. Butler, PhD; Sheila Willis, PhD; Melissa K. Taylor, BA

9:00 a.m. - 9:30 a.m.  Review of NIST Report, Feedback Received, and Website
John M. Butler, PhD; Rich Press, MESc

9:30 a.m. - 10:00 a.m.  Panel Discussion: The Role of the Resource Group and Lessons Learned
Sheila Willis, PhD; Bruce J. Heidebrecht; Jennifer Gombos Breaux, MFS; Eugene Y. Lien, MS; Tamyra R. Moretti, PhD; Keith Inman, MCrin; Roger Frappier, MSc; Charlotte J. Word, PhD; Lisa C. Schiermeier-Wood, MS; Joel D. Sutton, MSFS; Robin W. Cotton, PhD; Jack Ballantyne, PhD; Ray Wickenheiser, MBA

10:00 a.m. - 10:30 a.m.  Establishing Interpretation Standard Operating Procedures (SOPs) in Your Laboratory
Bruce J. Heidebrecht; Jennifer Gombos Breaux, MFS; Eugene Y. Lien, MS

10:30 a.m. - 10:45 a.m.  Break

10:45 a.m. - 11:30 a.m.  Performance-Based Validation Data and Receiver Operator Curves (ROCs)
Hariharan Iyer, PhD

11:30 a.m. - 12:00 p.m.  Exploring Capabilities and Limitations—Part 1
Keith Inman, MCrin; Lisa C. Schiermeier-Wood, MS

12:00 p.m. - 12:30 p.m.  The Potential of New Technologies (Massively Parallel Sequencing (MPS), Single Nucleotide Polymorphisms (SNPs), microhaplotypes, and cell sorting) and Questions and Answers
Peter M. Vallone, PhD

12:30 p.m. - 1:30 p.m.  Lunch

1:30 p.m. - 2:00 p.m.  Awareness of DNA Transfer and Persistence Studies
Sheila Willis, PhD

2:00 p.m. - 2:30 p.m.  Case Examples
Roger Frappier, MSc; Charlotte J. Word, PhD

2:30 p.m. - 3:00 p.m.  Exploring Capabilities and Limitations—Part 2
Tamyra R. Moretti, PhD; Joel D. Sutton, MSFS

3:00 p.m. - 3:15 p.m.  Break

3:15 p.m. - 4:00 p.m.  Core Literature and Principles You Should Know
John M. Butler, PhD

4:00 p.m. - 4:30 p.m.  Training and Establishing Expertise
Robin W. Cotton, PhD; Jack Ballantyne, PhD; Ray Wickenheiser, MBA

4:30 p.m. - 5:00 p.m.  Discussion on Next Steps, Questions and Answers, and Summary
John M. Butler, PhD; Melissa K. Taylor, BA
WORKSHOPS

*Presenting Author


Monday

February 18, 2019 8:30 a.m. – 5:30 p.m. 7.25 CE Hours

Learning Overview: After attending this presentation, attendees will have: (1) participated in several hands-on analyses of blunt force injuries of processed cranial and postcranial remains; (2) received peer and facilitator feedback on their analyses and interpretations; (3) acquired knowledge from a forensic anthropologist and pathologist on how fracture biomechanics methodology is used to interpret and validate fracture patterns and total body trauma in a medicolegal environment; and (4) experienced common errors in analysis and interpretation of broken bones.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with hands-on experience in analyzing blunt force injuries. Mentored, real-life case experiences are necessary for practitioners to develop expertise within their discipline. Informal, or formal, mentorship is crucial for novices to develop the schema and attitudes necessary for expertise development and self-regulated learning. Practitioners who encountered constraints in their work environment, such as a lack of skeletal resources and/or role models, express disappointment in their work, are less skilled, and are less confident than their mentored peers. In this workshop, current theoretical knowledge will be applied by practitioners and facilitators to assist attendees in using this knowledge in describing and interpreting bone fractures within a medicolegal investigation.

Chair:
Steven A. Symes, PhD*
Mississippi Medical Examiner’s Office
Mississippi Crime Laboratory
Pearl, MS

Co-Chair:
Ericka N. L’Abbe, PhD*
University of Pretoria
Pretoria, SOUTH AFRICA

Faculty:
James J.C.U. Downs, MD*
forensX, LLC
Savannah, GA

Cortney N. Hulse, MA*
Reno, NV

Anastasia Holobinko, PhD*
Mississippi State Medical Examiner's Office
Pearl, MS

Mark M. LeVaughn, MD*
Office of the Chief Medical Examiner
Pearl, MS

Targeted Audience: Anthropology, General, Pathology/Biology
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 570 Pages

*Presenting Author
Program Description: This workshop offers a unique opportunity to address, with a hands-on approach, a number of issues in experience and application, as well as the analysis and interpretation of blunt force traumatic injuries to bone in a medicolegal setting.

Fracture interpretations found in the deceased run counter to the interpretation of fractures in a living person. In a living person, a fracture must be repaired to restore the patient's well-being (medical health) and mobility. In an analysis of the bone fractures of a deceased person, the possible mechanisms that produced the injury are considered important and the purpose for interpreting these mechanisms is to provide supportive evidence for the cause and/or manner of death. In blunt force injuries, bone reacts to an external force as a bendable material that can elastically or plastically deform. If the bone progresses past elastic deformation, eventual failure is indicated as a fracture in the material. The biomechanics of bending bone are recognizable and can be examined and interpreted.

Yet, despite presenting with biomechanically predictive fracture patterns, blunt force injuries to bone are highly variable due to the intrinsic and extrinsic factors in addition to the circumstances of the death event. This workshop will focus on using the basic biomechanics behind fracture propagation to address the interpretation of fractured skeletal structures for both single and multiple impacts and within the framework of total body trauma. In this workshop, extensive hands-on opportunities for practitioners are provided in addition to lectures and focused group discussions around the application of current biomechanics methodology for the accurate interpretation of these injuries.

Program:
8:30 a.m. - 9:15 a.m. Introductions and Expectations of Workshop
Steven A. Symes, PhD; Ericka N. L’Abbe, PhD; Mark M. LeVaughn, MD

9:15 a.m. - 10:00 a.m. A Hands-On Analysis of Blunt Force Injuries in Bone
Steven A. Symes, PhD; Ericka N. L’Abbe, PhD; Mark M. LeVaughn, MD; Anastasia Holobinko, PhD; Cortney N. Hulse, MA

10:00 a.m. - 10:15 a.m. Break

10:15 a.m. - 12:30 p.m. Blunt Force Injuries to Bone: Biomechanics and Case Studies
Steven A. Symes, PhD

12:30 p.m. - 1:30 p.m. Lunch

1:30 p.m. - 2:15 p.m. Anthropological Interpretation of Blunt Force Injuries for a Forensic Pathologist: What Is Important
Mark M. LeVaughn, MD

2:15 p.m. - 3:15 p.m. Reanalysis of Previously Analyzed Cases: Group Feedback on Interpretations
Steven A. Symes, PhD; Ericka N. L’Abbe, PhD; Mark M. LeVaughn, MD; Anastasia Holobinko, PhD; Cortney N. Hulse, MA

3:15 p.m. - 3:30 p.m. Break

3:30 p.m. - 4:00 p.m. Blunt Force Injuries: A Case Study From Autopsy
James J.C.U. Downs, MD

4:00 p.m. - 5:15 p.m. Focused Group Discussion on Bone Trauma Cases and Interpretations
Steven A. Symes, PhD; Ericka N. L’Abbe, PhD; Mark M. LeVaughn, MD; Anastasia Holobinko, PhD; Cortney N. Hulse, MA

5:15 p.m. - 5:30 p.m. Reflection and Feedback
Ericka N. L’Abbe, PhD
WORKSHOPS

Pre-registration was required.

W12 Voluntary Consensus Standards—Where They Come From and What They Mean for You

Monday
February 18, 2019 1:00 p.m. – 4:50 p.m. 3.5 CE Hours

Learning Overview: The goals of this presentation are to educate attendees on the process and products of different forensic Standards Developing Organizations (SDO) and provide practical examples from experts on the application of consensus standards to different forensic disciplines.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing education regarding the development of consensus-based standards and the emerging role those standards may have as laboratories begin to implement them.

Chair:
Lucy A. Davis, BHS*
LDH Consultants, LLC
Pikeville, KY

Co-Chair:
Jennifer F. Limoges, MS*
New York State Police
Forensic Investigation Center
Albany, NY

Faculty:
Teresa Ambrosius, BA*
American Academy of Forensic Sciences
Colorado Springs, CO

Daniel G. Smith, MA*
American Society for Testing and Materials International
Hatboro, PA

Kenneth W. Aschheim, DDS*
New York, NY

Sharon K. Stanford, BA*
American Dental Association
Homewood, IL

Kris C. Cano, MA*
City of Scottsdale Police Department
Crime Laboratory
Scottsdale, AZ

Michael Wixted, MA*
National Fire Protection Association
Quincy, MD

Christine Funk, JD*
Saint Paul, MN

Diana M. Wright, PhD*
Federal Bureau of Investigation
Laboratory Division, Chemistry Unit
Quantico, VA

Targeted Audience: All disciplines

Knowledge Level Required: Basic (little to no knowledge of subject presented)

Expected Handout Length: 50 Pages

Proceeds from this workshop will benefit the Academy Standards Board.

*Presenting Author
Program Description: Voluntary consensus standards can seem like scary creatures. Rumors are flying about how they are developed in back alleys and that forensic scientists will be shackled with them and their evil ways for eternity. This workshop is designed to dispel those myths and rumors and promote peace and understanding between the forensic and standards worlds. Representatives from four forensic SDO will present their forensics standards and their procedures used for standards development. Next, four forensic scientists and a lawyer will discuss how standards have impacted their practices and what the future may hold. This program will include open discussion between the audience and presenters.

Program:

1:00 p.m. - 1:10 p.m. Welcome—Introduction of Panel and Session
Lucy A. Davis, BHS

1:10 p.m. - 1:30 p.m. American Dental Association (ADA) Standards Developing Organization
Sharon K Stanford, BA

1:30 p.m. - 1:50 p.m. AAFS-Academy Standards Board (ASB) Standards Developing Organization
Teresa Ambrosius, BA

1:50 p.m. - 2:10 p.m. American Society for Testing and Materials (ASTM) International Committee—E30 Forensic Sciences
Daniel G. Smith, MA

2:10 p.m. - 2:30 p.m. National Fire Prevention Association (NFPA)
Michael Wixted, MA

2:30 p.m. - 2:45 p.m. Open Panel Discussion and Questions
Sharon K. Stanford, BA; Teresa Ambrosius, BA; Daniel G. Smith, MA; Michael Wixted, MA

2:45 p.m. - 3:00 p.m. Break

3:00 p.m. - 3:10 p.m. Introduction of Panel and Session
Lucy A. Davis, BHS

3:10 p.m. - 3:25 p.m. Forensic Standards and Toxicology
Jennifer F. Limoges, MS

3:25 p.m. - 3:40 p.m. Forensic Standards and Odontology
Kenneth W. Aschheim, DDS

3:40 p.m. - 3:55 p.m. Forensic Standards and Forensic Biology
Kris C. Cano, MA

3:55 p.m. - 4:10 p.m. Forensic Standards and Trace Material
Diana M. Wright, PhD

4:10 p.m. - 4:25 p.m. Forensic Standards and Jurisprudence
Christine Funk, JD

4:25 p.m. - 4:40 p.m. Open Panel Discussion and Questions
Jennifer F. Limoges, MS; Kenneth W. Aschheim, DDS; Kris C. Cano, MA; Christine Funk, JD; Diana M. Wright, PhD

4:40 p.m. - 4:50 p.m. Summary of Points and Final Comments
Lucy A. Davis, BHS
W13 Statistical Interpretation Software for Friction Ridge Skin Impressions: FRStat

Monday

February 18, 2019 1:00 p.m. – 5:00 p.m. 3.5 CE Hours

Learning Overview: After attending this workshop, attendees will be familiar with a novel method for calculating the strength of fingerprint evidence using a statistical interpretation software, FRStat, developed by the United States government.

Impact on the Forensic Science Community: This workshop will impact the forensic science community by providing participants with the knowledge, skills, and abilities to provide a statistical foundation to latent print examinations using FRStat software to ensure examinations are conducted and conclusions are articulated in a more scientifically defensible manner.

Chair: Anthony Koertner, MS*
Forest Park, GA

Co-Chair: Henry J. Swofford, MSFS*
Forest Park, GA

Targeted Audience: Criminalistics, General

Knowledge Level Required: Intermediate (some knowledge of subject presented)

Expected Handout Length: 500 Pages

Program Description: Through a combination of lectures, group discussions, and practical exercises, this workshop will provide an overview of rudimentary statistical concepts relevant to FRStat, discuss the development, validation, and implementation of FRStat, and provide instruction on how to appropriately interpret, report, and testify to the FRStat results.

Program:

1:00 p.m. - 1:30 p.m. Introduction
Anthony Koertner, MS; Henry J. Swofford, MSFS

1:30 p.m. - 2:30 p.m. Introductory Statistics
Anthony Koertner, MS

2:30 p.m. - 3:00 p.m. Break

3:00 p.m. - 3:45 p.m. FRStat Overview: Operation, Interpretation, and Reporting
Anthony Koertner, MS

3:45 p.m. - 4:30 p.m. FRStat Development and Validation
Henry J. Swofford, MSFS

4:30 p.m. - 5:00 p.m. FRStat Limitations, Considerations for Policy and Procedure, and Implementation
Henry J. Swofford, MSFS

*Presenting Author
Classifying Unknown Human Mandibles Using the Statistical Procedures and Worldwide Databases Available in (hu)MANid

Learning Overview: After attending this presentation, attendees will better understand how to use (hu)MANid, a free, web-based Graphic User Interface (GUI) that allows the user to classify the sex and ancestry of an unknown mandible. Attendees will learn about the three primary statistical classification models available in GUI: linear discriminant analysis, mixture discriminant analysis, and random forest modeling. In-depth discussions detailing how to take appropriate measurements and score the morphology will be presented, culminating in hands-on practice using provided specimens and follow-on classification using the program.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by improving the understanding of how metric and morphological data from the human mandible can be used for determining sex and ancestry for unknown specimens via the free, easy-to-use GUI, (hu)MANid.

Chair: Gregory E. Berg, PhD*
Department of Defense POW/MIA Accounting Agency
Identification Laboratory
Joint Base Pearl Harbor-Hickam, HI

Co-Chair: Michael W. Kenyhercz, PhD*
Department of Defense POW/MIA Accounting Agency
Joint Base Pearl Harbor-Hickam, HI

Targeted Audience: Anthropology, General, Pathology/Biology

Knowledge Level Required: Intermediate (some knowledge of subject presented)

Expected Handout Length: 100

Workshop participants are encouraged to bring a tablet, smart phone, or laptop (a tablet is preferred) to access the Graphical User Interface (GUI) program, (hu)MANid.
W14  Classifying Unknown Human Mandibles Using the Statistical Procedures and Worldwide Databases Available in (hu)MANid

Program Description: This workshop uses (hu)MANid, a free, computer GUI that allows the user to classify the ancestry and sex of an unknown human mandible via a series of statistical procedures. The workshop will begin with metric and morphological assessments of human mandibles and do's and don'ts. Participants will be asked to create a worked example via metric and morphological assessment of one or more mandibles that will be compared to instructor results, as well as a re-evaluation by the participant later in the program. Next, detailed instruction on the GUI's three main evaluation statistics—linear discriminant function analysis, mixture discriminant function analysis, and random forest modeling—will be undertaken. As many practitioners are familiar with the first type of statistical manipulation, this will be an opportunity to broaden horizons with instruction on these relatively "new" statistical tests. Discussions will focus on how to use the statistics, their parameters, the pros and cons of each, and their overall performance for ancestry and sex estimation. Finally, classifications of the participants' worked examples will be undertaken individually and with instructor assistance to solidify the learning objectives of this workshop. Participants are encouraged to bring a smart device (iPad*/tablet, smart phone, laptop computer) for using (hu)MANid.

Program:

1:00 p.m. - 1:05 p.m.  Welcome and Introductions  
Gregory E. Berg, PhD; Michael W. Kenyhercz, PhD

1:05 p.m. - 1:40 p.m.  Metric and Morphological Assessment of a Mandible, Pre-Assessment  
Gregory E. Berg, PhD; Michael W. Kenyhercz, PhD

1:40 p.m. - 2:40 p.m.  Introduction to (hu)MANid, Using the GUI!  
Michael W. Kenyhercz, PhD; Gregory E. Berg, PhD

2:40 p.m. - 3:00 p.m.  Linear Discriminant Function Analysis in (hu)MANid  
Michael W. Kenyhercz, PhD; Gregory E. Berg, PhD

3:00 p.m. - 3:15 p.m.  Break

3:15 p.m. - 3:55 p.m.  Mixture Discriminant Analysis and Random Forest Analysis in (hu)MANid  
Michael W. Kenyhercz, PhD; Gregory E. Berg, PhD

3:55 p.m. - 4:55 p.m.  Metric and Morphological Assessment of a Mandible, Post-Presentation, and Hands-On Evaluations  
Gregory E. Berg, PhD; Michael W. Kenyhercz, PhD

4:55 p.m. - 5:30 p.m.  Panel Questions and Answers  
Gregory E. Berg, PhD
Presenting Author

WORKSHOPS

Pre-registration was required.

W15 So You Want to Publish? A Basic Primer and Introduction to Forensic Publishing

Tuesday

February 19, 2019 8:30 a.m. – 12:00 p.m. 3.0 CE Hours

Learning Overview: After attending this presentation, attendees will have a basic understanding of how to: (1) determine whether their proposed topic is suitable for publication; (2) identify and contact a publisher; and (3) work with the publisher through the publication process. Participants will attain a basic foundation of journal and book publishing. In addition, attendees will be able to identify the differences between publishing styles and formats and the differences in book, chapter, or journal requirements.

Impact on the Forensic Science Community: Publication of research and findings is essential for open review and discussion by those engaged in the forensic sciences. This presentation will impact the forensic science community by educating participants who desire to publish their forensic work in the solicitation, acquisition, and editing phases of the process for journal or textbook publication. This presentation will assist in furthering communication and enhancing awareness among scientific professionals and disciplines.

Chair: Rachel Hamilton Walton, EdD*
Price, UT

Co-Chair: Katherine M. Brown, PhD*
Tarleton State University
Department of Criminal Justice
Bryan, TX

Faculty:
Elizabeth A. Brown*
Elsevier Publishing
San Diego, CA

Michael A. Peat, PhD*
Journal of Forensic Sciences
The Woodlands, TX

Jenny Cossham, MS*
John Wiley & Sons, Ltd
Chichester, West Sussex, UNITED KINGDOM

Alexander J. Smith, MA*
Elsevier Publishing
Kidlington, Oxfordshire, UNITED KINGDOM

Mark A. Listewnik, MA*
Taylor and Francis
Boca Raton, FL

Targeted Audience: All disciplines
Knowledge Level Required: Basic (little to no knowledge of subject presented)
Expected Handout Length: None

*Presenting Author
**Program Description:** This workshop is a panel discussion by representatives of international forensic book and journal publishers, designed to assist potential authors interested in forensic publishing. Panel members will respond to questions posed by a moderator, and after each segment, attendees will have the opportunity to query the presenters on the topics presented. The questions will be designed to assist potential writers who wish to publish in textbook or journal format and wish to learn the procedures for doing so. The questions posed will focus on how to determine if one has material of interest to the forensic community and how to identify and communicate with a publisher. In addition, questions posed will address the various publication and editing processes for both journal and textbook formats. No handouts will be provided to attendees.

**Program:**

8:30 a.m. - 8:45 a.m.  Introductions and Review of Panel Format  
*Rachel Hamilton Walton, EdD; Katherine M. Brown, PhD*

8:45 a.m. - 10:00 a.m.  Discussion of Textbook Submission and the Publishing Process  
*Mark A. Listewnik, MA; Elizabeth A. Brown; Jenny Cossham, MS*

10:00 a.m. - 10:15 a.m.  Break

10:15 a.m. - 10:30 a.m.  Discussion of Textbook Submission and the Publishing Process (continued)  
*Mark A. Listewnik, MA; Elizabeth A. Brown; Jenny Cossham, MS*

10:30 a.m. - 11:40 a.m.  Discussion of Journal Submission, Review, and the Publication Process  
*Michael A. Peat, PhD; Alexander J. Smith, MA; Mark A. Listewnik, MA*

11:40 a.m. - 12:00 p.m.  Questions and Answers  
*Rachel Hamilton Walton, EdD; Katherine M. Brown, PhD; Mark A. Listewnik, MA; Elizabeth A. Brown; Jenny Cossham, MS; Michael A. Peat, PhD; Alexander J. Smith, MA*
Pre-registration was required.

W16  Litigating Fingerprint Evidence: Ensuring Transparent and Sound Scientific Foundations

Tuesday

February 19, 2019  8:30 a.m. – 12:00 p.m.  2.75 CE Hours

Learning Overview: After attending this workshop, attendees will better understand the basic tenets of scientific validity, understand how statistical methods may be applied to non-DNA disciplines with specific emphasis on fingerprint evidence, and be better equipped to litigate cases involving pattern evidence domains.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by introducing legal and scientific practitioners to key issues concerning the examination, interpretation, and testimony of forensic pattern evidence domains and discuss a roadmap for litigating forensic evidence to ensure expert testimony is transparent, empirically substantiated, and scientifically valid. This workshop will include recommendations for laying the foundation for the introduction of pattern analysis evidence and discuss the challenges for its admission.

Chair: Henry J. Swofford, MSFS*
Defense Forensic Science Center
United States Army
Criminal Investigation Laboratory
Forest Park, GA

Co-Chair: Anece Baxter-White, JD*
Defense Forensic Science Center
United States Army
Criminal Investigation Laboratory
Forest Park, GA

Faculty: Brendan P. Max, JD
Cook County Public Defender
Chicago, IL

Targeted Audience: Criminalistics, General, Jurisprudence

Knowledge Level Required: Intermediate (some knowledge of subject presented)

Expected Handout Length: 500 Pages

Program Description: Through a combination of lectures and group discussions, this workshop will provide a candid assessment of the current state of the forensic fingerprint discipline through the lenses of scientific validity, discuss existing gaps between the current state of the practice and the ideal future state of the science, and propose a way forward for the forensic fingerprint community to navigate toward a stronger scientific foundation. As a result, forensic science practitioners, laboratory leaders, forensic science policy makers, and criminal and civil litigators will have a much better understanding of the issues related to traditional practices of fingerprint examinations, become familiar with novel methods that can be leveraged by forensic science laboratories to promote more objective, transparent, and standardized practices, and become better positioned to litigate and introduce forensic evidence and advocate for appropriate improvements within their respective jurisdictions.

Program:

8:30 a.m.  -  9:00 a.m.  Introduction
Henry J. Swofford, MSFS; Anece Baxter-White, JD; Brendan P. Max, JD

9:00 a.m.  -  10:00 a.m.  Bridging the Scientific Gap: From Ipse Dixit to Demonstrable Data
Henry J. Swofford, MSFS

10:00 a.m.  -  10:15 a.m.  Break

10:15 a.m.  -  11:15 a.m.  Accountability in Court—Litigating Print Evidence Amid Reform Movements
Brendan P. Max, JD

11:15 a.m.  -  11:45 a.m.  Laying Stronger Foundations for Admissibility
Anece Baxter-White, JD

11:45 a.m.  -  12:00 p.m.  Questions and Answers
Henry J. Swofford, MSFS; Anece Baxter-White, JD; Brendan P. Max, JD
WORKSHOPS

Pre-registration was required.

W17 A Think Tank on the Leading Edge of Forensic Science: Big Data, Head Trauma, Risk Evaluation, Drones, Video Analysis, and Disruptive Technology

Tuesday
February 19, 2019
8:30 a.m. – 12:30 p.m.
3.5 CE Hours

Learning Overview: After attending this presentation, attendees will better understand the various new advances in forensic science that may have an impact on their work.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing the impact of new developments on big data, head trauma, risk evaluation, drones, video analysis, and disruptive technology.

Chair:
Laura L. Liptai, PhD*
BioMedical Forensics
Moraga, CA

Co-Chair:
Zeno J. Geradts, PhD*
Netherlands Forensic Institute
Den Haag, NETHERLANDS

Faculty:
Scott Blair, JD*
Brain Injury Law of Seattle
Edmonds, WA

Stephanie Domitrovich, JD, PhD*
Sixth Judicial District of Pennsylvania
Erie County Court House
Erie, PA

Mary E.S. Case, MD*
St. Louis County
Office of the Medical Examiner
St. Louis, MO

Anthony M. Hallett*
Unmanned Response, Inc
Beaver, PA

Curtis B. Coulter, JD*
Law Offices of Curtis B. Coulter, P.C.
Reno, NV

Victor W. Weedn, MD, JD*
The George Washington University
Washington, DC

Targeted Audience: Criminalistics, Digital & Multimedia Sciences, Engineering Sciences, General, Jurisprudence, Pathology/Biology, Questioned Documents, Toxicology

Knowledge Level Required: Intermediate (some knowledge of subject presented)

Expected Handout Length: 80 Pages

*Presenting Author
Program Description: Experts from all over the world will discuss the new developments that will revolutionize forensic science and how these developments may impact the work of forensic scientists. Practical examples will be presented on big data, head trauma, risk evaluation, drones, video analysis, and disruptive technology. This presentation will provide an overview of exciting new advances and open a forum for the discussion of issues that may arise regarding these new developments that will ultimately impact the forensic science community. A wide variety of new technology that will soon impact forensic science has been identified within the Think Tank Committee.

Program:

8:30 a.m. - 8:40 a.m. Welcome and Think Tank Committee Contributions  
Laura L. Liptai, PhD; Zeno J. Geradts, PhD

8:40 a.m. - 9:10 a.m. Big Data and Multimedia Forensics  
Zeno J. Geradts, PhD

9:10 a.m. - 9:40 a.m. Disruptive Technologies and Implications for the Judicial System  
Stephanie Domitrovich, JD, PhD

9:40 a.m. - 10:05 a.m. Drones: Challenges for Forensic Science  
Victor W. Weedn, MD, JD

10:05 a.m. - 10:30 a.m. Drones: Opportunities for Forensic Science  
Anthony M. Hallett

10:30 a.m. - 10:45 a.m. Break

10:45 a.m. - 11:15 a.m. Revolutionizing High Value Risk Evaluation: Achieving Resolution of Conflict Without (Protracted) Litigation  
Curtis B. Coulter, JD

11:15 a.m. - 12:00 p.m. Traumatic Unconsciousness and Forensic Pathology  
Mary E.S. Case, MD

12:00 p.m. - 12:30 p.m. Cutting-Edge Medical Forensics in Head Trauma Cases  
Scott Blair, JD

*Presenting Author
W18 Forensic Support of Fire Investigation: I Was Told There Would Be No Math

Tuesday
February 19, 2019 8:30 a.m. – 12:45 p.m. 4.0 CE Hours

Learning Overview: After attending this presentation, attendees will: (1) be introduced to fire investigation engineering and chemist support; (2) understand the various resources the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) brings to support a fire investigation, including forensic chemistry, engineering, modeling, fire dynamics, and laboratory measurements; (3) tour two working forensic laboratories dedicated to the support of fire investigation; (4) witness a live burn demonstration; and (5) gain insights through the discussion of forensic casework and associated laboratory measurements.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by presenting multidisciplinary and innovative approaches to tackle complex cases of fire investigation.

Chair: John L. Allen, PE*
Bureau of Alcohol, Tobacco, Firearms and Explosives
Beltsville, MD

Faculty: Raymond Kuk, MS*
Bureau of Alcohol, Tobacco, Firearms and Explosives
Forensic Science Laboratory
Beltsville, MD

Co-Chair: Julia A. Dolan, MS*
Bureau of Alcohol, Tobacco, Firearms and Explosives
Forensic Science Laboratory
Beltsville, MD

David T. Sheppard, PhD
Bureau of Alcohol, Tobacco, Firearms and Explosives
Beltsville, MD

Off-Site Workshop: This workshop will be held at the National Laboratory Center of the ATF in Beltsville, MD. The bus will leave promptly at 8:30 a.m. from the Charles Street Lobby (on Pratt Street) of the Baltimore Convention Center.

Attendees should arrive no later than 8:15 a.m. for boarding of bus. The bus will depart promptly at 8:30 a.m. to arrive at the ATF facility by 9:05 a.m. Please wear comfortable walking shoes. It is strongly suggested that attendees bring a snack for the return trip—lunch will not be provided. Because this is a United States government facility, additional security prerequisites are required for attendees to be able to access the ATF facility. Workshop attendees should be prepared for security screening upon entering the ATF facility.

Each participant should complete the applicable form(s) in order to be granted access to the facility. Refunds will not be allowed under any circumstances. Interpreters for attendees who require translation services must pre-register for the workshop, pay the full workshop registration fee, and pass all security access requirements. Attendees should submit the appropriate form(s) as soon as they are confirmed registered for the workshop. Waitlist and/or on-site registrations will not be accepted for this workshop. The requirements are provided below.

Non-Government Domestic Visitors to the National Laboratory Center (NLC) must complete ATF Form 8620.42—Police Check Inquiry. The NLC requester must submit the completed ATF Form 8620.42 by email to NLCSecurity@atf.gov 24 to 48 hours prior to the visit. NLC Security will notify the requester of the results (cleared for escorted entrance or not cleared for escorted entrance) upon completion of the background check.

Foreign/International Visitors to the National Laboratory Center (NLC) must complete ATF Form 8620.64—Foreign National Visitor Request. The NLC requester must submit the completed ATF Form 8620.64 by email to PSDVerifications@atf.gov at least 3 weeks prior to the visit. The Personnel Security Division (PSD) will notify the NLC requester of the results (cleared for escorted entrance or not cleared for escorted entrance) upon completion of the background check. Upon receipt of notification from PSD, the NLC requester should notify NLC Security at NLCSecurity@atf.gov so access can be granted.

*Presenting Author
Pre-registration was required.

**W18  Forensic Support of Fire Investigation: I Was Told There Would Be No Math**

**Targeted Audience:** Criminalistics, Engineering Sciences  
**Knowledge Level Required:** Intermediate (some knowledge of subject presented)  
**Expected Handout Length:** 10 Pages

**Program Description:** This half-day presentation incorporates a workshop and behind-the-scenes tour of the Bureau of Alcohol, Tobacco, Firearms and Explosives National Laboratory Center. Complex techniques for the support of fire/arson investigations will be introduced. These include analytical chemistry, electrical failure analysis, fire modeling, fire dynamics, and large-scale fire simulation experimental measurements and data. Participants will attend a large-scale burn demonstration in ATF’s state-of-the-art Fire Research Laboratory facility.

**Program:**  
8:30 a.m. - 9:00 a.m.  
Bus Transportation to ATF National Laboratory Center:  
Arrive No Later Than 8:15 a.m. for Check In

9:00 a.m. - 9:15 a.m.  
Processing Visitors and Gathering Required Government-Issued ID (All Visitors Will Require Pre-Screening; International Visitors Will Require Additional Pre-Screening)

9:15 a.m. - 9:30 a.m.  
Welcoming Remarks  
*John L. Allen, PE; Julia A. Dolan, MS*

9:30 a.m. - 10:00 a.m.  
Overview of Laboratory Data Gathered in Support of Fire Investigation  
*David T. Sheppard, PhD; Raymond Kuk, MS*

10:00 a.m. - 10:15 a.m.  
Break

10:15 a.m. - 10:45 a.m.  
Tour Forensic Science Laboratory—Washington  
*Julia A. Dolan, MS; Raymond Kuk, MS*

10:45 a.m. - 11:15 a.m.  
Tour Fire Research Laboratory  
*John L. Allen, PE; David T. Sheppard, PhD*

11:15 a.m. - 11:45 a.m.  
Live Burn Demonstrations  
*John L. Allen, PE; David T. Sheppard, PhD*

11:45 a.m. - 12:15 p.m.  
Round-Table Discussion  
*John L. Allen, PE; Julia A. Dolan, MS; David T. Sheppard, PhD; Raymond Kuk, MS*

12:15 p.m. - 12:45 p.m.  
Bus Departs ATF National Laboratory Center to Return to Baltimore Convention Center
W19  Multidisciplinary Techniques to Assist With Missing and Unidentified Persons Investigations

Tuesday

February 19, 2019  8:30 a.m. – 4:30 p.m.  6.0 CE Hours

Learning Overview: The goals of this presentation are to provide an overview of the different techniques available to generate potential investigative leads in missing person cases and to assist with the identification of unknown individuals.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by increasing awareness of forensic and investigative techniques utilized to provide support to unidentified and missing person investigations.

Chair:
Noelle J. Umback, PhD*
Office of the Chief Medical Examiner
Department of Forensic Biology
New York, NY

Faculty:
Patricia J. Aagaard, BS*
Federal Bureau of Investigation Laboratory
Combined DNA Index System Unit
Quantico, VA

Glenn K. Bard, AAS*
PATCtech
Plainfield, IN

Lori Bruski, BS*
University of North Texas Health Science Center
Fort Worth, TX

Lawrence A. Dobrin, DMD*
Office of the Chief Medical Examiner
New York, NY

Jonathan Hayes, MD*
Office of the Chief Medical Examiner
New York, NY

Co-Chair:
Richard M. Thomas, PhD*
Federal Bureau of Investigation Laboratory
Trace Evidence Unit
Quantico, VA

Bryan Johnson, MSFS*
Federal Bureau of Investigation Laboratory
Quantico, VA

Brandon C. Letts, PhD*
Federal Bureau of Investigation Laboratory
Quantico, VA

Aden G. Naka, MSc*
Office of the Chief Medical Examiner
New York, NY

Angela Soler, PhD*
Office of the Chief Medical Examiner
New York, NY

Targeted Audience: Anthropology, Criminalistics, Digital & Multimedia Sciences, General, Odontology, Pathology/Biology

Knowledge Level Required: Basic (little to no knowledge of subject presented)

Expected Handout Length: 100 Pages

*Presenting Author
**Program Description:** Presentations will include experts in a wide variety of fields, including anthropology, odontology, DNA, fingerprints, pathology, human identification, digital evidence, and national databases.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>Welcome</td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>Beyond the Database: Working to Resolve Missing and Unidentified Cases</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>Digital Evidence in Missing Person Investigations</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>Break</td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td>Anthropology, Facial Approximation, and National Resources for Missing Person and Unidentified Remains Investigations</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>Postmortem Change and the Forensic Pathology of Identification</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:15 p.m.</td>
<td>Odontology and Missing Person and Unidentified Remains Investigations</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>The Use of National DNA Databases for Missing Persons and Unidentified Remains Cases</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>Resolution of an Unidentified Human Remains Case Through Recognition of Type II DNA Damage</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Break</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Leveraging New Biometric Tools to Solve Cold Cases</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>Hard Cases, Cold Cases: Identification and Outreach at the New York City Office of the Chief Medical Examiner</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>Closing Discussion</td>
</tr>
</tbody>
</table>
W20 The Forensic Pathology of Gunshot Wounds

Tuesday

February 19, 2019 8:30 a.m. – 4:30 p.m. 6.5 CE Hours

Learning Overview: After attending this presentation, attendees will be able to: (1) classify typical gunshot entrance and exit wounds; (2) differentiate atypical gunshot wounds; (3) use new advances in gunshot residue analysis; (4) explain the pathophysiology of gunshot injury; (5) interpret bullet tracks given different scenarios; (6) integrate forensic anthropology findings in bullet injuries and tracks; (7) review typical and atypical suicide gunshot wounds; and (8) describe autopsy findings in an oral presentation as if testifying.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by increasing the competence of forensic pathologists, forensic anthropologists, and other practitioners in examining, describing, correlating, and documenting gunshot injuries.

Chair:
Jane W. Turner, PhD, MD*
St. Louis, MO

Faculty:
Marianna Eserman, MD*
New Orleans, LA

Diane C. Peterson, MD*
Office of the Jackson City Medical Examiner
Kansas City, MO

Co-Chair:
Nadia A. Granger, MD*
Monroe County Office of the Medical Examiner
Rochester, NY

Juliette Scantlebury, MD*
St. Louis City Medical Examiner's Office
St. Louis, MO

MariaTeresa A. Tersigni-Tarrant, PhD*
Saint Louis University School of Medicine
Center for Anatomical Science
St. Louis, MO

Targeted Audience: Anthropology, Pathology/Biology
Knowledge Level Required: Basic (little to no knowledge of subject presented)
Expected Handout Length: 80 Pages

*Presenting Author
Program Description: This workshop will offer didactic lectures on the forensic pathology of gunshot wounds plus a practicum using scene and autopsy photos and X-rays.

Program:

8:30 a.m. - 9:30 a.m. A Primer on Gunshot Wounds
Juliette Scantlebury, MD; Marianna Eserman, MD; Diane C. Peterson, MD

9:30 a.m. - 10:30 a.m. Atypical Gunshot Wounds
Jane W. Turner, PhD, MD; Nadia A. Granger, MD; Diane C. Peterson, MD

10:30 a.m. - 10:45 a.m. Break

10:45 a.m. - 11:45 a.m. Gunshot-Related Injuries
Jane W. Turner, PhD, MD; Juliette Scantlebury, MD; MariaTeresa A. Tersigni-Tarrant, PhD

11:45 a.m. - 12:45 p.m. Lunch

12:45 p.m. - 1:45 p.m. Topics Related to Gunshot Wounds
Jane W. Turner, PhD, MD; Marianna Eserman, MD; Diane C. Peterson, MD

1:45 p.m. - 2:45 p.m. Correlations of Gunshot Injuries With Scenes, Forensic Anthropology, Medical Records, X-Rays, and Hypothetical Scenarios
Jane W. Turner, PhD, MD; Nadia A. Granger, MD; Juliette Scantlebury, MD; Marianna Eserman, MD; MariaTeresa A. Tersigni-Tarrant, PhD; Diane C. Peterson, MD

2:45 p.m. - 3:00 p.m. Break

3:00 p.m. - 4:30 p.m. Gunshot Wound Practicum
Jane W. Turner, PhD, MD; Nadia A. Granger, MD; Juliette Scantlebury, MD; Marianna Eserman, MD; MariaTeresa A. Tersigni-Tarrant, PhD; Diane C. Peterson, MD
Pre-registration was required.

W21 The National Transportation Safety Board (NTSB): Understanding and Preventing Impairment in Transportation

Tuesday

February 19, 2019 8:30 a.m. – 4:30 p.m. 5.75 CE Hours

Learning Overview: After attending this presentation, attendees will be able to describe how the NTSB conducts its investigations of aviation, marine, rail, and highway events, the role of toxicology in the investigations, and how this knowledge leads to recommendations to improve transportation safety and prevent impairment.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the role of impairment in NTSB investigations and the importance of toxicology in understanding the contribution of drugs to impairment.

Chair:
Marilyn A. Huestis, PhD*
Huestis & Smith Toxicology, LLC
Severna Park, MD

Co-Chair:
Philip M. Kemp, PhD*
Bioaeronautical Research Laboratory
Oklahoma City, OK

Faculty:
Russell Lewis, PhD*
Bioaeronautical Research Laboratory
Oklahoma City, OK

Leah Walton, BA*
National Transportation Safety Board
Washington, DC

Jana M. Price, PhD*
National Transportation Safety Board
Washington, DC

Nicholas Webster, MD*
National Transportation Safety Board
Washington, DC

Robert L. Sumwalt III, MS*
National Transportation Safety Board
Washington, DC

Targeted Audience: Anthropology, Criminalistics, Digital & Multimedia Sciences, Engineering Sciences, General, Jurisprudence, Pathology/Biology, Psychiatry & Behavioral Science, Toxicology

Knowledge Level Required: Basic (little to no knowledge of subject presented)

Expected Handout Length: 100 Pages

*Presenting Author
The National Transportation Safety Board (NTSB): Understanding and Preventing Impairment in Transportation

Program Description: The role of the NTSB in transportation crashes and events, how they determine if impairment is a contributory cause, and how results of these investigations lead to recommendations to improve transportation safety will be described. The road map for performing toxicology in these cases will be provided, specific cases detailed with accompanying toxicological results, and final decisions given on whether substance use was a contributory cause of the crash or event. In addition, onsite testing of alternative matrices will be evaluated in terms of whether this could improve the data needed to determine if drug impairment was a contributory cause of the crash or event.

Program:

8:30 a.m. - 9:15 a.m. The Role of the NTSB in the Improvement of Transportation Safety: A Historical Overview and Current Issues
Robert L. Sumwalt III, MS

9:15 a.m. - 10:00 a.m. NTSB Investigator Methods to Collect and Document Evidence to Understand Potential Impairment Issues
Jana M. Price, PhD

10:00 a.m. - 10:25 a.m. Break

10:25 a.m. - 11:10 a.m. NTSB Criteria to Determine if Operator Impairment Contributed to the Cause of a Crash
Nicholas Webster, MD

11:10 a.m. - 11:55 a.m. The Impact of NTSB Recommendations on Transportation Safety
Leah Walton, BA

11:55 a.m. - 1:15 p.m. Lunch

1:15 p.m. - 2:00 p.m. The Civil Aerospace Medical Institute (CAMI) Toxicological Road Map for Analyzing Biological Specimens Collected in NTSB Investigations
Philip M. Kemp, PhD

2:00 p.m. - 2:45 p.m. Toxicological Findings in Specific NTSB Cases and Their Contribution to Probable Cause
Nicholas Webster, MD; Russell Lewis, PhD

2:45 p.m. - 3:15 p.m. Break

3:15 p.m. - 4:00 p.m. Onsite Biological Testing in NTSB Cases: The Current Value and Future Possibilities
Marilyn A. Huestis, PhD

4:00 p.m. - 4:30 p.m. Panel Discussion of NTSB Transportation Event Investigations, Recommendations for Improving Transportation Safety and Toxicological Analysis for Identifying Drug Impairment
Robert L. Sumwalt III, MS; Jana M. Price, PhD; Nicholas Webster, MD; Leah Walton, BA; Philip M. Kemp, PhD; Russell Lewis, PhD; Marilyn A. Huestis, PhD
Pre-registration was required.

W22 The Use of Dental Morphology in Forensic Anthropology

Tuesday

February 19, 2019 8:30 a.m. – 5:00 p.m. 6.5 CE Hours

Learning Overview: After attending this presentation, attendees will be able to identify various morphological traits of the dentition that are relevant to studies of human variation and forensic anthropology. Attendees will also be able to apply this knowledge to the estimation of ancestry using a newly developed web-based application. Additionally, attendees will be introduced to a new database designed for the collection of dental data.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with applied experience in the recordation of dental morphological variation and the application of these data in a statistical framework within which to estimate ancestry.

Chair:
Marin A. Pilloud, PhD*
University of Nevada, Reno
Reno, NV

Faculty:
Rebecca L. George, MA*
University of Nevada, Reno
Reno, NV

Co-Chair:
Christine M. Pink, PhD
Metropolitan State University of Denver
Department of Sociology and Anthropology
Denver, CO

G. Richard Scott, PhD*
University of Nevada, Reno
Reno, NV

Targeted Audience: Anthropology, Odontology, Pathology/Biology
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 60 Pages

Program Description: Dental morphology has been broadly used in biological anthropology to study human variation and explore various hypotheses related to migration, evolution, and social structure. Recent research has shown that these data may have much to offer the field of forensic anthropology; however, despite this background, these data have not been traditionally used within forensic anthropology and training has been minimal. This workshop will serve to provide the practitioner with a background in dental morphology to include the identification and recordation of the main traits employed in the study of human variation. Presentations will also provide an overview of analytical techniques. Participants will be shown a custom database for dental morphological data collection and will be provided the opportunity to collect these data and employ them in a web-based application for the estimation of ancestry. Dental morphological data can provide forensic anthropologists with one more method to employ in skeletal analysis, which may be particularly important in difficult or fragmentary cases.

*Presenting Author
Pre-registration was required.

**W22 The Use of Dental Morphology in Forensic Anthropology**

**Program:**

8:30 a.m. - 9:00 a.m. Welcome and Introduction to Dental Anthropology  
*Marin A. Pilloud, PhD*

9:00 a.m. - 10:15 a.m. Traits of the Maxillary Dentition  
*G. Richard Scott, PhD*

10:15 a.m. - 10:30 a.m. Break

10:30 a.m. - 11:45 a.m. Traits of the Mandibular Dentition  
*G. Richard Scott, PhD*

11:45 a.m. - 12:15 p.m. Global Trends and Analytical Techniques  
*Marin A. Pilloud, PhD*

12:15 p.m. - 1:45 p.m. Lunch

1:45 p.m. - 2:30 p.m. Introduction to rASUDAS and Dentabase  
*Marin A. Pilloud, PhD*

2:30 p.m. - 3:45 p.m. Hands-On Activities: Recording Data  
*Marin A. Pilloud, PhD; G. Richard Scott, PhD; Rebecca L. George, MA*

3:45 p.m. - 4:00 p.m. Break

4:00 p.m. - 4:30 p.m. Hands-On Activities: rASUDAS  
*Marin A. Pilloud, PhD; G. Richard Scott, PhD; Rebecca L. George, MA*

4:30 p.m. - 5:00 p.m. Concluding Remarks  
*Marin A. Pilloud, PhD*
W23  How to Measure and Reduce Drug Background Levels in Forensic Laboratories and Their Implications on Safety and Data Integrity

Tuesday

February 19, 2019  8:30 a.m. – 5:00 p.m.  6.25 CE Hours

Learning Overview: The goal of this workshop is for attendees to understand the significance and benefits of characterizing the composition and amount of drug background present in forensic laboratories. Attendees will learn: (1) about the recent work to establish drug background levels and how the data can be interpreted for the implications on health and safety and for data integrity purposes; (2) what processes contribute to a higher drug background and what controls and cleaning procedures can be implemented to reduce the potential for exposure; (3) what mechanisms laboratories are considering to improve analyst occupational health practices and maintain data integrity through changes to policies and procedures; (4) strategies for addressing drug background in court testimony; and (5) about analytical methods suitable to measure drug background levels and best practices required to collect and analyze the samples.

Impact on the Forensic Science Community: This workshop will impact the forensic science community by providing drug analysts, quality managers, and laboratory directors with valuable information to make informed decisions on a range of topics, including identification of workflow processes that contribute to elevated drug backgrounds, cleaning protocols that reduce drug background, exposure prevention controls such as Personal Protective Equipment (PPE), and occupational health hazards from drug analysis.

Chair:
Daniel E. Katz, MFS*
Maryland State Police
Forensic Sciences Division
Pikesville, MD

Faculty:
Kendra Broadwater, MS*
Center for Disease Control and Prevention
National Institute for Occupational Safety and Health
Cincinnati, OH

Amber Burns, MS*
Maryland State Police
Forensic Sciences Division
Pikesville, MD

Joaquin Cabrera, JD*
States Attorney’s Office of Worcester County
Snow Hill, MD

Theresa DeAngelo, MS*
Maryland State Police
Forensic Sciences Division
Pikesville, MD

Targeted Audience: Criminalistics, General, Jurisprudence, Toxicology
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 250 Pages

Co-Chair:
Susan M. Ballou, MS*
Gaithersburg, MD

Robert Kirkby, MS *
Michigan State Police
Lansing, MI

Marcela Najarro, MFS *
National Institute of Standards and Technology
Gaithersburg, MD

Edward Sisco, PhD*
National Institute of Standards and Technology
Gaithersburg, MD

*Presenting Author
W23  How to Measure and Reduce Drug Background Levels in Forensic Laboratories and Their Implications on Safety and Data Integrity

Program Description: Monitoring the chemical background of an operational environment is standard practice for industries such as pharmaceutical, food manufacturing, and healthcare for reasons from cross-contamination to health and safety concerns to regulatory and data integrity. For forensic laboratories, establishing drug background levels can provide a wealth of information to enhance their quality management system as well as provide data to suggest changes to laboratory policies and procedures. Additionally, the recent rise of drug evidence containing highly toxic opioids stresses the need to safeguard analysts from inadvertent exposure. This workshop will highlight recent efforts to measure and understand the drug background in forensic laboratories. Topics covered in this workshop include understanding how to properly measure drug background, what drug background levels to expect, and what those levels mean in terms of analyst safety and data integrity. General considerations regarding controls to improve analyst occupational health practices and reduce drug background levels will also be provided. Perspectives from a range of forensic practitioners and lab management will allow participants to understand what policy and procedural changes are being considered to reduce drug background levels and increase safety in other laboratories. Finally, participants will have a hands-on opportunity to learn how to appropriately sample their surfaces and how robust tools can be used to identify areas containing high drug background levels.

Program:

8:30 a.m. - 8:45 a.m.  Introduction to the Significance of Drug Background
Edward Sisco, PhD; Marcela Najarro, MFS

8:45 a.m. - 9:30 a.m.  Measurement of Drug Background on Surfaces in Forensic Laboratories
Edward Sisco, PhD; Marcela Najarro, MFS

9:30 a.m. - 10:00 a.m.  Net Weights and Other Processes That Contribute to Drug Background
Edward Sisco, PhD; Amber Burns, MS

10:00 a.m. - 10:30 a.m.  Break

10:30 a.m. - 11:30 a.m.  Occupational Health and Safety Considerations for Daily Operations
Kendra Broadwater, MS; Robert Kirkby, MS

11:30 a.m. - 11:45 a.m.  Risk Assessment: Responding to a NIOSH Evaluation
Theresa DeAngelo, MS

11:45 a.m. - 1:00 p.m.  Lunch

1:00 p.m. - 1:20 p.m.  Data Integrity: Quantifying Limits of Detection and Reporting Thresholds
Edward Sisco, PhD; Amber Burns, MS

1:20 p.m. - 1:50 p.m.  A Legal Perspective: Addressing Drug Background in Court Testimony
Amber Burns, MS; Joaquin Cabrera, JD

1:50 p.m. - 2:20 p.m.  Reducing Drug Background: Quantifying the Cleaning Process
Marcela Najarro, MFS; Theresa DeAngelo, MS

2:20 p.m. - 2:35 p.m.  Break

2:35 p.m. - 2:55 p.m.  The Next Steps: Implementation Through Change Management and Policy
Daniel E. Katz, MFS

2:55 p.m. - 3:45 p.m.  Panel Discussion: Perspectives From a Drug Analyst, QA Manager, Lab Director, and Industrial Hygenist
Amber Burns, MS; Robert Kirkby, MS; Daniel E. Katz, MFS; Theresa DeAngelo, MS

3:45 p.m. - 4:00 p.m.  Break

4:00 p.m. - 4:50 p.m.  Hands-On: Practical Considerations for the Optimal Swipe Collection of Drug Residues—Using LFIs for Drug Background Detection
Edward Sisco, PhD; Marcela Najarro, MFS

4:50 p.m. - 5:00 p.m.  Conclusions: Implementing a Drug Background Monitoring Program in Your Laboratory
Edward Sisco, PhD; Marcela Najarro, MFS
WORKSHOPS

Pre-registration was required.

W24 Adult Skeletal Age Estimation: Transition Analysis Using the Entire Skeleton

Tuesday

February 19, 2019 8:30 a.m. – 5:00 p.m. 6.5 CE Hours

Learning Overview: After attending this presentation, participants will: (1) learn why attention must shift to many traits distributed throughout the skeleton to improve age estimation; (2) understand the analytical approach needed to use these age-informative traits effectively; and (3) acquire a basic comprehension of how to apply the procedure for generating age estimates.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by introducing an accurate and precise method of age estimation from the skeleton. Standard and frequently used procedures have long been known to yield inaccurate, biased (especially beyond 50 years), and imprecise age estimates. The new procedure, based on a wide range of skeletal features and refined analytical methods, yields far more accurate age estimates throughout all of adulthood. Attendees will learn how to apply the newly developed procedure, from scoring traits to generating age estimates.

Chair:
Stephen D. Ousley, PhD*
Mercyhurst University
Department of Computing and Information Science
Erie, PA

Faculty:
Jesper L. Boldsen, PhD*
University of Southern Denmark
Institute of Forensic Medicine
Odense, DENMARK

Sara M. Getz, PhD*
Mercyhurst University
Department of Applied Forensic Sciences
Erie, PA

Co-Chair:
George R. Milner, PhD*
Pennsylvania State University
Department of Anthropology
University Park, PA

Svenja Weise, PhD*
University of Southern Denmark
Institute of Forensic Medicine
Odense, DENMARK

Targeted Audience: Anthropology, Pathology/Biology
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 85 Pages

*Presenting Author
Program Description: Using the TA3 system, this workshop introduces participants to a new way of estimating age from adult skeletons using transition analysis and data from ca. 1,700 individuals from four continents. TA3 yields estimates of age throughout the adult lifespan that are ideal for forensic use. The integrated approach features age-informative traits located throughout the skeleton, incorporates improvements in analytical approaches to make full use of those traits, and features a computer program to implement computationally intensive procedures.

Program:

8:30 a.m. - 8:45 a.m. Welcome
Stephen D. Ousley, PhD; George R. Milner, PhD

8:45 a.m. - 10:15 a.m. The Past, Present, and Future of Age Estimation
Stephen D. Ousley, PhD; Jesper L. Boldsen, PhD

10:15 a.m. - 10:30 a.m. Break

10:30 a.m. - 12:00 p.m. The Traits: Part I
Svenja Weise, PhD

12:00 p.m. - 1:15 p.m. Lunch

1:15 p.m. - 2:00 p.m. The Traits: Part II
Sara M. Getz, PhD

2:00 p.m. - 3:00 p.m. Statistics and Software
Stephen D. Ousley, PhD; Jesper L. Boldsen, PhD

3:00 p.m. - 3:15 p.m. Break

3:15 p.m. - 5:00 p.m. Hands-On Scoring and Age Estimation
Stephen D. Ousley, PhD; George R. Milner, PhD; Jesper L. Boldsen, PhD; Svenja Weise, PhD; Sara M. Getz, PhD
W26  Aspects of DNA Admissibility Hearings From the Prosecution, Defense, and Crime Lab Perspective

Tuesday

February 19, 2019  1:00 p.m. – 5:00 p.m.  3.5 CE Hours

Learning Overview: After attending this workshop, participants will better understand the general aspects of preparing for a DNA admissibility hearing from the lab, prosecution, and defense perspective. Attendees will be introduced to the challenges faced in preparing for and conducting hearings and the overall impact of the admission or preclusion of various scientific techniques in a court of law. The panel discussion will include information and techniques that the various speakers use to prepare for and conduct hearings.

Impact on the Forensic Science Community: This workshop will impact the forensic science community by introducing participants to the challenges faced in preparing for and conducting hearings and the overall impact of the admission or preclusion of various scientific techniques in a court of law.

Chair:
Craig O. O'Connor, PhD*
New York City Office of Chief Medical Examiner
New York, NY

Co-Chair:
Kristin Schelling, MS*
Lansing, MI

Faculty:
Danielle Grootenboer, JD*
Bergen County Prosecutor’s Office
Hackensack, NJ

John D. Schmid, JD*
Duluth, MN

Florence Hutner, JD*
New York City Office of the Chief Medical Examiner
New York, NY

Targeted Audience: Criminalistics, Jurisprudence
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 140 Pages

*Presenting Author
W26 Aspects of DNA Admissibility Hearings From the Prosecution, Defense, and Crime Lab Perspective

**Program Description:** Attendees will understand the general aspects of admissibility hearings as they apply to the introduction of DNA evidence in a court of law. The workshop will focus on hearings under the commonly used *Frye* and *Daubert* legal standards. Topics covered will include contacting experts, gathering journal articles and court rulings, and summarizing validation documents, as well as crafting questions and responses that will adequately convey the reasons the technique is or is not scientifically sound and generally accepted in the relevant scientific community. This panel of experts will also discuss case studies, highlighting the challenges that were faced and how they went about overcoming them.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m.</td>
<td>Introduction</td>
<td>Florence Hutner, JD</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>Preparing for an Admissibility Hearing From the Prosecution Perspective</td>
<td>Danielle Grootenboer, JD</td>
</tr>
<tr>
<td>2:25 p.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>2:40 p.m.</td>
<td>Preparing for an Admissibility Hearing From the Laboratory Perspective</td>
<td>Kristin Schelling, MS</td>
</tr>
<tr>
<td>3:35 p.m.</td>
<td>Preparing for an Admissibility Hearing From the Defense Perspective</td>
<td>John D. Schmid, JD</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>4:40 p.m.</td>
<td>Panel Discussion</td>
<td>Florence Hutner, JD; Kristin Schelling, MS; Danielle Grootenboer, JD; John D. Schmid, JD</td>
</tr>
</tbody>
</table>
**Learning Overview:** The goals of this presentation are to provide the attendees with knowledge regarding ethanol absorption, distribution, and elimination in humans and to provide a scientific basis for the interpretation of postmortem ethanol findings as well as for the estimation of Blood Alcohol Concentrations (BACs) from given doses and from analytical results in the living.

**Impact on the Forensic Science Community:** This workshop will impact the forensic science community by: (1) providing current knowledge in the field of ethanol interpretation, thus enhancing the qualifications of forensic toxicologists practicing clinical and postmortem toxicology; and (2) increasing the competency of other disciplines, such as medical examiners and lawyers/attorneys.

**Chair:**
Robert Kronstrand, PhD*
National Board of Forensic Medicine
Department of Forensic Toxicology
Linkoping, SWEDEN

**Co-Chair:**
Nikolas P. Lemos, PhD*
University of California–San Francisco
Palm Springs, CA

**Faculty:**
Sherri L. Kacinko, PhD*
NMS Labs
Willow Grove, PA

Laura M. Labay, PhD*
NMS Labs
Willow Grove, PA

**Targeted Audience:** Jurisprudence, Pathology/Biology, Toxicology

**Knowledge Level Required:** Intermediate (some knowledge of subject presented)

**Expected Handout Length:** 40 Pages
**Program Description:** Learn the ABCs about BAC in this workshop that offers lectures and discussions with a faculty that has nearly 100 years of experience in the field. The focus is interpretation of ethanol in driving under the influence cases, violent crimes, and autopsy cases. A toxicologist may report an extrapolated ethanol concentration in a blood sample collected from a living person or be asked to estimate the dose of ethanol from body burden calculations or calculate the maximum BAC arising from a certain dose. This requires knowledge concerning ethanol absorption, distribution, and elimination as well as the factors that affect them. Attendees will be provided with the scientific basis for giving and understanding such estimations.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Duration</th>
<th>Topic</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m. - 1:45 p.m.</td>
<td>15 min</td>
<td>Welcome and Objectives</td>
<td>Robert Kronstrand, PhD; Nikolas P. Lemos, PhD</td>
</tr>
<tr>
<td>1:45 p.m. - 2:30 p.m.</td>
<td>45 min</td>
<td>Ethanol Metabolism, Absorption, Distribution, and Elimination in Humans</td>
<td>Laura M. Labay, PhD</td>
</tr>
<tr>
<td>2:30 p.m. - 3:00 p.m.</td>
<td>30 min</td>
<td>The Science Behind Estimations of Dose and Blood Alcohol Concentrations</td>
<td>Nikolas P. Lemos, PhD</td>
</tr>
<tr>
<td>3:00 p.m. - 3:30 p.m.</td>
<td>30 min</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30 p.m. - 4:00 p.m.</td>
<td>30 min</td>
<td>Back Extrapolation of BACs in DUI and Other Contexts</td>
<td>Robert Kronstrand, PhD</td>
</tr>
<tr>
<td>4:00 p.m. - 4:45 p.m.</td>
<td>45 min</td>
<td>Strategies to Analyze and Interpret Postmortem Ethanol</td>
<td>Sherri L. Kacinko, PhD</td>
</tr>
<tr>
<td>4:45 p.m. - 5:15 p.m.</td>
<td>30 min</td>
<td>Knowledge Gaps and Future Research (Open Forum)</td>
<td>Robert Kronstrand, PhD; Nikolas P. Lemos, PhD</td>
</tr>
<tr>
<td>5:15 p.m. - 5:30 p.m.</td>
<td>15 min</td>
<td>Closing Remarks</td>
<td>Robert Kronstrand, PhD</td>
</tr>
</tbody>
</table>
**Workshops**

*Pre-registration was required.*

**W28**  Forensic Multimedia Authentication: Real-Life Challenges and Solutions

**Tuesday**

**February 19, 2019**  
1:30 p.m. – 5:30 p.m.  
3.5 CE Hours

**Learning Overview:** After attending this workshop, attendees will: (1) be familiar with the latest developments in forensic video and audio authentication; (2) understand criteria used for media authentication; (3) understand how to conduct analysis within a forensic framework; and (4) understand the current challenges and scientific solutions.

**Impact on the Forensic Science Community:** This workshop will impact the forensic science community by: (1) explaining the scientific approach in forensic media authentication; (2) demonstrating an authentication investigation framework; and (3) discussing tools used to combat multimedia forgery.

**Chair:**  
Catalin Grigoras, PhD*

**Co-Chair:**  
Zeno J. Geradts, PhD*

**Chair:**  
Catalin Grigoras, PhD*

**Co-Chair:**  
Zeno J. Geradts, PhD*

**Denver, CO**

**Netherlands Forensic Institute**

**Den Haag, NETHERLANDS**

**Program Description:** Digital multimedia authentication seeks to determine the validity of digital multimedia containers and contents by investigating their format, structure, time, frequency, pixel, and/or sample level features. This workshop will discuss the multimedia authentication process, providing the user with methods of authenticating both video and audio. This workshop will also demonstrate the incorporation of multiple tools and techniques into unified frameworks appropriate in forensic examinations where reducing examiner bias and error is crucial.

**Targeted Audience:** Criminalistics, Digital & Multimedia Sciences, Engineering Sciences, General, Jurisprudence, Questioned Documents

**Knowledge Level Required:** Intermediate (some knowledge of subject presented)

**Expected Handout Length:** 50 Pages

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Duration</th>
<th>Topic</th>
<th>Chair(s)</th>
</tr>
</thead>
</table>
| 1:30 p.m. | 1:45 p.m. | Opening Remarks  
*Catalin Grigoras, PhD; Zeno J. Geradts, PhD* | *Catalin Grigoras, PhD* |
| 1:45 p.m. | 3:15 p.m. | Image and Video Authentication, Photo Response Non-Uniformity (PRNU), and Deep Fakes  
*Catalin Grigoras, PhD; Zeno J. Geradts, PhD* | *Catalin Grigoras, PhD* |
| 3:15 p.m. | 3:45 p.m. | Break                                                                 |                                 |
| 3:45 p.m. | 5:15 p.m. | Audio Authentication  
*Catalin Grigoras, PhD* |                                 |
| 5:15 p.m. | 5:30 p.m. | Discussion and Final Remarks  
*Catalin Grigoras, PhD; Zeno J. Geradts, PhD* |                                 |

*Presenting Author*
# American Society of Forensic Odontology

## 49th Annual Scientific Session

Registration can be accomplished on the ASFO website at www.asfo.org.

**Forensic Odontology—Principles and Practice**

**Tuesday**

**February 19, 2019**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 a.m. - 8:00 a.m.</td>
<td>Registration and Breakfast</td>
<td></td>
</tr>
<tr>
<td>8:00 a.m. - 8:10 a.m.</td>
<td>Welcome</td>
<td><em>Jacqueline S. Reid, DDS</em> President, American Society of Forensic Odontology</td>
</tr>
<tr>
<td>8:10 a.m. - 8:20 a.m.</td>
<td>Program Introduction</td>
<td><em>Robin A. Ainsworth, DDS</em> President-Elect, American Society of Forensic Odontology</td>
</tr>
<tr>
<td>8:20 a.m. - 9:30 a.m.</td>
<td>Forensic Odontology Principles and Practice: Introduction of Textbook</td>
<td><em>Thomas J. David, DDS; James M. Lewis, DMD</em></td>
</tr>
<tr>
<td>9:30 a.m. - 10:15 a.m.</td>
<td>Chapter 1—Forensic Sciences and Forensic ID</td>
<td><em>Melissa Mourges, JD; Kenneth E. Melson, JD</em></td>
</tr>
<tr>
<td>10:15 a.m. - 10:30 a.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:30 a.m. - 11:00 a.m.</td>
<td>Bringing Our Fallen Home: The Impact of Forensic Identification on the Family</td>
<td><em>Sharon R. Bannister, Brigadier General, United States Air Force</em></td>
</tr>
<tr>
<td>11:00 a.m. - 12:00 p.m.</td>
<td>Chapter 7—Domestic Violence: Techniques for Recording Evidence/ Talking to Children About Abuse</td>
<td><em>John D. Melville, MD</em></td>
</tr>
<tr>
<td>12:00 p.m. - 2:00 p.m.</td>
<td>Luncheon and Annual Business Meeting</td>
<td></td>
</tr>
<tr>
<td>2:00 p.m. - 2:45 p.m.</td>
<td>Chapter 3—Dental ID and Radiographic Pitfalls</td>
<td><em>Peter W. Loomis, DDS</em></td>
</tr>
<tr>
<td>2:45 p.m. - 3:30 p.m.</td>
<td>Chapter 9—Patterned Injury: Is Patterned Injury Analysis a Science? Minimizing Bias</td>
<td><em>James M. Lewis, DMD</em></td>
</tr>
<tr>
<td>3:30 p.m. - 3:45 p.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:45 p.m. - 4:15 p.m.</td>
<td>Chapter 10—Jurisprudence</td>
<td><em>Roger D. Metcalf, DDS; Robert E. Barsley, DDS</em></td>
</tr>
<tr>
<td>4:15 p.m. - 4:45 p.m.</td>
<td>Chapter 11—Expert Witness Guidelines</td>
<td><em>Thomas J. David, DDS</em></td>
</tr>
<tr>
<td>4:45 p.m. - 5:15 p.m.</td>
<td>Chapter 12—Liability</td>
<td><em>Roger D. Metcalf, DDS</em></td>
</tr>
</tbody>
</table>
The National Institute of Justice (NIJ) Forensic Science Research and Development Symposium is an open meeting where attendees can learn about NIJ-funded research across a variety of forensic science areas. Feel free to stop by and listen to specific presentations or stay all day and learn about the diverse NIJ forensic science R&D portfolio.

Information will be available at www.forensicCOE.org.

Program:

8:30 a.m. - 8:40 a.m.  Welcome and Opening Remarks  
Gerald M. LaPorte, MSFS

Morning Session I—Impression and Pattern Evidence/Trace Evidence  
Moderated by Gregory Dutton, PhD

8:40 a.m. - 9:05 a.m.  Developing Effective Methods for Addressing Contextual Bias in Forensic Science  
William C. Thompson, PhD, JD

9:05 a.m. - 9:30 a.m.  Finding the Region of Origin of Bloodspatters in Complex Situations: Physical Description, New Data, Tools, and Reconstruction Method  
Daniel Attinger, PhD

9:30 a.m. - 9:55 a.m.  Raman Microspectroscopy and Advanced Statistics for the Detection and Characterization of Gunshot Residue  
Igor K. Lednev, PhD

9:55 a.m. - 10:20 a.m.  The Consistent Single-Shot Detection of Organic and Inorganic Residues From One Sample Using Liquid Chromatography/Mass Spectrometry (LC/MS) and Host-Guest Complexes  
Suzanne Bell, PhD

10:20 a.m. - 10:35 a.m.  Break

Morning Session II—Forensic Biology/DNA  
Moderated by Gregory Dutton, PhD

10:35 a.m. - 11:00 a.m.  A Method to Estimate the Age of Bloodstains using Quantitative Polymerase Chain Reaction (PCR)  
Robert W. Allen, PhD

11:00 a.m. - 11:25 a.m.  A Proteomic Analysis of a Single Human Hair for Ancestral Classification  
Zachary C. Goecker MPS
### Forensic Science Research and Development Symposium

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 a.m.-11:25 a.m.</td>
<td>A Proteomic Analysis of a Single Human Hair for Ancestral Classification</td>
<td>Zachary C. Goecker MPS</td>
</tr>
<tr>
<td>11:25 a.m.-11:50 a.m.</td>
<td>Cellular Autofluorescence Signatures for the Determination of Tissue Type, Age of Evidence, and Separating Contributors From Biological Mixtures</td>
<td>Christopher J. Ehrhardt, PhD</td>
</tr>
<tr>
<td>11:50 a.m.-12:15 p.m.</td>
<td>Ultrahigh-Speed Direct Polymerase Chain Reaction (PCR): A Method for Obtaining Short Tandem Repeat (STR) -Based Genotypes in Less Than Six Minutes</td>
<td>Bruce R. McCord, PhD</td>
</tr>
<tr>
<td>12:15 p.m.-1:35 p.m.</td>
<td>Lunch Break—On Your Own</td>
<td></td>
</tr>
<tr>
<td>1:35 p.m.-2:00 p.m.</td>
<td>A Chemical Analysis of Controlled Substances Using Automated Headspace Solid-Phase Microextraction—Gas Chromatography/Mass Spectrometry</td>
<td>Jorn Chi-Chung Yu, PhD</td>
</tr>
<tr>
<td>2:00 p.m.-2:25 p.m.</td>
<td>Δ9-THC Infused Foods</td>
<td>Jason Schimschal, MS</td>
</tr>
<tr>
<td>2:25 p.m.-2:50 p.m.</td>
<td>The Detection and Quantification of Synthetic Opioids in Oral Fluid</td>
<td>Michael Truver; Kaitlyn B. Palmquist, BS</td>
</tr>
<tr>
<td>2:50 p.m.-3:15 p.m.</td>
<td>A Comparison of Two Validated Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) Methods for the Quantitative Analysis of Opioids, Cocaine, and Cocaine Metabolites in Biological Matrices</td>
<td>Rebecca Wagner, PhD</td>
</tr>
<tr>
<td>3:15 p.m.-3:30 p.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30 p.m.-3:55 p.m.</td>
<td>The Detection of Insect Stains From Four Species of Necrophagous Flies on Household Materials Using Immunoassays</td>
<td>David B. Rivers, PhD</td>
</tr>
<tr>
<td>3:55 p.m.-4:20 p.m.</td>
<td>ICPUTRD: Image Cloud Platform for Use in Tagging and Research on Decomposition</td>
<td>Audris Mockus, PhD</td>
</tr>
<tr>
<td>4:20 p.m.-4:45 p.m.</td>
<td>An Analysis of Alternate Light in the Detection of Cutaneous Bruises: A Multisite Randomized Controlled Trial</td>
<td>Katherine Scafide, PhD</td>
</tr>
<tr>
<td>4:45 p.m.-5:10 p.m.</td>
<td>Using Fundamental Mechanics to Predict Infant Skull Fracture Patterns</td>
<td>Brittany Coats, PhD</td>
</tr>
</tbody>
</table>

---

**Afternoon Session I—Controlled Substances and Toxicology**

*Moderated by Frances Scott, PhD*

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35 p.m.-2:00 p.m.</td>
<td>A Chemical Analysis of Controlled Substances Using Automated Headspace Solid-Phase Microextraction—Gas Chromatography/Mass Spectrometry</td>
<td>Jorn Chi-Chung Yu, PhD</td>
</tr>
<tr>
<td>2:00 p.m.-2:25 p.m.</td>
<td>Δ9-THC Infused Foods</td>
<td>Jason Schimschal, MS</td>
</tr>
<tr>
<td>2:25 p.m.-2:50 p.m.</td>
<td>The Detection and Quantification of Synthetic Opioids in Oral Fluid</td>
<td>Michael Truver; Kaitlyn B. Palmquist, BS</td>
</tr>
<tr>
<td>2:50 p.m.-3:15 p.m.</td>
<td>A Comparison of Two Validated Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) Methods for the Quantitative Analysis of Opioids, Cocaine, and Cocaine Metabolites in Biological Matrices</td>
<td>Rebecca Wagner, PhD</td>
</tr>
<tr>
<td>3:15 p.m.-3:30 p.m.</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

**Afternoon Session II—Forensic Anthropology and Forensic Pathology**

*Moderated by Danielle L. McLeod-Hemming, MFS*

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30 p.m.-3:55 p.m.</td>
<td>The Detection of Insect Stains From Four Species of Necrophagous Flies on Household Materials Using Immunoassays</td>
<td>David B. Rivers, PhD</td>
</tr>
<tr>
<td>3:55 p.m.-4:20 p.m.</td>
<td>ICPUTRD: Image Cloud Platform for Use in Tagging and Research on Decomposition</td>
<td>Audris Mockus, PhD</td>
</tr>
<tr>
<td>4:20 p.m.-4:45 p.m.</td>
<td>An Analysis of Alternate Light in the Detection of Cutaneous Bruises: A Multisite Randomized Controlled Trial</td>
<td>Katherine Scafide, PhD</td>
</tr>
<tr>
<td>4:45 p.m.-5:10 p.m.</td>
<td>Using Fundamental Mechanics to Predict Infant Skull Fracture Patterns</td>
<td>Brittany Coats, PhD</td>
</tr>
</tbody>
</table>
Direct Real-Time MS Analysis of Powders, Solids, and Liquids with QuickProbe

Enjoy the speed and simplicity of direct sample analysis combined with the benefits of reviewable mass spectral data. All on a familiar, affordable, and robust platform that has been a workhorse in your laboratory for decades.

Agilent: Your partner in forensic analysis.

www.agilent.com

Join us at booth # 309

Introducing QuickProbe: A cost-effective alternative for rapid screening without sample preparation.

For Forensic Use.
© Agilent Technologies, Inc. 2019
Join us at booth #125
Learn how we’re listening to your challenges and providing answers to help you uncover the truth

From forensic toxicology testing with Thermo Scientific™ products to human identification testing with Applied Biosystems™ products, we’re transforming the way forensic scientists work.

Find out more at thermofisher.com/forensics
DILIGENCE TO THE
DEDICATION TO HANDLING THE DETAILS.
DEVOTION TO THE FIELD.

Scientific Sessions
Due to potential changes in the program, the AAFS encourages you to access the most up-to-date schedule on the AAFS website at www.aafs.org.
Due to potential changes in the program, the AAFS encourages you to access the most up-to-date schedule on the AAFS website at www.aafs.org.
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m.  A1  Quantification of Age-Related Pubic Symphyseal Morphological Changes Based on the Analysis of Clinical Multi-Detector Computed Tomographic (MDCT) Scans in Malaysian Males  
Salina Hisham, MSc*; Nurliza Abdullah, MPath; Mohamad Helmee Mohamad Noor, MS; Daniel Franklin, PhD

11:30 a.m. - 1:00 p.m.  A2  An Evaluation of the Inter-Observer Reliability of Aging Methods From the Pubic Symphysis  
Tyler E. Dunn, MS*; Sarah C. Kindschuh, PhD; Brittany S. Walter, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  A3  Assessing the Utility of the Suchey-Brooks Method on a Historical Sample  
Sarah C. Kindschuh, PhD*; Brittany S. Walter, PhD; Tyler E. Dunn, MS

11:30 a.m. - 1:00 p.m.  A4  Topographic Analyses and the Estimation of Age at Death From the Pubic Bone  
Andrew C. Seidel, MA*; Christopher Stojanowski, PhD; Laura C. Fulginiti, PhD; Kristen Hartnett-McCann, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  A5  An Estimation of American Black and White Ancestry From Measurements of the Vertebrae and Sacrum  
Rhian Dunn, MS*; Luis L. Cabo, MS

11:30 a.m. - 1:00 p.m.  A6  Ancestry Estimation Using Vertebrae: Koreans Versus United States Whites  
Yangseung Jeong, PhD*; Heli Maijanen, PhD

11:30 a.m. - 1:00 p.m.  A7  Metric Variability in the Femur and Patella: The Potential for Ancestry Assessment  
Marica Baldoni, MA*; Rachel Joseph, MSc*; Carole A.L. Davenport, PhD; Constantine Eliopoulos, PhD; Matteo Borrini, PhD

11:30 a.m. - 1:00 p.m.  A8  An Examination of Pelvic Scarring as a Determinant of Sex  
Helen M. Brandt, MS*; Stephen P. Nawrocki, PhD; Krista E. Latham, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  A9  The Impact of Antimeric Leg Length Asymmetry on Adult Stature Estimation: A Validation Study  
Megan E. Ingvoldstad, PhD*; Brittany S. Walter, PhD

11:30 a.m. - 1:00 p.m.  A10  An Estimation of Stature Using Cranial Dimensions  
Mubarak A. Bidmos, PhD*; Abduljelil Adebisin, MSc

11:30 a.m. - 1:00 p.m.  A11  A Comparative Analysis of Stature Estimation Methods for Application in Forensic Anthropology  
Susie C. Athey*; Mackenzie Walls; Alexandra R. Klales, PhD; Heather M. Garvin, PhD

11:30 a.m. - 1:00 p.m.  A12  Tall Tales: Various Regression Stature Methods Applied to the Huntington Collection  
Ashley Espinoza,*; David R. Hunt, PhD; Gene Hunt, PhD

*Presenting Author
11:30 a.m. - 1:00 p.m.  A13  Blast and Aircraft Crash Trauma: A Selection of World War II (WWII) Cases From the Defense POW/MIA Accounting Agency (DPAA) Laboratory
Andrea Palmiotto, PhD*; Kyle A. McCormick, PhD; Traci L. Van Deest, PhD; Laurel E. Freas, PhD

11:30 a.m. - 1:00 p.m.  A14  The Prevalence of Peri-Mortem Trauma Among Casualties of Armed Conflict
Andrea Palmiotto, PhD; Carrie B. LeGarde, MA*

11:30 a.m. - 1:00 p.m.  A15  Patterns of Intentional Dismemberment in Florida Medicolegal Death Investigations
Katie M. Rubin, MS*; Janet E. Finlayson, MA

11:30 a.m. - 1:00 p.m.  A16  Skeletal Asymmetry of the World War II (WWII) Battle of Tarawa Skeletal Assemblage: The Impact on the Resolution of Commingling
Caryn E. Tegtmeyer, PhD*; Jesse Roberto Goliath, PhD; Rebecca J. Wilson-Taylor, PhD*

11:30 a.m. - 1:00 p.m.  A17  Reassociating Commingled Human Crania With First Cervical Vertebrae: An Osteometric Approach
Vasiliki Louka, MSc; Ioanna Anastopoulou, BSc; Konstantinos Moraitis, PhD*

11:30 a.m. - 1:00 p.m.  A18  Reassessing Determining Season at Death Using Dental Cementum Increment Analysis (DCIA) in Young Adults
Vicki Wedel, PhD*; Timothy P. Gocha, PhD

11:30 a.m. - 1:00 p.m.  A19  The Application of Textile Biodeterioration Rates to Postmortem Interval (PMI) Estimation
Randi Marie Depp, BS*; Kellie Jones, BA*; Jennifer L. Webb, BS*; Jessica T. Novak, BA*

11:30 a.m. - 1:00 p.m.  A20  Best Practices for Macerating Cartilage
Alexis M. LaGoy*; Tessa Somogyi, MA*; Elizabeth A. Evangelou, MA*; Elizabeth A. DiGangi, PhD*

11:30 a.m. - 1:00 p.m.  A21  Integrating Forensic Anthropology and Cold Case Databases: A Look at Resolved Unidentified and Missing Persons Cases in Louisiana
Emily F. Wiegers, MA*; Teresa V. Wilson, PhD; Ginesse A. Listi, PhD; Maria T. Allaire, MA; Larry J. Livaudais, Jr., MS

11:30 a.m. - 1:00 p.m.  A22  Introduction of a Mobile Digital Database System for Standardization, Quality Assurance, and Efficiency in Forensic Anthropology Casework
Christine M. Pink, PhD*; Rebecca E. Bria, PhD

11:30 a.m. - 1:00 p.m.  A23  A Geospatial Database for Coroner Records: Developing a Collaborative Partnership to Facilitate Undergraduate Research
Katherine E. Weisensee, PhD*

11:30 a.m. - 1:00 p.m.  A24  Hidden in a Dark Past: The 1887 Thibodaux Massacre of Black Sugarcane Workers
Davette N. Gadison, MA*; Mark Rees, PhD

*Presenting Author
Thursday—Session I

Biological Profile: Age Estimation I

Moderator: Nicholas V. Passalacqua, PhD
Western Carolina University
Cullowhee, NC

Co-Moderator: Stephanie J. Cole, MS
University of Nevada, Reno
Reno, NV

8:30 a.m. - 8:45 a.m. A25 The Use and Misuse of Transition Analysis: An Assessment of the Boldsen et al. Age-at-Death Estimation Method
Sara M. Getz, PhD*
(FSF Emerging Forensic Scientist Award Paper Presentation)

8:45 a.m. - 9:00 a.m. A26 A New Method for Adult Skeletal Age Estimation Using Transition Analysis: TA3
Stephen D. Ousley, PhD*; George R. Milner, PhD; Jesper L. Boldsen, PhD; Sara M. Getz, PhD; Svenja Weise, PhD

9:00 a.m. - 9:15 a.m. A27 New Solutions for Old Problems? Examining Machine Learning as a Strategy for Age-at-Death Estimation
Melissa Ann Brown, MA*; Dillon G. Daudert, BS; James Jenkins, BS

9:15 a.m. - 9:30 a.m. A28 Bone Mineral Density (BMD) as an Indicator of Age at Death in Forensic Anthropology: A Test of DXAGE
Jonathan D. Bethard, PhD*; Jacqueline M. Berger, MS; Justin R. Maiers, MS; Ann H. Ross, PhD

9:30 a.m. - 9:45 a.m. A29 Age Estimation on Two Mediterranean Populations Using Rib Histomorphology
Julia Gomez Garcia-Donas*; Andrea Bonicelli, MSc; Caroline Lill, MSc; Robert R. Paine, PhD; Elena Kranioti, PhD

9:45 a.m. - 10:00 a.m. A30 Utilizing Osteon Volume for Histological Age-at-Death Estimation
Suzanna Michener, MSc*; Lynne S. Bell, PhD; David Swanlund, BA; Nadine Schuurman, PhD

10:00 a.m. - 10:15 a.m. Break

Global Applications of Anthropology to Humanitarian and Human Rights Violations

Moderator: Davette N. Gadison, MA
Tulane University
Department of Anthropology
New Orleans, LA

Co-Moderator: Douglas H. Ubelaker, PhD
Smithsonian Institution
Department of Anthropology
Washington, DC

10:15 a.m. - 10:30 a.m. A31 Humanitarian Forensics: Applications Today and Emerging Challenges
Oran Finegan, MSc*; Pierre M.M. Guyomarc’h, PhD

10:30 a.m. - 10:45 a.m. A32 After Atrocity: Why Wouldn’t You Investigate?
Dawnie W. Steadman, PhD*; Hugh H. Tuller, MA; Julia Hanebrink, MA; Jaymelee Kim, PhD; Tricia Hepner, PhD

10:45 a.m. - 11:00 a.m. A33 Ethical Technologies: The Social Impacts of Forensic Interventions in Human Rights Violations
Alexa Hagerty, PhD*
## 11:00 a.m. - 11:15 a.m. A34 Forensic Archaeology in the Horn of Africa: Humanitarian Action and Posthumous Rights
*Franco Mora, BA*; Valeska Martinez, BA*; Jose P. Baraybar, MSc, PhD

## 11:15 a.m. - 11:30 a.m. A35 Capacity Building of Forensic Scientists
*Elizabeth A. DiGangi, PhD*; Jonathan D. Bethard, PhD*

## 11:30 a.m. - 11:45 a.m. A36 Assessing the Role of Churches in Missing Migrant Identifications
*Richard Phillips, BA*; Sara H. Katsanis

## 11:45 a.m. - 12:00 p.m. Discussion

## 12:00 p.m. - 1:30 p.m. Lunch

### Poster Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>A37</td>
<td>The Assessment of Jugular Growth Plate (JGP) Ossification for Age Estimation</td>
<td>Brittany S. Walter, PhD*; Katherine Skorpinski, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A38</td>
<td>Age-at-Death Estimation From the Auricular Surface of the Ilium: A Comparison of Two Methods</td>
<td>Andrea Ost, MS*; Luis L. Cabo, MS</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A39</td>
<td>A New Version Release of 3D-ID Geometric Morphometric Classification of Crania for Forensic Scientists</td>
<td>Ann H. Ross, PhD*; Dennis E. Slice, PhD; Desiré Brits, PhD; Tamara L. Lottering, BSc; Candice Small, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A40</td>
<td>A Reevaluation of the (hu)MANid Classification Software Using Virtually Collected Mandibulometer Measurements</td>
<td>Heather M. Garvin, PhD*; Kelsey A. Carpenter, MS; Gregory E. Berg, PhD; Michael W. Kenyhercz, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A41</td>
<td>Cranio metric Variation and Sexual Dimorphism in a Chilean Population</td>
<td>Rachel M. Kreher, BS*; Krista E. Latham, PhD; Stephen P. Nawrocki, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A42</td>
<td>The Application of the Optimized Summed Scored Attributes (OSSA) Method to Sex Estimation in Whites and Blacks</td>
<td>Summer M. Mizell*; Holly Long*; Alexandra R. Klales, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A43</td>
<td>Worldwide Population Variation in Skull Sexual Dimorphism</td>
<td>Alexandra R. Klales, PhD*; Stephanie J. Cole, MS; Kyra E. Stull, PhD; Heather M. Garvin, PhD; Matthew C. Go, MA; Antínea Menéndez Garmendia, MS; Mackenzie Walls; Gabriela Sánchez-Mejorada, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A44</td>
<td>Cognitive Bias and the Order of Examination on Skeletal Remains</td>
<td>Marion E. Davidson*; Carolyn Rando, PhD; Sherry Nakhaezadeh</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A45</td>
<td>The Impact of Bone Density and Bone Thickness on Gunshot Trauma to the Skull</td>
<td>Elizabeth A. Evangelou, MA*; Tessa Somogyi, MA*; Alexis M. LaGoy*; Kevin E. Sheridan, PhD*; Elizabeth A. DiGangi, PhD*</td>
</tr>
</tbody>
</table>

*Presenting Author: [Indication of presenting authors in the original text]*
<table>
<thead>
<tr>
<th>Session Time</th>
<th>Presentation Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A6</strong> A Comparison of Bullet Construction to the Area and Perimeter of Gunshot Entrance and Exit Wounds</td>
<td>Tessa Somogyi, MA*; Elizabeth A. Evangelou, MA*; Alexis M. LaGoy*; Kevin E. Sheridan, PhD*; Elizabeth A. DiGangi, PhD*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A7</strong> Differential Mass Loss in Bullets From Frontal and Temporal/Parietal Bone Impacts</td>
<td>Kevin E. Sheridan, PhD*; Donald Poon, BA; Jessica E. Sanger, BA; Elizabeth A. Evangelou, MA; Tessa Somogyi, MA; Elizabeth A. DiGangi, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A8</strong> Scanning Electron Microscopes With Energy Dispersive X-Ray Spectroscopy (SEM/EDX) Analysis of Gunshot Residue (GSR) on Pig Bone</td>
<td>Anthony B. Falsetti, PhD*; Natalie R. Langley, PhD; Blake D. Ehlers; Bethany M. Pittman; AmberCherie Lasala; Kimberly G. Cheek, BS; Derek A. Boyd, MA</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A9</strong> Thermogravimetric Analysis (TGA) of Juvenile Pig Rib Compositional Changes</td>
<td>Luisa Marinho, MSc*; Dev Sharma, PhD; Carolyn J. Sparrey, PhD; Stephen N. Robinovitch, PhD; Alison Galloway, PhD; Hugo Cardoso, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A10</strong> The Effects of Chemotherapy and/or Radiotherapy Treatment on Decomposition</td>
<td>Shelby Garza, BS*; Daniel J. Wescott, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A11</strong> Time to Skeletonization (TTS): <em>Dermestes maculatus</em> De Geer Skin/Hide Beetles and Skeletonization on <em>Python Bivittatus</em> Kuhl Burmese Python Remains</td>
<td>Amy Pham, BA*; Shannon L. Dery*; Heather A. Walsh-Haney, PhD; Jason H. Byrd, PhD; Ian Bartoszek</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A12</strong> Understanding Bone Diagenesis and Its Effects on Commingled Remains: The Potential and Hazards of Portable X-Ray Fluorescence (pXRF) Analysis</td>
<td>Kent M. Adamson, MSc*; Tim Thompson, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A13</strong> DNA Preservation in Bone From a Multi-Individual Burial</td>
<td>Alexandra L. Emmons, MA*; Sarah W. Keenan, PhD; Jon Davoren; Jennifer M. DeBruyn, PhD; Amy Z. Mundorff, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A14</strong> Recognizing Transplanted Allograft Bone in Forensic Anthropological Cases</td>
<td>Angi M. Christensen, PhD*; Louis Jares, BS</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A15</strong> Inferring Species Origin Through Virtual Histology: A Comparison of Third Metapodials From <em>Homo Sapiens</em> and <em>Ursus Americanus</em> Using Micro-Computed Tomography</td>
<td>Hannah Stephen, BS*; Reed A. Davis, MSc*; Janna M. Andronowski, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A16</strong> The Scavenging Patterns of Feral Cats on Human Remains in an Outdoor Setting</td>
<td>Sara N. García*; Alexander J. Smith*; Christiane Baigent, MSc; Melissa A. Connor, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A17</strong> Positive Identification Via Frontal Sinus Morphology: A Geographic Information Systems (GIS) Approach</td>
<td>Jenna M.S. Watson, MA* (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>A18</strong> The Identification of United States Casualties by the Central Identification Unit in Kokura, Japan</td>
<td>Alexander F. Christensen, PhD*</td>
</tr>
</tbody>
</table>
ANTHROPOLOGY

11:30 a.m. - 1:00 p.m.  A59  Interactive Resources for Craniofacial Identification
   Terrie Simmons-Ehrhardt, MA*; Anthony B. Falsetti, PhD; Catyana R. Falsetti, MFS; Christopher J. Ehrhardt, PhD

Postmortem Interval and the Recovery Scene

Moderator: Christine M. Pink, PhD
   Metropolitan State University of Denver
   Department of Sociology and Anthropology
   Denver, CO

1:30 p.m. - 1:45 p.m.  A60  What Can Forensic Proteomics Tell Us About Biological Age and Postmortem Interval (PMI) Estimation?
   Noemi Procopio, PhD*; Anna Williams, PhD; Andrew Chamberlain, PhD; Michael Buckley, PhD

1:45 p.m. - 2:00 p.m.  A61  Using Stable Nitrogen Isotope Ratios From Human Muscle Tissue for Postmortem Interval (PMI) Estimation
   Melanie M. Beasley, PhD*; Julie Lesnik, PhD; Hayden McKee, MSc; Dawnie W. Steadman, PhD

2:00 p.m. - 2:15 p.m.  A62  The Human Cadaver Decomposition Island and the Vegetation Regrowth Interval
   Haeli Kennedy; Jasmine Garcia; West Ryan; Jacqueline A. Aitkenhead-Peterson, PhD; Joan A. Bytheway, PhD*

2:15 p.m. - 2:30 p.m.  A63  Longitudinal Comparison of the Megyesi and Moffatt Total Body Scoring (TBS) Methods for Estimating the Postmortem Interval (PMI)
   Derek A. Boyd, MA*; Kelly Sauerwein, PhD; Angela M. Dautartas, PhD

2:30 p.m. - 2:45 p.m.  A64  The Effects of Hydrochloric Acid (HCl) on Decomposition: Evidence of Preferential Destruction to the Head and Extremities
   Dayanira Lopez, BS*; Heather A. Walsh-Haney, PhD; Laura Frost, PhD; Brian Johnson, PhD

2:45 p.m. - 3:00 p.m.  A65  Outdoor Crime Scene Reconstruction
   Dennis C. Dirkmaat, PhD*; Luis L. Cabo, MS

3:00 p.m. - 3:15 p.m.  A66  Use of an Alternate Light Source (ALS) to Locate Surface-Deposited Skeletal Remains
   Tracy E. Brown*; Angi M. Christensen, PhD

3:15 p.m. - 3:30 p.m.  A67  Evaluating the Use of Photogrammetry in the Excavation of Buried Human Remains
   Kathleen Flor-Stagnato, MA*

3:30 p.m. - 3:45 p.m.  A68  Complexities in Transporting Human Remains Across International Borders
   Denise To, PhD; Debra Prince Zinni, PhD*

3:45 p.m. - 4:00 p.m.  Break
Defining Qualifications and Competencies in Forensic Anthropology: Implications for Education, Training, Accreditation, and Certification

Moderator: Natalie R. Langley, PhD
Mayo Clinic School of Medicine
Department of Anatomy
Scottsdale, AZ

4:00 p.m. - 4:15 p.m. A69 Qualifications for Forensic Anthropologists
Marin A. Pilloud, PhD; Nicholas V. Passalacqua, PhD*

4:15 p.m. - 4:30 p.m. A70 Harris County Forensic Anthropology Training Program
Deborrah C. Pinto, PhD*; Michal L. Pierce, MS

4:30 p.m. - 4:45 p.m. A71 The American Board of Forensic Anthropology (ABFA) Examination Turns 40: Historical Perspectives and Current Trends in Certification for Forensic Anthropology
Eric J. Bartelink, PhD*; Donna C. Boyd, PhD; Diane L. France, PhD; James Pokines, PhD; Debra Prince Zinni, PhD

4:45 p.m. - 5:00 p.m. A72 Exploring Educational Needs Beyond Technical Competency: Laboratory Management, Testimony, and Vicarious Trauma
Jennifer C. Love, PhD*

5:00 p.m. - 5:15 p.m. A73 Core Competencies and Entrustable Professional Activities: A Model for Forensic Anthropology Qualifications
Natalie R. Langley, PhD*; MariaTeresa A. Tersigni-Tarrant, PhD*

5:15 p.m. - 5:30 p.m. Discussion

Thursday—Session II

Isotopic Analyses and Taphonomy

Moderator: Lauren R. Pharr, PhD
Memphis, TN

8:45 a.m. - 9:00 a.m. A74 Using Apatite Yield From Bone Sample Preparations for Quality Control in Stable Isotope Analysis Applications
Lesley A. Chesson, MS*; Gregory E. Berg, PhD; Eric J. Bartelink, PhD; Melanie M. Beasley, PhD; Miranda Jans, PhD

9:00 a.m. - 9:15 a.m. A75 A Large-Scale Evaluation of Intraperson Isotopic Variation Within Human Bone Collagen and Bioapatite
Gregory E. Berg, PhD*; Eric J. Bartelink, PhD; Jang Yuryang, PhD; Youngsoo Shin, MA; Lesley A. Chesson, MS

9:15 a.m. - 9:30 a.m. A76 Conservation of Isotope Ratios in Burned Bones of Pigs and Humans
Julianne J. Sarancha, MS*; Gwyneth W. Gordon, PhD; Jelmer Eerkens, PhD; Christopher J. Hopkins, MS; Eugenia Cunha, PhD; David Gonçalves, PhD; Inês Santos, MSc; Ana Vassalo, MSc

*Presenting Author
9:30 a.m. - 9:45 a.m. A77 The Role of Stable Isotope Analysis in Forensic Cases From Flagstaff, Arizona
Taylor Lambrigger*

9:45 a.m. - 10:00 a.m. A78 Experimental Lacustrine Taphonomy: Decompositional Changes in Freshwater Lake-Submerged Skeletal Remains
Vienna C. Lam, MA*; Lynne S. Bell, PhD
(FSE Emerging Forensic Scientist Award Paper Presentation)

10:00 a.m. - 10:15 a.m. A79 Modeling the Fluvial Transport of Human Remains in the Sacramento River of California
Colleen F. Milligan, PhD*; Eric J. Bartelink, PhD

10:15 a.m. - 10:30 a.m. A80 Introducing Forensic Investigation Research Station (FIRS-TB40): Scavenger Succession and Progression at a High-Altitude Site in Colorado
Christiane Baigent, MSc*; Melissa A. Connor, PhD; Gretchen R. Dabbs, PhD

10:30 a.m. - 10:45 a.m. Break

Sex Estimation and Methods in Forensic Anthropology

Moderator: Megan K. Moore, PhD
Eastern Michigan University
Department of Sociology, Anthropology, and Criminology
Ypsilanti, MI

Co-Moderator: Derek A. Boyd, MA
University of Tennessee, Knoxville
Knoxville, TN

10:45 a.m. - 11:00 a.m. A81 Sex Estimation of Black South African Sacra Using Geometric Morphometrics
Tamara L. Lottering, BSc*; Jason Hemingway, PhD; Candice Small, PhD

11:00 a.m. - 11:15 a.m. A82 Virtual Forensic Anthropology: The Accuracy of Osteometry on 3D Virtual Models of the Os Coxa Derived From Clinical Computer Tomography (CT) Scans
Kerri L. Colman, MSc; Hans H. De Boer, MD, PhD*; Johannes G.G. Dobbe, PhD; Niels Liberton; Kyra E. Stull, PhD; Maureen van Eijnatten, PhD; Johannes G. Streekstra, PhD; Roelof-Jan G. Oostra, PhD; Rick R. Van Rijn, PhD; Lida A.E. Van der Merwe, PhD

11:15 a.m. - 11:30 a.m. A83 Virtual Anthropology: The Interchangeability of Morphological Sex Estimation Methods on 3D Models of the Pelvis and Their Dry Skeletal Counterpart
Kerri L. Colman, MSc; Lida A.E. Van der Merwe, PhD; Kyra E. Stull, PhD; Aubrey Van Het Reve, BSc; Hannah E.M. Crijns, BSc; Johannes G.G. Dobbe, PhD; Johannes G. Streekstra, PhD; Rick R. Van Rijn, PhD; Roelof-Jan G. Oostra, PhD; Hans H. De Boer, MD, PhD*

11:30 a.m. - 11:45 a.m. A84 Perceptions and Cognitive Bias in Decomposition Scoring Methods in Forensic Anthropology
Kelly Sauerwein, PhD*; Xiaojuan Zhu, PhD; Dawnie W. Steadman, PhD

11:45 a.m. - 12:00 p.m. A85 Evaluation and Minimization of Contextual Bias in Forensic Anthropological Casework in the Context of a Medical Examiner’s Office
Julie M. Fleischman, PhD*; Michal L. Pierce, MS; Christian Crowder, PhD

12:00 p.m. - 1:30 p.m. Lunch
## International Forensic Anthropology

**Moderator:** Melina Calmon Silva, MA  
New Orleans, LA

**Co-Moderator:** Eugenia Cunha, PhD  
National Institute of Legal Medicine and Forensic Sciences  
Coimbra, PORTUGAL

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m.</td>
<td>A86</td>
<td>Forensic Anthropology Down Under: Reflections on the Development and Practice of Forensic Anthropology in Australia</td>
<td>Soren Blau, PhD; Samantha K. Rowbotham, MArSc*</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>A87</td>
<td>Forensic Anthropology: A View of Brazil</td>
<td>Yara V. Lemos, MS*</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>A88</td>
<td>Forensic Anthropology and the Philippines</td>
<td>Matthew C. Go, MA*</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>A89</td>
<td>An Anthropology Roadmap: Sri Lanka</td>
<td>Sunil P.A. Hewage*</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>A90</td>
<td>Forensic Anthropology As a Neglected Field of Inquiry in Forensic Death Investigations in India: A Critical Evaluation of the Current Scenario and Future Possibilities</td>
<td>Jagmahender Singh Sehrawat, PhD*</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td>A91</td>
<td>Forensic Anthropology Practice in Indonesia</td>
<td>Evi Untoro, MD*</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>A92</td>
<td>Forensic Anthropology Research Centre (FARC): An Emerging Community of Practice in South Africa</td>
<td>Ericka N. L'Abbe, PhD*; Leandi Liebenberg, MS; Gabriele C. Kruger, MSc; Anna C. Oettle, MBChB, PhD; Steven A. Symes, PhD; Shari A. Eppel, BA; Kyra E. Stull, PhD; Marie Christine Dussault, PhD; Michael W. Kenyhercz, PhD; Yvette Scholtz, MSc; Clarisa Sutherland, BSc; Alieske C. Hagg, MSc</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>A93</td>
<td>Forensic Anthropology in Greece: An Overview of the Discipline's Status</td>
<td>Elena Kranioti, PhD*; Konstantinos Moraitis, PhD*</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>A94</td>
<td>Routine Practice in Forensic Anthropology in Europe: Attempting to Achieve a State of the Art</td>
<td>Eugenia Cunha, PhD*; Elena Kranioti, PhD; Pascal Adalian; Eric Baccino, MD; Cristina Cattaneo, PhD</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td></td>
<td>Discussion</td>
<td></td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td></td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>
Identification Efforts in Forensic Anthropology

Moderator: Annarita Franza, PhD
Department of Experimental & Clinical Biomedical Sciences
University of Florence
Florence, ITALY

Co-Moderator: Katie M. Rubin, MS
University of Florida
C.A. Pound Human Identification Laboratory
Gainesville, FL

4:15 p.m. - 4:30 p.m.  A95 The Use of a Gelatin-Based Consolidant to Preserve Thermally Altered Remains
Jan J. Topoleski, MFS*; Angi M. Christensen, PhD

4:30 p.m. - 4:45 p.m.  A96 The Application of X-Ray Photoelectron Spectroscopy to Examine the Surface Chemistry of Cancellous Bone and Medullary Contents to Refine Bone Sample Selection for Nuclear DNA Analysis
Janna M. Andronowski, PhD*; Amy Z. Mundorff, PhD; Jon Davoren; Reed A. Davis, MSc; Eric W. Price, PhD

4:45 p.m. - 5:00 p.m.  A97 Forensic Anthropology and Identification at the State Level: Lessons From the Louisiana Repository for Unidentified and Missing Persons
Teresa V. Wilson, PhD*; Ginesse A. Listi, PhD; Maria T. Allaire, MA

5:00 p.m. - 5:15 p.m.  A98 Forensic Anthropology and Identification in Natural Disaster-Related Cemetery Disruptions
Ginesse A. Listi, PhD*; Christine L. Halling, MS; Ryan M. Seidemann, MA; Teresa V. Wilson, PhD

5:15 p.m. - 5:30 p.m.  A99 A Virtual Anthropology Consultancy Service (VACS)
Lucina Hackman, PhD*; Sue Black, PhD

Friday

Biological Profile: Ancestry Estimation

Moderator: Gregory E. Berg, PhD
Defense POW/MIA Accounting Agency
Identification Laboratory
Joint Base Pearl Harbor-Hickam, HI

Co-Moderator: Janet E. Finlayson, MA
University of Florida
Gainesville, FL

8:30 a.m. - 8:45 a.m.  A100 Ancestry Estimation Using Cranial and Postcranial Macromorphoscopic Traits
Micayla C. Spiros, MS*

8:45 a.m. - 9:00 a.m.  A101 Macromorphoscopic Trait Analysis in Forensic Anthropological Casework
Joseph T. Hefner, PhD*; Stephen D. Ousley, PhD

9:00 a.m. - 9:15 a.m.  A102 A Reevaluation of Tooth Crown Measurements in the Estimation of Ancestry Using Random Forest Classification
Michael W. Kenyhercz, PhD*; Marin A. Pilloud, Ph.D; Joseph T. Hefner, PhD

9:15 a.m. - 9:30 a.m.  A103 Assessing the Within-Group Structure of the “Hispanic” Sample in FORDISC® 3.1
Dorianis Perez, BS*; Luis L. Cabo, MS
(FSF Emerging Forensic Scientist Award Paper Presentation)

*Presenting Author
9:30 a.m. - 9:45 a.m. A104 Testing the Homogeneity of “White”: Dental Morphology in Americans and Australians of European Decent
Heather J.H. Edgar, PhD*; Shamsi Berry, PhD

9:45 a.m. - 10:00 a.m. A105 Estimating Ancestry and Region of Origin: A Multidisciplinary Approach to the Identification of Unknown Individuals
Angela Soler, PhD*; Andrew J. Schweighardt, PhD; Laura Huynh, MS; Carl Gajewski, MS

10:00 a.m. - 10:15 a.m. A106 Using Mitochondrial DNA (mtDNA) -Derived Maternal Ancestry to Assist in Forensic Anthropology Investigations of Deceased Unidentified Individuals From the United States-Mexico Border
Cris E. Hughes, PhD*; Charla Marshall, PhD; Sonia E. John; Bruce E. Anderson, PhD

10:15 a.m. - 10:30 a.m. **Break**

Biological Profile: Age Estimation II

**Moderator:** Denise To, PhD
**Co-Moderator:** Laura Cirillo, BA
Defense POW/MIA Accounting Agency
Identification Laboratory
Joint Base Pearl Harbor-Hickam, HI

10:30 a.m. - 10:45 a.m. A107 New Methods for Forensic Age Estimation Based on Dental Development
Kelly Heim, PhD*; Marin A. Pilloud, PhD; Hassem Geha, DDS; Ying Wu, DDS, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

10:45 a.m. - 11:00 a.m. A108 Variations in Skeletal and Dental Growth and Development Patterns and Their Effect on Age Estimation: A Preliminary Study of Five Populations
Louise K. Corron, PhD*; Kyra E. Stull, PhD; Michael H. Price, PhD; Yueran Yang, PhD

11:00 a.m. - 11:15 a.m. A109 Estimation of Juvenile Age at Death Using Anterior-Posterior (AP) Radiographs of the Knee
Rachel E. Smith*; Carolyn V. Isaac, PhD; Jered B. Cornelison, PhD; Jane Wankmiller, PhD

11:15 a.m. - 11:30 a.m. A110 **WITHDRAWN**

11:30 a.m. - 11:45 a.m. A111 Staging Clavicular Development on Magnetic Resonance Imaging (MRI): Pitfalls and Recommendations for Age Estimation
Jannick De Tobel, MD*; Elke Hillewig, MSc; Mayonne Van Wijk, MSc; Steffen Fieuws; Patrick W. Thevissen, PhD; Koenraad L. Verstraete, PhD

11:45 a.m. - 12:00 p.m. A112 Age-at-Death Estimation: Accuracy and Reliability of Age-Reporting Strategies
Christine Bailey, MA*

12:00 p.m. - 1:30 p.m. **Lunch**
<table>
<thead>
<tr>
<th>Time</th>
<th>Duration</th>
<th>Poster #</th>
<th>Title</th>
<th>Authors</th>
<th>Presenting Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A113</td>
<td>The Validation of a New Age-at-Death Method Utilizing Osteoarthritis (OA) of the Shoulder</td>
<td>Morgan J. Ferrell*; Jonathan D. Bethard, PhD*</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A114</td>
<td>The Application of Dental Cementochronology in Unidentified Migrants in South Texas</td>
<td>Mary C. Swearengin, MA*; Nicholas P. Herrmann, PhD; Kate Spradley, PhD; Sophia Mavroudas, MA</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A115</td>
<td>Ancestral Variation of the Relative Proportionality of Skeletal Facial Features: A Metric Assessment</td>
<td>Janet E. Finlayson, MA*; Michala K. Stock, PhD</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A116</td>
<td>Undocumented Border Crossers (UBCs) By Sea: Investigating the Eastern Border Crisis</td>
<td>Amanda N. Friend, MA*</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A117</td>
<td>Examining Differences in Presumed Migrants From Texas and Arizona Using Cranial and Dental Data</td>
<td>Christopher A. Maier, PhD*; Rebecca L. George, MA</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A118</td>
<td>A Mixed-Method Approach to Predicting Deceased Migrant Attributes in the Southern Arizona Desert</td>
<td>Caitlin C.M. Vogelsberg, MS*</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A119</td>
<td>A Validation of the 2014 Hefner and Ousley Decision Tree Model for Ancestry in a Mexican Population</td>
<td>Bersal C. Villegas-Camposocco; Mackenzie Walls*; Antinea Menéndez Garmendia, MS; Gabriela Sánchez-Mejorada, PhD; Alexandra R. Klales, PhD; Jorge A. Gómez-Valdés, PhD</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A120</td>
<td>Spatial Distributions of Stable Isotope Ratios in Tap Water From Mexico for Region of Origin Predictions of Unidentified Border Crossers</td>
<td>Saskia Ammer, MSc*</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A121</td>
<td>Using Semimechanistic Modeling for the Prediction of Oxygen and Hydrogen Drinking Water Isotopes From Human Hair in Mexican Populations</td>
<td>Chelsey A. Juarez, PhD*</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A122</td>
<td>Predicting Region of Origin for Unidentified Deceased Migrants at the Texas-Mexico Border Utilizing Stature and Stable Isotopes</td>
<td>Nicholas P. Herrmann, PhD*; Robyn Theresa Kramer, BA; Christopher A. Wolfe, MA; Kate Spradley, PhD</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A123</td>
<td>Early Bone Healing Response in an Acute Occipital Skull Fracture of a 19-Month-Old After a 72- to 78-Hour Survival Interval</td>
<td>Dana Austin, PhD*; Maryvi Gonzalez-Sola, PhD; Susan J. Roe, MD</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A124</td>
<td>Fracture Surface Characteristics for the Interpretation of Peri-Mortem Blunt Force Fractures in Bone</td>
<td>Christopher W. Rainwater, MS*; Derek Congram, PhD; Steven A. Symes, PhD; Nicholas V. Passalacqua, PhD</td>
<td></td>
</tr>
</tbody>
</table>
11:30 a.m. - 1:00 p.m. A125 Buckle Rib Fractures: More Than a Pleural Surface Phenomenon
Timothy P. Gocha, PhD*; Mariah E. Moe, BS*

11:30 a.m. - 1:00 p.m. A126 Is Puppe's Rule That Flawless? Two Peculiar Cases of Cranial Fractures Running Through Craniotomy Holes
Alberto Amadasi, MD*; Francesca Magli, MA; Debora Mazzarelli, BS; Annalisa Cappella, PhD; Enrico A. Muccino, MD; Katiuscia Bisogni, MD; Cristina Cattaneo, PhD

11:30 a.m. - 1:00 p.m. A127 Using High Resolution Mass Spectrometry Analysis to Investigate Trabecular Bone Metabolomics for Postmortem Interval (PMI) Estimation
Beatrix Dudzik, PhD*; Natalie R. Langley, PhD; Kathleen Hauther; Lee Meadows Jantz, PhD; Taylor Beckmann, BS; Johnny E. Cebak, PhD; Michelle Donohue, BS; Corey Hoch, BS; Stacy Chelf, MS; Paul Wood, PhD

11:30 a.m. - 1:00 p.m. A128 Assessing the Accuracy of Decomposition Scoring Methods in Arizona’s Sonoran Desert
Shari G. Ex, BA*; Jason P. De León, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. A129 Deconstructing Non-Carious Cervical Lesions on Teeth in Forensic Contexts
Jessica I. Cerezo-Román, PhD*; Bruce E. Anderson, PhD

11:30 a.m. - 1:00 p.m. A130 A Retrospective Study of the Forensic Anthropology Cases Investigated by the Legal Medicine Institute in Rio de Janeiro, Brazil, From 2011 Through 2017
Melina Calmon Silva, MA*; Marcos Paulo Machado
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. A131 Beyond the Biological Profile: Demographic Patterns in Forensic Anthropology Casework in Honolulu, Hawaii
Jennifer F. Byrnes, PhD*; William R. Belcher, PhD; Christina G. Mello, PhD

11:30 a.m. - 1:00 p.m. A132 The Use of Ground Penetrating Radar (GPR) in the Search for Remains of Missing United States Servicemembers
Sabrina C. Ta’alå, MA*; Ryan Taira, BA

11:30 a.m. - 1:00 p.m. A133 The Use of Ground Penetrating Radar (GPR) to Possibly Locate Remains Associated With Surgical Devices
Adam Munera*

11:30 a.m. - 1:00 p.m. A134 The Forensic Utility of Photogrammetry in Surface Scene Documentation
Elizabeth Church*; James Pokines, PhD; Christopher J.H. Ames, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. A135 Best Practice Procedures for Sampling Differentially Burned Bone for Successful DNA Recovery
Katelyn L. Bolhofner, PhD*; Matthew V. Emery, PhD; Jane E. Buikstra, PhD; Laura C. Fulginiti, PhD; Anne Stone, PhD

11:30 a.m. - 1:00 p.m. A136 Putting Life Back Into the Bones: The Symptomatology of Pain and Suffering in the Cyprus Research Reference Collection and Its Relationship to Positive Identification
Jennifer A. Sizemore*; Anna S. La Valley, MSc; Emily Brooks; Xenia Paula Kyriakou*
Skeletal Trauma

Moderator: Julie M. Fleischman, PhD
Harris County Institute of Forensic Sciences
Houston, TX

Co-Moderator: Ashley E. Kendell, PhD
California State University, Chico
Department of Anthropology
Chico, CA

1:30 p.m. - 1:45 p.m.  A137  A Multidisciplinary Investigation of Chronic Animal Abuse: Contributions From Veterinary Forensics and Forensic Anthropology
Jonathan D. Bethard, PhD*; Martha Smith-Blackmore, DVM

1:45 p.m. - 2:00 p.m.  A138  Evaluating Non-Accidental Injury and Comorbidity in Elderly Decedents Through Macroscopic and Microscopic Patterning of Fracture and Fracture Repair
Donna C. Boyd, PhD*; Jennifer C. Love, PhD

2:00 p.m. - 2:15 p.m.  A139  An Experimental Investigation of Blunt Force Fracture in the Human Mandible
Mariyam I. Isa, MA*; Todd W. Fenton, PhD; Alexis C. Goots, MA; Feng Wei, PhD; Roger C. Haut, PhD

2:15 p.m. - 2:30 p.m.  A140  Assessing the Impact of High- Versus Low-Velocity Thoracic Trauma: A Study of Experimental Rib Fracturing Using Juvenile Pigs (Sus Scrofa)
Harman Nahal, BSc*; Luisa Marinho, MSc; Carolyn J. Sparrey, PhD; Hugo Cardoso, PhD

2:30 p.m. - 2:45 p.m.  A141  Factors Affecting Bone Speed of Sound (SOS) in Infants
Miriam E. Soto Martinez, PhD*; Christian Crowder, PhD; Brian Dawson, MS; Urszula Polak, MS

2:45 p.m. - 3:00 p.m.  A142  An Analysis of Skeletal Demographics and Traumatic Injuries From the Khmer Rouge Period in Cambodia
Julie M. Fleischman, PhD*

3:00 p.m. - 3:15 p.m.  Break

Diversity and Inclusion

Moderator: Allysha P. Winburn, PhD
University of West Florida
Department of Anthropology
Pensacola, FL

Co-Moderator: Susan C. Anton, PhD
New York University
Department of Anthropology
New York, NY

3:15 p.m. - 3:30 p.m.  A143  Diversity and Inclusion in Forensic Anthropology: Where We Stand and Prospects for the Future
Sean D. Tallman, PhD*; Cate E. Bird, PhD

3:30 p.m. - 3:45 p.m.  A144  Increasing Graduate Student Diversity in Forensic Anthropology Through Research
Kate Spradley, PhD*; Olivia A. Jones

3:45 p.m. - 4:00 p.m.  A145  Perspectives on Diversity in Skeletal Collections
Allysha P. Winburn, PhD*; Antaya L. Jennings, BA*; Dawnie W. Steadman, PhD; Elizabeth A. DiGangi, PhD

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00 p.m. - 4:15 p.m.</td>
<td>A146</td>
<td>Why Are There So Many Women in Forensic Anthropology: A Critical Evaluation of Gender Politics in Forensic Anthropology</td>
<td>Marin A. Pilloud, PhD*; Nicholas V. Passalacqua, PhD</td>
</tr>
<tr>
<td>4:15 p.m. - 4:30 p.m.</td>
<td>A147</td>
<td>Recruitment Strategies From the Increasing Diversity in Evolutionary Anthropological Sciences (IDEAS) Program of the American Association of Physical Anthropology (AAPA)</td>
<td>Phoebe R. Stubblefield, PhD*; Susan C. Anton, PhD</td>
</tr>
<tr>
<td>4:30 p.m. - 4:45 p.m.</td>
<td>A148</td>
<td>The Morphology of Intersectionality: Discordance Between Ancestry Estimates and Social Identifiers</td>
<td>Chaunesey Clemmons, BA*</td>
</tr>
<tr>
<td>4:45 p.m. - 5:00 p.m.</td>
<td>A149</td>
<td>A Push for Trans-Inclusive Language in Forensic Sciences</td>
<td>Fatimah Bouderdaben*</td>
</tr>
<tr>
<td>5:00 p.m. - 5:30 p.m.</td>
<td></td>
<td>Discussion</td>
<td></td>
</tr>
</tbody>
</table>
CRIMINALISTICS

Wednesday

Poster Session

11:30 a.m. - 1:00 p.m.  B1  Costal Cartilage as an Alternative Source for DNA Typing in Personal Identification  
Marcin Tomsia; Rafał Skowronek; Michał Szczepanski; Christian Jablonski;  
Gulnaz T. Javan, PhD*

11:30 a.m. - 1:00 p.m.  B2  Population Analysis and Forensic Utility of Sequence-Based X-Chromosomal  
Short Tandem Repeat (X-STR) Loci  
Lisa Borsuk, MS*; Toni M. Diegoli, PhD; Katherine B. Gettings, PhD; Becky Steffen, MS;  
Kevin Kiesler, MS; Peter M. Vallone, PhD

11:30 a.m. - 1:00 p.m.  B3  A Novel Collection Method That Improves Direct DNA Amplification From  
Various Bloodstained Porous Materials  
Jamie D. Fredericks, PhD*; Stephen Lipic; Lucille Giordullo

11:30 a.m. - 1:00 p.m.  B4  An Investigation of Forensic DNA Methylation Profiling as a Method of Age  
Estimation Using High Resolution Melting (HRM)  
Rachelle A. Turiello, MS*; Cynthia B. Zeller, PhD

11:30 a.m. - 1:00 p.m.  B5  Optimizing the Processing of Databasing Samples Using the Hamilton® easyPunch™  
STARlet  
Allie Flores, BS*; Heather Sarik, MS; Kevin W.P. Miller, PhD; Daniel Watsula, MS;  
Robert A. Bever, PhD; Kristen Naughton, BS

11:30 a.m. - 1:00 p.m.  B6  Evaluating In Vitro Seminal Fluid and Saliva Biomarker Degradation Using a  
Mass Spectrometry-Based Serological Assay  
Catherine O. Brown, MSFS*; Janelle Leo, BS; Phillip Danielson, PhD; Kevin M. Legg, PhD;  
Heather E. McKiernan, MSFS

11:30 a.m. - 1:00 p.m.  B7  Improving the “Front End” of DNA Analysis and Trace Evidence Collection  
Through a Versatile Vacuum-Based Device  
Julian L. Mendel, PhD*; DeEtta Mills, PhD

11:30 a.m. - 1:00 p.m.  B8  The Development of a Polymerase Chain Reaction (PCR) High-Resolution  
Melt (HRM) Assay for Wormwood (Artemisia Absinthium)  
Brianna D. Kiesel, BA*; Kelly M. Elkins, PhD*

11:30 a.m. - 1:00 p.m.  B9  An Improved Swabbing Method for the Collection of DNA From Fired Cartridge Cases  
Glenn P. Fahrig*; Gregory A. Peiffer, PhD; Todd W. Bille, MS

11:30 a.m. - 1:00 p.m.  B10  Quadrat Sampling of Splashing Incident Evidence for Urine Stain Identification  
Shelby Carlson*

11:30 a.m. - 1:00 p.m.  B11  A Comparative Study of Differential DNA Extraction Methods in United States  
Laboratories  
Jenna K. Sweet*; Kelly L. Knight, MS

*Presenting Author
11:30 a.m. - 1:00 p.m.  B12  Confirming Statistical Phased Single Nucleotide Polymorphisms (SNPs) Haplotype Data of 74 Microhaplotypes (MH) Across a Global Set of Populations by Massively Parallel Sequencing (MPS)
Fabio Oldoni, PhD; Leena Yoon*; Sathya Prakash Harihar; Aishwaryaa Subramanian; Drew A. Bader, AB; Sharon C. Wootton, PhD; Robert Lagacé, BS; Ryo Hasegawa, BS; Joseph P. Chang, BS; Kenneth Kidd, PhD; Daniele S. Podini, PhD

11:30 a.m. - 1:00 p.m.  B13  A Biological Sample and Fingerprint Collection From Various Surfaces: Which Comes First?
Aylin Yalçin Saribey, PhD*; Tugba Ünsal, PhD; Kaan Yilancioglu, PhD; Sevil Atasoy, PhD

11:30 a.m. - 1:00 p.m.  B14  Building a Face for a Case: Advanced Investigative Leads From Forensic DNA Phenotyping and Prediction Markers
Gregoreese Willocks*; Ismail M. Sebetan, MD, PhD; Paul Stein, PhD; Vivian L. Stafford, MFS
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B15  A Statistical Comparison of Mass Spectral Data for Positional Isomer Differentiation
Emma L. Stuhmer, BS*; Victoria L. McGuffin, Ph.D; Ruth Waddell Smith, Ph.D
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B16  Multiple Transfers of Drug-Contaminated Fingerprints and Their Analysis With Raman Spectroscopy
Victoria R. DePrimo, BS*; Kenneth B. Zercie, MFS; Pauline E. Leary, PhD; Nicholas D. Petraco, PhD; Lisa Dadio, MS; Brooke W. Kammrath, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B17  The Detection of Explosive Residue on Gloves Exposed to Environmental Conditions
Shannon Lamy*; Alyssa L. Marsico, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B18  WITHDRAWN

11:30 a.m. - 1:00 p.m.  B19  Increased Objectivity of Shooting Distance Determinations by Spectrochemical Mapping
Courtney H. Vander Pyl*; Oriana Ovide*; Bayram Yuksel, PhD; Tatiana Trejos, PhD

11:30 a.m. - 1:00 p.m.  B20  A New Color Identification of Benzodiazepines in Blood and Pharmaceuticals: Using Cobalt Thiocyanate as Reagent
Zahid Mahmood, MPhil*

11:30 a.m. - 1:00 p.m.  B21  The Application of Surface-Enhanced Raman Spectroscopy (SERS) for the Detection of Opioids
Ling Wang, MS*

11:30 a.m. - 1:00 p.m.  B22  The Effects of Exposure to Various Environmental Conditions on the Analytical Data of Manufactured Fibers
Alexis R. Weber, BS*; Virginia M. Maxwell, DPhil
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B23  The Development of a Rule-Based Protocol for Evaluating Fire Debris Using Known Ground Truth Samples and a Best Factors Algorithm
Taylor A. Wood*; Mary R. Williams, MS; Michael E. Sigman, PhD
11:30 a.m. - 1:00 p.m.  B24  WITHDRAWN

11:30 a.m. - 1:00 p.m.  B25  The Simultaneous Detection of Rodenticides and Drugs Using Thermal Desorption Direct Analysis in Real-Time Mass Spectrometry (TD/DART®-MS)
Elizabeth Robinson, MS*; Edward Sisco, PhD

11:30 a.m. - 1:00 p.m.  B26  New Psychoactive Substances (NPS): How a Forensic Institute Deals With the Lack of Certified Standards in Brazil
Lara R.S. Gris, MS*; Emmanuele V. Baggio; Paulini B. Wegner; Patricia D. Correa

11:30 a.m. - 1:00 p.m.  B27  Portable Quadrupole-Based Gas Chromatography/Mass Spectrometer (GC/MS) Versus a GC/MS Benchtop System: An Analytical Comparison
Taís R. Fiorentin, PhD*; Shana M. Hogg, PhD; David M. Martin, PhD; Thom Browne, Jr.; Barry K. Logan, PhD

11:30 a.m. - 1:00 p.m.  B28  WITHDRAWN

11:30 a.m. - 1:00 p.m.  B29  Bomb Biometrics: Detection and Imaging of Markers Indicative of Explosive Compounds in Fingerprints
Cameron M. Longo*; Rabi A. Musah, PhD

11:30 a.m. - 1:00 p.m.  B30  Gunshot Residue Detection on Wounds in Stagnant Water: Scanning Electron Microscopy With Energy-Dispersive X-Ray Spectroscopy (SEM/EDX) or Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)? A Preliminary Study
Romain Montoriol, MD*; Céline Guilbeau Frugier, PhD; Sébastien Aries, PhD; Lauriane Onfroy, PhD; Bruno Payré, PhD; Valentin Lombardi; Norbert Telmon, PhD, MD; Frederic Savall

11:30 a.m. - 1:00 p.m.  B31  The Decomposition Clock: A Characterization of Insect Volatile Odor Profiles
Katie E. Blanar, BS*; Paola A. Prada, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B32  Use of Blood Volatiles as Trace Evidence
Lena M. Dubois, MSc*; Katelynn A. Perrault, PhD; Pierre-Hugues Stefanuto, PhD; Jean-François M. Focant, PhD

11:30 a.m. - 1:00 p.m.  B33  The Use of Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) in the Identification of the Elemental Composition of Kratom and the Determination of Geographical Origin
Cody L. Braley*; Ellen Hondrogiannis, PhD
Multidisciplinary Session: Criminalistics I/General II—Rape Kit Collection and Processing

Moderator: Gina Londino-Smolar, MS
Indiana University–Purdue University Indianapolis
Indianapolis, IN

Co-Moderator: Noelle J. Umback, PhD
Office of the Chief Medical Examiner
Department of Forensic Biology
New York, NY

8:30 a.m. - 8:50 a.m. E74 Testing Sexual Assault Kits Supports the Principle of “Justice For All”
Julie L. Valentine, PhD*; Suzanne Miles, BS*; Leslie Miles, DNP; Linda Mabey, DNP

8:50 a.m. - 9:05 a.m. B34 A Casework Review for Determining Time Since Intercourse in Boston, Massachusetts
Cassandra A. Swart, BS*; Caitlin E. Rogers, MS; William Cavedon, MS;
Amy N. Brodeur, MFS; Kathryne Hall, MS

9:05 a.m. - 9:20 a.m. E75 Forensic Doctors and Clinical Forensic Medicine: Should or Could?
Pierre-Antoine Peyron, MD; Elodie Michel; Eric Baccino, MD*

9:20 a.m. - 9:40 a.m. B35 A Strategic Design to Arrest a Serial Rapist and Killer: The Role of a DNA Profiling Database and Population Census Data
Mohammad A. Tahir, PhD; Syed W. Hamdani*; Mudassar Naseer, MPhil;
Nasir Siddique, MPhil, LLB

9:40 a.m. - 9:55 a.m. E76 DNA Evidence Collection and Analysis in Groping Sexual Assault Cases
Julie L. Valentine, PhD*; Suzanne Miles, BS*

9:55 a.m. - 10:10 a.m. Break

10:10 a.m. - 10:25 a.m. B36 The Recovery of Foreign DNA Introduced Through Kissing
Joyce P. Williams, DNP*; David A. Williams, DDS*

10:25 a.m. - 10:40 a.m. E77 Forensic Nurses in Institutes of Forensic Medicine: An Evaluation of the Zurich Integration Model
Valeria Hofer*; Michael Thali, MD; Rosa M. Martinez, MD

10:40 a.m. - 11:00 a.m. B37 Rapid DNA Turnaround for the Analysis of All Victim Sexual Assault Evidence When a Kit Is Collected
Diana K. Faugno, MSN*; Patricia M. Speck, DNSc

Bones and DNA

Moderator: Janine Kishbaugh, MS
Cedar Crest College
Forensic Science Program
Allentown, PA

Co-Moderator: Amy L. Southall-Malone, BA
Mississippi Crime Laboratory
Pearl, MS

11:00 a.m. - 11:15 a.m. B38 Efficient Sampling of Skeletonized Human Crania for DNA Testing
Suni M. Edson, MS*

*Presenting Author
11:15 a.m. - 11:30 a.m.  B39  Rapid DNA Analysis for Disaster Victim Identification in New York City
Andrew J. Schweighardt, PhD*; Veronica N. Cano, BS; Yasser D. Hernandez, BA; Arianna Lionetti; Brad Greenstein, MS; April V Kwong, MSc; Kaleel Wainwright, MPH; Carl Gajewski, MS; Mark A. Desire, MS, JD

11:30 a.m. - 11:50 a.m.  B40  Coupling DNA and Gas Chromatography/Mass Spectrometry (GC/MS) Analysis of Skeletal Remains: A Case Study of the USS Oklahoma
Suni M. Edson, MS*

11:30 a.m. - 1:00 p.m.  Lunch

Poster Session

11:30 a.m. - 1:00 p.m.  B41  The Development of an Innovative Massively Parallel Sequencing (MPS) Panel of Microhaplotypes for Improved Biogeographic Ancestry Inference
Sathya Prakash Harihar*; Fabio Oldoni, PhD; Aishwaryaa Subramanian; Leena Yoon; Sharon C. Wootton, PhD; Robert Lagacé, BS; Ryo Hasegawa, BS; Joseph P. Chang, BS; Moses S. Schanfield, PhD; Kenneth Kidd, PhD; Daniele S. Podini, PhD

11:30 a.m. - 1:00 p.m.  B42  The Persistence of Salivary α-Amylase on Decomposing Skin
Jennifer P. Kidd*; Martin Jimenez-Navarro; Courtney Manas

11:30 a.m. - 1:00 p.m.  B43  Comparing Novel Differential Lysis Methods and Direct Polymerase Chain Reaction (PCR) to Traditional Differential Extraction
Meghan N. Roig, MSFS*; Vanessa Martinez; Jeff Johnson, MS; George T. Duncan, PhD; Jeffrey A. Hickey, MS; Bruce R. McCord, PhD

11:30 a.m. - 1:00 p.m.  B44  The Development of a Single-Tube Assay for the Simultaneous Detection of Blood, Semen, and Saliva Utilizing DNA Methylation and ScreenClust® High Resolution Melt Software
Ellyn A. Zeidman, BS*; Cynthia B. Zeller, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B45  The Evaluation of a Novel Massively Parallel Sequencing (MPS) Panel of 74 Microhaplotypes for Ancestry Prediction of Four Major United States Population Groups
Aishwaryaa Subramanian*; Fabio Oldoni, PhD; Sathya Prakash Harihar; Leena Yoon; Sharon C. Wootton, PhD; Robert Lagacé, BS; Ryo Hasegawa, BS; Joseph P. Chang, BS; Moses S. Schanfield, PhD; Kenneth Kidd, PhD; Daniele S. Podini, PhD

11:30 a.m. - 1:00 p.m.  B46  Utilizing DNA Profiles Generated From Human Nail Clippings as a Means of Personal Identification
Jonah W.P. Stone, BS*; Haley Rock, BS*; Rachel M. Kreher, BS*; Krista E. Latham, PhD; Cynthia Cale, MS; Gay L. Bush, PhD

11:30 a.m. - 1:00 p.m.  B47  Dual Separation of DNA and Peptides From Semen
Ashleigh K. Matzoll*; Victoria L. Montgomery, BSc; Zachary C. Goecker, MPS; Glendon Parker, PhD

11:30 a.m. - 1:00 p.m.  B48  Recovery of Touch DNA: A Comparison of Four Collection Methods on Various Substrates
Rachel B. Gilmore*; Emily Neverett; Claire Glynn, PhD

*Presenting Author
11:30 a.m. - 1:00 p.m.  B49  A Comparison of Two Commercial Quantitative Polymerase Chain Reaction (qPCR) DNA Quantitation Kits for Prioritizing Forensic Samples for Downstream Genetic Analysis  
Megan M. Foley, MSFS*; Catherine O. Brown, MSFS; Heather E. McKiernan, MSFS

11:30 a.m. - 1:00 p.m.  B50  MicroFLOQ®: Swabs and Direct Amplification of Trace DNA Samples  
Dana M. Yenko, BS*; Daniele S. Podini, PhD

11:30 a.m. - 1:00 p.m.  B51  Optimal Small-Molecular Reference RNA for MicroRNA-Based Body Fluid Identification  
Shuntaro Fujimoto, MS*; Sho Manabe, PhD; Chie Morimoto, MS; Munetaka Ozeki, PhD; Yuya Hamano, PhD; Keiji Tamaki, MD, PhD

11:30 a.m. - 1:00 p.m.  B52  The Forensic Value of Electrospun Nanofiber Mesh for Sexual Assault Samples  
Juliette Smith*; James P. Creecy, PhD

11:30 a.m. - 1:00 p.m.  B53  DNA Methylation-Based Assay for the Identification of Smoking Status  
Hussain J.H. Alghanim, MS*; Bruce R. McCord, PhD; Wensong Wu, PhD

11:30 a.m. - 1:00 p.m.  B54  Fast Analysis Workflow With No Sample Preparation for Forensic Applications Using Open Probe Fast Gas Chromatography/Mass Spectrometry (GC/MS)  
Luis A. Cuadra-Rodriguez, BS*; Bjorn Flatt, PhD

11:30 a.m. - 1:00 p.m.  B55  The Fusion of Electrochemical and Spectrochemical Data for the Detection of Organic and Inorganic Gunshot Residues (GSR)  
Luis E. Arroyo, PhD*; Korina Menking-Hoggatt, MSc; Tatiana Trejos, PhD

11:30 a.m. - 1:00 p.m.  B56  The Adsorption and Persistence of Gasoline Residues on Household Materials Investigated by Inverse Gas Chromatography  
Eric Frauenhofer*; Joonyeong Kim, PhD

11:30 a.m. - 1:00 p.m.  B57  The Optimization of Superglue Fuming to Develop Fingermarks Exposed to Different Bodies of Water  
Emily L. Horrocks, MSc*  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B58  Blood Decomposition Odor Profiling: An Instrumental and Field Application Tool in Forensic Detection  
Kiana L. Holbrook, BS*; Paola A. Prada, PhD

11:30 a.m. - 1:00 p.m.  B59  Characterization and Comparison of Electrical Tape Backings by X-Ray Florescence (XRF)  
Meghan Prusinowski*; Andria H. Mehlretter, MSFS; Claudia Martinez, BSc; Jose R. Almirall, PhD; Tatiana Trejos, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B60  Differentiation of Isobaric and Isomeric Fentanyl Analogs by Gas Chromatography/Mass Spectrometry (GC/MS)  
Jianmei Liu*; Roxanne E. Franckowski, MS

11:30 a.m. - 1:00 p.m.  B61  An Analysis of Non-Detonable Canine Training Aids for Hexamethylene Triperoxide Diamine (HMTD)  
Alison G. Simon, PhD*; Lauryn DeGreeff, PhD

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presentation Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>B62</td>
<td>A Quantitative Analysis of Trace Elements in Electrical Tapes</td>
<td>Saeed Almheiri*, Claudia Martinez, BSc; Jose R. Almirall, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B63</td>
<td>The Effect of Aqueous Foam Concentrate-380 Blast Suppression Foam on Latent Fingerprints</td>
<td>Kelsey Kyllonen, MA*; Jeffrey Leggitt; Maria A. Roberts; Kelli Edmiston; Keith L. Monson, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B64</td>
<td>The National Forensic Laboratory Information System (NFLIS): Monitoring Trends in Cannabis/THC, Methamphetamine, and Cocaine Drug Reports</td>
<td>DeMia P. Pressley, MS*; Liqun Wong, MS; Terrence Boos, PhD; Belinda J. Weimer, MA; Hope Smiley-McDonald, PhD; Katherine N. Moore, MS; Jeffrey M. Ancheta, BS; Neelima Kunta, BS; David Heller, BS; Jeri D. Ropero-Miller, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B65</td>
<td>Identification of an Ultraviolet (UV) -Induced Promethazine Dimer</td>
<td>Sarah E. Chaffman*, Tyler Williams; James T. Miller, MA; J. Tyler Davidson, MS; Glen P. Jackson, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B66</td>
<td>Burning Down the House: The Biometric Recovery of Latent Prints and Blood in Arson Crime Scenes</td>
<td>Jason A. Casper, MFS*; Ismail M. Sebetan, MD, PhD*; Jose E. Valdez, Jr., MFS; Paul Stein, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B67</td>
<td>Trinitrotoluene (TNT) Recovery Via Microbial-Vac System (M-Vac) Collection</td>
<td>Jacqueline Ruchti, BS*; John V. Goodpaster, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B68</td>
<td>Split-Second Decision: Is It Real or Is It Fake?</td>
<td>Andrew J. Winter, MS*; Peter J. Diaczuk*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B69</td>
<td>The Repeatability of Ridge Width Measurements for Latent Fingermark Aging Studies</td>
<td>Josep De Alcaraz-Fossoul, PhD*; Michelle Mancenido, PhD; Carme Barrot, PhD; Sara C. Zapico, PhD; Katherine A. Roberts, PhD; Melissa J. Sirard; Anahi Barraza; Sara R. Anderson; Natalie Rivera Cardenas, BSc</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B70</td>
<td>A Comparison and Analysis of New Impression Casting Mediums to Dental Stone and Plaster of Paris</td>
<td>Alexander J. Colla, MFS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B71</td>
<td>The Dealkylation of Secondary Amines in the Presence of Botanical Materials</td>
<td>Katherine E. Eames*, Shana M. Hogg, PhD; David Buzby, BS; Francis X. Diamond, BS; Heather L. Harris, JD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B72</td>
<td>Practical Techniques for the Enhancement of Textile Impressions in Vehicle Surface Coatings</td>
<td>Jessica E. Hovingh*; Abigail J. Bender, BS*; Ralph R. Ristenbatt III, MS</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B73</td>
<td>A Comparison of D-Amino Acid Levels in Historical Parchment and Leather</td>
<td>Krysaly C. Gerhardt, BS*; Mehdi Moini, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
CRIMINALISTICS

Likelihood Ratios and Probabilistic Genotyping

Moderator: Daniele S. Podini, PhD
Department of Forensic Science
Washington, DC

Co-Moderator: Kelly L. Knight, MS
George Mason University
Forensic Science Program
Fairfax, VA

1:00 p.m. - 1:15 p.m. B74 The Application of Probabilistic Genotyping Software Analysis for Mixture Deconvolution Using a New Massively Parallel Sequencing (MPS) Panel for Microhaplotypes
Drew A. Bader, AB*; Fabio Oldoni, PhD; Charles H. Brenner, PhD; Kenneth Kidd, PhD; Daniele S. Podini, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

1:15 p.m. - 1:30 p.m. B75 Quantifying the Impact of Post-Validation Modifications to Forensic Statistical Tool (FST)
Nathaniel D. Adams, BS*; Stephen Lorenz; Marzieh Babaeianjelodar, MS; Jeanna N. Matthews, PhD; Dan Krane, PhD

1:30 p.m. - 1:50 p.m. B76 How to Decide How Many Contributors Are in a Mixture
Charles H. Brenner, PhD*

1:50 p.m. - 2:05 p.m. B77 A Logistic Regression Approach For Combining Likelihood Ratio (LR) in the Field of DNA Mixture Interpretation
Eugenio Alladio, PhD*; Monica Omodei, PhD; Selena Cisana, PhD; Denise Caneparo, MS; Paolo Garofano, MD, PhD; Tereza Neocleous, PhD

2:05 p.m. - 2:20 p.m. B78 Evaluating Likelihood Ratio Variability of Major Component DNA Profiles in Complex Mixtures
Steven Weitz, MS*; Todd W. Bille, MS; Gregory A. Peiffer, PhD; John S. Buckleton, PhD; Jo-Anne Bright, PhD; Michael D. Coble, PhD

2:20 p.m. - 2:30 p.m. Discussion

2:30 p.m. - 2:45 p.m. Break

Developments in Laboratory Methods

Moderator: Taylor M. Dickerson, MSFS
American Registry of Pathology
Armed Forces DNA Identification Laboratory
Dover Air Force Base, DE

Co-Moderator: Nasir A. Butt, PhD
Cuyahoga County Medical Examiner’s Office
Cleveland, OH

2:45 p.m. - 3:00 p.m. B79 Proteomic Genotyping of Human Head Hair
Zachary C. Goecker, MPS*; Michelle Salemi, MS; Brett Phinney, PhD; Glendon Parker, PhD; Robert Rice, PhD

3:00 p.m. - 3:15 p.m. B80 The Evaluation of a Quantitative Proteomic Seminal Fluid Assay for Assessing Lateral Flow Test Error Rates and Predicting Downstream DNA Profiling Success
Heather E. McKiernan, MSFS*; Catherine O. Brown, MSFS; Kevin M. Legg, PhD; Phillip Danielson, PhD

*Presenting Author
3:15 p.m. - 3:30 p.m. B81 The Developmental Validation of a MicroRNA (miRNA) Panel for Forensic Body Fluid Identification
Annabelle C. Campbell, BSc*; Jennifer Szekely, BS; Carolyn Lewis, BS; Sarah J. Seashols Williams, PhD; Raquel Green, BS; Tracey Dawson Cruz, PhD

3:30 p.m. - 3:45 p.m. B82 Antibody-Mediated Separation of Seminal Male/Female Mixtures From Sexual Assault Samples
Chelsie N. Testerman, BS*; Jordan Cox, MS; Kemper Gibson, MS; James P. Landers, PhD; Tracey Dawson Cruz, PhD

3:45 p.m. - 4:00 p.m. B83 The Optimization and Validation of a Novel Direct-Lysis Differential Extraction Procedure
Andrew D. Ziegler, BS*; Anooja Rai; Mike Yakoo, MS; Robin W. Cotton, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

4:00 p.m. - 4:15 p.m. B84 The Integration of a High-Resolution Melt (HRM) Curve Short Tandem Repeat (STR) Assay Into a Commercial Quantification Kit for Preliminary Mixture Detection: Getting More Information Earlier in the DNA Workflow
Hannah Wines, BS; Laura C. Oliver, MS*; Jordan Cox, MS; Darienne Cloudy, BS; Sarah J. Seashols Williams, PhD; Steven Weitz, MS; Todd W. Bille, MS; Edward Boone, PhD; Tracey Dawson Cruz, PhD

4:15 p.m. - 4:30 p.m. B85 Forensic Body Fluid Identification Using Microbiome Signature Attribution Through 16S Ribosomal DNA (rDNA) High-Throughput Sequencing (HTS)
Denise Wohlfahrt, BS*; Raquel Green, BS; Angela L. Brand, BS; Eric A. Abshier, BS; Elena Martinez Planes; Antonio Tan-Torres, MS; J. Brooks, PhD; Sarah J. Seashols Williams, PhD; Baneshwar Singh, PhD

4:30 p.m. - 4:45 p.m. B86 Typing Highly Degraded DNA Using Circularized Molecules and Target Enrichment
Rachel E. Wiley, MFS*; Magdalena Bus, PhD; Jonathan King, MS; Bruce Budowle, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

4:45 p.m. - 5:00 p.m. Discussion

Thursday—Session II

Multidisciplinary Session: Criminalistics II/Engineering Sciences II—Fire Science and Investigation, Part I

Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM

Co-Moderator: Sandra B. Sachs, PhD
Oakland Police Department
Crime Laboratory
Oakland, CA

8:30 a.m. - 8:45 a.m. D24 The Vision and Progress of the Organization of Scientific Area Committees (OSAC) Fire Debris and Explosives (FD&E) Analysis Subcommittee
Susan Seebode Hetzel, BA*
(FSF Emerging Forensic Scientist Award Paper Presentation)

8:45 a.m. - 9:00 a.m. B87 The Bomb Maker Project: How Human Factors Affect the Characteristics and Interpretation of Explosives Evidence
John V. Goodpaster, PhD*
CRIMINALISTICS

9:00 a.m. - 9:15 a.m.  B88 Exploring a New Approach to Canine Training Aids for Explosives
William A. MacCrehan, PhD*; Craig Angle, PhD; Michele Schantz, PhD; Paul Waggoner, PhD; Jason Barrow, PhD; Kelly Van Arsdale, MS

9:15 a.m. - 9:30 a.m.  B89 A Quantitative Comparison and Differentiation of Smokeless Powders
Casey M. Brown, MPS; Ryan Schonert, MPS; Wayne Moorehead, MS; Jack Hietpas, PhD*

9:30 a.m. - 9:45 a.m.  D25 The Use of Toxicological Evidence in Fire Investigation
Douglas J. Carpenter, MS*

9:45 a.m. - 10:00 a.m.  D26 Exceeding the Scope of Law Enforcement in Forensic Fire Investigation
S.B. Addison Larson, MS*

10:00 a.m. - 10:30 a.m.  Break

Multidisciplinary Session: Criminalistics II/Engineering Sciences II—Fire Science and Investigation, Part II

Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM

Co-Moderator: John L. Allen, PE
Bureau of Alcohol, Tobacco, Firearms and Explosives
Ammendale, MD

10:30 a.m. - 10:45 a.m.  D27 Heavy Truck Fuel-Fed Fires: Predictable Fuel Leakage, Ignition Sources, Fuel Tank Placement Hazards, and Safer Alternative Designs
Mark C. Pozzi, MS*; David R. Bosch, PhD*; Kenneth J. Saczalski, PhD

10:45 a.m. - 11:00 a.m.  D28 Electrical Homicide or Not?
Helmut G. Brosz, BASc, PEng*

11:00 a.m. - 11:15 a.m.  D29 Sabotaged Electrical Grid: Worse Than 9/11?
Helmut G. Brosz, BASc, PEng*

11:15 a.m. - 11:30 a.m.  B90 Yes, Everybody Knows a Fire Needs Oxygen, But Why Should We Care?
John J. Lentini, BA*

11:30 a.m. - 11:45 a.m.  D30 American Association for the Advancement of Science (AAAS) Forensic Science Assessments: A Quality and Gap Analysis of Fire Investigation
Jose R. Almirall, PhD*

11:45 a.m. - 1:00 p.m.  Lunch

Pattern Recognition—Science of Latent Print and Firearm Analysis

Moderator: Thomas A. Brettell, PhD
Cedar Crest College
Allentown, PA

1:00 p.m. - 1:15 p.m.  B91 A Large-Scale Study for the Differentiation of Individuals Based on Triacylglycerols (TG) in Latent Fingerprints
Kelly C. O’Neill*; Paige L. Hinners, MS; Young-Jin Lee

*Presenting Author
**CRIMINALISTICS**

1:15 p.m. - 1:30 p.m. **B92** Tape-Dependent Latent Print Development  
Vidia A. Gokool, BSc*; Monika Garcia, MFS; Rachel L. Creager

1:30 p.m. - 1:45 p.m. **B93** Latent Print Processing of Glassine Stamp Bags Containing Suspected Heroin: The Search for an Efficient and Safe Method  
Brittany Barnes, BS; Jason Clark, MS; Joseph B. Kadane, PhD*; Marla Priestley, BS; Neil Spencer, MS; Deborah Tator, MS; Denielle Wauthier, BS; Joshua Yohannan, MS

1:45 p.m. - 2:00 p.m. **B94** Latent Fingermark Detection Using Functional Nanomaterials  
Fehmida Kanodarwala, PhD*; Po Lun Lee, BSc; Sebastien Moret, PhD; Xanthe Spindler, PhD; Christopher J. Lennard, PhD; Claude Roux, PhD

2:00 p.m. - 2:15 p.m. **B95** Why Do Latent Print Examiners Differ in Their Conclusions?  
Bradford Ulery, MS; R. Austin Hicklin, PhD*; Tom Busey, PhD; Maria A. Roberts; JoAnn Buscaglia, PhD*

2:15 p.m. - 2:30 p.m. **B96** Assessing the Expected Weight of Evidence for a Latent Print (Fingerprint) That Is Insufficient for Identification and Without Reference to a Putative Source  
Marco De Donno*; Christophe Champod, PhD; David A. Stoney, PhD; Paul Stoney, MBA

2:30 p.m. - 2:45 p.m. **B97** The Associative Value of Latent Print Correspondences That Are Insufficient for Identification  
David A. Stoney, PhD*; Marco De Donno; Christophe Champod, PhD; Paul Stoney, MBA

2:45 p.m. - 3:00 p.m. **B98** Probabilistic Reporting in American Criminal Cases: A Baseline Study  
Simon Cole, PhD*; Matt Barno, JD

3:00 p.m. - 3:15 p.m. **B99** A Pathway Toward Firearm Population Statistics  
Xiaoyu A. Zheng, MS*; Erich D. Smith, MS*; Martin Baiker-Sørensen, PhD; Johannes A. Soons, PhD

3:15 p.m. - 3:30 p.m. Break

Firearm Markings, Explosive Devices, and Components

**Moderator:** Desiree A. Reid, BS  
New Jersey State Police, East Laboratory  
Sea Girt, NJ

**Co-Moderator:** Peter J. Diaczuk  
Penn State University  
State College, PA

3:30 p.m. - 3:45 p.m. **B100** An Experiment to Explore Persistence of Bullet Striations  
Heike Hofmann, PhD*; Alicia L. Carriquiry, PhD; Nicholas A. Lennie, BSc

3:45 p.m. - 4:00 p.m. **B101** A Comparison of VisionX and Leica UFM4 Comparison Microscopes and Validation of the VisionX Comparison Microscope for Intra- and Inter-Laboratory Examination  
Mark S. Dreyfuss, PhD*; Daniel E. Katz, MFS; Torin Z. Saber; Susan L. Kim, MFS

4:00 p.m. - 4:20 p.m. **B102** The Development and Validation of Machine Learning Models for Fire Debris Analysis  
Michael E. Sigman, PhD*; Mary R. Williams, MS

4:20 p.m. - 4:40 p.m. **B103** The Detection and Forensic Analysis of Trace Fuel-Oxidizer Mixture Evidence by Infrared Thermal Desorption (IRTD) With Direct Analysis in Real-Time Mass Spectrometry (DART-MS): Black Powders and Black Powder Substitutes  
Thomas P. Forbes, PhD*; Jennifer R. Verkouteren, MS; Edward Sisco, PhD; Matthew E. Staymates, MS

*Presenting Author
Friday—Session I

The Next Generation of Sequencing

Moderator: Christina Rivera Sorensen, MS
Office of the Chief Medical Examiner
New York, NY

Co-Moderator: Andrew J. Schweighardt, PhD
Northport, NY

8:30 a.m. - 8:50 a.m. B105 Forensic Genetic Genealogy for Law Enforcement
Ellen M. Greytak, PhD*; CeCe Moore; Steven Armentrout, PhD

8:50 a.m. - 9:05 a.m. B106 The Characterization and Repair of Hydrolytically Induced DNA Damage in the Mitochondrial DNA (mtDNA) Control Region Through Massive Parallel Sequencing (MPS) Analysis
Sidney Gaston Sanchez*; Charity A. Holland, MPH; Mitchell M. Holland, PhD

9:05 a.m. - 9:20 a.m. B107 Massively Parallel Sequencing (MPS) and Short Tandem Repeat (STR) Analysis of Human DNA From Partial Bloody Fingerprints Enhanced With Columnar Thin Films (CTF)
Teresa M Tiedge*; Nivedita Nagachar, PhD; Akhlesh Lakhtakia, PhD, DSc; Reena Roy, PhD
(FSE Emerging Forensic Scientist Award Paper Presentation)

9:20 a.m. - 9:35 a.m. B108 A Newly Developed Massively Parallel Sequencing (MPS) Microhaplotype Forensic Assay for Mixture Detection and Deconvolution and Ancestry Prediction
Fabio Oldoni, PhD*; Drew A. Baiden, AB; Sharon C. Wootton, PhD; Robert Lagacé, BS; Ryo Hasegawa, BS; Joseph P. Chang, BS; Kenneth Kidd, PhD; Daniele S. Podini, PhD
(FSE Emerging Forensic Scientist Award Paper Presentation)

9:35 a.m. - 9:50 a.m. B109 FONTANA: A FOrensic NexT-Generation ANAlysis Pipeline for High-Throughput Microhaplotype Data Analysis
Keylie M. Gibson, BS*; Fabio Oldoni, PhD; Rebecca M. Hart; Daniele S. Podini, PhD; Keith A. Crandall, PhD

9:50 a.m. - 10:05 a.m. B110 The Use of Receiver Operating Characteristic (ROC) Curves as a Tool to Assess Noise and Zygosity in the Targeted Sequencing of Forensic Short Tandem Repeat (STR) Markers
Sarah Riman, PhD*; Hariharan Iyer, PhD; Lisa Borsuk, MS; Peter M. Vallone, PhD

10:05 a.m. - 10:20 a.m. B111 Eye, Hair, and Skin Color Prediction Using the HIrisPlex-S (HPS) System and Massively Parallel Sequencing (MPS)
Krystal Breslin, MS; Bailey M. Wills, BS*; Susan Walsh, PhD
Low Copy Number DNA Techniques

Moderator: Baneshwar Singh, PhD
Virginia Commonwealth University
Department of Forensic Science
Richmond, VA

Co-Moderator: Michelle K. Gordon, MS
Office of the Chief Medical Examiner
New York, NY

10:35 a.m. - 10:50 a.m. B112 The Examination of DNA Extraction Lysis and Wash Step Modification for Low Template DNA Sample Processing
Sydney Menchhoff*; Milady T. Delacruz; Madison Hytinen, BS; Marilyn T. Miller, EdD; Tracey Dawson Cruz, PhD

10:50 a.m. - 11:05 a.m. B113 Standardizing Testing for DNA Shedding Propensity
Mechthild K. Prinz, PhD*; Marine Bougerie Le Du; Dimura Gunatilake, BS; Nicholas D. Petraco, PhD

11:05 a.m. - 11:20 a.m. B114 Improved DNA Recovery From Handwritten Documents
Patrick McLaughlin, BS*; Mechthild K. Prinz, PhD

11:20 a.m. - 11:35 a.m. B115 Improving Recovery of Trace DNA From Cotton Swabs Using Pressure Cycling and Alkali-Based Lysis
Meghan N. Roig, MSFS*; Nicole Fernandez Tejero; Vanessa Martinez; Bruce R. McCord, PhD
(FSE Emerging Forensic Scientist Award Paper Presentation)

11:35 a.m. - 11:50 a.m. B116 The Assessment of Variable Elution Volumes for Efficient Recovery of Low-Level DNA Samples From Robotic Extraction Platforms
Heather V. Milnthorp, MSFS*; Yih Ling Saw, MSFS; Heather E. McKiernan, MSFS

11:50 a.m. - 1:00 p.m. Lunch

Poster Session

11:30 a.m. - 1:00 p.m. B117 A Proteomic Analysis of Epidermal Squamous Corneocytes
Trevor A. Borja, BA*; Noreen Karim, PhD; Zachary C. Gecker, MPS; Michelle Salemi, MS; Brett Phinney, PhD; Robert Rice, PhD; Glendon Parker, PhD

11:30 a.m. - 1:00 p.m. B118 The Determination of Biogeographic Ancestry Within Hispanic Populations
Casandra Hernandez Setser, MSFS*; Deanna S. Cross, PhD; John V. Planz, PhD; Ranajit Chakraborty, PhD

11:30 a.m. - 1:00 p.m. B119 A Faster, Easier, and More Effective Bone Processing Method for DNA Analysis
LeAnn Michelle Harrel, BS*; Sheree R. Hughes-Stamm, PhD
(FSE Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. B120 Forensic Match Probabilities and the Impact of Historical Migrations and Consanguinity: A Population Study
Ijaz Anwar, MPhil*; Shahid Hussain, MPhil

11:30 a.m. - 1:00 p.m. B121 Developing a Contaminant-Abatement Method for Isolation DNA From Cancellous Bones
Bryan Bernal, BS; Jordana Centauro; Tova Akerman; Yilin Kong, HSD; Richard Li, PhD*
11:30 a.m. - 1:00 p.m.  B122  A Developmental Validation of a Body Fluid Identification Multiplex Via DNA Methylation Analysis  
Quentin T. Gauthier, MSFS*; Sohee Cho, PhD; Bruce R. McCord, PhD

11:30 a.m. - 1:00 p.m.  B123  The Optimization of a Semi-Automated Differential Extraction Protocol for Recovery of Low-Level Male DNA From Sexual Assault Samples  
Janelle Leo, BS*; Heather V. Mlinthorp, MSFS; Heather E. McKiernan, MSFS

11:30 a.m. - 1:00 p.m.  B124  An Examination of the Persistence of Indirectly Transferred DNA on Regularly Used Knives in a Stabbing Simulation  
Erica Cantor, BS*; Jessica Miller, BS*; Krista E. Latham, PhD; Cynthia Cale, MS; Gay L. Bush, PhD

11:30 a.m. - 1:00 p.m.  B125  Nanoscale Imaging and Chemical Analysis of Extracellular DNA in Trace Biological Samples  
Congzhou Wang, PhD; Emily Brocato; Christopher J. Ehrhardt, PhD; Vamsi Yadavalli, PhD*

11:30 a.m. - 1:00 p.m.  B126  Tracking DNA Loss in Forensic Touch Samples  
Jessica Tang, BS*; Ray Wickenheiser, MBA; Ashley Hall, PhD

11:30 a.m. - 1:00 p.m.  B127  The Development of a Universal Quantitative Reverse Transcription-Polymerase Chain Reaction (qRT-PCR) Protocol for Differentiating a Mixture of Forensically Relevant Body Fluids Using microRNA (miRNA)  
Zoe S. Garcia, BSc*; Cynthia B. Zeller, PhD

11:30 a.m. - 1:00 p.m.  B128  The Generation of Interpretable, Single-Source, Short Tandem Repeat (STR) Profiles From Mixed Samples Using Optical Tweezers  
Michael K. Valle, BS*; Nicole Auka, MS; Joseph E. Reiner, PhD; Tracey Dawson Cruz, PhD; Sarah J. Seashols Williams, PhD

11:30 a.m. - 1:00 p.m.  B129  The Evaluation of the Short Tandem Repeat (STR) Genotype Concordance Between Massively Parallel Sequencing (MPS) and Capillary Electrophoresis (CE) STR Kits in Japanese Population Samples  
Tetsushi Kitayama, PhD*; Kevin Kiesler, MS; Lisa Borsuk, MS; Becky Steffen, MS; Takashi Fukagawa, PhD; Haruhiko Watahiki, MS; Yusuke Mita, PhD; Koji Fujii, PhD; Peter M. Vallowe, PhD; Natsuko Mizuno, PhD

11:30 a.m. - 1:00 p.m.  B130  An Evaluation of the Stability of High Throughput Sequencing (HTS) of Microbial DNA From Compromised Human Samples  
Francy Scarlett Nogales, BS*; Sarah J. Seashols Williams, PhD; Baneshwar Singh, PhD; J. Brooks, PhD; Denise Wohlfahrt, BS*; Raquel Green, BS*; Antonio Tan-Torres, MS; Kathleen D. Brim, BS; Najai Bradley

11:30 a.m. - 1:00 p.m.  B131  The Development of Magnetic Carbon Nanotubes (Mag-CNT) for Dispersive Solid Phase Extraction (dSPE) of Cyanide Metabolite (2-Aminothiazoline-4-Carboxylic Acid) in Biological Samples  
Sun Yi Li, BSc*; Jorn Chi-Chung Yu, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  B132  A Three-Year Review of Novel Psychoactive Substance (NPS) Prevalence in Drug Identification Casework  
Keith-Dane H. Temporal, MS*; Donna M. Papsun, MS; Frederick Strathmann, PhD; Barry K. Logan, PhD

*Presenting Author
11:30 a.m. - 1:00 p.m. B133 The Forensic Evaluation of Cut and Torn Duct Tape Fractures: A Validation Study to Quantify the Quality of a Physical Match
Meghan Prusinowski*; Tatiana Trejos, PhD

11:30 a.m. - 1:00 p.m. B134 Chemical Waste From a Chemistry Forensic Laboratory and the Challenge of Segregating, Treatment, and Disposal
Marcus de Abreu Farias Costa*; Natilene M. Brito, PhD

11:30 a.m. - 1:00 p.m. B135 The Detection of Human Decomposition Products by Infrared and Visible Spectroscopy at a Disturbed 19th-Century Native American Burial Ground
Afrin Lopa, MS*

11:30 a.m. - 1:00 p.m. B136 The Determination of Weathering Levels of Gasoline Using Various Methods of Analysis
Morgan N. Carpenter, BS*; William M. Davis, PhD

11:30 a.m. - 1:00 p.m. B137 Drug Trends in Correctional Facilities: An Assessment of Forensic Drug Chemistry Casework
Mollie Mares, MSFS*; Frederick Strathmann, PhD; Barry K. Logan, PhD; Francis X. Diamond, BS

11:30 a.m. - 1:00 p.m. B138 Differentiation and Identification of U-47700, U-51754, and U-49900 Using Gas Chromatography/Mass Spectrometry (GC/MS) and Nuclear Magnetic Resonance (NMR) Spectroscopy
Krystal T. Byrd, BSc*; Susan M. Schelble, PhD; Kelly M. Elkins, PhD

11:30 a.m. - 1:00 p.m. B139 Fingermark Recovery Methods From Submerged Knives in Different Aquatic Environments
Emily L. Horrocks, MSc*

11:30 a.m. - 1:00 p.m. B140 The Determination of a Canine Olfactory Detection Threshold Using a Universal Detection Calibrant (UDC)
Kelvin J. Frank, Jr., BS*; Rodolfo Mesa, BS*

11:30 a.m. - 1:00 p.m. B141 The Detection of Arson Accelerants Using Porous-Layer Open-Tubular (PLOT)-Cryoadsorption
Daniella M. Hernandez*; April A. Hill, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. B142 Automatic Groove Identification in 3D Bullet Land Scans Using Statistical Models
Nathaniel M. Garton, MSc*; Heike Hofmann, PhD; Ulrike Genschel

11:30 a.m. - 1:00 p.m. B143 The Estimation of True Compositions of Volatile Compounds in Headspace Via Solid Phase Microextraction (HS/SPME) and Inverse Gas Chromatography (IGC)
Joonyeong Kim, PhD*

11:30 a.m. - 1:00 p.m. B144 A Biological Sample and a Gunshot Residue Collection from the Shooter’s Hand: Which Comes First?
Tugba Ünsal, PhD*; Aylin Yalçın Saribey, PhD; Kaan Yilancıoglu, PhD; Sevil Atasoy, PhD

11:30 a.m. - 1:00 p.m. B145 Determining the Confidence of Fingerprint Examiners at Various Steps in the Analysis, Comparison, Evaluation-Verification (ACE-V) Method
Kierstyn L. Evans, BS*; Megan Thoen, PhD

*Presenting Author
CRIMINALISTICS

11:30 a.m. - 1:00 p.m.  **B146**  Canine Detection of Organic and Inorganic Gunshot Residues (GSR) on the Suspected Shooters
Marcello Rendine, DBA*; Irene Riezzo, MD, PhD; Carmela Fiore, MD; Michela Ferrara, MD; Francesco Sessa, MS; Gianfranco Guccia; Pietrantonio Ricci, MD, PhD

11:30 a.m. - 1:00 p.m.  **B147**  An Evaluation of Novel Headspace Extraction Methods for the Analysis of Ignitable Liquid Residues (ILRs)
Michelle N. Torres, BS*; Nicole Valdes, BA; Jose R. Almirall, PhD

11:30 a.m. - 1:00 p.m.  **B148**  Snapshotting Individuals From Nose Shape Genetics—A Novel Tool of DNA Witnesses
Zeenat Salahuddin, PhD*; Tomás B. González; Julie White, MA; Peter Claes; Susan Walsh, PhD; Mark D. Shriver, PhD; Allah Rakha, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  **B149**  A Comparison of Methods for Developing Submerged Fingerprints
Irene M. Chiang, BS*; Elizabeth A. Gardner, PhD

11:30 a.m. - 1:00 p.m.  **B150**  Pyrolysis Direct Analysis in Real-Time Mass Spectrometry (DART*-MS) Analysis of Ignitable Liquids With Chemometrics
Isabella C. Barnett, BA*; Mengliang Zhang, PhD*

**Multidisciplinary Session: Criminalistics I/Jurisprudence II—Justice Cannot Happen in a Vacuum**

**Moderator:** Amrita Lal-Paterson, MSFS  
Division of Forensic Science  
Wilmington, DE

**Co-Moderator:** Jacquelyn A. Smith, JD  
Charlotte Mecklenburg Schools  
Cornelius, NC

1:00 p.m. - 3:00 p.m.  **F43**  Justice Cannot Happen in a Vacuum: Toward a Better Representation of the Science, the Client, and the Case Through Open Communication
Charlotte J. Word, PhD*; Terri Rosenblatt, JD*; Raymond Valerio, JD*; Heather H. Degnan, PhD*

3:00 p.m. - 3:15 p.m.  Break

**Not Just Humans**

**Moderator:** Katherine B. Gettings, PhD  
National Institute of Standards and Technology  
Gaithersburg, MD

**Co-Moderator:** Lisa C. Schiermeier-Wood, MS  
Virginia Department of Forensic Science  
Richmond, VA

3:15 p.m. - 3:30 p.m.  **B151**  Mosquitoes: A Potential Source for Human Identity
Shayna L. Gray, BS*; Scott Lindner, PhD; Reena Roy, PhD (FSF Emerging Forensic Scientist Award Paper Presentation)

3:30 p.m. - 3:45 p.m.  **B152**  Small Unmanned Aerial System (sUAS) Attribution Phenomenology Via Plant/ Fungal and Human DNA Sequencing
Josh Dettman*; Tara Boettcher, BS; Jim Comolli, PhD; Martha Petrovick, PhD

3:45 p.m. - 4:00 p.m.  **B153**  Internal Validation of the “DogFiler” Short Tandem Repeat (STR) Amplification Assay for the Analysis of Canine DNA Evidence
Sam Kwiatkowski, PhD*; Michael A. Donley, MS; Katherine Welch, MS; Roger Kahn, PhD

*Presenting Author
4:00 p.m. - 4:15 p.m. B154 The Utility of the Human Hair Microbiome in the Forensic Analysis of Human Hairs
Tyler Kennedy, BS*; Baneshwar Singh, PhD*

4:15 p.m. - 4:30 p.m. B155 The Characterization of New Chloroplast Markers to Determine the Biogeographical Origin and Crop Type of Cannabis Sativa Samples
Madeline G. Roman, BS*; Rachel M. Houston, PhD; Bobby Larue, Jr., PhD; David A. Gangitano, PhD
(FSE Emerging Forensic Scientist Award Paper Presentation)

4:30 p.m. - 4:45 p.m. B156 Massively Parallel Sequencing (MPS) of 12 Autosomal Short Tandem Repeats (STRs) in Cannabis Sativa
Rachel M. Houston, PhD*; Carrie Mayes, BS; Jonathan King, MS; Sheree R. Hughes-Stamm, PhD; David A. Gangitano, PhD

4:45 p.m. - 5:00 p.m. B157 The Development of a Method to Extract Opium Poppy (Papaver somniferum L.) DNA From Heroin
Michael Marciano, MS*; Sini Panicker; Garrett Liddil; Danielle Lindgren, MS; Kevin S. Sweder, PhD

5:00 p.m. - 5:15 p.m. Discussion

Criminalistics Believe It or Not!

Moderator: Mechthild K. Prinz, PhD
John Jay College of Criminal Justice
Department of Sciences
New York, NY

Co-Moderator: Cyndi Hall, MS
Idaho State Police
Forensic Services
Meridian, ID

7:00 p.m. - 9:00 p.m. Criminalistics Believe It or Not!

Believe It Or Not! is back! During this casual Friday evening session, you will have the pleasure of learning about unusual and challenging cases in which physical evidence played an amazing role. This evening session is intended to be informal, entertaining, and informational (in that order!). The list of Believe It Or Not! speakers, as well as the subject matter of each presentation, will be kept under wraps until the last minute to keep our attendees in suspense.

Join us to hear about unique or historical evidence substrates, challenging cases that yielded results due to creative thinking by analysts, and other assorted adventures in criminalistics. Past years’ speakers have entertained the crowd with tales of interesting substrates such as smugglers’ drug-filled candles, expert witness experiences, and the authentication of the Ground Zero flag.

After the more serious science has finished for the day, come and listen to your friends and colleagues share stories that will be even more entertaining than your favorite forensic-themed TV shows—no reruns here!

If you’ve ever found yourself with nothing to do on the Friday night before the end of the annual meeting, this session is for you!
## Trace Analyses

### Friday—Session II

**Moderator:** A. Bakarr Kanu, PhD  
Winston-Salem University  
Department of Chemistry  
Winston-Salem, NC  
Co-Moderator: Jason C. Kolowski, PhD  
Forensic Insight Consulting, LLC  
Aldie, VA

8:30 a.m. - 8:50 a.m.  **B158**  
**The Use of Optical Profilometry to Characterize Fabric Impressions in Vehicle Surfaces**  
Abigail J. Bender, BS*; Jessica E. Hovingh*; Ralph R. Ristenbatt III, MS

8:50 a.m. - 9:10 a.m.  **B159**  
**On the Development of Score Rules for the Pairwise Sample Comparison of Particle Micromorphometry of Aluminum (Al) Powders**  
Danica Ommen, PhD*; JenaMarie Baldaino, MS; Cami Fuglsby, MS; Christopher P. Saunders, PhD*; Jack Hietpas, PhD; JoAnn Buscaglia, PhD*

9:10 a.m. - 9:30 a.m.  **B160**  
**Learning Algorithms to Evaluate Glass Evidence**  
Soyoung Park, MS; Samantha Tyner, PhD; Alicia L. Carriquiry, PhD*

9:30 a.m. - 9:45 a.m.  **B161**  
**The Feasibility of Ultra High-Performance Liquid Chromatography-Mass Spectrometry (UHPLC-MS) for the Forensic Analysis of Permanent Hair Dyes**  
Taylor M. Tipton, BS*; Ioan Marginean, PhD

9:45 a.m. - 10:00 a.m.  **B162**  
**Trace Vapor Generator for Explosives and Narcotics (TV-Gen): An Overview**  
Susan Rose-Pehrsson, PhD; Greg Collins, PhD; Michael Malito; Mark Hammond, PhD; Lauryn DeGreeff, PhD; Christopher J. Katilie; Michelle Cerreta, PhD; Alison G. Simon, PhD*  
(FSF Emerging Forensic Scientist Award Paper Presentation)

10:00 a.m. - 10:15 a.m.  
**Break**

## Trace DNA, Fabric, Fiber, Drugs, and Instrumentation

**Moderator:** Philip R. Antoci, MS  
New York City Police Department Crime Laboratory  
Jamaica, NY  
Co-Moderator: Pamela M. Hofsass, MS  
Contra Costa County Sheriff’s Crime Laboratory  
Martinez, CA

10:15 a.m. - 10:30 a.m.  **B163**  
**MicroFLOQ®: Collection and Direct Amplification Methods Using the GlobalFiler™ Kit for DNA Recovered From Common Pipe Bomb Components**  
Esiri Tasker, BA*; Carrie Mayes, BS; Sheree R. Hughes-Stamm, PhD

10:30 a.m. - 10:45 a.m.  **B164**  
**Cellular Autofluorescence Signatures for Quantifying Cell Types in Trace Biological Samples and Establishing Age of Evidence**  
Emily Brocato; Kate Philpott, JD; Christopher J. Ehrhardt, PhD*

10:45 a.m. - 11:00 a.m.  **B165**  
**Distinguishing Between Fluorinated Surface Treatments of Fibers Using Pyrolysis-Gas Chromatography Plasma-Assisted Reaction Chemical Ionization-Mass Spectrometry (py-GC-PARCI-MS)**  
Michael J. Dolan, Jr., MS*; Robert D. Blackledge, MS; Kaveh Jorabchi, PhD

*Presenting Author
### Criminalistics

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors/Co-authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 a.m.</td>
<td>B166</td>
<td>The Effect of Ultraviolet Radiation on the Microspectrophotometry (MSP) of Dyed Textile Fibers: Spectral Alteration Categories</td>
<td>Meggan B. King, BSc; Sebastian B. Sarenga, MS; Gary J. Laughlin, PhD; Patrick Buzzini, PhD*</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>B167</td>
<td>The Discrimination and Identification of Fiber Samples Using Raman Microspectroscopy</td>
<td>Sergey Mamedov, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B168</td>
<td>The Identification of Phencyclidine (PCP) and Designer PCP Analogs Using Microcrystalline Tests Followed by Raman Microspectroscopy</td>
<td>Matthew Quinn*; Lawrence Quarino, PhD; Monica Joshi, PhD; Thomas A. Brettell, PhD</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>B169</td>
<td>Field Identification of Kratom by Portable Gas Chromatography/Mass Spectrometry (GC/MS) Instrumentation</td>
<td>Zachary Lawton, MS; Sarah Goda, BS; Peter Massey, MS; Brooke W. Kammrath, PhD*</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td></td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>

### Drug Chemistry I

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors/Co-authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m.</td>
<td>B170</td>
<td>2019 Update From the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG)</td>
<td>Sandra E. Rodriguez-Cruz, PhD*</td>
</tr>
<tr>
<td>1:15 p.m.</td>
<td>B171</td>
<td>The Identification of a Novel Fragmentation Pathway of Synthetic Cathinones</td>
<td>J. Tyler Davidson, MS*; Zachary J. Sasiene, BS; Younis F. Abiedalla, PhD;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Randall Clark, PhD; Glen P. Jackson, PhD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>B172</td>
<td>WITHDRAWN</td>
<td></td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>B173</td>
<td>The Development of an In Silico Mass Spectral Library</td>
<td>Janelle D.S. Newman, MD*; Eileen B. Eubank, MFS; Jeremy Zehr, MS; Joseph A. Trimboli, PhD</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>B174</td>
<td>A Confirmatory Method for the Analysis of 30 Fentanyl Analogs Using Gas Chromatography/Mass Spectrometry (GC/MS)</td>
<td>Delilah DeWilde, BS*; Matthew R. Wood, PhD; Thomas A. Brettell, PhD; Thomas H. Pritchett, MS</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>B175</td>
<td>A Forensic Sample Comparison of Heroin by the Analysis of Its Elemental Composition</td>
<td>Joshua S. DeBord, PhD*; Ruthmara Corzo; Jose R. Almirall, PhD</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>B176</td>
<td>Medible Testing: The Preparation of Matrix-Matched Calibrators and Controls for Forensic Analysis</td>
<td>Kathryn L. Orton, BS*; Casey Spencer, BS; Jean A. Heneks, BS; Rachel B. Fielden, MD;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Justin L. Poklis, BS; Carl E. Wolf, II, PhD</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td></td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>
CRIMINALISTICS

Drug Chemistry II

Moderator: Carmen L. Masters, MSFS  
Northeast Laboratory  
New York, NY

Co-Moderator: Glen P. Jackson, PhD  
West Virginia University  
Department of Forensic and Investigative Science  
Morgantown, WV

3:00 p.m. - 3:15 p.m. B177 A Comparison of Gas Chromatography/Infrared Spectroscopy (GC/IR) and Gas Chromatography/Mass Spectrometry (GC/MS) Methods for the Identification of Isomeric Synthetic Drugs  
Randall Clark, PhD*; Lewis W. Smith, BS; Younis F. Abiedalla, PhD

3:15 p.m. - 3:30 p.m. B178 The Separation of Fentals From Complex and Confounding Mixtures Using Gradient Elution Moving Boundary Electrophoresis (GEMBE)  
Thomas P. Forbes, PhD*; David Ross, PhD

3:30 p.m. - 3:45 p.m. B179 Gas Chromatography (GC) With Tandem Cold Electron Ionization/Mass Spectrometric (Cold EI/MS) Detection and Vacuum Ultraviolet (VUV) Detection for the Comprehensive Analysis of Fentanyl Analogos  
Sydney R. Buchalter, BS*; Ioan Marginean, PhD; Ira S. Lurie, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

3:45 p.m. - 4:00 p.m. B180 The Application of Ultra High-Performance Liquid Chromatography-Time-of-Flight/Mass Spectrometry (UHPLC-TOF/MS) to the Analysis of Phenethylamine Derivatives  
Georgina R. Nicholls, MS*; Ioan Marginean, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

4:00 p.m. - 4:15 p.m. B181 The Detection and Differentiation of Controlled Substances by Gas Chromatography-Vacuum Ultraviolet (GC-VUV) and Chemometrics  
Zackery Roberson, BS*; John V. Goodpaster, PhD

4:15 p.m. - 4:30 p.m. B182 Stability Studies of Components of Nyaope in Organic Solvents Using Gas Chromatography/Mass Spectrometry (GC/MS)  
Pabalala M. Mthembi, MSc*; Ellen M. Mwenesongole, PhD; Michael D. Cole, PhD

Friday—Session III

Multidisciplinary Session: Criminalistics III/General—Forensic Science Education

Moderator: Matthew G. Manns, MS  
United States Army Criminal Investigation Command  
Fort Campbell, KY

Co-Moderator: Micah Rush, MSFS  
Fort Benning Criminal Investigation Battalion  
Fort Benning, GA

1:15 p.m. - 1:30 p.m. E113 National Institute of Justice (NIJ) Initiatives and Partnerships to Advance the Forensic Sciences  
Jonathan G. McGrath, PhD*

1:30 p.m. - 1:45 p.m. B183 Forensic Science Education: Future-Proof or Flawed Paradigm?  
Scott Chadwick, PhD*; Claude Roux, PhD

*Presenting Author
Saturday—Session I

Of Managerial Interest, Part I

**Moderator:** Craig O. O’Connor, PhD
New York City Office of the Chief Medical Examiner
New York, NY

**Co-Moderator:** Amy Kelly, MS
Maryland State Police
Forensic Sciences Division
Pikesville, MD

8:30 a.m. - 8:45 a.m. **B184**
*The Use of a Database Feature in the TrueAllele® Casework System to Cross-Reference DNA Cases*
Jeffrey Oblock, BS; Nasir A. Butt, PhD*

8:45 a.m. - 9:00 a.m. **B185**
*Genotype Information Criteria for Forensic DNA Databases*
John Donahue, MA*; Mark W. Perlin, PhD, MD

9:00 a.m. - 9:25 a.m. **B186**
*The First Five Exonerations Using TrueAllele® Statistical Software: How Labs Can Review and Correct Old Cases*
Greg Hampikian, PhD*; Mark W. Perlin, PhD, MD*

9:25 a.m. - 9:40 a.m. **B187**
*Challenges in Establishing an Innocence Project in the Philippines: The Innocence Project Philippines Network Experience*
Maria Corazon Abogado De Ungria, PhD*; Jose M. Jose, LLB

9:40 a.m. - 10:00 a.m. **B188**
*The Introduction of Massively Parallel Sequencing (MPS) of Mitochondrial DNA (mtDNA) Into Forensic Laboratory Practice in Croatia*
Marina Korolija, PhD*; Viktorija Sukser, MS; Sara Rožić, MS; Lucija Barbaric, PhD

10:00 a.m. - 10:15 a.m. **Break**
### Of Managerial Interest, Part II

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15 a.m. - 10:30 a.m.</td>
<td>A Reproducible Failure of One Base Pair Resolution in Casework Samples on the 3500xL Genetic Analyzer</td>
<td>Rachel Maragliano*; Jason M. Chute, MSFS; Kelly Beatty, MSFS</td>
</tr>
<tr>
<td>10:30 a.m. - 10:45 a.m.</td>
<td>Bias in Quantitative Polymerase Chain Reaction (qPCR): Does It Matter for Forensic Applications?</td>
<td>Erica L. Romsos, MFS*; Steven P. Lund, PhD; Peter M. Vallone, PhD</td>
</tr>
<tr>
<td>10:45 a.m. - 11:00 a.m.</td>
<td>The Development of the National Institute of Standards and Technology (NIST) Polymerase Chain Reaction (PCR)-Based DNA Profiling Standard (Standard Reference Material 2391d): Where Are We Now?</td>
<td>Becky Steffen, MS*; Erica L. Romsos, MFS; Kevin Kiesler, MS; Katherine B. Gettings, PhD; Lisa Borsuk, MS; Peter M. Vallone, PhD</td>
</tr>
<tr>
<td>11:00 a.m. - 11:15 a.m.</td>
<td>Increasing Productivity Through Process Management: The Experience of the Brazilian Federal Police DNA Laboratory</td>
<td>Ronaldo C. da Silva, Jr., PhD; Levy Heleno Fassio; Jorge Freitas, PhD; Renato T. Ferreira de Paraná, BA; Renata S. Paiva, BS; Ana Paula V. Castro, MSc; Carlos B. Carvalho, PhD; Bruno R. Trindade, MSc; Jeferson L. Badaraco, MSc; Aline C. Minervino, MSc; Carlos Eduardo M. Medeiros, BS; Helio Lima, PhD; Sergio M. Aguiar, MSc</td>
</tr>
<tr>
<td>11:15 a.m. - 11:30 a.m.</td>
<td>Discussion</td>
<td>-</td>
</tr>
</tbody>
</table>

### Saturday—Session II

#### Crime Scene Evidence and Analysis

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m. - 8:45 a.m.</td>
<td>A Characterization of Sexual Assault Lubricants: Lubricant Database Use in an Operational Setting</td>
<td>Brooke R. Baumgarten, BS*; Caterina Vadell-Orsini; Mark Maric, PhD; Candice Bridge, PhD (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>8:45 a.m. - 9:00 a.m.</td>
<td>Hair as a Trap for Evidence and a Tool for the Forensic Investigation</td>
<td>Giulia Caccia, BSc; Annalisa Cappella, PhD; Alberto Amadasi, MD*; Debora Mazzarelli, BS; Agostino Rizzi, BSc; Cristina Cattaneo, PhD (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
</tbody>
</table>

*Presenting Author*
## CRIMINALISTICS

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presentation Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 a.m.</td>
<td>B195</td>
<td>Identifying Paradoxical Undressing During Investigations: A Case Study</td>
<td>Adam C. Armstrong, MS*</td>
</tr>
<tr>
<td>9:15 a.m.</td>
<td>B196</td>
<td>Using Drones as a Valid Alternative to Employing Traditional Documentation Systems at Crime Scenes</td>
<td>Luciano Garofano, PhD*</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>B197</td>
<td>Detection of Fentanyl Analogs in Soil Via Paper Spray Mass Spectrometry</td>
<td>Sarah Dowling, BS*; Trevor Glaros; Nick Manicke</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>B198</td>
<td>Forensic Analysis of the Soil Microbiome: Linking a Piece of Evidence to a Location</td>
<td>Jill H. Cocking, MSc*; Greg A. Caporaso, PhD; Viacheslav Y. Fofanov, PhD; Ryan Turley; Crystal Y. Hepp, PhD</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td></td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

### Concerns in Running a Crime Laboratory

**Moderator:** Jack Hietpas, PhD  
**Co-Moderator:** Sandra B. Sachs, PhD  
**Penn State University**  
**Oakland Police Department**  
**University Park, PA**  
**Crime Laboratory**  
**Oakland, CA**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presentation Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15 a.m.</td>
<td>B199</td>
<td>Redefining Crime Scene Investigation</td>
<td>Michelle D. Miranda, PhD; Peter R. De Forest, DCrIm*; Rebecca E. Bucht, PhD</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>B200</td>
<td>Rise of the Machine and the Demise of the Forensic Science Laboratory?</td>
<td>Brooke W. Kammrath, PhD*; David San Pietro, PhD*; Peter R. De Forest, DCrIm*</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>B201</td>
<td>Human Factors in Forensic Science Practice Sourcebook: Beyond Bias</td>
<td>Heidi Eldridge, MS*; John Morgan, PhD; Tom Busey, PhD</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>B202</td>
<td>Quantifying the Efficacy of Cleaning Agents for Removing Drug Background</td>
<td>Marcela Najarro, MFS*; Edward Sisco, PhD; Amber Burns, MS</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B203</td>
<td>False Inferences From True False and False True Positives and Negatives</td>
<td>Stewart Walker, PhD*</td>
</tr>
</tbody>
</table>

*Presenting Author*
**Wednesday**

**Poster Session**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>C1</td>
<td>Convolutional Neural Networks for the Automatic Classification of Shoe Print Features</td>
<td>Miranda R. Tilton, BA*; Susan VanderPlas</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>C2</td>
<td>Digital Evidence in Missing Persons Investigations</td>
<td>Glenn K. Bard*</td>
</tr>
</tbody>
</table>

**Thursday**

**Can We Talk? Information Sharing and Caring**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m. - 8:50 a.m.</td>
<td>C3</td>
<td>Improving Information Sharing With the Cyber-Investigation Analysis Standard Expression/Unified Cyber Ontology (CASE/UCO)</td>
<td>Vikram Harichandran, MS*; Cory Hall, MS</td>
</tr>
<tr>
<td>8:50 a.m. - 9:05 a.m.</td>
<td>C4</td>
<td>Inter-Regional Digital Forensic Knowledge and Information Exchange Platform</td>
<td>Eoghan Casey, PhD*; Anna Zehnder</td>
</tr>
<tr>
<td>9:05 a.m. - 9:25 a.m.</td>
<td>C5</td>
<td>Digital Trace Reference Library (DTRL)</td>
<td>Eoghan Casey, PhD*; Owen Brady, PhD</td>
</tr>
<tr>
<td>9:25 a.m. - 9:45 a.m.</td>
<td>C6</td>
<td>The Development of Protocols for the Analysis of Mobile Devices That Have Been Submerged in Oil-Based, Flammable, and Clandestine Chemical Liquids</td>
<td>Nico Kresl*; Chelsey McPhillen*; HollyAnn D. Swann, BA; Steven B. Watson, BA; David Rathbone; Lauren L. Richards-Waugh, PhD; Joshua L. Brunty, MS; Catherine G. Rushton, EdD</td>
</tr>
<tr>
<td>9:45 a.m. - 10:10 a.m.</td>
<td>C7</td>
<td>Guidance to Digital Forensics Practitioners on the Handling of Evidence Exposed to Biohazardous Materials</td>
<td>Steven B. Watson, BA*; Kaitlyn Fox, BS*</td>
</tr>
<tr>
<td>10:10 a.m. - 10:20 a.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Presenting Author*
**Danger Ahead! DMS Forensic Impacts**

**Moderator:** Stephen B. Roche, MS  
Sempra Energy  
San Diego, CA  
**Co-Moderator:** Alex J. Nelson, PhD  
National Institute of Standards and Technology  
Gaithersburg, MD

10:20 a.m. - 10:40 a.m.  
C8 Examination of First-Year Research Findings for the Safer Viewing Platform: A Convergence of Convolutional Neural Network Predictions and a Safer Viewing Technology to Speed Up the Triage of Sex Assault Multimedia While Managing the Investigator's Stress Level  
Cory Hall, MS*; Jay Doyle, PhD*; John Tavolacci, BS*; James D. Morris-King, PhD; Rob H. Schmicker, BS

10:40 a.m. - 11:00 a.m.  
C9 Human Versus Computer: Age Estimation Applied to Child Pornography  
Mateus D.C. Polastro, MSc*

11:00 a.m. - 11:20 a.m.  
C10 Assessing the Psychological Well-Being of Multimedia Forensic Analysts  
Kathryn C. Seigfried-Spellar, PhD*; Kyle A. Schmetzer, BS; Marla E. Carroll, BS*

11:20 a.m. - 11:35 a.m.  
C11 A Fake News Reporting Manual to the Elections  
Mateus D.C. Polastro, MSc*; Pedro M.S. Eleuterio, MSc

11:35 a.m. - 11:55 a.m.  
C12 Social Network Image Ballistics Through Automatic Reverse Engineering  
Oliver Giudice, PhD*; Antonino Paratore, MS*; Sebastiano Battiato, PhD*; Luca Guarnera, MS*

11:55 a.m. - 1:00 p.m.  
**Lunch**

**Poster Session**

11:30 a.m. - 1:00 p.m.  
C13 Child Pornography in Computer Forensics: What Are the Most Relevant Pieces of Digital Evidence?  
Pedro M.S. Eleuterio, MSc*

**Hiding in Plain Sight: Evidence Collection**

**Moderator:** Christina A. Malone, MSFS  
Defense Forensic Science Center  
Forest Park, GA

1:00 p.m. - 1:20 p.m.  
C14 Fortnite Forensics: A Study of How to Extract Artifacts From Android™ Memory  
Justin Grover, MS*; Chris Meffert, MS*

1:20 p.m. - 1:40 p.m.  
C15 WAEventsLogParser: Recovering Hidden (and Relevant) Evidence From WhatsApp Events Log File in Android™ Devices  
Mateus D.C. Polastro, MSc*

1:40 p.m. - 1:55 p.m.  
C16 Breaking User Passwords in Android™ Devices Through Recovery Partition Substitution  
Pedro M.S. Eleuterio, MSc*
1:55 p.m. - 2:10 p.m.  C17  Stego App Database (DB) and the Prevalence of Mobile Steganography  
Jennifer Newman, PhD*; Li Lin, BS; Wenhao Chen, BS; Yong Guan, PhD; Stephanie Reinders, BA; Min Wu, PhD

2:10 p.m. - 2:20 p.m.  Break

**Hiding in Plain Sight: Evidence Analysis**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:20 p.m.</td>
<td>C18</td>
<td>Forensic Audio Analysis of Apple iPhone® Voice Memo Recordings</td>
<td>Catalin Grigoras, PhD*; Jeff M. Smith, MS</td>
</tr>
<tr>
<td>2:40 p.m.</td>
<td>C19</td>
<td>Android™ App Forensic Evidence Database</td>
<td>Chao-Chun C. Cheng*; Chen Shi, MS; Brody Concannon; Zhenqiang Gong, PhD; Yong Guan, PhD</td>
</tr>
<tr>
<td>2:55 p.m.</td>
<td>C20</td>
<td>Go-Go Gadget, Smartwatch! An Investigation of Wearable Devices and Their Forensic Value</td>
<td>Nicole R. Odom, BS*; Jesse M. Lindmar; Joshua L. Brunty, MS*; Catherine G. Rushton, EdD</td>
</tr>
<tr>
<td>3:10 p.m.</td>
<td>C21</td>
<td>Using Reverse Projection and File Metadata Analysis to Calculate Speed in Recorded Digital Video</td>
<td>Brandon Epstein, BS*; Marla E. Carroll, BS*</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>C22</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

**Fun Times! Emerging Technologies**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:40 p.m.</td>
<td>C22</td>
<td>Smarthome Internet of Things (IoT) Traces: Forensic Potential and Challenges</td>
<td>Eoghan Casey, PhD*; Joshua I. James, PhD; Francesco Servida</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>C23</td>
<td>Diving Into Blockchains Contents: The Bitcoin Snapshot</td>
<td>Oliver Giudice, PhD*</td>
</tr>
<tr>
<td>4:20 p.m.</td>
<td>C24</td>
<td>Face Morphing Detection</td>
<td>Ilias Batskos, BSc*; Andrea Macarulla, MSc*; Zeno J. Geradts, PhD*</td>
</tr>
<tr>
<td>4:40 p.m.</td>
<td>C25</td>
<td>Analysis of “Deepfakes” Creation and Detection: Video and Image Fabrication Using Deep Learning</td>
<td>Jeff M. Smith, MS*; Catalin Grigoras, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
Friday

Some Sci-Fi Stuff Goin’ On Here: Fraud and Anti-Forensics

Moderator: Irfan Ahmed, PhD
Virginia Commonwealth University
Richmond, VA

Co-Moderator: James E Siegmund, BS
United States Army Criminal Investigation Command
Guyton, GA

8:30 a.m. - 8:45 a.m.  C26  Non-Obvious Links in Online Frauds: Modeling and Comparison of Digital Traces, Context, and Actions
Timothy Bollé*; Eoghan Casey, PhD

8:45 a.m. - 9:05 a.m.  C27  Proving Database Tampering Through In-Memory Object Reconstruction
Aisha Ali-Gombe, PhD*; Sneha Sudhakaran, MTech; Andrew Case, MS;
Golden G. Richard III, PhD

9:05 a.m. - 9:25 a.m.  C28  Hands-On Digital Image Authentication Techniques
Oliver Giudice, PhD*; Antonino Paratore; Sebastiano Battiato, PhD*; Luca Guarnera

9:25 a.m. - 9:45 a.m.  C29  Analysis of Virtual Machines and Type II Hypervisors in Forensics and Anti-Forensics Paradigm
Hammad Riaz, MS*; Mohammad A. Tahir, PhD

9:45 a.m. - 10:00 a.m.  C30  A New Botnet Command and Control Mechanism Using the Ethereum Platform
Joshua Ralls; Shuangteng Zhang, PhD*

10:00 a.m. - 10:10 a.m.  Break

The Fuzziness of IT: Evidence Collection II

Moderator: Jason Lewis, PhD
University of South Florida
Department of Computer Science & Engineering
Tampa, FL

10:10 a.m. - 10:30 a.m.  C31  Rapid Differential Forensic Acquisition Using Limited Resource Computing
Mark D. Guido, MS*; Vikram Harichandran, MS; Glenn A. Melton, BS

10:30 a.m. - 10:50 a.m.  C32  Reevaluating the Mobile Forensic Acquisition Levels
Troy Lawrence, BBA*; Umit Karabiyyik, PhD*

10:50 a.m. - 11:10 a.m.  C33  iPhone® Video Metadata: What Can It Teach Us About a Recordings History?
James Zjalic, MSc*; Jeff M. Smith, MS; Cole Whitecotton, BS; Catalin Grigoras, PhD

11:10 a.m. - 11:25 a.m.  C34  Instagram™ Forensic Artifacts on Windows® Systems
Carol S. Smith, BS; Shuangteng Zhang, PhD*
### DIGITAL & MULTIMEDIA SCIENCES

**11:25 a.m. - 11:45 a.m.**  
**C35**  
**Fuzzing Memory Forensics Frameworks**  
Arian Dokht Shahmirza, BSc*; Aisha Ali-Gombe, PhD; Andrew Case, MS; Golden G. Richard III, PhD

**11:45 a.m. - 12:05 p.m.**  
**C36**  
WITHDRAWN

**12:05 p.m. - 1:10 p.m.**  
Lunch

---

**Machines and People—Match-Making: Biometrics and Hardware**

**Moderator:** Yong Guan, PhD  
Iowa State University  
Ames, IA  

**Co-Moderator:** Andrew N. Crouse, BA  
Epiq Systems, Inc  
Washington, DC

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:10 p.m. - 1:35 p.m.</td>
<td>C37</td>
<td>Machine Learning to Detect and Localize Forensics-Relevant Features</td>
<td>Sara Mousavi; Audris Mockus, PhD*; Dawnie W. Steadman, PhD; Angela M. Dautartas, PhD</td>
</tr>
<tr>
<td>1:35 p.m. - 2:00 p.m.</td>
<td>C38</td>
<td>An Investigation of Distinctiveness of Skin Texture for Forensic Applications</td>
<td>Frodo Chan, PhD; Xiaojie Li, PhD; Wojciech Matkowski*; Adams Wai Kin Kong, PhD</td>
</tr>
<tr>
<td>2:00 p.m. - 2:25 p.m.</td>
<td>C39</td>
<td>A Study of Wrist Identification for Forensic Applications</td>
<td>Wojciech Matkowski*; Frodo Chan, PhD; Adams Wai Kin Kong, PhD</td>
</tr>
<tr>
<td>2:25 p.m. - 2:50 p.m.</td>
<td>C40</td>
<td>Methods to Characterize 3D Scanners for Forensic Applications</td>
<td>Prem Rachakonda*; Bala Muralikrishnan, PhD*</td>
</tr>
<tr>
<td>2:50 p.m. - 3:10 p.m.</td>
<td>C41</td>
<td>A Ladder Logic Decompiler for Supervisory Control and Data Acquisition (SCADA) Network Forensics</td>
<td>Irfan Ahmed, PhD*</td>
</tr>
</tbody>
</table>

*Presenting Author
**Wednesday**

**Poster Session**

11:30 a.m. - 1:00 p.m.  **D1** The Application of Optical Coherence Tomography (OCT) in the Detection of Latent Fingerprints  
*Ning Zhang*; Chenming Wang; Zhigang Li, MD; Zhihui Li, PhD; Wei Huang

**Thursday—Session I**

**Guns, Grenades, and Knives**

*Moderator:* David Pienkowski, PhD  
University of Kentucky  
Albert B. Chandler Hospital  
Lexington, KY

8:30 a.m. - 8:50 a.m.  **D2** Would Blunt Blades Cut Knife Crime?  
*Sarah V. Hainsworth, PhD*; *Patrick H. Geoghegan, PhD*; *Guy N. Rutty, MD*

8:50 a.m. - 9:10 a.m.  **D3** Understanding the Difference Between Expirated and Impact Bloodstain Patterns  
*Patrick H. Geoghegan, PhD*; *Erik Van Zuijlen, BSc*; *Loek J. Van Steijn, BSc*;  
*Michael Taylor, PhD*; *Mark C. Jermy, PhD*

9:10 a.m. - 9:30 a.m.  **D4** Buffy the Vampire Slayer: But How Much Force Did She Need?  
*Sarah V. Hainsworth, PhD*; *Patrick H. Geoghegan, PhD*

9:30 a.m. - 9:50 a.m.  **D5** Assessing the Construction and Performance Potential of Improvised Hand Grenades  
*John Nixon, CEng, MBA*

9:50 a.m. - 10:10 a.m.  **D6** Handgun and Ammunition Performance Influencers  
*John Nixon, CEng, MBA*

10:10 a.m. - 10:40 a.m. **Break**

**Instrumentation and Analysis**

*Moderator:* Darren Franck, MSME  
Advanced Engineering Associates, Inc  
Charleston, WV

10:40 a.m. - 11:10 a.m.  **D7** Environmental Forensic Microscopy of Particles  
*James Millette, PhD*

11:10 a.m. - 11:30 a.m.  **D8** An Overview of Computational Linguistic Techniques for Forensic Purposes  
*Carole E. Chaski, PhD*

*Presenting Author*
11:30 a.m. - 11:50 a.m. D9 An Investigation of Large-Scale Safety Accidents Using a 3D Scanner and a 3D Modeling Method
Kwangsoo Choi, MA*

11:50 a.m. - 12:10 p.m. D10 WITHDRAWN

12:10 p.m. - 12:25 p.m. D11 In Vivo Tribometry: An Analysis of Muscle Activity Using Electromyography (EMG) During a Passive Leg Drop
Marcus P. Besser, PhD*

12:25 p.m. - 1:30 p.m. Lunch

Poster Session

11:30 a.m. - 1:00 p.m. D12 WITHDRAWN

11:30 a.m. - 1:00 p.m. D13 Improvement of the Human Body Damage Evaluation Method by Computer Simulation: Verification of Infant Bone Properties Compared With Actual Experiments
Tomotaka Matsubara*; Yasumi Ito, PhD; Tatsuya Fukuoka; Ryuichi Yamada; Yoshiyuki Kagiyama, PhD; Tetsuya Nemoto, PhD

11:30 a.m. - 1:00 p.m. D14 The Influence That Personal Attributes of Elderly Drivers Contribute to Driving Ability and Its Secular Change: An Analysis of Physical and Mental Functions, Living Conditions, and the Effects of Diseases and Medication
Yasumi Ito, PhD; Tomoya Sakuragawa*; Kei Sato; Shota Sakaïda; Yoshiyuki Orino; Ryuichi Yamada; Ryota Okuwaki; Tsukasa Kouno; Natsumi Suzuki; Yoshiyuki Kagiyama, PhD

Head and Neck Injuries

Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM

1:30 p.m. - 2:10 p.m. D15 A Computational Analysis of Traumatic Head Injuries Resulting From Falls and Impacts in Sports
Michael D. Gilchrist, PhD, DEng*; Michael Thomas Connor, BAI; Michio Clark, MSc; Adrian McGoldrick, MB, BCh, BAO

2:10 p.m. - 2:40 p.m. D16 A Predictive Finite Element Human Head Model to Assist Forensic Scientists
Jean-Sébastien Raull*; Caroline Deck, PhD; Franck Meyer, PhD; Nicolas Bourdet, PhD; Blandine Schnedecker, MD; Remy Willinger

2:40 p.m. - 3:10 p.m. D17 WITHDRAWN

3:10 p.m. - 3:25 p.m. Break

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 3:25 p.m.    | D18 Mechanisms of Motorcycle Helmet Accident Retention Failures and Experimental Comparisons With a Safer Alternative Retention System Design Used in an Adult Football Helmet  
Kenneth J. Saczalski, PhD; Mark C. Pozzi, MS*; Todd Saczalski, BSMET |
| 3:45 p.m.    | D19 The Conspicuity of a Horizontal Rope Hazard in the Path of a Bicyclist: A Case Study  
James B. Hyzer, PhD* |
| 4:00 p.m.    | Break                                                                |
|              | Ethics and Litigation                                               |
| 4:10 p.m.    | D20 Ethics in Forensic Engineering: Examples of Malpractice  
Darren Franck, MSME*; Harold Franck, MSEE* |
| 4:30 p.m.    | D21 The Role of the Technical Experts in Civil Law Countries: The Italian Case  
Alessandro M. Ferrero, MSc*; Veronica Scotti, LLM |
| 4:50 p.m.    | D22 What to Do When a Client’s “Pet Theory” Conflicts With Good Forensic Science Practice  
David R. Bosch, PhD*; Mark C. Pozzi, MS* |
| 5:10 p.m.    | D23 The Potential Conflict Between Forensic Science and Certain Legal Approaches in Litigation  
Kenneth J. Saczalski, PhD; Mark C. Pozzi, MS*; Todd Saczalski, BSMET |

**Thursday—Session II**

**Multidisciplinary Session: Criminalistics II/Engineering Sciences II—Fire Science and Investigation, Part I**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 8:30 a.m.    | D24 The Vision and Progress of the Organization of Scientific Area Committees (OSAC) Fire Debris and Explosives (FD&E) Analysis Subcommittee  
Susan Seebode Hetzel, BA* |
| 8:45 a.m.    | B87 The Bomb Maker Project: How Human Factors Affect the Characteristics and Interpretation of Explosives Evidence  
John V. Goodpaster, PhD* |
| 9:00 a.m.    | B88 Exploring a New Approach to Canine Training Aids for Explosives  
William A. MacCrehan, PhD*; Craig Angle, PhD; Michele Schantz, PhD; Paul Waggoner, PhD; Jason Barrow, PhD; Kelly Van Arsdale, MS |
9:15 a.m. - 9:30 a.m.  B89  A Quantitative Comparison and Differentiation of Smokeless Powders
Casey M. Brown, MPS; Ryan Schonert, MPS; Wayne Moorehead, MS; Jack Hietpas, PhD*

9:30 a.m. - 9:45 a.m.  D25  The Use of Toxicological Evidence in Fire Investigation
Douglas J. Carpenter, MS*

9:45 a.m. - 10:00 a.m.  D26  Exceeding the Scope of Law Enforcement in Forensic Fire Investigation
S.B. Addison Larson, MS*

10:00 a.m. - 10:30 a.m.  Break

Multidisciplinary Session: Criminalistics II/Engineering Sciences II—Fire Science and Investigation, Part II

Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM

Co-Moderator: John L. Allen, PE
Bureau of Alcohol, Tobacco, Firearms and Explosives
Ammendale, MD

10:30 a.m. - 10:45 a.m.  D27  Heavy Truck Fuel-Fed Fires: Predictable Fuel Leakage, Ignition Sources, Fuel Tank Placement Hazards, and Safer Alternative Designs
Mark C. Pozzi, MS*; David R. Bosch, PhD*; Kenneth J. Saczalski, PhD

10:45 a.m. - 11:00 a.m.  D28  Electrical Homicide or Not?
Helmut G. Brosz, BASc, PEng*

11:00 a.m. - 11:15 a.m.  D29  Sabotaged Electrical Grid: Worse Than 9/11?
Helmut G. Brosz, BASc, PEng*

11:15 a.m. - 11:30 a.m.  B90  Yes, Everybody Knows a Fire Needs Oxygen, But Why Should We Care?
John J. Lentini, BA*

11:30 a.m. - 11:45 a.m.  D30  American Association for the Advancement of Science (AAAS) Forensic Science Assessments: A Quality and Gap Analysis of Fire Investigation
Jose R. Almirall, PhD*

Friday

A Miscellany

Moderator: James Millette, PhD
Millette Technical Consultants
Lilburn, GA

Co-Moderator: Sarah V. Hainsworth, PhD
Aston University
School of Engineering and Applied Science
Birmingham, UNITED KINGDOM

8:30 a.m. - 8:50 a.m.  D31  A Case Report on a Cable Car Stoppage Accident Caused by Wild Mice
Youngsu Kong*; Jaehak Lee, PhD; Gie-tae Lee, MS; Jae-mo Goh, PhD; Nam-Kyu Park, PhD

8:50 a.m. - 9:10 a.m.  D32  Data Center Failures, Losses, and Litigation
Helmut G. Brosz, BASc, PEng*; Ralph A. Ruffolo, BSc*
9:10 a.m. - 9:30 a.m. D33  Propane Explosions: The Result of Failed Water Heater Gas Control Valves—Manufacturing Flaws Brought on by Design Changes by an Outsourcer
   Tim G. Dunn, MS*

9:30 a.m. - 9:50 a.m. D34  An Explosion of a Primitive Industrial Oven in India: A Forensic Analysis
   Jatin Bodwal, MD*; Anil Aggrawal, MD

9:50 a.m. - 10:10 a.m. D35  A Framework for the Cost Evaluation of Deforestation Based on the Habitat Equivalency Analysis (HEA) Principle
   David Domingues Pavanelli, PhD*; Nickolaos Voulvoulis, PhD

10:10 a.m. - 10:30 a.m.  Break

Automotive

10:30 a.m. - 10:50 a.m. D36  A Fatal Injury Caused by a Scissor Jack in a Rear-End Collision
   Kurt D. Weiss, MS*

10:50 a.m. - 11:10 a.m. D37  Positional Asphyxia
   David Pienkowski, PhD*

11:10 a.m. - 11:30 a.m. D38  Seat Belt Load Marks on Aged Restraint Systems
   Mike Markushewski, BS*

11:30 a.m. - 12:10 p.m. D39  Shared Anchor Seat Belt Buckle Self-Release
   Kurt D. Weiss, MS*

11:50 a.m. - 12:10 p.m. D40  Seat Belt Analysis: Sometimes Plastic Transfer to a Webbing Indicates the Restraint Was NOT in Use During a Crash
   David J. Porta, PhD*

Poster Session

11:30 a.m. - 12:00 p.m. D41  Void Analysis in the Inside of Arc Melting Using 3D X-Rays
   Young Jin Cho*; Dong Gyu Lee, MA; Sun Jae Kim, MA; Jong Teak Park, MA; Jae-mo Goh, PhD; Nam-Kyu Park, PhD

11:30 a.m. - 12:00 p.m. D42  The Distinction Between Arc Melting and Fire Melting Using X-Rays
   Jae-mo Goh, PhD*; Young Jin Cho; Dong Gyu Lee, MA; Sun Jae Kim, MA; Jong Teak Park, MA; Nam-Kyu Park, PhD
**Wednesday**

**Poster Session**

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E1</strong> The First Cut Is the Deepest</td>
<td>Tyrish Y. Page, MA*; Jeff Thomas, MBA*; Angelina I. Phillips, MD*</td>
</tr>
<tr>
<td></td>
<td><strong>E2</strong> Which Came First, the Chicken or the Egg? A Key to Shed Light on a “Road Murder”</td>
<td>Giuseppe Bertozzi, MD*; Stefania De Simone, MD; Michela Ferrara, MD; Lorenzo Spagnolo, MD; Giuseppe Davide Albano, MD; Pietrantonio Ricci, MD, PhD; Francesca Maglietta, MD; Monica Salerno, MD, PhD</td>
</tr>
<tr>
<td></td>
<td><strong>E3</strong> Bilateral Internal Carotid Arteries Dissection in Motorcycle Accidents: A Case Report and Review of the Literature</td>
<td>Caterina Petetta, MD*; Niccolò D. Melloni, MD*; Lucia Tattoli, PhD; Davide Santovito, MD; Giancarlo Di Vella, MD, PhD*</td>
</tr>
<tr>
<td></td>
<td><strong>E4</strong> Gone in 60 Seconds: A Fatal Case of Asphyxiation in a Confined Working Space</td>
<td>Giuseppe Davide Albano, MD; Giuseppe Bertozzi, MD*; Mauro A. Ciavarella; Stefania De Simone, MD; Pietrantonio Ricci, MD, PhD; Irene Riezzo, MD, PhD; Francesca Maglietta, MD*</td>
</tr>
<tr>
<td></td>
<td><strong>E5</strong> Fatal Alveolar Capillary Dysplasia (ACD) in Two Siblings: A Rare Heritable Form of Persistent Pulmonary Hypertension in Neonates</td>
<td>Caterina Petetta, MD*; Giovanni Botta, MD; Andrea Zonta, MD; Eleonora Di Gregorio, PhD; Giancarlo Di Vella, MD, PhD*</td>
</tr>
<tr>
<td></td>
<td><strong>E6</strong> A Young Mummy</td>
<td>Giuliana D’Anna; Ilaria Santoiemma*; Francesco Introna, MD; Valeria Santoro, PhD</td>
</tr>
<tr>
<td></td>
<td><strong>E7</strong> Mortality Among Hospitalized Injured Older Adults (HIOAs) for a Major Trauma: A Retrospective Autopsy Analysis (2000–2017)</td>
<td>Francesco Amico, MD; Giuseppe Davide Albano, MD; Aldo Liberto, MD; Federico Patentè, MD; Dario Condorelli; Martina Fichera, MD; Diego Geraci, PhD; Monica Salerno, MD, PhD*</td>
</tr>
<tr>
<td></td>
<td><strong>E8</strong> Funny Games: Homicide Among Neighbors</td>
<td>Francesco Sessa, MS*; Michela Ferrara, MD; Francesca Maglietta, MD*; Giuseppe Bertozzi, MD*; Irene Riezzo, MD, PhD; Marcello Rendine, DBA; Pietrantonio Ricci, MD, PhD; Natascha Pascale, MD</td>
</tr>
<tr>
<td></td>
<td><strong>E9</strong> A Mafia Ritual of Hiding Murders: Sheep in Boots!</td>
<td>Francesca Sessa, MS*; Elena Varotto*; Laura Landini, MS; Francesca Maglietta, MD*; Santina Cantatore; Pietrantonio Ricci, MD, PhD</td>
</tr>
<tr>
<td></td>
<td><strong>E10</strong> Three Cases of Traumatic Death?</td>
<td>Costanza Filomena*; Francesca Iannaccone; Federica Gori, MD; Luigi Papi; Angela Pucci, MD</td>
</tr>
<tr>
<td></td>
<td><strong>E11</strong> Child Sexual Abuse of Boys: A Six-Year Retrospective Analysis</td>
<td>Serena Maria Curti, MD*; Caterina Bosco, MD*; Sara S. Rascalbuto, PsyD; Elena Cappo, MD; Giancarlo Di Vella, MD, PhD*</td>
</tr>
</tbody>
</table>

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m. - 1:00 p.m. E12</td>
<td>A Multiple Congenital Malformation in a Forensic Infant Autopsy</td>
<td>Francesco Lupariello, MD*; Serena Maria Curti, MD; Janet B. Duval, MSN; Giovanni Botta, MD; Giancarlo Di Vella, MD, PhD*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E13</td>
<td>Penetration Injury From Child Sexual Abuse: A Systematic Literature Review</td>
<td>Patricia M. Speck, DNSc*; Caroline Concannon, BSN*; Kimberly Peek, BSN*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E14</td>
<td>The Challenge of Diagnosing Child Abuse (CA): The Perks of a Multidisciplinary Approach</td>
<td>Francesco Lupariello, MD*; Sara S. Racalbuto, PsyD; Elena Coppo, MD; Greta Cena, MD*; Giancarlo Di Vella, MD, PhD*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E15</td>
<td>A Rare Case of Iatrogenic Skull Damage in a Newborn</td>
<td>Luigi Papi; Federica Gori, MD; Chiara Toni, MD; Sara Turco*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E16</td>
<td>Causes of Death in Patients Under the Age of 65 at the Bari Polyclinic</td>
<td>Gianni De Giorgio*; Fiorenza Zotti, PhD; Eloisa Maselli, MD; Valeria Bruno, MD; Valentina Ronco, MD; Davide Ferorelli; Francesca Donno, MD; Alessandro Dell’Erba, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E17</td>
<td>An Analysis of Death at Long-Term Care Health Facilities in Japan</td>
<td>Alissa M. Shida, BA*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E18</td>
<td>The Faithless Nurse: A Strange Case of Hyperthermia</td>
<td>Francesca Maglietta, MD*; Lorenzo Spagnolo, MD; Michela Ferrara, MD; Danià De Carlo, MD; Giuseppe Davide Albano, MD; Mauro A. Ciavarella</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E19</td>
<td>A Tale of Two Sisters: A Case Review of a Suicide Pact Between Adult Siblings</td>
<td>Meryle A. Dotson, MA*; Mary Mainland, MD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E20</td>
<td>A Case of Strangulation With a Cable Tie: Homicide or Suicide?</td>
<td>Omar Bonato, MD*; Elena Lucenti, MD; Mauro Coppone, MD*; Erica Bacchio, MD; Chiara Marini, MD; Letizia Alfieri, MD; Rosa Maria Gaudio; Lorenzo Marinelli; Margherita Neri, MD, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E21</td>
<td>The Evolving Suicide Note</td>
<td>Imron G. Ramos, BS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E22</td>
<td>Determining the Accuracy and Suitability of Measurement Apps for Crime Scene Documentation</td>
<td>Victoria Zeger*; Christina A. Malone, MSFS</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m. E23</td>
<td>Observation, Explanation, and Testing in Forensic Science Using a Death Investigation Active Learning Assignment</td>
<td>Trevor I. Stamper, PhD*; Krystal R. Hans, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
# Thursday—Session I

Drugs and Explosives

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m. - 8:45 a.m.</td>
<td>E24</td>
<td>The Development of a Flexible Algorithm for Substance Identification Using Mass Spectrometry</td>
<td>Samantha A. Mehnert*, Brandon D. Lowe; J. Tyler Davidson, MS; Glen P. Jackson, PhD</td>
</tr>
<tr>
<td>8:45 a.m. - 9:00 a.m.</td>
<td>E25</td>
<td>A Qualitative Analysis of Human Growth Hormone (HGH) by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) and Complementary Techniques</td>
<td>Breanne Hamlett*; Natalie Howard, BS; Anna L. Deakin, MS; Brent M. Allred, PhD</td>
</tr>
<tr>
<td>9:00 a.m. - 9:15 a.m.</td>
<td>E26</td>
<td>Identification of the Polymer-Bound Drugs on the Fabric Surface: A Challenge to Forensic Drug Analysts</td>
<td>Shahnaz Akhtar, MPhil; Abdul Razaq, MPhil*; Khalid S. Feras, MPhil*; Muhammad Taimoor Chaudhary, MPhil*; Mohammad A. Tahir, PhD*</td>
</tr>
<tr>
<td>9:15 a.m. - 9:30 a.m.</td>
<td>E27</td>
<td>Flubromazepam: Synthesis and Characterization of Positional Isomers for Forensic Analysis</td>
<td>Evelyn S. Ligon*; Jason R. Nawyn, MSFS; Lonnie V. Jones II, BS; Stefan A. France, PhD; Brent M. Allred, PhD; Daniel V. Reinhardt, PhD</td>
</tr>
<tr>
<td>9:30 a.m. - 9:45 a.m.</td>
<td>E28</td>
<td>Sudden Infant Death in a Newborn From Drug-Dependent Parents: The Utility of Hair Analysis</td>
<td>Costanza Filomena*; Silvio Chericoni; Fabio Stefanelli; Chiara Toni, MD</td>
</tr>
<tr>
<td>9:45 a.m. - 10:00 a.m.</td>
<td>E29</td>
<td>A Novel Vapor Delivery Device for Homemade Explosive Analysis</td>
<td>Lauryn DeGreeff, PhD*; Christopher J. Katsilie; Susan Rose-Pehrsson, PhD; Michael Malito</td>
</tr>
<tr>
<td>10:00 a.m. - 10:15 a.m.</td>
<td>E30</td>
<td>The Current State of Homemade Explosive Detection by Canines—Research and Knowledge Gaps</td>
<td>Lauryn DeGreeff, PhD*; Kimberly Peranich, BS; Alison G. Simon, PhD</td>
</tr>
<tr>
<td>10:15 a.m. - 10:30 a.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Presenting Author
Crime Scene Investigation

**Moderator:** James P. O’Burke, BS  
The Polygraph Institute  
San Antonio, TX

**Co-Moderator:** Derek J. Kingsbury, MBA  
United States Army  
Criminal Investigation Command  
Fort Riley, KS

10:30 a.m. - 10:45 a.m.  **E31**  The Detection of Risk Factors of Elder Abuse in Domestic Settings  
Maria Carla Mazzotti, MD*; Alberto Amadasi, MD; Anna Maria Govi, MD; Giancarlo Salsi, PhD; Susi Pelotti, MD

10:45 a.m. - 11:00 a.m.  **E32**  Forensic Evidence and Investigation Implications in Domestic Violence Incidents Involving Non-Fatal Strangulation  
Katherine M. Brown, PhD*; Tara O. Shelley, PhD; Lacy Hensley, MA

11:00 a.m. - 11:15 a.m.  **E33**  Staging: A Human Rights Issue  
Edwin O. Olaya Molina, BA*; Daniela Tafur*

11:15 a.m. - 11:30 a.m.  **E34**  Forensic Investigation and Criminal Profiling of Very Unusual Infanticide in Italy  
Luciano Garofano, PhD*; Laura Volpini, PhD*

11:30 a.m. - 11:45 a.m.  **E35**  Crime Scene Reconstruction in an Organization of Scientific Area Committees (OSAC) World  
Peter R. Valentin, MSFS*

11:45 a.m. - 12:00 p.m.  **E36**  Dermoscopy in Forensic Medicine  
Benjamin Mokdad*; Anne-Claire Lhoumeau, MD; Pauline Jorda; Paul Young, MD; Gilles P. Tournel

12:00 p.m. - 1:15 p.m.  **Lunch**

Poster Session

11:30 a.m. - 1:00 p.m.  **E37**  Diligence, Dedication, and Devotion: Reaching Back Into History for the Image of a Victim  
Sandra R. Enslow, BA*

11:30 a.m. - 1:00 p.m.  **E38**  How Accurate Is Forensic Image Identification of Surgically Altered Faces?  
Petra Urbanová, PhD*; Hana Eliasova, PhD; Tatjana Dostalova, MD, PhD

11:30 a.m. - 1:00 p.m.  **E39**  Forensic Validity and Usefulness of the Apache Tracking Method: A Multifaceted Research and Development Protocol  
Joseph L. Lewis III, MFS*; Ismail M. Sabetan, MD, PhD*; Paul Stein, PhD*

11:30 a.m. - 1:00 p.m.  **E40**  A Holistic Assessment of Job Satisfaction of Forensic Psychology Professionals  
Dione Washington*

11:30 a.m. - 1:00 p.m.  **E41**  A Forensic Criminological Approach to Oil Spill Investigation  
Edidiong Mendie*; Ashraf Mozayani, PharmD, PhD

*Presenting Author
 VALIDATION OF A DRY VACUUM SWABBING METHOD FOR THE RECOVERY OF EPITHELIAL CELLS FROM HANDLED POROUS SUBSTRATES
Yih Ling Saw, MSFS*; Kevin J. Piccirilli, MSFS; Sara G. Goodman, MSFS; Heather E. McKiernan, MSFS

INVESTIGATING TOUCH DNA RECOVERY FROM IVORY AS A METHOD TO IDENTIFY POACHERS AND TRAFFICKERS
Emily L. Horrocks, MSc*

VALIDATION OF THE PREPFILER® EXPRESS BTA™ FORENSIC DNA EXTRACTION KIT
Jessica Slater*; Dorothy M. Catella, MSFS; Megan Connolly, MPS; Kelly Beatty, MSFS

AN EVALUATION OF THE EFFECTS OF VARIOUS DIGEST TIMES ON THE DNA YIELD FOR DIFFERENTIAL SEPARATIONS AT THE WEST VIRGINIA STATE POLICE FORENSIC LABORATORY
Allegra N. Forwith, BA*; Bailey E. Hill, MS; Kelly Beatty, MSFS

THE EFFECT OF CRIME SCENE INVESTIGATION (CSI) ON FORENSIC DNA DATABASE RECOGNITION: A PUBLIC SURVEY OF SOUTH KOREANS
Jihyun Lee; Sung Kyum Cho, PhD; Sohee Cho, PhD; Moon-Young Kim; Soong Deok Lee, PhD; Kun Won Jung, MD, PhD*

AN EVALUATION OF THE EFFICACY OF WHOLE GENOME AMPLIFICATION (WGA) FOR DEGRADATED DNA
Mitsuyo Machida*; Kazuhiro Kibayashi, MD

AN OPTIMIZED SMALL MOLECULE EXTRACTION METHOD FOR DRIED BLOOD SPOTS (DBS)
You-Rim Lee, BS*; Jiyeong Lee, PhD; Yoo-Jin Lee, MT; Hyo-Jin Kim, MT; Sora Mun, MT; Hee-Gyoo Kang, PhD

THE DEVELOPMENT OF TWO FORENSICALLY IMPORTANT BLOW FLIES COLLECTED FROM HUMAN REMAINS IN WESTERN COLORADO
Brandon V. Everhart, BS*; Alexander J. Smith; Melissa A. Connor, PhD; Elson Shields, PhD

THE EFFECTS OF KETAMINE AND XYLAZINE ON LARVAL DEVELOPMENT IN THE BLOW FLY (PHORMIA REGINA)
Stephanie A. Olson*; Tobias Landberg, PhD; Brandon Strauss, MS; Karen S. Scott, PhD

PROFILING THE ODORANT CHEMICALS PRESENT IN CIMEX LECTULARIUS
Katelynn A. Perrault, PhD*

CAN BODY COOLING ANIMAL MODELS HELP SOLVE THE JEJU ISLAND COLD CASE?
Dae-Kyoön Park, MD, PhD*; Duk-Soo Kim, PhD; Cheolho Hyun; Tachwa Song; Kyeongyang Sim; Na Jin Kim

CLIMATE'S INFLUENCE ON DIPTERA PRESENT ON A CARCASS
Timothy Juedes, MS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*

THE MYSTERY BEHIND THE COMPOSITION OF BLACK FINGERPRINT POWDERS
Grayce Behnke, BS*; Andrea Kardohely*, Catherine G. Rushton, EdD; Rosalynn Quinones, PhD

A COMPREHENSIVE SCHEMATIC FOR POSTMORTEM FINGERPRINT STATIONS AT MASS FATALITY INCIDENTS
Marzena H. Mulawka, MFS*; Michael A. Mosco, MS*; David Martinez, BS

*Presenting Author
11:30 a.m. - 1:00 p.m.  E56  Forensic Podiatric Science and Practice in Crime Scene Investigation  
Kewal Krishan, PhD*; John A. DiMaggio, DPM

11:30 a.m. - 1:00 p.m.  E57  A Reference Collection of Footwear Randomly Acquired Characteristics (RACs) for Frequency and Spatial Distribution Analysis  
Kim Dang, BS; Colbey Ryman*; Thomas G. Kocpzynski, BS*; Katherine Ky

11:30 a.m. - 1:00 p.m.  E58  A Longitudinal Database of Athletic Shoe Outsole Wear  
Susan VanderPlas*; Guillermo Basulto-Elias, PhD; James E. Kruse; Stacy Renfro, MS; Alicia L. Carriquiry, PhD

11:30 a.m. - 1:00 p.m.  E59  Paternity Testing and Next-Generation Sequencing: New Approaches to Detecting Illegal Bird Trading  
Ana Luiza Queiroz, BA*; Wander U. Mesquita, BSc; Adriana H. Pereira, MSc; Susanne Facchin, PhD; Sandra Ludwig, PhD; Nazaré L. Abreu, MSc; Isabella Pena, PhD; Evanguedes Kalapothakis, PhD

Death Investigation

Moderator:  Teresa A. White, MA  
Missoula, MT

Co-Moderator:  Gregory M. Dickinson, MD  
Montefiore Medical Center  
Department of Pathology and Laboratory Medicine  
Bronx, NY

1:15 p.m. - 1:30 p.m.  E60  Death Due to Unintentional Dichloromethane Inhalation: A Case Report and Cautionary Tale  
Anita Roman Hasert, BS*; Demi B. Garvin, PharmD; Angelina I. Phillips, MD

1:30 p.m. - 1:45 p.m.  E61  Artificial Intelligence for Homicide Investigations  
Jiaqi M. Lu, MS*; Xuanfeng Fang, MSc; Elaine M. Pagliaro, JD; Henry C. Lee, PhD

1:45 p.m. - 2:00 p.m.  E62  Complex Suicides and Where to Find Them: Disclosing the Mystery  
Giuseppe Bertozzi, MD*; Francesca Maglietta, MD*; Mauro A. Ciavarella; Carmela Fiore, MD; Irene Riezzo, MD, PhD; Pietrantonio Ricci, MD, PhD; Francesco Sessa, MS

2:00 p.m. - 2:15 p.m.  E63  An Eight-Year Retrospective Study on Suicides in Washington, DC  
Breanna M. Cuchara, MFS*; Francisco J. Diaz, MD

2:15 p.m. - 2:30 p.m.  E64  Drowning in the District: A Ten-Year Retrospective Review of Cases in the Nation’s Capital  
Daniel J. Morgan, MS*

2:30 p.m. - 2:45 p.m.  E65  A Killer in the Hospital Wards: Murders Committed by the Criminal Administration of Heparin  
Luigi Papi; Federica Gori, MD; Chiara Toni, MD; Sara Turco*

2:45 p.m. - 3:00 p.m.  E66  Down the Rabbit Hole: The Functional Paralysis of a Medical Examiner Facility by Contaminated Palo Mayombe Artifacts  
Brett E. Harding, MBA*; Kyle Shaw, MBBS; Barbara C. Wolf, MD

3:00 p.m. - 3:15 p.m.  Break

*Presenting Author
### Homicide Investigation

**Moderator:** Adam C. Armstrong, MS  
United States Army Criminal Investigation Division  
Fort Bragg, NC  

**Co-Moderator:** Carlos A. Gutierrez, MS  
Chaminade University of Honolulu  
Honolulu, HI  

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 3:15 p.m. -   | Look in the Freezer—The Story of a Murder: A Case Report From Portugal  
João Manata, MSc*; Diogo J. Calçada, MSc; Claudia Marques, MD  |
| 3:30 p.m. -   | A Practical Classification for Spree Killers  
Mark E. Safarik, MS*; Katherine Ramsland, PhD*  |
| 3:45 p.m. -   | Pozzetto: Inside Behavioral Mazes  
Edwin O. Olaya Molina, BA*  |
| 4:00 p.m. -   | Gargano Mafia: The Fifth Italian Mafia With an Analysis of 129 Murders  
Francesca Maglietta, MD*; Mauro A. Ciavarella; Giuseppe Bertozzi, MD; Giuseppe Davide Albano, MD; Angelo Montana, MD; Anna Cornacchio; Pietranontio Ricci, MD, PhD; Monica Salerno, MD, PhD*  |
| 4:15 p.m. -   | A Closer Look Into Latino Youth Gang Violence: From MS13 to the Latin Kings  
Cliff Akiyama, MPH, MA*  |
| 4:30 p.m. -   | The Cruel Deaths by Suffocation of 71 Migrants Smuggled From Hungary to Austria: A Tragic Case Study  
Armin A. Farid, DMD*; Christoph Reisinger, MD*  |
| 4:45 p.m. -   | A Crucifixion Experiment to Assess Wrist and Forearm Blood Flows as Observed on the Shroud of Turin  
John P. Jackson, PhD*; Keith E. Propp, PhD*; Kim M. Look, DDS*; Rebecca S. Jackson, MBA*  |

### Thursday—Session II

#### Multidisciplinary Session: Criminalistics I/General II—Rape Kit Collection and Processing

**Moderator:** Gina Londino-Smolar, MS  
Indiana University–Purdue University Indianapolis  
Indianapolis, IN  

**Co-Moderator:** Noelle J. Umback, PhD  
Office of Chief Medical Examiner  
Department of Forensic Biology  
New York, NY  

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 8:30 a.m. -   | Testing Sexual Assault Kits Supports the Principle of “Justice For All”  
Julie L. Valentine, PhD*; Suzanne Miles, BS*; Leslie Miles, DNP; Linda Mabey, DNP  |
| 8:50 a.m. -   | A Casework Review for Determining Time Since Intercourse in Boston, Massachusetts  
Cassandra A. Swart, BS*; Caitlin E. Rogers, MS; William Cavedon, MS; Amy N. Brodeur, MFS; Kathryne Hall, MS  |
| 9:05 a.m. -   | Forensic Doctors and Clinical Forensic Medicine: Should or Could?  
Pierre-Antoine Peyron, MD; Elodie Michel; Eric Baccino, MD*  |

*Presenting Author
9:20 a.m. - 9:40 a.m.  B35  A Strategic Design to Arrest a Serial Rapist and Killer: The Role of a DNA Profiling Database and Population Census Data  
Mohammad A. Tahir, PhD; Syed W. Hamdani*; Mudassar Naseer, MPhil; Nasir Siddique, MPhil, LLB

9:40 a.m. - 9:55 a.m.  E76  DNA Evidence Collection and Analysis in Groping Sexual Assault Cases  
Julie L. Valentine, PhD*; Suzanne Miles, BS*

9:55 a.m. - 10:10 a.m.  Break

10:10 a.m. - 10:25 a.m.  B36  The Recovery of Foreign DNA Introduced Through Kissing  
Joyce P. Williams, DNP*; David A. Williams, DDS*

10:25 a.m. - 10:40 a.m.  E77  Forensic Nurses in Institutes of Forensic Medicine: An Evaluation of the Zurich Integration Model  
Valeria Hofer*; Michael Thali, MD; Rosa M. Martinez, MD

10:40 a.m. - 11:00 a.m.  B37  Rapid DNA Turnaround for the Analysis of All Victim Sexual Assault Evidence When a Kit Is Collected  
Diana K. Faugno, MSN*; Patricia M. Speck, DNSc

**Friday**

**DNA, Serology, and Veterinary Forensics**

*Presenting Author*
10:00 a.m. - 10:15 a.m. **E84** Veterinary Forensics: Animal Death Investigations and Veterinary Diagnostic Laboratory Personnel
Megan Romano, DVM*; Michael S. Filigenzi, PhD; Robert H. Poppenga, DVM, PhD; Cynthia L. Gaskill, DVM, PhD

10:15 a.m. - 10:30 a.m. **Break**

**Firearms and Fingerprints**

*Moderator:* Lawrence Lavine, DO  
**Lakewood, WA**  
*Co-Moderator:* Theodore W. Born, MSFS  
Department of Defense Inspector General  
**Stafford, VA**

10:30 a.m. - 10:45 a.m. **E85** A Validation Study on Automated Groove Detection Methods in 3D Bullet Land Scans
Kiegan Rice, MS*; Heike Hofmann; Ulrike Genschel

10:45 a.m. - 11:00 a.m. **E86** Discrimination Between Aerial and Targeted Shooting by the Analysis of Trace Evidence: A Case Study
Khalid S. Feras, MPhil*; Mohammad A. Tahir, PhD*; Mudassar Baig, MSc*; Abdul Razaq, MPhil*; Muhammad Irfan Ashiq, PhD*; Zumrad Usman Bhutta, MS*

11:00 a.m. - 11:15 a.m. **E87** The Forensically Relevant Applications of Laser Ablation Direct Analysis in Real Time Imaging-Mass Spectrometry (LADI-MS)
Kristen L. Fowble, BS*; Rabi A. Musah, PhD

11:15 a.m. - 11:30 a.m. **E88** How Do Latent Print Examiners Perceive Proficiency Testing? An Analysis of Examiner Perceptions, Performance, and Print Quality
Sharon Kelley, PhD*; Daniel C. Murrie, PhD; Brett O. Gardner, PhD; Karen D.H. Pan; Karen Kafadar, PhD; Kelllyn Blaisdell, BA

11:30 a.m. - 11:45 a.m. **E89** How Does Training and Certification Affect the Perception of Accuracy During Fingerprint Examinations?
Crystal L. Wagoner, MFS*

11:45 a.m. - 12:00 p.m. **E90** What Do Latent Print Examiners Want in a Statistical Model?
Anthony Koertner, MS*

12:00 p.m. - 1:15 p.m. **Lunch**

**Poster Session**

11:30 a.m. - 1:00 p.m. **E91** Plato: Unaware Narrator of a Death by Hemlock Poisoning—From Socrates’ Death to the Present
Isabella Aquila, MD*; Matteo A. Sacco, MD*; Roberto Raffaele, BE*; Santo Gratteri, MD; Pietrantonio Ricci, MD, PhD

11:30 a.m. - 1:00 p.m. **E92** WITHDRAWN

11:30 a.m. - 1:00 p.m. **E93** The Classification of an Ethanol Coeluting Compound Via Headspace Gas Chromatography (HS/GC)
Andrea Kardohely*; Jay D. Spencer, MBA; Jennifer Creed, BS; Michele M. Foster, BS; Lauren L. Richards-Waugh, PhD

*Presenting Author
11:30 a.m. - 1:00 p.m. E94 Illicit Drug Deaths in Older Adults: The Need for Comprehensive Scene Investigation
Stanislaw T.J. Bielous, BS*; Dennis J. Chute, MD; Veronica Salvas, MPH; Robert J. Bready, MS; Kia K. Newman, MD*

11:30 a.m. - 1:00 p.m. E95 I Smell a Rat: Optimizing a Method for Detecting the Rat Poison Brodifacoum With Gas Chromatography
Abigail L. Meyer, BS*; Morgan M. Clothier, MFS; Brandon P. Jones, MS; Luke C. Short, PhD; Lauren L. Richards-Waugh, PhD

11:30 a.m. - 1:00 p.m. E96 Method Validation for the Detection of 22 Benzodiazepines, Including Clonazolam, Etizolam, and Flubromazolam, Using Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)
Rachel Lane*; Dustin Smith, BS; Jared Castellani, MSFS; Lauren L. Richards-Waugh, PhD

11:30 a.m. - 1:00 p.m. E97 A Paper Analytical Device to Evaluate Illicit Drug Supply Chains
Tracy-Lynn E. Lockwood, BS*; Marya Lieberman, PhD

11:30 a.m. - 1:00 p.m. E98 Anabolic Androgenic Steroids Abuse: New Molecular Biomarkers
Francesco Sessa, MS*; Monica Salerno, MD, PhD; Pietrantonio Ricci, MD, PhD; Cristoforo Pomara, MD, PhD

11:30 a.m. - 1:00 p.m. E99 The Comparison of Entry Bullet Holes in Glass, Metal, and Wood With a Variance in Caliber, Distance, and Grain Weight
Mark A. Waldo, MFS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*

11:30 a.m. - 1:00 p.m. E100 An Investigation Into the Discriminating Potential of Different Techniques for the Analysis of Cosmetic Foundations
Jessica McFarland*; Thomas A. Bretell, PhD; Megan Zellner, MSFS; Lawrence Quarino, PhD

11:30 a.m. - 1:00 p.m. E101 Strengthening the Evaluation of Forensic Glass Evidence Using a Likelihood Ratio Approach
Ruthmara Corzo*; Jose R. Almirall, PhD

11:30 a.m. - 1:00 p.m. E102 Preparation of Molecularly Imprinted Polymers for the Extraction of Azo and Anthraquinone Dyes From Diesel Fuel
Antonija Glavac, BSc; Hrvoje Sarajlija, PhD*; Ivana Bacic, PhD; Dragana Mutavdic Pavlovic, PhD; Gordana Matijašić, PhD

11:30 a.m. - 1:00 p.m. E103 Self-Organizing Maps to Analyze the Relationship of Ignitable Liquids and Substrates
Nicholas A. Thurn*; Mary R. Williams, MS; Michael E. Sigman, PhD

11:30 a.m. - 1:00 p.m. E104 An Application for Forensic Analysis: Discrimination of Fibers Using a Trace Organic Additive and Pyrolyzate Marker
Chikako Takei; Kenichi Yoshizawa, MPharm*

11:30 a.m. - 1:00 p.m. E105 Validation of New Test Media for Gunshot Residue Visualization in Distance Determination Methods
Steven J. Little, BS*; Jessica Coudriet, BS; Jessica Pappas, MS; Catherine G. Rushton, EdD; Lauren L. Richards-Waugh, PhD

11:30 a.m. - 1:00 p.m. E106 A Comparison of Gunshot Residue (GSR) Visualization With Alternate Light Sources (ALS) and Infrared (IR)
Mark Vecellio, MFS*; Alysia M. Smentkiewicz*; Sarah V. Morello*; Patrick M. Wright*
11:30 a.m. - 1:00 p.m.  E107  The Detection and Identification of Organic Gunshot Residue (OGSR) Via Fluorescence Mapping and Raman Spectroscopy
Shelby R. Khandasammy, BS*; Alexander Rzhevskii, PhD; Igor K. Lednev, PhD

11:30 a.m. - 1:00 p.m.  E108  Laser-Induced Breakdown Spectroscopy (LIBS) as a Rapid Detection Technique for Gunshot Residue (GSR)
Korina Menking-Hoggatt, MSc*

11:30 a.m. - 1:00 p.m.  E109  A Review of Forensic Analysis of Phenolphthalein in Bribery Cases
Geetanjli Sachdeva, MSc*

11:30 a.m. - 1:00 p.m.  E110  Violence Against Health Workers in Turkey
Inci Y. Tezbasan, BSc*; Umit Ertem, MSc; Sevil Atasoy, PhD

11:30 a.m. - 1:00 p.m.  E111  The Role of Human Rights as a Reason for Refugee Status and Immigration Requests: A Retrospective Analysis of Southern Italy
Isabella Aquila, MD*; Matteo A. Sacco, MD*; Elena Sacco; Piero Luca; Fabio Luca; Santo Gratteri, MD; Pietrantonio Ricci, MD, PhD

11:30 a.m. - 1:00 p.m.  E112  Perceptions of Task Relevance in Forensic Science: A Survey of Forensic Analysts
Brett O. Gardner, PhD*; Sharon Kelley, PhD; Daniel C. Murrie, PhD; Kellyn Blaisdell, BA

Multidisciplinary Session: Criminalistics III/General—Forensic Science Education

Moderator: Matthew G. Manns, MS
United States Army Criminal Investigation Command
Fort Campbell, KY

Co-Moderator: Micah Rush, MSFS
Fort Benning Criminal Investigation Battalion
Fort Benning, GA

1:15 p.m. - 1:30 p.m.  E113  National Institute of Justice (NIJ) Initiatives and Partnerships to Advance the Forensic Sciences
Jonathan G. McGrath, PhD*

1:30 p.m. - 1:45 p.m.  B183  Forensic Science Education: Future-Proof or Flawed Paradigm?
Scott Chadwick, PhD*; Claude Roux, PhD

1:45 p.m. - 2:00 p.m.  E114  Addressing the Challenge of Conducting Undergraduate Research in Forensic Science Academic Programs Using a Course-Based Undergraduate Research Experience (CURE)
Kimberly S. Kobojeck, MS*; Pamela A. Marshall, PhD; Ken G. Sweat, PhD; Jennifer Broatch, PhD; Jennifer Holtz-Sweat, PhD; Anthony B. Falsetti, PhD

2:00 p.m. - 2:15 p.m.  E115  The Use of Large-Scale Faux Crime Scenes and Cold Case Coursework to Teach Forensic Science in Social Science-Based Coursework
Michelle Rippy*

2:15 p.m. - 2:30 p.m.  E116  The Educational Outreach Program at the Defense Forensic Science Center (DFSC)
Rachel L. Creager; Thomas A. Meyer, MS; Henry P. Maynard III, MSFS*

2:30 p.m. - 2:45 p.m.  E117  Improving Forensic Science Information Seeking
Laura Sare*; Sarah Bankston, MS; Jeffery K. Tomberlin, PhD*; Samantha J. Sawyer, BS*

2:45 p.m. - 3:00 p.m.  E118  A Journal of Our Own: The Journal of Forensic Science Education—The Official Publication of the Council of Forensic Science Educators
Lawrence Quarino, PhD*; Kelly M. Elkins, PhD; Adrienne L. Brundage, PhD

3:00 p.m. - 3:15 p.m.  Break
Decomposition

Moderator:  Daniel Marion, PhD
Denver, CO

3:15 p.m. - 3:30 p.m.  E119  Is the Decentralization of Forensic Capabilities Providing an Opportunity for Forensic Science to Reach the End of the Crossroads?
Claude Roux, PhD*; Eoghan Casey, PhD; Frank Crispino, PhD; Olivier Delémont, PhD; Olivier Ribaux, PhD

3:30 p.m. - 3:45 p.m.  E120  Perceptions and Estimates of Error Rates in Forensic Science: A Survey of Forensic Analysts
Daniel C. Murrie, PhD*; Brett O. Gardner, PhD; Sharon Kelley, PhD; Kellyn Blaisdell, BA

3:45 p.m. - 4:00 p.m.  E121  Response of Soil Microbial Communities to Mammal Decomposition During Above-Ground and Subsurface Decomposition: A Comparison
Chawki Bisker, MSc*

4:00 p.m. - 4:15 p.m.  E122  Forensic Archaeology and Search Strategies for Clandestine Burials: Geographic Profiling in Reverse and “Winthropping”
Sharon K. Moses, PhD*

4:15 p.m. - 4:30 p.m.  E123  Interagency Cooperation in the Recovery of Human Cremains and Human Remains
Rebecca Wood, MFS*; Francisco J. Diaz, MD*

4:30 p.m. - 4:45 p.m.  E124  The Identification of Necrophagous Insect Species by Ambient Ionization Mass Spectrometry and Chemometrics for Postmortem Interval Estimations
Rabi A. Musah, PhD*; Samira Beyramysoltan, PhD; Justine E. Giffen, BS; Jennifer Rosati, PhD

4:45 p.m. - 5:00 p.m.  E125  The Ability of Cotton, Polyester, and Wool to Retain Diatomaceous Evidence Following Submersion to Study the Postmortem Submersion Interval (PMSI)
Alexandra Rizzuto, BS; Jillian Conte, PhD*
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m. F1 A Jurisprudential Analysis of the DNA Exam and Its Use as Evidence in Decisions of Brazil's Superior Court of Justice
Maria Eduarda A. Amaral*; Nereu J. Giacomolli

11:30 a.m. - 1:00 p.m. F2 Iter Criminis and Mens Rea: A Methodology to Understand an Offender's True Intention Based on a Revision of the Concept of Guilt in Italian Criminal Law
Vincenzo Lusa, JD*; Annarita Franza, PhD*

11:30 a.m. - 1:00 p.m. F3 Judicial Aspects of Suicide Inducement in the Turkish Judicial System and a Review of the Erol Cetin Case
Oktay Cavus, MSc*; Hatice Yilmaz, BSc*; Sevil Atasoy, PhD; Tugba Ünsal, PhD

Thursday

DNA

Moderator: Roderick T. Kennedy, JD
Albuquerque, NM

8:30 a.m. - 9:30 a.m. F4 The Theory of Criminal Relativity: Using Genealogy Databases to Solve Crimes
Donald E. Shelton, JD, PhD*; Frederick R. Bieber, PhD*

9:30 a.m. - 9:50 a.m. F5 A Proposal for Legislative Oversight of Genealogical Websites
Stephen B. Mercer, JD*; Isabelle R. Raquin, LLM*

9:50 a.m. - 10:10 a.m. F6 Results of a Survey on Probabilistic Genotyping From the Legal Community
Michael D. Coble, PhD*

10:10 a.m. - 10:30 a.m. Break

DNA II

Moderator: Jason D. Ricke, JD, LLM
Office of the Public Defender
Upper Marlboro, MD

10:30 a.m. - 11:00 a.m. F7 The Strengths and Limitations of Transfer DNA Evidence Recovered From Objects Handled by Multiple Individuals
Leann G. Rizor, BS*; Jonah W.P. Stone, BS; Krista E. Latham, PhD; Cynthia Cale, MS; Gay L. Bush, PhD

11:00 a.m. - 11:20 a.m. F8 Indirect DNA Transfer: The Impact of Contact Length on Skin-to-Skin-to-Object DNA Transfer
Cynthia Cale, MS*; Krista E. Latham, PhD; Stephen P. Nawrocki, PhD; Gay L. Bush, PhD

*Presenting Author
11:20 a.m. - 11:40 a.m.  F9  Investigating the Potential for Transfer DNA on Laboratory Gloves  
Caitlin C.M. Vogelsberg, MS*; Krista E. Latham, PhD; Cynthia Cale, MS; Gay L. Bush, PhD

11:40 a.m. - 12:00 p.m.  F10  Post-Conviction DNA Testing: A Laboratory's Perspective and Participation in a Multi-Agency Collaboration for the Identification and Evaluation of Post-Conviction Cases  
Kerry A. Collins, JD*; Lynn A. Schneeweis, MS*; Dorothea S. Collins, MLA; Kristen Sullivan, MS

12:00 p.m. - 1:30 p.m.  Lunch

Poster Session

11:30 a.m. - 1:00 p.m.  F11  False Confessions in Juveniles: Do Juveniles Know and Understand Their Miranda Rights?  
Crystal Cafiero, MFS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*

11:30 a.m. - 1:00 p.m.  F12  A New Informed Consent in View of the 2017 Italian Law 219—Marketing and Communication  
Valentina Ronco, MD*; Fiorenza Zotti, PhD; Angela Pezzolla; Eloisa Maselli, MD; Valeria Bruno, MD; Francesca Donno, MD; Davide Ferorelli; Gianni De Giorgio; Federica Miscoe; Alessandro Dell’Erba, PhD

11:30 a.m. - 1:00 p.m.  F13  Voluntas Aegroti Suprema Lex Esto: Ethics in Real Life in New Italian Law  
Francesca Donno, MD*; Valentina Ronco, MD; Davide Ferorelli; Gianni De Giorgio; Fiorenza Zotti, PhD; Eloisa Maselli, MD; Valeria Bruno, MD; Loreto Gesualdo, FP; Alessandro Dell’Erba, PhD

Ethical Considerations

Moderator: Michele Vaira, JD  
Foggia, ITALY

1:30 p.m. - 1:50 p.m.  F14  The Potential and Problem of Academics as Forensic Experts  
Carole E. Chaski, PhD*

1:50 p.m. - 2:10 p.m.  F15  The Duty to Correct Erroneous or Inadvertently Misleading Forensic Science Testimony  
Sarah Chu, MS*; Bryce Benjet, JD

2:10 p.m. - 2:30 p.m.  F16  The Ethical Boundaries of Presenting Expert Testimony in a Criminal Trial  
Walter M. Reaves, JD*

2:30 p.m. - 3:00 p.m.  F17  I Didn't Get It Wrong: Prosecutorial Denial in the Face of Forensic Evidence of Innocence  
Alissa L. Bjerkhoel, JD*

3:00 p.m. - 3:20 p.m.  Break

*Presenting Author
**JURISPRUDENCE**

*Presenting Author*

**Miscellaneous Science**

**Moderator:** S.B. Addison Larson, MS  
**Sherman, CT**

3:20 p.m. - 3:40 p.m.  **F18**  
**K-9 Evidence in the Courtroom**  
*Mary E. Cablk, PhD*

3:40 p.m. - 4:00 p.m.  **F19**  
**Legal Theories for Prosecution of Opioid Overdoses Resulting in Death Under State and Federal Law Principles**  
*M.J. Menendez, JD*; *Barry K. Logan, PhD*

4:00 p.m. - 4:20 p.m.  **F20**  
**Novel Psychoactive Substances, Fentanyl Analogs, and Scheduling: Federal and State Responses**  
*M.J. Menendez, JD*; *Barry K. Logan, PhD*

4:20 p.m. - 4:40 p.m.  **F21**  
**Secure Continuous Remote Alcohol Monitor (SCRAM) Test Results: Fact, Fiction, Puffery, Rhetoric, and Hokum**  
*Donald J. Ramsell, JD*; *Gil Sapir, JD*

4:40 p.m. - 5:00 p.m.  **F22**  
**Due Process and Ethics: Crime Laboratories Cannot Be Paid for Convictions**  
*Michelle L. Behan, JD*; *Gil Sapir, JD*

**Friday—Session I**

**Forensic Challenges**

**Moderator:** Veronica Scotti, LLM  
**Politecnico Di Milano—Il Dipartimento di Elettronica Informazione e Bioingegneria**  
**Milano, ITALY**

8:30 a.m. - 8:50 a.m.  **F23**  
**New York City (NYC) Polo Grounds Murders: Was It Bernard Perez or “The Beast”?**  
*Kerry J. O’Connell, JD*

8:50 a.m. - 9:10 a.m.  **F24**  
**The Evidentiary Standard for Authenticating Social Media Posts in Litigation**  
*Stephanie Domitrovich, JD, PhD*

9:10 a.m. - 9:30 a.m.  **F25**  
**Emerging Trends in Electronic Surveillance**  
*Gary McDonald, Jr., JD*

9:30 a.m. - 9:50 a.m.  **F26**  
**Expert Challenges Using Industry Standards**  
*John J. Lentini, BA*

9:50 a.m. - 10:10 a.m.  **F27**  
**National Fire Protection Association (NFPA) 921 in Court: Lessons From 500 Case Decisions Over a Quarter Century and Across Two Countries**  
*Terry-Dawn Hewitt, LLM*; *Wayne J. McKenna, LLB*

10:10 a.m. - 10:30 a.m.  **Break**
Fingerprints and Forensics in Europe

Moderator: Kenneth E. Melson, JD
The George Washington University Law School
Montclair, VA

10:30 a.m. - 11:20 a.m. F28 Three Attorneys Participate in Fingerprint Proficiency Testing: Results and Observations
Brendan P. Max, JD*; Joseph Cavise, JD*; Richard E. Gutierrez, JD*

11:20 a.m. - 11:40 a.m. F29 The Regulation of Forensic Science Evidence in Europe
Joelle V. Vuille, PhD*

11:40 a.m. - 12:00 p.m. F30 The International Criminal Court and the Forensic Science Community
Victor W. Weedn, MD, JD*

12:00 p.m. - 1:30 p.m. Lunch

Poster Session

11:30 a.m. - 1:00 p.m. F31 False Positive Breath Alcohol After Pharyngeal Spray Treatment
Duygu Yavuz*; Tugba Ünsal, PhD; Sevil Atasoy, PhD

11:30 a.m. - 1:00 p.m. F32 Self-Determination and Living Wills: The Actual Italian Context After the Promulgation of the 2017 Law 219 on End of Life Issues
Matteo Scopetti, MD; Vittorio Gatto, MD; Alessandro Santurro, MD; Mariantonia Di Sanzo, MD*; Raffaele La Russa, MD; Paola Frati, PhD

11:30 a.m. - 1:00 p.m. F33 Depleted Uranium and Cancer Risk: A Case Report
Martina Fichera, MD*; Giuseppe Davide Albano, MD; Aldo Liberto, MD*; Francesco Amico, MD; Maria Tea Teodoro, MD; Massimiliano Esposito, MD*; Diego Geraci, PhD; Orazio Cascio, MD

Metrology and Methods

Moderator: John D. Schmid, JD
Duluth, MN

1:30 p.m. - 1:50 p.m. F34 Should Forensic Science Rely on Opinions or Factual Data? The Role of Forensic Metrology
Alessandro M. Ferrero, MSc; Veronica Scotti, LLM*

1:50 p.m. - 2:10 p.m. F35 A Metrologically Sound Assessment of Blood Alcohol Concentration (BAC) Through a Breath Alcohol Concentration (BrAC) Measurement
Alessandro M. Ferrero, MSc; Veronica Scotti, LLM*

2:10 p.m. - 2:30 p.m. F36 Preferred Crime Scene Documentation Methods
Giovanna M. Vidoli, PhD*; Michael W. Kenyhercz, PhD; Joanne Devlin, PhD; Jason J. Keller, MFS

*Presenting Author
2:30 p.m. - 2:50 p.m. F37 Developing an Introductory Analytical Science Training Program for Lawyers and Judges
Nicolas R. Hughes, JD*; Ashraf Mozayani, PharmD, PhD; Jasmine M. Drake, PhD

2:50 p.m. - 3:20 p.m. Break

Forensic Consequences

Moderator: Robert M. Sanger, JD
Sanger Swysen & Dunkle
Santa Barbara, CA

3:20 p.m. - 3:40 p.m. F38 To Disclose or Not To Disclose: How Outcome-Based Case Theory Guides Information Gathering in Mental Health Evaluations
Jason D. Ricke, JD, LLM*

3:40 p.m. - 4:00 p.m. F39 The Impact of Forensic Evidence on Drug-Related Offense Sentencing Outcomes
Jennifer W. Bourgeois, MS*; Jasmine M. Drake, PhD*

4:00 p.m. - 4:20 p.m. F40 Problems and Possibilities With Foreign DNA in a Capital Post-Conviction Defense Investigation
Matilde J. Carbia, JD*; Kevin Riach, JD*

4:20 p.m. - 4:40 p.m. F41 The Forensic Use of Closed-Circuit Television (CCTV) Surveillance Cameras in Italy: A Standard Procedure in Criminal Investigations to Enhance the Impact on Decision Making
Donatella Curtotti*; Sebastiano Battiato, PhD*; Vittorio Rizzi*; Oliver Giudice, PhD*; Antonino Paratore*; Wanda Nocerino*

4:40 p.m. - 5:00 p.m. F42 Dead or Alive: A Bioethics Approach to the Understanding of Brain Death Diagnosis by Families and Courts—A Report on Two Cases From the United States and Argentina
Maria Susana Ciruzzi, PhD*

Friday—Session II

Multidisciplinary Session: Criminalistics I/Jurisprudence II—Justice Cannot Happen in a Vacuum

Moderator: Amrita Lal-Paterson, MSFS
Division of Forensic Science
Wilmington, DE

Co-Moderator: Jacquelyn A. Smith, JD
Charlotte Mecklenburg Schools
Cornelius, NC

1:00 p.m. - 3:00 p.m. F43 Justice Cannot Happen in a Vacuum: Toward a Better Representation of the Science, the Client, and the Case Through Open Communication
Charlotte J. Word, PhD*; Terri Rosenblatt, JD*; Raymond Valerio, JD*;
Heather H. Degnan, PhD*

*Presenting Author
Saturday

Cases and Controversies I

Moderator: Quandece Semrow, JD
Cook County Public Defender
Forensic Science Division
Chicago, IL

8:30 a.m. - 9:30 a.m.  F44  You Are the Judges! An Interactive Session in Forensic Medicine and Pathology on the Admissibility of Scientific Evidence in Shaken Baby Syndrome (SBS) and Abusive Head Trauma (AHT) Cases
W. Milton Nuzum III, JD*; Stephanie Domitrovich, JD, PhD*

9:30 a.m. - 9:50 a.m.  F45  Forensic Validation, Error, and Reporting: A Unified Approach
Mark W. Perlin, PhD, MD*

9:50 a.m. - 10:10 a.m.  Break

Cases and Controversies II

Moderator: Robert M. Sanger, JD
Sanger Swysen & Dunkle
Santa Barbara, CA

10:10 a.m. - 10:30 a.m.  F46  An Introduction to Forensic Science for Criminal Defense Attorneys: An Online Class Between Switzerland and Africa
Durdica Hazard, PhD*; Joelle V. Vuille, PhD*; Sanjeeewa Liyanage, LLM

10:30 a.m. - 10:50 a.m.  F47  Caught by the Laws of Physics
Peter J. Diaczuk*; Xiao Shan Law, BS

10:50 a.m. - 11:10 a.m.  F48  Recent Legal Measures Against Stalking in India
Anil Aggrawal, MD*

11:10 a.m. - 11:30 a.m.  F49  Law N. 24 of March 2017 and the Italian National System of Guidelines (SNLG): Bureaucratization of Medicine in the Name of Security of Care or a Spending Review?
Federico Patanè, MD*; Massimiliano Esposito, MD; Martina Fichera; Pasquale Malandrino, MD; Orazio Cascio; Monica Salerno, MD, PhD*; Cristoforo Pomara, MD, PhD*
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m.  G1  Child Abuse and Neglect: A Forensic Odontological Approach  
Salem Altalie; Patrick W. Thevissen, PhD*

11:30 a.m. - 1:00 p.m.  G2  Forensic Odontology Education in Indonesia  
Nurtami Soedarsono, PhD*; Masniari Novita, PhD; Elza I. Auerkari, PhD

Thursday

Thomas Krauss Memorial Bitemark Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>G3</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>G4</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>G5</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>G6</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>Break</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>G7</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>G8</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

**Moderator:** Emilio Nuzzolese, PhD  
**Dental Team DVI Italia**  
**Bari, ITALY**

**Co-Moderator:** Beverly Hedgepeth, DDS  
**Cookeville, TN**

G3  A Review of the Published Research on the Use of Overlays for the Analysis of Bitemarks in Skin  
John P. Demas, DDS*

G4  Bitemark Moratorium Part 1: Past Culture and Present Thinking  
Cynthia Brzozowski, DMD*; Robert E. Wood, DDS, PhD; Franklin D. Wright, DMD*

G5  Bitemark Moratorium Part 2: Moving Forward  
Cynthia Brzozowski, DMD; Robert E. Wood, DDS, PhD*; Franklin D. Wright, DMD

**Break**

G6  What We Can Learn From Cadaver, Volunteer, or Actual Case Material in the Analysis of Bitemark Evidence Using the Full Spectrum of Photographic Techniques  
Richard R. Souviron, DDS*

G7  A Bitemark Case  
John Berketa, PhD*

G8  From Gerontophilia to Fruit Biting: A Series of Bitemark Cases in Hungary  
Armin A. Farid, DMD*

*Lunch*
ODONTOLOGY

Poster Session

11:30 a.m. - 1:00 p.m.  G9 The Impact of the First International Forensic Odontology in Human Rights Workshop in the United Arab Emirates
Salem Altalie; Emilio Nuzzolese, PhD*; Joe Adserias-Garriga, DDS, PhD; Alexander S. Forrest, MDS

11:30 a.m. - 1:00 p.m.  G10 Analysis and Identification of Bitemarks in Forensic Casework: Child Sexual Abuse
Carmen Silvia M. Miziara, MD, PhD*; Elaine S.N. Goto; Gabriela P. Ascani; Karen A.C. Fukuma; Thainá A. Marin; Daniela M. Abe*; Ivan D. Miziara, MD, PhD

Dental Age Assessment

Moderator: Marnie L. Sperling, DMD
Whippany, NJ

Co-Moderator: Mark D. Porco, DDS
Lincoln, CA

1:00 p.m. - 1:30 p.m.  G11 Profiling an Unknown Castaway: “The Philly Cocoa Man”
John B. Nase, DDS*

1:30 p.m. - 1:50 p.m.  G12 When a 70-Year-Old Mummified Baby Falls on Your Head: Collaboration in a Multidisciplinary Team
Corinne D’Anjou, DMD*; Caroline Tanguay, MD*

1:50 p.m. - 2:05 p.m.  G13 Fetal Maceration and Dental Age
Mark W. Crumpton, DMD*; James M. Lewis, DMD; Darinka Mileusnic, PhD, MD; Murray K. Marks, PhD

2:05 p.m. - 2:20 p.m.  G14 The Effects of Third Molar Impaction Parameters on Third Molar Development and Related Age Estimation
Rosalina Intan Saputri, DDS, MSc*; Jannick De Tobel, MD; Patrick W. Thevissen, PhD

2:20 p.m. - 2:35 p.m.  G15 Age Estimation in Children and Subadults Combining Ratios of Pulp and Tooth Area With Tooth Development
Manasa Ravoori, BDS*; Jannick De Tobel, MD; Patrick W. Thevissen, PhD

2:35 p.m. - 2:50 p.m.  G16 The Influence of Lower Third Molar Segmentations on Automated Tooth Development Staging Using a Convolutional Neural Network Approach
Rizky Merdietio Boedi, MSc*; Nikolay Banar, MSc; Jannick De Tobel, MD; Jeroen Bertels, MSc; Dirk Vandermeulen, PhD; Patrick W. Thevissen, PhD

2:50 p.m. - 3:05 p.m.  Break

*Presenting Author
Dental Age Assessment

Moderator: Marnie L. Sperling, DMD  
Whippany, NJ

Co-Moderator: Mark D. Porco, DDS  
Lincoln, CA

3:05 p.m. - 3:15 p.m.  G17 Age and Sex Estimation of Ajnala Skeletal Remains From Trace Elemental and Radiographic Analysis of Molar Teeth: A Comparative Forensic Odontological Study  
Jagmahender Singh Sehrawat, PhD*

3:15 p.m. - 3:30 p.m.  G18 Magnetic Resonance Imaging (MRI) of Third Molars, Clavicles, and Wrists for Age Estimation: A Combined Bayesian Approach  
Jannick De Tobel, MD*; Elke Hillewig, MSc; Ines Phlypo, DDS; Michiel B. de Haas, BSc; Mayonne Van Wijk, MSc; Steffen Fieuws; Koenraad L. Verstraete, PhD; Patrick W. Thevissen, PhD

3:30 p.m. - 3:45 p.m.  G19 The Use of Cone Beam Computed Tomography (CBCT) to Examine the Relationship Between Mandibular Bone Density and the Disappearance of the Clarity of Root Pulp Visibility (RPV) and Periodontal Ligament Visibility (PLV)  
Victoria S. Lucas, PhD*; Fraser McDonald, PhD; Graham J. Roberts, MDS; Mark D. Viner, MSc

3:45 p.m. - 4:05 p.m.  G20 UT-Age 2018: An Updated Tool for Third Molar Development Age Assessment  
Leigh-Arn Schuerman, DMD*; James M. Lewis, DMD; David R. Senn, DDS

4:05 p.m. - 4:35 p.m.  G21 The Dental Age Research London Information Group (DARLInG) Development of a Database of Dental and Related Data to Enable Logical Dental Age Estimation (DAE)  
Graham J. Roberts, MDS*; Victoria S. Lucas, PhD; Fraser McDonald, PhD

Friday

Dental Imaging

Moderator: Kyle C. Tanaka, DDS  
Lynwood, WA

Co-Moderator: Khlea Sumani, DMD  
Zanesville, OH

8:30 a.m. - 9:30 a.m.  G22 Using Photoshop* for Odontology Doesn't Have to Bite  
David Witzke, BA*

9:30 a.m. - 10:00 a.m.  G23 Digital Image Processing for the Forensic Dentist  
James McGivney, DMD*

10:00 a.m. - 10:20 a.m.  G24 Improvements to Digitized Radiographic Images Using Adobe* Photoshop*  
Robert E. Wood, DDS, PhD*; David Sweet O.C., DMD, PhD

10:20 a.m. - 10:35 a.m.  Break

*Presenting Author
ODONTONTOLOGY

Dental Identification

Moderator: Kyle C. Tanaka, DDS
Lynwood, WA

10:35 a.m. - 11:05 a.m. G25 Digital Techniques for Dento-Facial Superimposition
John B. Nase, DDS*

11:05 a.m. - 11:20 a.m. G26 Combining 3-Dimensional (3D) Technology With the Traditional 2-Dimensional (2D) Smiling Photographs to Aid in Accurate Forensic Dental Identification
Gowri V. Reesu, MSc*; Scheila Manica, PhD; Gavin F. Revie, PhD; Peter A. Mossey, PhD

11:20 a.m. - 11:35 a.m. G27 The Prevalence of Morphological Variations of the Maxillary Sinus in Panoramic Radiographs of Caucasian Individuals
Ludovica Gorza, MSc*; Patrick W. Thevissen, PhD

11:35 a.m. - 1:00 p.m. Lunch

Poster Session

11:30 a.m. - 1:00 p.m. G28 WITHDRAWN

11:30 a.m. - 1:00 p.m. G29 The Application of Discriminant and Regression Models Developed From Odontometrics of Known Molars for Sex Determination of Ajnala Skeletal Remains: A Forensic Odontological Study
Monika Singh, MSc*; Jagmahender Singh Sehrawat, PhD

Dental Identification

Moderator: Iris L. Shields, DDS
Bel Air, MD

1:00 p.m. - 1:15 p.m. G30 When Arson Becomes Murder: Antemortem Records Fire the Identification Process
Randolph L. Mitchell, DMD*

1:15 p.m. - 1:30 p.m. G31 The Mystery of the Unidentified Human Remains Found Wrapped in Dental Packing Tape and Its Dental Biography
Francesca Tarantino, MD*; Maricla Marrone, MD*; Stefania Lonero Baldassarra; Maria M. Lepore; Emilio Nuzzolese, PhD*

1:30 p.m. - 1:50 p.m. G32 Dental Identification of Carbonized Victims in a 2015 Traffic Accident in France
Gwenola Drogou, DDS*; Charles E. Georget, PhD*; Aime Conigliaro, MSc*

1:50 p.m. - 2:10 p.m. G33 WITHDRAWN

2:10 p.m. - 2:30 p.m. G34 Dental Identification: An Important Thing—The Second Time Around
Jacqueline S. Reid, DDS*

2:30 p.m. - 2:45 p.m. Break

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:45 p.m.</td>
<td>G35</td>
<td>A Review of Postmortem Dental Radiographic Protocol for Emergency Responders in Individual to Mass Fatality Operations</td>
<td>Khlea Sumani, DMD*; Charles E. Berner, DDS</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>G36</td>
<td>A Cemetery Named the Mediterranean Sea: Best Practice in Human Identification</td>
<td>Francesco Sessa, MS*; Stefania C. Bello, MD; Giuseppe Bertozzi, MD; Francesca Maglietta, MD; Emilio Nuzzolese, PhD*</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>G37</td>
<td>Not Your Typical Forensic Odontology Cases</td>
<td>John Berketa, PhD*</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>G38</td>
<td>The Art of Working in Reverse to Resolve a Dental Identification</td>
<td>Mary K. Shields, DMD*; Mark L. Bernstein, DDS</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>G39</td>
<td>The Need for a Complete Dental Autopsy of Unidentified Edentulous Human Remains</td>
<td>Emilio Nuzzolese, PhD*; Mario Torreggianti, DDS*; Gina R. Quaglione, MD</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>G40</td>
<td>A Review of Unconventional Points of Dental Identification at the Ontario Forensic Pathology Service: Thinking Outside the Viewbox</td>
<td>Yolanda Nerkowski, BA*; Robert E. Wood, DDS, PhD*; Taylor L. Gardner, BFSc*</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>G41</td>
<td>The Lethal Migrant Sea Route to Italy and the Nigerian Disaster Victim Identification (DVI) Operation</td>
<td>Antonello Crisci, MD; Emilio Nuzzolese, PhD*; Joe Adserias-Garriga, DDS, PhD*; Margherita Neri, MD, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
**Wednesday**

**Poster Session**

11:30 a.m. - 1:00 p.m. **H1** Stress Evaluation in Indonesian Civil Aviators  
Meta Y. Candra, MSc*; Nurtami Soedarsono, PhD; Dewi F. Suniarti, PhD;  
Febriana Setiawati, PhD

11:30 a.m. - 1:00 p.m. **H2** The Application of Decomposition Scoring Methods to Predict Postmortem Submersion Interval (PMSI) in Human Bodies Recovered From Aquatic Environments: A Comparison Between Freshwater and Salt Water in Italian Areas  
Chiara Palazzo, MD*; Paolo Fais, PhD; Guido Pelletti, MD; Alberto Amadasi, MD;  
Federica Fersini; Filippo Pirani, MD; Rosa Maria Gaudio; Adriano Tagliabracci, MD;  
Susi Pelotti, MD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. **H3** Unusual Asphyxial Deaths: Sand, Soil, and Stool  
Diana C. Nointin, MD*; Pamela A. Ferreira, MD; Carol Allan, MD; Zabiullah Ali, MD;  
David R. Fowler, MD

11:30 a.m. - 1:00 p.m. **H4** Strangulation to Stroke: A Fatal Case of Delayed Traumatic Internal Carotid Artery Dissection  
Amber R. Wang, MD*; Alan C. Wang, MD; Benjamin Mathis, MD

11:30 a.m. - 1:00 p.m. **H5** A Fatal Case of Candy Aspiration in a Child: Was It a Choking Death?  
Giuseppe Davide Albano, MD*; Pasquale Malandrino, MD; Massimiliano Esposito, MD;  
Aldo Liberto, MD; Dario Condorelli; Monica Salerno, MD, PhD; Giulio Di Mizio, MD, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. **H6** Lichtenberg Figures in Electrocution Deaths by Evaporative Cooler  
Nilesh K. Tumram, MD*

11:30 a.m. - 1:00 p.m. **H7** Modeling of Inflicted Head Injury by Shaking Trauma in Children—What Can We Learn? Part 1: A Systematic Review of Animal Models  
Marloes E.M. Vester, MD*; Rob A.C. Bilo, MD; Arjo J. Loeve, PhD; Rick R. Van Rijn, PhD;  
Jan Peter van Zandwijk, PhD

11:30 a.m. - 1:00 p.m. **H8** Modeling of Inflicted Head Injury by Shaking in Children—What Can We Learn? Part 2: Mathematical and Physical Models  
Jan Peter van Zandwijk, PhD*; Arjo J. Loeve, PhD; Marloes E.M. Vester, MD;  
Rob A.C. Bilo, MD; Rick R. Van Rijn, PhD

11:30 a.m. - 1:00 p.m. **H9** Chillin’ in Hotlanta: A Five-Year Retrospective Study of Hypothermia Deaths in Fulton County, Georgia  
Maxwell O. Rollins, MD*; Jan M. Gorniak, DO; Jason Singh, MD

11:30 a.m. - 1:00 p.m. **H10** “Hot Deaths”; A Review of Foggia Hyperthermia Cases  
Stefania De Simone, MD*; Francesca Maglietta, MD; Lorenzo Spagnolo, MD;  
Santina Cantatore; Pietrantonio Ricci, MD, PhD; Monica Salerno, MD, PhD;  
Francesco Sessa, MS; Giuseppe Bertozzi, MD*

11:30 a.m. - 1:00 p.m. **H11** The Strange Trajectories of Death: Avtomat Kalashnikov—The New Weapon of the Garganic Mafia  
Mauro A. Ciavarella; Lorenzo Spagnolo, MD; Santina Cantatore; Gianfranco Guccia;  
Marcello Rendine, DBA; Pietrantonio Ricci, MD, PhD; Irene Riezzo, MD, PhD*
11:30 a.m. - 1:00 p.m. H12 Cardiac Wounds Induced by Cardiopulmonary Resuscitation in a Context of Phlebotomy: A Case Report and a Review of the Literature
Erwan Le Garff, MD*; Vadim Mesli, MD; Philipp Morbidelli, MD; Anne A. Becart, DDS, PhD; Valéry C. Hedouin, MD, PhD; Didier Gosset, MD, PhD

11:30 a.m. - 1:00 p.m. H13 Retinal Hemorrhages and Spinal Nerve Root Hemorrhages in Pediatric Resuscitated Near-Drownings: Recognizing Ischemia-Reperfusion Injuries
Anna G. McDonald, MD*; Nathan S. Shaller, MD; Patrick E. Lantz, MD

11:30 a.m. - 1:00 p.m. H14 Only the Vagus Nerve: A Pair of Unusual Homicides
Stacey L. Reed, DO*; Todd M. Luckasevic, DO; Abdulrezak M. Shakir, MD; Karl E. Williams, MD

11:30 a.m. - 1:00 p.m. H15 Unusual Frangible Ammunition Used in a Homicide: A Case Report
Sandra E. Jones, BS*; Michelle B. Aurelius, MD; Chad Moose

11:30 a.m. - 1:00 p.m. H16 Plugged, Unplayable Lies: A Case Report of a Novel Suicide by Foreign Body Airway Obstruction
Stacey L. Reed, DO*; Todd M. Luckasevic, DO

11:30 a.m. - 1:00 p.m. H17 Death by Fractal Art: A Tale of Beauty and Electrocution
Tasha Zemrus Greenberg, MD*; Nizam Peerwani, MD; Stephen P. White

11:30 a.m. - 1:00 p.m. H18 Homicidal Violence Against Children in Mississippi: Four Case Reports
Mark M. LeVaughn, MD*; L.R. Funte, MD; Brent Davis, MD; Anastasia Holobinko, PhD; Steven A. Symes, PhD

11:30 a.m. - 1:00 p.m. H19 What a Dangerous Place: An Unusual Homicide in the Hospital
Roberto Vaglio; Alessandro Dell’Erba, PhD; Francesca Donno, MD*

11:30 a.m. - 1:00 p.m. H20 The “Tin Man”: Another Mafia Homicide
Francesca Donno, MD*; Alessandro Dell’Erba, PhD; Eloisa Maselli, MD; Roberto Vaglio

11:30 a.m. - 1:00 p.m. H21 An Autopsy Case of Suicide With Three Knives: A Forensic and Anatomical Discussion
Beatrice Defraia*; Martina Focardi; Niccolo Norberti; Stefano Colagrande; Vilma Pinchi, PhD; Gian A. Norelli, PhD

11:30 a.m. - 1:00 p.m. H22 An Analysis of Risk Factors Involving All-Terrain Vehicle (ATV) Deaths
Charlene Admissions, BA*; Joanne Catania, MS; Theodore T. Brown, MD

11:30 a.m. - 1:00 p.m. H23 Delayed Subdural Hematomas in Decedents on Anticoagulation Medication in the County of Santa Clara, California
Michelle A. Jorden, MD; Karin E. Wells, BA*

11:30 a.m. - 1:00 p.m. H24 Forensic Analysis in Mass Disasters: Were Gunpowder Explosions in a Fireworks Factory an Accident or a Terrorist Bombing?
Francesca Tarantino, MD; Maricla Marrone, MD; Valentina Ronco, MD*; Paola Corsignano Carrieri; Stefania Lonero Baldassarra; Alessandro Dell’Erba, PhD; Francesco Vinci, MD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. H25 Small RNA Sequencing and Real-Time Quantitative Polymerase Chain Reaction (RT-qPCR) Validation of Forensically Relevant Body Fluids
Karly L. Johannsen*; Claire Glynn, PhD
11:30 a.m. - 1:00 p.m. **H26** A Forensic Volatolomic Approach: A Step Forward in the Characterization of Wound Pathogens  
*Presenting Author* Shawna F. Gallegos*; Paola A. Prada, PhD; Kendra P. Rumbaugh, PhD

11:30 a.m. - 1:00 p.m. **H27** Forensic Body Fluid Identification With the Epitect® Bisulfite Kit and the Reliability of DNA Methylation With Real-Time Quantitative Polymerase Chain Reaction (qPCR)  
*Presenting Author* Mandy Pascu*; David San Pietro, PhD

11:30 a.m. - 1:00 p.m. **H28** Evaluating Bioinformatic Pipeline Performance for Forensic Microbiome Analysis  
*Presenting Authors* Sierra Kaszubinski, BS*; Jennifer L. Pechal, PhD; Heather R. Jordan, PhD; Carl J. Schmidt, MD; M. Eric Benbow, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. **H29** Investigating Commercially Available MicroRNA Extraction Kits for Use With Forensically Relevant Body Fluids  
*Presenting Author* Autumn T. Muise*; Karly L. Johannsen; Claire Glynn, PhD

11:30 a.m. - 1:00 p.m. **H30** Postmortem Submersion Interval (PMSI) Estimation From the Microbiome of Bone in a Freshwater Lake Across 4,750 Accumulated Degree Days (ADD)  
*Presenting Author* Claire M. Cartozzo, MS*; Baneshwar Singh, PhD; Tal Simmons, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. **H31** The Mouse Thanatomeicrobiome and Postmortem Interval (PMI) Estimation  
*Presenting Author* Molly B. Still*; Scott S. Crupper, PhD

11:30 a.m. - 1:00 p.m. **H32** Postmortem Hair Microbiome and Its Forensic Applications  
*Presenting Authors* Denise Wohlfahrt, BS*; Kailey Babcock*; Courtney Hutchens, BS; Vadim Mesli, MD; Erwan Le Garff, MD; Valéry C. Hedouin, MD, PhD; Xavier Demondion, MD, PhD; Baneshwar Singh, PhD

11:30 a.m. - 1:00 p.m. **H33** Forensic Microbiology: An Analysis of a Series of Cases  
*Presenting Author* Elvira Ventura Spagnolo, MD*; Cristina Mondello, MD*; Salvatore Roccuzzo, MD; Francesco Daleo, MD; Stefania Zerbo, MD; Antonina Argo

11:30 a.m. - 1:00 p.m. **H34** Calliphoridae of Forensic Importance of Campeche, Mexico  
*Presenting Author* Carolina Núñez-Vázquez, PhD*

11:30 a.m. - 1:00 p.m. **H35** Development of the Discrimination Procedures Between Nasal Secretion and Saliva by Real-Time Reverse Transcription Polymerase Chain Reaction (rRT-PCR) and Indirect Enzyme-Linked Immunosorbent Assay (ELISA)  
*Presenting Author* Tomoko Akatsu, PhD*; Ken Watanabe

11:30 a.m. - 1:00 p.m. **H36** The Estimation of Postmortem Submersion Interval (PMSI): Are Nails’ Ultrastructure of Any Help?  
*Presenting Author* Silvia D. Visona, MD; Ilenia G. Tredici, PhD; Elena Mercuri*; Chiara Siodambro*; Matteo Moretto, MD; Luisa Andrello, MD; Gulnaz T. Javan, PhD; Giovanni Fassina; Antonio M.M. Osculati, MD

11:30 a.m. - 1:00 p.m. **H37** Intentional Body Dismemberment: A Difficult Path for the Forensic Pathologist in the Search for Truth  
*Presenting Authors* Aniello Maiese; Alessandra De Matteis; Matteo Scopetti, MD*; Alessandro Santurro, MD; Vittorio Gatto, MD; Mariantonia Di Sanzo, MD; Luigi Cipolloni, MD, PhD; Massimiliano dell’Aquila, MD

*Presenting Author
Thursday—Session I

Epidemiology and Others

Moderator: Todd M. Barr, MD  
Cuyahoga County Medical Examiner’s Office  
Cleveland, OH  
Co-Moderator: Rebecca Asch-Kendrick, MD  
Midwest Medical Examiner  
Ramsey, MN

8:30 a.m. - 8:45 a.m.  H38 Buried Secrets: A Multidisciplinary Approach to Solving a Half-Century-Old Homicide  
Elizabeth M. Sepulveda, BA*; Ruth E. Kohlmeier, MD

8:45 a.m. - 9:00 a.m.  H39 Suicides Among the Young: A Ten-Year (2007–2017) Retrospective Analysis of Suicides Under the Age of 18 in Metro Detroit  
Vera Mendes-Kramer, BA*; Lynette Desjarlais, BA*; LokMan Sung, MD; David Moons, MD, PhD; Leigh Hlavaty, MD; Avneesh Gupta, MD*

9:00 a.m. - 9:15 a.m.  H40 Difficult Suicide Cases: A Case-Based Approach  
Wendy M. Ganther, MD*; Michael Alan Hays, MD

9:15 a.m. - 9:30 a.m.  H41 A Broad Demographic Analysis of Chronic Ethanol Deaths and Sequelae From Two Different Medical Examiner Offices  
Anastasiya Haponyuk, BSc; Sarah Lathrop, DVM, PhD; Lori A. Proe, DO; Daniel W. Dye, MD; Matthew D. Cain, MD*

Shauna Kumar*; Meredith A. Frank, MD; James Louis Caruso, MD

9:45 a.m. - 10:00 a.m.  H43 Mississippi Organ and Tissue Recovery: A Collaborative Success Story  
Mark M. LeVaughn, MD*; Anastasia Holobinko, PhD; Taylor Phillips; Carrie Deese, BS; Kevin Stump, BS

10:00 a.m. - 10:15 a.m.  H44 A Death Investigation of Mining Fatalities: The Utah Experience  
Kacy Krehbiel, MD*; Joseph Pestaner, MD; Erik D. Christensen, MD

10:15 a.m. - 10:30 a.m.  Break

Administration

Moderator: Gregory A. Schmunk, MD  
Polk County Medical Examiner’s Office  
Des Moines, IA  
Co-Moderator: Casey P. Bitting, DO  
Office of the Coroner-Arapahoe County  
Centennial, CO

10:30 a.m. - 10:45 a.m.  H45 Trends in the Certification of Choking-Related Deaths  
Joshua Vandeburgh*; Abigail Jacqueline Grande, MPH; Amanda O. Fisher-Hubbard, MD

10:45 a.m. - 11:00 a.m.  H46 Cremation Clearance by the Medical Examiner: What Is the Best Method?  
James R. Gill, MD*; Maura DeJoseph, DO; Holly Olko, MA

11:00 a.m. - 11:15 a.m.  H47 The Native American Graves Protection and Repatriation Act’s (NAGPRA’s) Broader Impact: Assessing NAGPRA Implementation Within the Medicolegal System  
Megan K. Kleeschulte, MA*  
(FSF Emerging Forensic Scientist Award Paper Presentation)
11:15 a.m. - 11:30 a.m.  H48  Next-of-Kin—May I? Providing Information to an Organ/Tissue Procurement Organization (O/TPO) on Out-of-Hospital Deaths  
Jan M. Gorniak, DO*; Charles M. Gammill, BA*

11:30 a.m. - 11:45 a.m.  H49  A Novel Adaptation of Electronic Health Records (EHR) for Medical Examiner Use  
Carley J. Holmes*; Kaila Jakubczak, BS; Brian C. Hunter, MD

11:45 a.m. - 12:00 p.m.  H50  Mass Disaster Management and Disaster Victim Identification (DVI) Activities in the 2016 Central Italy Earthquake  
Luigi Cipolloni, MD, PhD; Benedetta Baldari*; Mariantonia Di Sanzo, MD; Livia Besi; Matteo Scopetti, MD; Alessia Quattrocchi

12:00 p.m. - 1:00 p.m.  Lunch

**Poster Session**

11:30 a.m. - 1:00 p.m.  H51  Acute Myocarditis Following PD-1 Inhibitor (Nivolumab) Treatment for Lung Carcinoma  
Peter Houston, MD; Angelina I. Phillips, MD*

11:30 a.m. - 1:00 p.m.  H52  Arrhythmogenic Atrioventricular Node Fibrosis—An Unexpected Cause of Death in the Young: Regarding Two Autopsy Cases  
Paulina Henry, MD; Gregory Schmit, MD*; Julie Lelotte, MD; Jessica Vanhaebost*

11:30 a.m. - 1:00 p.m.  H53  Madelung’s Disease: A Rare and Benign Life-Threatening Condition  
Helena D. Corro, MSc, MD*; Carla Carreira; Rosa H. Gouveia, PhD; Ana S. Coelho, MSc; Joao E.S. Pinheiro, PhD, MD; Francisco Corte-Real, PhD

11:30 a.m. - 1:00 p.m.  H54  Disseminated Miliary Staphylococcal Infection: A Case of Pyomyositis and Bacterial Myocarditis in a Prisoner  
Ariana Pape, BA*; Wendy M. Gunther, MD

11:30 a.m. - 1:00 p.m.  H55  Deaths Due to Cardiomyopathy of Unknown Etiology in Children and Young Adults  
Serenella Serinelli, MD*; Ponni Arunkumar, MD; Steven M. White, MD, PhD; Lorenzo Gitto, MD*

11:30 a.m. - 1:00 p.m.  H56  Alveolar Capillary Dysplasia With Misalignment of the Pulmonary Veins: Histopathology and Applicability to Autopsy  
Rhonda M. Mittenzwei, MD*; Elizabeth Pavlisko, MD; Laura Hale, MD, PhD

11:30 a.m. - 1:00 p.m.  H57  Exacerbation of Traumatic Brain Injury in the Presence of Diabetes Mellitus: An Experimental Study of Mice  
Kazuhiko Kibayashi, MD*

11:30 a.m. - 1:00 p.m.  H58  Primary Cardiac Tumor as a Cause of Sudden Death: A Report of a Rare Case of Atrial Lipoma  
Stefano D’Errico, MD, PhD; Diana Bonuccelli, MD; Alberto Mandoli, MD; Massimo Martelloni, MD; Francesca Maglietta, MD*

11:30 a.m. - 1:00 p.m.  H59  WITHDRAWN
11:30 a.m. - 1:00 p.m. H60 Massive Portal Vein Thrombosis as a Rare Cause of Unexpected Death in a Non-Cirrhotic Patient
Stefano D’Errico, MD, PhD; Sara Niballi, MD; Giuseppe Davide Albano*; Massimiliano Esposito, MD; Marco Conti, MD

11:30 a.m. - 1:00 p.m. H61 Salmonella Urosepsis in a Postpartum Patient With Sickle Cell Trait
Emilie Cook, DO*; Patrick E. Lantz, MD; Anna G. McDonald, MD

11:30 a.m. - 1:00 p.m. H62 Asbestos Fiber Burden in the Lungs of the Deceased From Asbestos-Related Diseases (ARD): An Epidemiological Study and Scanning Microscope/Energy Dispersive Spectroscopy (SEM/EDS) Analysis
Silvia D. Visona, MD*; Silvana Capella, PhD; Elena Belluso; Simona Villani, PhD; Federica Manzoni; Yao Chen, MD; Giorgio Ardissino, MD; Francesca Russo; Antonio M.M. Osculati, MD

11:30 a.m. - 1:00 p.m. H63 WITHDRAWN

11:30 a.m. - 1:00 p.m. H64 A Rare Case of Sudden Death From Hereditary Hemorrhagic Telangiectasia (HHT)
Heather M. O'Connor, DO*; Ellen C. Riemer, MD, JD

11:30 a.m. - 1:00 p.m. H65 Silicosis: Medicolegal Implications of Diagnosis
Brandon J. Bukovitz, BS*; Jonathan G. Meiman, MD; Henry A. Anderson, MD; Erin G. Brooks, MD

11:30 a.m. - 1:00 p.m. H66 Pulmonary Alveolar Microlithiasis: A Case of Sudden Death
Adrienne E. Sauder, MD*; Marlon Osbourne, MD; Craig T. Mallak, JD, MD

11:30 a.m. - 1:00 p.m. H67 Tau and Neurofilament Light Proteins in Cerebrospinal Fluid as Biomarkers of the Time of Death
Pierre-Antoine Peyron, MD*; Sylvain Lehmann, PhD; Constance Delaby, PhD; Eric Baccino, MD; Christophe Hirtz, PhD

11:30 a.m. - 1:00 p.m. H68 An Uncommon Fatal Ruptured Pseudoaneurysm of the Brachial Artery in an Injected Drug Abuser
Silvia Trotta*; Antonella Sorrentino, MD; Giuseppe Bertozzi, MD; Pietrantonio Ricci, MD, PhD; Biagio Solarino, PhD*

11:30 a.m. - 1:00 p.m. H69 A Fatal Idiopathic Spontaneous Intraperitoneal Hemorrhage (Spontaneous Hemoperitoneum) in a 56-Year-Old Male With Cirrhosis
Gregory M. Dickinson, MD*; Hannah C. Jarvis, MRCS*; Jacob Steinberg, MD

11:30 a.m. - 1:00 p.m. H70 A Case Report on the Death of a 20-Year-Old Female Due to Complications of Minimally Invasive Transcatheter Atrial Septal Defect (ASD) Closure
Jan Ynav T. Quiz*; Marco Ross, MD; Erica Curry, MD

11:30 a.m. - 1:00 p.m. H71 Alcoholic Hepatomegaly: A Case Report and Review of the Literature
Ashley M. Luebbers, MS*; Wendy M. Gunther, MD

11:30 a.m. - 1:00 p.m. H72 A Ruptured Infective Aneurysm Presenting as an Acute Subdural Hematoma: A Case of Sudden Death in a Drug Addict With Previously Undiagnosed Bacterial Endocarditis
Michael Alan Hays, MD*
11:30 a.m. - 1:00 p.m. H73 Sudden Death in Adults With Congenital Heart Disease (CHD): A Retrospective Review of Cases in the Cook County Medical Examiner’s Office
Lorenzo Gitto, MD*; Steven M. White, MD, PhD; Ponni Arunkumar, MD; Serenella Serinelli, MD*

11:30 a.m. - 1:00 p.m. H74 Strangulated and Incarcerated Internal Hernia: A Rare Complication of Meckel’s Diverticulum
Mark A. Giffen, Jr., DO*; Lauren E. Dvorscak, MD

11:30 a.m. - 1:00 p.m. H75 Spontaneous Uterine Rupture as a Complication of Placenta Previa and Percreta
Mark A. Giffen, Jr., DO*; Lauren E. Dvorscak, MD

11:30 a.m. - 1:00 p.m. H76 A Ten-Year Retrospective Study of Risk Factors Associated With Deaths Due to Pulmonary Emboli in Washington, DC
Breanna M. Cuchara, MFS*; Francisco J. Díaz, MD; Sasha Brelad, MD

11:30 a.m. - 1:00 p.m. H77 Determination of Hemoglobin A1c Levels by a High-Performance Liquid Chromatography (HPLC) Method in Bloodstains
Kemalettin Acar*; Ayse Kurtulus; Esin Avci; Volkan Zeybek; Erdi Kutlu; Süleyman Demir

11:30 a.m. - 1:00 p.m. H78 A Case of Necrotizing Pneumonia From a Marijuana Water Pipe: A Recreational Experience Gone Wrong
Drake Ryan Thrasher, BS*; Deanna A. Oleske, MD (FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. H79 Sudden Death in a Case of Hiatal Hernia Mimicking a Bochdalek Hernia
Vittorio Gatto, MD*; Alessia Quattrocchi; Valentina Fazio; Matteo Scopetti, MD; Alessandro Santurro, MD; Mariantonia Di Sanzo, MD

11:30 a.m. - 1:00 p.m. H80 Death Due to External Compression of the Trachea in a Case of Multinodular Hemorrhagic Goiter
Massimiliano dell’Aquila, MD*; Alessandra De Matteis; Alessandro Santurro, MD; Vittorio Gatto, MD; Matteo Scopetti, MD; Aniello Maiese

11:30 a.m. - 1:00 p.m. H81 Cryptococcal Central Nervous System (CNS) Disease in a Large Urban Forensic Population
Jonee Taylor, MD*; Rebecca Folkerth, MD, PhD

11:30 a.m. - 1:00 p.m. H82 A Review of Shellfish Illnesses and Deaths in Mississippi
Mark M. LeVaughn, MD*; Brent Davis, MD; L.R. Funte, MD; Anastasia Holobinko, PhD; Steven A. Symes, PhD

11:30 a.m. - 1:00 p.m. H83 A Fatal Dental Extraction: A Case of Ceftriaxone-Induced Anaphylactic Shock in an Inmate
Massimiliano Esposito, MD; Federico Pata, MD; Francesco Amico; Giulio Di Mizio, MD, PhD; Aldo Liberto; Giuseppe Davide Albano; Angelo Montana, MD*

11:30 a.m. - 1:00 p.m. H84 An Intrapericardial Rupture of an Aortic Aneurysm in the Anatomic Aortic Arch Variant: A Multidisciplinary Approach
Enrica Calabrese, MD*; Rosa Maria Gaudio; Raffaella Marioni, MD; Letizia Alfieri, MD; Erica Bacchio, MD; Mauro Coppone, MD; Paolo Frisoni, MD; Francesca Gualandi, MD; Matteo Fabbr, MSc; Margherita Neri, MD, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)
11:30 a.m. - 1:00 p.m.  
**H85** An Interesting Case of a Pregnant Female With Systemic Calcification and Thromboemboli  
*Presenting Author*  
*Tasha Zemrus Greenberg, MD*; *Joshua Smith, BS*

11:30 a.m. - 1:00 p.m.  
**H86** Carbohydrates That Kill: Death From Refeeding Syndrome?  
*Carolyne L. Lemieux, MD*; *Vickie Willoughby, DO*; *Keith Pinckard, MD, PhD*

11:30 a.m. - 1:00 p.m.  
**H87** A Very Affordable Postmortem Computed Tomography (PMCT) Angiography Kit: A Feasibility Study Using an Immersion Pump and 3D-Printed Parts  
*Wolf Schweitzer*; *Markus Enders, Präparator*; *Dominic Gaschio*; *Michael Thali, MD*

**Biology**

**Moderator:** Heather R. Jordan, PhD  
**Co-Moderator:** Jennifer L. Pechal, PhD  
Mississippi State University  
Michigan State University  
Mississippi, MS  
East Lansing, MI

1:00 p.m. - 1:15 p.m.  
**H88** The Detection of Insect Stains From Four Species of Necrophagous Flies on Household Materials Using Immunoassays  
*David B. Rivers, PhD*; *Gregory Cavanagh, BS*; *Valerie Greisman, BS*; *Rebecca Brogan, PhD*; *Andrew Schoeffield, PhD*

1:15 p.m. - 1:30 p.m.  
**H89** Diurnal Oviposition Timing by Blow Flies (Diptera: Calliphoridae) in Different-Aged Carrion  
*Kristi Bugajski, PhD*

1:30 p.m. - 1:45 p.m.  
**H90** DNA Methylation for Donor Age Estimation in Touch DNA Samples Associated With Child Labor  
*Emily Neverett*; *Lisa M. McEwen, PhD*; *Julia MacIsaac, PhD*; *Michael S. Kobor, PhD*; *Claire Glynn, PhD*; *Timothy M. Palmbach, JD*

1:45 p.m. - 2:00 p.m.  
**H91** Transcriptional Markers of Sex Determination for Forensic Entomology  
*Michele Jonica*; *Ashleigh M. Faris, PhD*; *Carl E. Hjelmen, PhD*; *Aaron M. Tarone, PhD*

2:00 p.m. - 2:15 p.m.  
**H92** An Investigation of Volatile Profiles of Specific Human Organs During Decomposition  
*Lena M. Dubois, MSc*; *Pierre-Hugues Stefanuto, PhD*; *Katelyn A. Perrault, PhD*; *Jean-François M. Focant, PhD*  
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:15 p.m. - 2:30 p.m.  
**H93** An Investigation of the Decomposition Odor Profile Produced by Postmortem Microbes  
*Terezie Cernosek; Kevin E. Eckert, MS; David O. Carter, PhD; Katelynn A. Perrault, PhD*

2:30 p.m. - 2:45 p.m.  
**H94** Estimating Postmortem Interval (PMI) Using Microbial Succession in Human Cadaver Rib Bones  
*Heather L. Deel*; *Aeriel D. Belk, MS*; *Aaron M. Lynne, PhD*; *Sibyl R. Bucheli, PhD*; *Zech Xu Zhenjiang, MS*; *Franklin E. Damann, PhD*; *David O. Carter, PhD*; *Rob Knight, PhD*; *Jessica L. Metcalf, PhD*

2:45 p.m. - 3:00 p.m.  
**H95** Investigating Italian Criminal Cases’ Postmortem Microbiome Signatures  
*Gulnaz T. Javan, PhD*; *Holly L. Lutz*; *Sheree J. Finley, PhD*; *Neil Gottel, BSc*; *Silvia D. Visona, MD*; *Antonio M.M. Osculati, MD*; *Jack A. Gilbert, PhD*

3:00 p.m. - 3:15 p.m.  
**Break**
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:15 p.m.</td>
<td>H96</td>
<td>The Application of Eukaryotic Community Succession on Porcine Remains for Postmortem Interval Estimation</td>
<td>Luisa Forger, MS*; Michael Shane Woolf, MS; Tal Simmons, PhD; Jenise Swall, PhD; Catherine Capples Conn, PhD; Baneshwar Singh, PhD</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>H97</td>
<td>iFly: Mobile Software for Recording Data From a Carrion Source or Death Scene</td>
<td>Trevor I. Stamper, PhD*</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>H98</td>
<td>International Associations of the Postmortem Microbiome</td>
<td>Jennifer L. Pechal, PhD*; Carl J. Schmidt, MD; Heather R. Jordan, PhD; M. Eric Benbow, PhD</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>H99</td>
<td>The Composition and Shifts of Soil Bacterial and Fungal Communities Following Cadaver (<em>Sus Scrofa Domesticus</em>) and Plant Litter (<em>Quercus Robur</em>) Burial</td>
<td>Chawki Bisker, MSc*</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>H100</td>
<td>A Field Study on the Effects of Morphine on the Carrion Decomposition Process and Dipteran Larvae Development</td>
<td>Abigail J. Props, MS*</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>H101</td>
<td>Building a Microbial Model to Estimate the Postmortem Interval (PMI) Using Data Collected During the Spring Season at Three Anthropological Facilities</td>
<td>Aerial D. Belk, MS*; Heather L. Deel; Zech Xu Zhenjiang, MS; David O. Carter, PhD; Sibyl Bucheli, PhD; Aaron M. Lynne, PhD; Melissa A. Connor, PhD; Dawnie W. Steadman, PhD; Giovanna M. Vidoli, PhD; Rob Knight, PhD; Jessica L. Metcalf, PhD</td>
</tr>
<tr>
<td>4:45 p.m.</td>
<td>H102</td>
<td>Using Larvae of Carrion Beetles to Estimate the Time of Death in a Highly Decayed Corpse in Southwestern China: A Case Report</td>
<td>Zhou Lyu, PhD*; Zeying Tang, LLM*</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>H103</td>
<td>Scanning Electron Microscopy (SEM) in the Identification of Fly Artifacts (FAs): A Preliminary Qualitative Study</td>
<td>Guido Pelletti, MD; Paolo Fais, PhD; Alberto Amadasi, MD*; Chiara Palazzo, MD; Maria Carla Mazzotti, MD; Laura Ingrà, PhD; Desiree Martini, PhD; Susi Pelotti, MD</td>
</tr>
</tbody>
</table>
## Thursday—Session II

### Radiology

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>H104</td>
<td>Forensic Imaging in Two Cases of Survived Car Surfing in Zurich, Switzerland</td>
<td>Michela Lanfranchi*, Michael Thali, MD*, Wolf Schweitzer*</td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>H105</td>
<td>Postmortem Computed Tomography (PMCT) Versus the Skeletal Survey in Children: A Pathology-Proven Study</td>
<td>Esther L. Van De Mortel, MSc; Judith Fronczek, MD, PhD; Simon G.F. Robben, MD,PhD; Rick R. Van Rijn, PhD*</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>H106</td>
<td>Upper Versus Lower Limb Pediatric Fracture Healing: A Radiographic Study of Time Since Injury (TSI)</td>
<td>Diana L. Messer, MS*; Brent H. Adler, MD; Farah W. Brink, MD; Huiyun Xiang, MD, PhD; Amanda M. Agnew, PhD</td>
</tr>
<tr>
<td>9:15 a.m.</td>
<td>H107</td>
<td>Virtopsy in Clinical Forensic Medicine: A Trauma Case Series With Clinical Emergency Computed Tomography (CT) Reconstruction Details</td>
<td>Eddie Surer, MD*; Michael Thali, MD*; Rosa M. Martinez, MD*; Valeria Hofer*; Michela Lanfranchi*; Wolf Schweitzer*</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>H108</td>
<td>My Darkest Hour: Bringing a Consumer LED Torch Light Into Forensic Macrophotography Through 3D-Design of a Lamp Mount for a Consumer Point-and-Shoot Camera</td>
<td>Wolf Schweitzer*; Valeria Hofer*; Rosa M. Martinez, MD*; Michael Thali, MD*</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>H109</td>
<td>Role of Postmortem Computed Tomography (PMCT) as a Triage Tool Between External Inspection and Full Autopsy</td>
<td>Vasiliki Chatzaraki, MD*; Jakob Heimer, MD; Michael Thali, MD; Wolf Schweitzer*</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>H110</td>
<td>Postmortem Fetal Angiography: A Tool for Better Understanding Congenital Vascular Malformations</td>
<td>Jessica Vanhaebost*; Xavier De Spiegeleire, Bac; Gregory Schmit, MD; Catherine Behets, PhD; Emmanuel Coche, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
### Radiology

**Moderator:** Rebecca Jufer Phipps, PhD  
**Office of the Chief Medical Examiner**  
**Baltimore, MD**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 a.m.</td>
<td>H111</td>
<td>The Value of Craniocervical Magnetic Resonance Imaging (MRI) Following Non-Fatal Strangulation</td>
<td>Jakob Heimer, MD*; Carlo Tappero; Dominic Gascho; Patricia Flach, PD; Thomas Ruder, PD; Michael Thali, MD; Sabine Franckenberg, MD</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>H112</td>
<td>Evaluation of Arterial Injuries Using Contrast and Conventional X-Rays: A Practical Method for the Assessment of Arterial Injuries in Forensic Settings</td>
<td>Nikki Mourtzinos, DO*; Zabiullah Ali, MD; David R. Fowler, MD</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>H113</td>
<td>The Needle in the Haystack: Histology of Postmortem Computed Tomography (CT) - Guided Biopsies Versus Autopsy-Derived Tissue</td>
<td>Bartholomeus G.H. Latten, MSc*; Frans Bakers; Paul Hofman, PhD; Axel zur Hausen, MD, PhD; Bela Kubat, Ph.D</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>H114</td>
<td>Deep Learning on Volumetric Radiologic Imaging Datasets for Forensic Pathology Investigations</td>
<td>Summer J. Decker, PhD*; Lars C. Ebert, PhD*; Jonathan M. Ford, PhD; Akos Dobay, PhD; Natalie L. Adolphi, PhD; Kurt B. Nolte, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H115</td>
<td>Simulation-Based Learning in Forensic Medicine: The Use of 3D Photogrammetry</td>
<td>Vadim Mesli, MD*; Erwan Le Garff, MD; Vincent Deffaux; Elodie Marchand, MD; Anne A. Becart, DDS, PhD; Valéry C. Hedouin, MD, PhD; Didier Gosset, MD, PhD</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>H116</td>
<td>Anatomical Distribution and Autopsy Features of Gunshot Injuries to Discriminate Between Homicides and Suicides: A Five-Year Retrospective Study From the Onondaga County Medical Examiner's Office</td>
<td>Lorenzo Gitto, MD*; Serenella Serinelli, MD*; Robert Stoppacher, MD</td>
</tr>
</tbody>
</table>

**Lunch**

### Pediatrics

**Moderator:** Francisco J. Diaz, MD  
**Office of the Medical Examiner**  
**District 23 Medical Examiner's Office**  
**Washington, DC**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m.</td>
<td>H117</td>
<td>The Value of Elevated Transaminases, Lipase, and Amylase in Children for Predicting Abdominal Injury After Blunt Abdominal Trauma: Is Laboratory Screening Valuable for Recognizing Physical Child Abuse? A Literature Review</td>
<td>Daniel H. Hoekstra, MD; Joost G. Daams, MA; Wouter A. Karst, MD; Rick R. Van Rijn, PhD*</td>
</tr>
<tr>
<td>1:15 p.m.</td>
<td>H118</td>
<td>Optic Nerve Hemorrhage: A Sensitive or Specific Marker of Trauma?</td>
<td>Melissa M. Blessing, DO*; Merrill O. Hines III, MD; Dwayne A. Wolf, MD, PhD; Glenn D. Sandberg, MD</td>
</tr>
</tbody>
</table>

*Presenting Author*
### Brain and Heart

**Moderator:** Giancarlo Di Vella, MD, PhD  
University of Torino  
Department of Public Health Sciences  
Sezione di Medicina Legale  
Torino, ITALY  

**Co-Moderator:** Rudy J. Castellani, MD  
Center for Neuropathology  
Kalamazoo, MI  

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 p.m.</td>
<td>H124</td>
<td>Chronic Traumatic Encephalopathy Pathology Following Shotgun Injury to the Brain</td>
<td>Rudy J. Castellani, MD*; Taylor Tribett, BS; Theodore T. Brown, MD</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>H125</td>
<td>Massive Intracranial Bleeding Due to the Rupture of a Rare Spontaneous Pseudoaneurysm of the Middle Cerebral Artery in a Pediatric Patient: A Case Report With Clinical, Radiological, Gross, and Microscopic Findings</td>
<td>Lorenzo Gitto, MD*; Serenella Serinelli, MD*</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>H126</td>
<td>Dorsal Root Ganglia and Nerve Root Hemorrhage in Resuscitated Respiratory Syncytial Virus (RSV) Bronchiolitis</td>
<td>Nathan S. Shaller, MD*; Anna G. McDonald, MD</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>H127</td>
<td>An Evaluation of Cardiac Implantable Electronic Devices in Forensic Practice: How It Can Improve the Medicolegal Analysis of Cause of Death in Postmortem Analysis and Even Answer Unexpected Questions in the Living</td>
<td>Justine Canales, MD*; Camille Rerolle, MD; Pauline Saint-Martin, MD, PhD</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>H128</td>
<td>A Comparison of Coronary Artery Stenosis Estimates Made by Forensic Pathologists and Medical Students</td>
<td>Mitchell Messner, BA*; Sarah Meyers, MD; Walter L. Kemp, MD, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
PATHOLOGY/BIOLOGY

4:15 p.m. - 4:30 p.m.  H129  Coronary Calcifications in Sudden Cardiac Death (SCD) Cases in Postmortem Computed Tomography (PMCT)
Katarzyna Michaud, MD*; Stefano Draisci, MD; Diego Procicchiani, MD; Silke Grabherr, PhD; Fabrice Dedouit, MD, PhD

4:30 p.m. - 4:45 p.m.  Break

Miscellaneous

Moderator: Jennifer L. Pechal, PhD  Michigan State University  East Lansing, MI  Co-Moderator: Heather R. Jordan, PhD  Mississippi State University  Mississippi State, MS

4:45 p.m. - 5:00 p.m.  H130  Manual Large Volume DNA Extraction and Purification From a Large Substrate
Abigail Chesness*; Rachel L. Creager; Thomas A. Meyer, MS

5:00 p.m. - 5:15 p.m.  H131  Eye Temperature Measured After Death in Human Bodies as an Alternative Method of Time-of-Death Estimation in the Early Postmortem Period
Michal Kalisz, PhD*; Magdalena Wujtewicz, PhD

5:15 p.m. - 5:30 p.m.  H132  Cold Case Homicides: DNA Testing of Retained Autopsy Sexual Assault Smears
Michelle S. Clark, MS*; Angela McGuire, MD; Kristin Sasinoski, MSFS; James R. Gill, MD

5:30 p.m. - 5:45 p.m.  H133  Normalization of Polymerase Chain Reaction (PCR) -Based Quantification Using 9947A Human Standard DNA
Grace S. Woods, BS*; Rachel L. Creager

5:45 p.m. - 6:00 p.m.  H134  Body Coloration Artifacts in Forensic Autopsy
Asit Kumar Sikary, MD*; Chittaranjan Behera, MD

6:00 p.m. - 6:15 p.m.  H135  A Study on Detection of A-Helix Protein in Post-Traumatic Epileptogenic Focus by Fourier Transform Infrared (FTIR) Mapping
Bin B. Dai*; Siyang Xiang; Xu Wang, MD; Tiantong Yang

Friday—Session I

Multidisciplinary Session: Pathology/Biology I/Toxicology—Postmortem Forensic Toxicology, Part I

Moderator: Rebecca Jufer Phipps, PhD  Office of the Chief Medical Examiner  Baltimore, MD

8:30 a.m. - 8:45 a.m.  H136  Trends in Novel Opioid Use in the United States From January 2014 Through April 2018 in Medicolegal Death Investigations (MDIs) and Strategies to Improve Early Identification, Detection, and Interpretation
Barry K. Logan, PhD*; Sherri L. Kacinko, PhD; Donna M. Papsun, MS; Amanda L.A. Mohr, MSFS

*Presenting Author
8:45 a.m. - 9:00 a.m.  **H137** Acetaminophen Toxicity Deaths in New Mexico: 1990–2016  
Lori A. Proe, DO*; Sarah Lathrop, DVM, PhD

9:00 a.m. - 9:15 a.m.  **K69** Infant and Toddler Deaths Associated With Potent Opioid Exposure  
Robert Hargrove, BS*; Sandra C. Bishop-Freeman, PhD*; Ruth E. Winecker, PhD

9:15 a.m. - 9:30 a.m.  **H138** Comparative and Correlation Studies of Biochemical Substances in Vitreous Humor (VH) and Synovial Fluid (SF)  
Supawon Srettabunjong, MD, MSc, MTox, LLB*; Wantawanop Thongphap, BSc*; Anchalee Chittamma*; Wanna Thongnoppakhun*

9:30 a.m. - 9:45 a.m.  **K70** A Comparison of Cannabinoid Concentrations in Central and Peripheral Postmortem Blood Samples  
Daniel S. Isenschmid, PhD*; William H. Anderson, PhD; Barry K. Logan, PhD

9:45 a.m. - 10:00 a.m.  **H139** The Outbreak of Fentanyl-Related Deaths in Cook County, Illinois, Between October 2015 and December 2017: A Retrospective Study and a Comparison With Previous Data  
Lorenzo Gitto, MD*; Steven M. White, MD, PhD; Ponni Arunkumar, MD; Serenella Serinelli, MD*

10:00 a.m. - 10:15 a.m.  **Break**  
Sponsored by: The Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation  
Lemos Toxicology Services LLC  
NMS Labs

---

**Multidisciplinary Session: Pathology/Biology I/Toxicology—Postmortem Forensic Toxicology, Part II**

**Moderator:** Laura M. Labay, PhD  
NMS Labs  
Willow Grove, PA  
**Co-Moderator:** Douglas E. Rohde, MS  
Lake County Crime Laboratory  
Painesville, OH

10:15 a.m. - 10:30 a.m.  **K71** A Comparison of Syringe Contents to Respective Biological Counterparts in 43 Medical Examiner Cases  
Sophia Brathwaite, BSc*; Lucas W. Zarwell, MFS; Samantha Tolliver, PhD; Chikarlo R. Leak, PhD; Roger A. Mitchell, Jr.

10:30 a.m. - 10:45 a.m.  **H140** Loperamide Intoxication: Case Reports and a Review of the Literature  
Paul Uribe, MD*

10:45 a.m. - 11:00 a.m.  **K72** Suicide by Pesticide? A Case Study of Fenobucarb Ingestion  
Marissa J. Finkelstein, MS*; Katherine L. Kenerson, MD; George W. Hime, MS; Diane Boland, PhD

11:00 a.m. - 11:15 a.m.  **H141** Cocaine as the Sole Intoxicant in an Unusual Suicidal Overdose  
Michael Heninger, MD*

11:15 a.m. - 11:30 a.m.  **K73** Death Due to Acute Nicotine Intoxication  
Tiffany A. Hollenbeck, DO*; Marius Tarau, MD; Lindsey J. Haldiman, DO

11:30 a.m. - 11:45 a.m.  **H142** The Utilization of Preliminary Urine Drug Screens in Heroin- and Fentanyl-Related Deaths  
Gerald Feigin, MD*

11:45 a.m. - 1:00 p.m.  **Lunch**

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>H143</td>
<td>WITHDRAWN</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H144</td>
<td>A Modern Application of Forensic Anthropology in Coroner and Medical Examiner Offices: A Preview</td>
<td>Katharine Chapman Pope, MA*; Lindsay H. Trammell, PhD; Sharon M. Derrick, PhD; Elizabeth A. Miller, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H145</td>
<td>The Histomorphology of Cranial Fracture Healing: Case Examples</td>
<td>Carolyn V. Isaac, PhD*; Jered B. Cornelison, PhD; Joseph A. Prahlow, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H146</td>
<td>A Comparison of Three Methods for Assessment of Bone Decalcification Time and Quality of Histological Slides for Cranial Fracture Healing Investigation</td>
<td>Jered B. Cornelison, PhD*; Carolyn V. Isaac, PhD; Joseph A. Prahlow, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H147</td>
<td>Drugs and Homicide in Memphis and Shelby County: A Continued Epidemic of Violence—2014–2016</td>
<td>David W. Coates, MS*; Benjamin J. Figura, PhD; Sherri L. Kacinko, PhD; Kevin Jenkins, MD; Paul V. Benson, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H148</td>
<td>Violence Against Vulnerable Persons: The Death of a Transgendered Individual in Mississippi</td>
<td>L.R. Funte, MD; Mark M. LeVaughn, MD*; Brent Davis, MD; Anastasia Holobinko, PhD; Steven A. Symes, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H149</td>
<td>The Tale of an Operating Room Fire Fatality</td>
<td>Tasha Zemrus Greenberg, MD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H150</td>
<td>The Botanical Survey in the Collection of Scientific Evidence for Reconstructing the Dynamics of Deaths From High Falls: A Case Report and Review of Literature</td>
<td>Isabella Aquila, MD*; Matteo A. Sacco, MD*; Fabrizio Barbagnalo, MD; Francesco Sicilia, MD*; Vincenzo Rania, MD; Santo Gratteri, MD; Pietro Tarzia, MD; Pietrantonio Ricci, MD, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H151</td>
<td>Deaths Due to Illegal Immigration: Always Drowning?</td>
<td>Isabella Aquila, MD*; Fabrizio Cordasco, MD*; Francesco Sicilia, MD*; Santo Gratteri, MD; Matteo A. Sacco, MD; Pietrantonio Ricci, MD, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H152</td>
<td>An Unusual Case of Suicide Due to a Gas Mixture Poisoning</td>
<td>Isabella Aquila, MD*; Matteo A. Sacco, MD*; Roberto Raffaele, BE*; Santo Gratteri, MD; Luigi De Aloe, MD*; Pietrantonio Ricci, MD, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H153</td>
<td>A Multidisciplinary Forensic Approach in the Analysis of Skeletal Remains: A Chronology of Injuries and Dynamics of Events</td>
<td>Sara Sablone, MD; Antonio De Donno, PhD; Chiara Lauretti; Ilaria Santoiemma*; Francesco Introna, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H154</td>
<td>Spleen Attenuation and Routine Measurements With Regard to Cause of Death and Estimation of Spleen Weight: A Study on Postmortem Computed Tomography (PMCT)</td>
<td>Vasiliki Chatzaraki, MD*; Wolf Schweitzer*; Michael Thali, MD; Garyfalia Ampanozi, MD</td>
</tr>
</tbody>
</table>
11:30 a.m. - 1:00 p.m.  H155  “ Enlightened ”: The Effect of Training Forensic Pathology Residents With LED-Enhanced Point-and-Shoot Cameras for Forensic Macro Photography  
Valeria Hofer*; Michael Thali, MD*; Rosa M. Martinez, MD*; Wolf Schweitzer*  

11:30 a.m. - 1:00 p.m.  H156  Multiplanar Reconstruction (MPR) of Antemortem Computed Tomography (CT) Images to Visualize Sphenoidal Sinus and Cranial Base Morphology for Identification Purposes  
Carlos J. Zambrano, PhD*; Angela Berg, MA, RN; Marc Allen Harrison, MD; Eric Duval, DO; Inas Z. Yacoub, MD  

11:30 a.m. - 1:00 p.m.  H157  3D Anatomical Model Acquisition and Reproduction of Human Organs: Which Perspectives for Forensic Pathology?  
Antonio Guajana*; Francesco Di Paola; Marco Arrigo; Stefania Zerbo, MD; Elvira Ventura Spagnolo, MD; Gennaro Baldino; Daniele Daricella, MD; Dario Saguto, MD; Mariella Farella, MD; Giosue' Lo Bosco, PhD; Fabio Buccheri, MD; Francesco Cappello; Antonina Argo  

11:30 a.m. - 1:00 p.m.  H158  The Value of Postmortem Computed Tomography (PMCT) in the Examination of Advanced Decomposed Bodies  
Alessandro Santurro, MD*; Gaia Cartocci; Matteo Scopetti, MD; Vittorio Gatto, MD; Mariantonia Di Sanzo, MD; Raffaele La Russa, MD  

11:30 a.m. - 1:00 p.m.  H159  An Interesting and Timely Dental Identification in a Uniquely Posed Decomposed Female Using Premortem Computed Tomography (CT) Images and Postmortem Radiographs  
Tasha Zemrus Greenberg, MD*; Roger D. Metcalf, DDS, JD  

11:30 a.m. - 1:00 p.m.  H160  Postmortem Computed Tomography (PMCT) Investigation in Cases of Suspected Infanticide  
Nivia A.M. Matias, MD*; Sara Anieli Costa Braz Fonseca, MD  

11:30 a.m. - 1:00 p.m.  H161  Fatal Nitrous Oxide Intoxication—Suicide or Accident?  
Serge Schneider, PhD; Martine Schaul, MD; Thorsten Schwark, MD*  

11:30 a.m. - 1:00 p.m.  H162  Accidental Corrosive Acid Poisoning in an Infant: A Case Report  
Manoj Bhausaheb Parchake, MD*  

11:30 a.m. - 1:00 p.m.  H163  Homicide by Intramuscular Cyanide Injection: Investigation and Adjudication  
Megan R. Hall, BA*; Wendy M. Gunther, MD  

11:30 a.m. - 1:00 p.m.  H164  Validation of a Urine Drug Screen Assay in the Postmortem Setting  
Emily Wolak, DO*; Sarah Lathrop, DVM, PhD; Monique Dodd, PharmD; Hannah A. Kastenbaum, MD  

11:30 a.m. - 1:00 p.m.  H165  An Immunohistochemical Study of Central Nervous System (CNS) Damage in Two Drug Abusers (Synthetic Cannabinoids, Synthetic Cathinones, and Phenethylamine Derivatives)  
Mio Takayama, PhD*; Masayuki Kashiwagi, PhD; Aya Matsusue, PhD; Brian Joseph Waters, MS; Kenji Hara, PhD; Natsuki Ikematsu, BPharm; Shin-ich Kubo, PhD  

11:30 a.m. - 1:00 p.m.  H166  Filicide-Feticide-Suicide: An Unusual Variant of Triadic Death  
Nilesh K. Tumram, MD*  

*Presenting Author
PATHOLOGY/BIOLOGY

11:30 a.m. - 1:00 p.m.  
H167 The Evolution of the Opioid Crisis in Cuyahoga County, Ohio, From 2012 to 2016  
Vaishali S. Deo, MD*; Thomas P. Gilson, MD

11:30 a.m. - 1:00 p.m.  
Gruschenka Mojica Sanchez, MD*; Rebecca Jufer Phipps, PhD; David R. Fowler, MD

11:30 a.m. - 1:00 p.m.  
H169 Aqueous Fluid as a Viable Substitute for Vitreous Fluid in Postmortem Chemistry Analysis  
Daniel C. Butler, MD*; Cynthia A. Schandl, MD, PhD; S. Erin Presnell, MD

11:30 a.m. - 1:00 p.m.  
H170 The Frequency of Cannabinoids in a Medical Examiner Population  
Caitlin N. Markey; Michael A. Markey, MD*; Patrick A. Hansma, DO; Luke R. Vogelsberg

11:30 a.m. - 1:00 p.m.  
H171 Generalized Organomegaly and the Use of Performance-Enhancing Substances Identified Following Sudden Death  
Stephanie Diu, BA*; Jennifer L. Hammers, DO

11:30 a.m. - 1:00 p.m.  
H172 Three Deaths in Tarrant County, Texas, Related to the Use of 25H-NBOMe, 25B-NBOMe, or 25I-NBOMe  
Tasha Zemrus Greenberg, MD*; Robert D. Johnson, PhD; Richard C. Fries, DO; Susan J. Roe, MD

11:30 a.m. - 1:00 p.m.  
H173 Accidental Overdose Deaths Involving Fentanyl and the Growing Trend of Counterfeit Prescription Pills in New Mexico  
Jolee T. Suddock, DO*; Sarah Lathrop, DVM, PhD; Garon Bodor, MS; Matthew D. Cain, MD

11:30 a.m. - 1:00 p.m.  
Ayomide Oludoyi, BS*; Sarah J. Sides, BS*; Alyssa Dean, MS*; Allison C. Klein, BA; David R. Fowler, MD; Mary G. Ripple, MD; Ling Li, MD

11:30 a.m. - 1:00 p.m.  
H175 Fatal Rodenticide Poisoning in Association With Synthetic Cannabinoid Use—Is It Industrial Contamination?  
Rochelle A. Simon, MD*; David R. Fowler, MD; John Stash, DO

11:30 a.m. - 1:00 p.m.  
H176 An Excipient-Induced Oxycodone Fatality  
Deanna A. Oleske, MD; Drake Ryan Thrasher, BS*; Jeff Walterscheid, PhD

11:30 a.m. - 1:00 p.m.  
H177 A Medical Examiner's Office Review of Mechanisms of Injury in Crush-Related Deaths  
Catherine Rood, BS*; Robert J. Bready, MS; Dennis J. Chute, MD*

11:30 a.m. - 1:00 p.m.  
William Sago, MD*; Paul V. Benson, MD

11:30 a.m. - 1:00 p.m.  
Allison C. Klein, BA*; Kelsey Mason, BS*; David R. Fowler, MD; Mary G. Ripple, MD; Ling Li, MD

*Presenting Author
Natural Disease

**Moderator:** Giancarlo Di Vella, MD, PhD  
University of Torino  
Department of Public Health Sciences  
Sezione di Medicina Legale  
Torino, ITALY

**Co-Moderator:** Thomas P. Gilson, MD  
Cuyahoga County Medical Examiner’s Office  
Cleveland, OH

1:00 p.m. - 1:15 p.m.  **H180** Trousseau’s Syndrome in Forensic Medicine  
Henry J. Carson, MD*

1:15 p.m. - 1:30 p.m.  **H181** Exercise-Associated Hyponatremia: An Update  
Paul Uribe, MD*

1:30 p.m. - 1:45 p.m.  **H182** Sudden Unexpected Death in Pemphigus Vulgaris: An Autopsy Report  
Asit Kumar Sikary, MD*

1:45 p.m. - 2:00 p.m.  **H183** Sudden Death Caused by Bilateral Diaphragmatic Eventration in Myotonic Dystrophy Type 1  
Sulin Wu, PhD*; Joseph A. Prahlow, MD

2:00 p.m. - 2:15 p.m.  **H184** Mutations of Plakophilin-2 (PKP2) in Sudden Unexplained Death (SUD)  
Junyi Lin; Bi Xiao; Ziqin Zhao, MS; Sisi Cheng; Yiwen Shen; Mingchang Zhang*

2:15 p.m. - 2:30 p.m.  **H185** The Use of High-Mobility Group Protein (HMGB1) to Determine Time Since Death: An Autopsy-Based Study  
Paneet Setia, MD*; Rutwik D. Shedge, MSc; Anupama Modi, MSc; Purvi Purohit, PhD; Praveen Sharma

2:30 p.m. - 2:45 p.m.  **H186** Fatal Angioedema Due to a Delayed Hypersensitivity Reaction Associated With Hair Dye and a Temporary Tattoo  
Ami L. Jackson, DO*; Jerri McLemore, MD

2:45 p.m. - 3:00 p.m.  **H187** Fatal Clostridial Necrotizing Fasciitis Resulting From Skin Popping in Heroin Abusers  
Hannah Elysse Bielamowicz, MD*; Kendall V. Crowns, MD; Keith Pinckard, MD, PhD; Michelle S. Montonera, MS

3:00 p.m. - 3:15 p.m.  Break

**Trauma**

3:15 p.m. - 3:30 p.m.  **H188** Cable-Tie Neck Ligatures: A Series of Five Cases  
Nicole B. Ahmed, BA*; Laura Bauler, PhD; Joyce L. deJong, DO; Jacqueline J. Pender, MD; Theodore T. Brown, MD; Joseph A. Prahlow, MD

3:30 p.m. - 3:45 p.m.  **H189** Unrecognized Anatomical Larynx Variants May Lead to More Than 70% of False Larynx Fractures  
Joao E.S. Pinheiro, PhD, MD*; José L. Cascallana, PhD; Benito Lopez de Abajo, MD; Xose L. Otero, PhD; Maria Sol Rodriguez-Calvo, PhD

*Presenting Author
PATHOLOGY/BIOLOGY

3:45 p.m. - 4:00 p.m. H190 It's Not Just Assault Rifles: A Case Study of a Mass Shooting Involving a Shotgun
Brooke H. Blake, MD*; Erin A. Barnhart, MD

4:00 p.m. - 4:15 p.m. H191 Elevator-Related Deaths
Joseph A. Prahlow, MD*; Zuhha Ashraf; Natalie Plaza, MD; Christopher B. Rogers, MD;
Pamela A. Ferreira, MD; David R. Fowler, MD; Melissa M. Blessing, DO;
Dwayne A. Wolf, MD, PhD; Michael A. Graham, MD; Kelly L. Sandberg, MS;
Krista L. Timm, MD; Theodore T. Brown, MD; Patrick E. Lantz, MD

4:15 p.m. - 4:30 p.m. H192 Who Pulled the Trigger ... First?: The Biomechanics of a Ballistic Injury
Steven A. Symes, PhD*; Mark M. LeVaughn, MD; Ericka N. L'Abbe, PhD

4:30 p.m. - 4:45 p.m. H193 Tractor-Related Fatalities
Tracy C. Johnson, BS; Abigail Jacqueline Grande, MPH; Amanda O. Fisher-Hubbard, MD*

4:45 p.m. - 5:00 p.m. H194 Postmortem Computed Tomography (PMCT) in Shooting Fatalities
Marloes E.M. Vester, MD*; Rick R. Van Rijn, PhD; Chandra Y. Gerrard, BS;
Kurt B. Nolte, MD; Reinoud D. Stoel, PhD; Gary M. Hatch, MD

Friday—Session II

Jay Dix Memorial Bonus Day

9:00 a.m. - 9:10 a.m. H195 Jay Dix Memorial Bonus Day Introduction
Michael A. Graham, MD*

9:10 a.m. - 10:00 a.m. H195 Firearm Injuries
Andrew M. Baker, MD*

10:00 a.m. - 10:15 a.m. Break

10:15 a.m. - 11:05 a.m. H195 Update on the Investigation of Infant Sudden Deaths
Tracey S. Corey, MD*

11:05 a.m. - 11:55 a.m. H195 An Investigation of Suicide
Jonathan Hayes, MD*

11:55 a.m. - 2:00 p.m. Lunch

2:00 p.m. - 2:50 p.m. H195 An Investigation of Environment-Related Deaths
Joseph A. Prahlow, MD*

2:50 p.m. - 3:05 p.m. Break

3:05 p.m. - 3:55 p.m. H195 Sports-Related Deaths
Joyce L. deJong, DO*

3:55 p.m. - 4:45 p.m. H195 Asphyxia
James R. Gill, MD*
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m.  I1 Closing Judicial Psychiatric Hospitals: Not Guilty by Reason of Insanity Offenders’ Socially Dangerous Treatment Inside the Psychiatric Community Network—An Italian Perspective
   Felice F. Carabellese, MD*; Luca Castelletti, MD; Franco Scarpa, MD; Donatella La Tegola, PhD; Roberto Catanese, MD

11:30 a.m. - 1:00 p.m.  I2 The Hearsay Rule: An Adversary to the Mental Health Field—Which Field Is Next?
   Amber N. Bridges, MD*

11:30 a.m. - 1:00 p.m.  I3 The Art of Manliness: Law, Gender, and Sexuality in a 19th-Century Case Study
   Annarita Franza, PhD*; Vincenzo Lusa, JD*

11:30 a.m. - 1:00 p.m.  I4 Use of the Minnesota Multiphasic Personality Inventory*-2 (MMPI*-2) and Rorschach Test in Forensic Psychological and Psychiatric Evaluations Regarding Parenting in the Context of Marital Conflicts
   Ignazio Grattagliano, PsyD*; Romy Greco, PsyD; Anna Convertini; Giancarlo Di Vella, MD, PhD; Valeria Affatati, PhD; Lucrezia Cavallo, PhD; Filippo Campobasso, PhD; Luciana Lo Bianco, PhD; Ylenia Massaro, PhD; Valentina Stallone, PhD; Roberto Catanese, MD

11:30 a.m. - 1:00 p.m.  I5 Aging and Prison: A Study of a Large Number of Italian Penitentiaries
   Ignazio Grattagliano, PsyD*; Carlo A. Romano; Luisa Ravagnani, PhD; Silvio Tafuri; Francesco Paolo Bianchi, PhD; Carlo P. Campobasso, MD, PhD; Graziamaria Corbi, PhD; Patrizia Gasparo; Roberto Catanese, MD

Thursday

Psychopathy and Theory of Aggression

Moderator: Alick Wang, BSc
McMaster University
Hamilton, ON, CANADA

Co-Moderator: Alexia Delbreil
Chu La Milétrie
Département De Médicine Légale
Poitiers, FRANCE

8:45 a.m. - 9:00 a.m.  I6 Assessing the Risk of Violence for Psychopaths: What Is the Right Method?
   Sebastien S. Prat, MD*; Gary A. Chaimowitz, MD

9:00 a.m. - 9:15 a.m.  I7 A Psychopathologic and Etiologic Analysis of Psychopathic Traits in Klinefelter Syndrome
   Raphaëlle Jouin*

9:15 a.m. - 9:35 a.m.  I8 Aggression Is Inversely Related to Serum Cholesterol
   John L. Young, MD*

*Presenting Author
9:35 a.m. - 9:50 a.m.  I9  Serotonin and Aggression in Children and Adolescents: A Systematic Review  
R. Ryan Leahy, MD*

9:50 a.m. - 10:00 a.m.  Break

**Particular Types of Violence**

*Moderator: John L. Young, MD  
Yale University  
New Haven, CT  
Co-Moderator: R. Ryan Leahy, MD  
Charleston, SC*

10:00 a.m. - 10:15 a.m.  I10  An Update on Female Arsonists: A Systematic Review  
Alick Wang, BSc*; Yedishtra Naidoo, MD; Sebastien S. Prat, MD

10:15 a.m. - 10:30 a.m.  I11  Spousal Homicide: What Do We Know and How Do We Prevent It From Happening?  
Alexia Delbreil*; Jean-louis Senon

10:30 a.m. - 11:00 a.m.  I12  Linguistic Indicators for Psychological Violence Detection in the Language of Domestic Abusers  
Victoria Guillén, PhD*

11:00 a.m. - 11:30 a.m.  I13  Bullying and Sexting on Social Networks  
Cinzia Gimelli, PsyD, PhD*; Luciano Garofano, PhD*

11:30 a.m. - 1:00 p.m.  Lunch

**Poster Session**

11:30 a.m. - 1:00 p.m.  I14  The Rorschach Test and Perpetrators of Homicide  
Ignazio Grattagliano, PsyD*; Salvatore Zizolfi, MD; Antonella Valerio; Daniele Zizolfi, MD; Stefania Zecca, PhD; Alessio Ostuni, MD; Roberto Catanese, MD

11:30 a.m. - 1:00 p.m.  I15  Firearm-Bearing Rates During Neuropsychiatry Hospital Admission  
Oktay Cavus*; Gokben Sayar, PhD; Sevil Atasoy, PhD; Kadri Dalgić*

11:30 a.m. - 1:00 p.m.  I16  I Am Not Pregnant: A Multidisciplinary Approach in a Case of Feticide Due to Denial of Pregnancy  
Ilaria Santoiemma*; Alessio Ostuni, MD; Matteo Favia; Sara Sablone, MD; Francesco Introna, MD; Felice F. Carabellese, MD; Roberto Catanesi, MD

11:30 a.m. - 1:00 p.m.  I17  Overkill by Proxy  
Alessio Ostuni, MD; Giuliana D’anna; Federica Mele, MD*; Davide Ferorelli; Biagio Solarino, PhD; Roberto Catanesi, MD; Francesco Introna, MD

11:30 a.m. - 1:00 p.m.  I18  “Corrective Rape” and Its Medicolegal Aspects  
Anil Aggrawal, MD*
Serial Killers & Cannibalism

Moderator: Eleanor B. Vo, MD  
OmaDesala Psychiatric Services  
Ewing, NJ  
Co-Moderator: Ingrid Bertsch, MA  
University Hospital Center of Tours  
Hopital Trousseau  
Tours, FRANCE

1:00 p.m. - 1:15 p.m.  I19 The Psychopathologic Profile of Cannibals: A Review of Five Cases  
Sophie Raymond, MD*

1:15 p.m. - 1:35 p.m.  I20 The Vicarious and Literal Consumption of Identity: Interpreting Psychological Cannibalism  
Julian C.W. Boon, PhD*; Lynsey F. Gozna, PhD

1:35 p.m. - 1:50 p.m.  I21 Serial Killers Seen on the Other Side of the Atlantic  
Nidal Nabhan Abou, MD*

1:50 p.m. - 2:00 p.m.  Break

Symposium on Child Pornography and Child Sex Dolls

Moderator: Emily D. Gottfried, PhD  
Medical University of South Carolina  
Charleston, SC  
Co-Moderator: Taylor J. Willis  
Claflin University  
Orangeburg, SC

2:00 p.m. - 3:30 p.m.  I22 Child Pornography and Child Sex Dolls: An Expanding Virtual Phenomenon  
Dean Michael De Crisce, MD*; Sébastien S. Prat, MD*; Eleanor B. Vo, MD*; Jessica Morel, DO*; Renee Sorrentino, MD*; Matthew E. Hirschtritt, MD, MPH

3:30 p.m. - 3:45 p.m.  Break

Sexual Offenders, Characteristics, and Cognition

Moderator: Dean Michael De Crisce, MD  
Special Treatment Unit  
Avenel, NJ  
Co-Moderator: Sébastien S. Prat, MD  
St. Joseph’s Healthcare-McMaster University  
Forensic Psychiatry Program  
Hamilton, ON, CANADA

3:45 p.m. - 4:00 p.m.  I23 A Psycho-Criminological Profile of Child Sex Offenders  
Mathieu Lacambre, MD*; Cindy Prudhomme; Helena Berthet; Philippe Courtet, MD

4:00 p.m. - 4:15 p.m.  I24 A Sample of Men Convicted of or Charged With a Sex Offense: Penile Plethysmography (PPG) Results  
Emily D. Gottfried, PhD*; R. Gregg Dwyer, MD, EdD

4:15 p.m. - 4:30 p.m.  I25 Understanding Sexual Offenders: The Importance of Personality Dimensions  
Ingrid Bertsch, MA*; Christian Réveillère; Thierry H. Pham; Robert Courtois, PhD

4:30 p.m. - 4:45 p.m.  I26 Sex Offender Reading Levels: Recidivism, Referral, and Age of First Offense  
Taylor J. Willis*; Emily D. Gottfried, PhD; R. Gregg Dwyer, MD, EdD
Friday

Forensic Practice: Admission, Assessment, and Treatment

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 a.m. -</td>
<td>I27</td>
</tr>
<tr>
<td>9:20 a.m.</td>
<td>Characteristics of a Forensic Inpatient Sample in a Strict Security Facility: An Update</td>
</tr>
<tr>
<td>9:20 a.m. -</td>
<td>I28</td>
</tr>
<tr>
<td>9:40 a.m.</td>
<td>Implementing Cognitive Behavioral Therapy for Psychosis (CBTp) With Forensic Patients: The Identification of Barriers to Positive Treatment Outcomes</td>
</tr>
<tr>
<td>9:40 a.m. -</td>
<td>I29</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>The Relationship Between Mental Illness, Criminal Offenses, and Discharge</td>
</tr>
<tr>
<td>10:00 a.m. -</td>
<td>Break</td>
</tr>
</tbody>
</table>

Legal and Ethical Issues

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:15 a.m. -</td>
<td>I30</td>
</tr>
<tr>
<td>10:35 a.m.</td>
<td>A Poorly Thought-Out Method to Reduce Homelessness: Proposed California Assembly Bill 1971</td>
</tr>
<tr>
<td>10:35 a.m. -</td>
<td>I31</td>
</tr>
<tr>
<td>10:55 a.m.</td>
<td>Assessing the Propensity for the Future Risk of Revenge in Secure Forensic Settings and in the Community: An Evidence-Based Approach</td>
</tr>
<tr>
<td>10:55 a.m. -</td>
<td>I32</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>Ethical Challenges in Forensic Psychiatric Practice</td>
</tr>
<tr>
<td>11:15 a.m. -</td>
<td>I33</td>
</tr>
<tr>
<td>11:35 a.m.</td>
<td>Mistaken Identity: Cultural, Religious, and Ideological Beliefs in Forensic Evaluation</td>
</tr>
<tr>
<td>11:35 a.m. -</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

*Presenting Author
### Poster Session

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>I34</td>
<td>The Phenomenon of Suicide-Peticide: Case Reports and a Review of the Literature</td>
<td>Federica Fersini*; Chiara Palazzo, MD; Paolo Fais, PhD; Susi Pelotti, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>I35</td>
<td>A Fatal Pulmonary Embolism in a Hospitalized Psychiatric Patient: A Medicolegal Analysis</td>
<td>Biagio Solarino, PhD; Alessio Ostuni, MD*; Alessandro Dell’Erba, PhD; Salvatore Moliterno, MD; Roberto Catanesi, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>I36</td>
<td>Awareness and Attitudes of Healthcare Professionals in Unperceived Pregnancies</td>
<td>Oktay Cavus; Inci Y. Tezbasan, BSc*; Gokben Sayar, PhD; Sevil Atasoy, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>I37</td>
<td>Sudden Death Caused by Hyponatremia Related to Psychogenic Polydipsia</td>
<td>Rohan P. Kedar, MD*; Joseph A. Prahlow, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>I38</td>
<td>The Brains of Suicides by Violent Methods Reveal a Distinct Biology</td>
<td>Giovanna Punzi*; Gianluca Ursini, MD, PhD; Leonardo Collado Torres, PhD; Joo Heon Shin, PhD; Roberto Catanesi, MD; Andrew E. Jaffe, PhD; Thomas M. Hyde, MD, PhD; Joel E. Kleinman, MD, PhD; Daniel R. Weinberger, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>I39</td>
<td>The Contribution of Suicide Notes in the Resolution of Doubtful Cases of Suicide: From the Psychological Autopsy to the Forensic Evidence—A Case Report and Review of the Literature</td>
<td>Isabella Aquila, MD*; Ada Maida, MD; Santo Gratteri, MD; Fabrizio Cordasco, MD*; Luigi De Aloe, MD*; Roberto Raffaele, BE*; Valerio Riccardo Aquila*; Pietranantonio Ricci, MD, PhD</td>
</tr>
</tbody>
</table>

### Miscellaneous

**Moderator:** Debra M. Osterman, MD  
**Co-Moderator:** Oktay Cavus, MSc  
Mental Health and Mental Retardation Authority  
Forensic Assertive Community Treatment Team  
Houston, TX

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m.</td>
<td>I40</td>
<td>When Freedom of Speech Harms: 13 Reasons Why and Its Influence on Suicide in Youths</td>
<td>Sharon L. Guo, MD*</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>I41</td>
<td>Parental Alienation: Misinformation and Fake News</td>
<td>William Bernet, MD*</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>I42</td>
<td>Repressed Memory Syndrome Goes to Court: The Lopez Hearing</td>
<td>Vivian Shnaidman, MD*</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>I43</td>
<td>A New Classification of Exhibitionism</td>
<td>Anil Aggrawal, MD*</td>
</tr>
</tbody>
</table>
QUESTIONED DOCUMENTS

Wednesday

Poster Session

11:30 a.m. - 1:00 p.m. J1 A Pre-Osborn Timeline of Events and References Concerning Handwriting Examination and Forgery
Judith A. Gustafson, BS*

11:30 a.m. - 1:00 p.m. J2 Education and Training in Forensic Document Examination: A Discussion of Issues and Ideas
Mara L. Merlino, PhD*; Veronica B. Dahir, PhD*; Mauricio Alvarez, PhD; Chris Sanchez, MA; J. Guillermo Villalobos, MA; Chris Swinger, MA; Denise Schaar Buis, MA

11:30 a.m. - 1:00 p.m. J3 Evaluation of Gray Value Measurements of Visual Spectral Data to the Characterization of Alcohol-Based Inks From Colored Felt-Tipped Blending Markers
Clarra G. Moore, BS*; Patrick Buzzini, PhD

11:30 a.m. - 1:00 p.m. J4 Laser Printer Identification: A Real Case Study
Jasna Galekovic*

Thursday

Moderator: Ronald N. Morris, BS
RNM&AI
Bedford, VA

8:30 a.m. - 8:40 a.m. Introduction

8:40 a.m. - 9:00 a.m. J5 Measuring the Frequency Occurrence of Handwritten Numerals: An Expanded Database
Thomas W. Vastrick, BS*; Ellen M. Schuetzner, BA; Kelsey Osborn

9:00 a.m. - 10:00 a.m. J6 Cognitive Human Factors and Forensic Document Examiner Methods and Procedures: Key Results From an International Study of Handwriting Experts
Mara L. Merlino, PhD*; Veronica B. Dahir, PhD*; Derek L. Hammond, BA*; La'Quida Smith, MA*; Chandler D. Al Namer, BA; Taleb A. Al Namer, BA; Mauricio Alvarez, PhD; J. Guillermo Villalobos, MA; Charles Edwards, MA

10:00 a.m. - 10:15 a.m. J7 A Methodology for the Removal of Adhesives
Kevin P. Kulbacki, MSFS*

10:15 a.m. - 10:30 a.m. Break

10:30 a.m. - 10:55 a.m. J8 Analysis of Black Toners Using Scanning Electron Microscopy (SEM)
Anna Lasinska*

10:55 a.m. - 11:10 a.m. J9 An Interdisciplinary Study: Alcohol and Its Influence on Breath Alcohol Concentration (BrAC), Blood Alcohol Concentration (BAC), and Handwriting
Andrea Ledic, BS*

*Presenting Author
11:10 a.m. - 11:30 a.m.  J10  The Classification of Raman Patterns From Inkjet Printer Inks Using Visual Comparisons of Spectra and Different Statistical Methodologies  
Patrick Buzzini, PhD*; James M. Curran, PhD; Carrie Polston, BA

11:30 a.m. - 11:45 a.m.  Questions & Answers

11:45 a.m. - 1:00 p.m.  Lunch

Poster Session

11:30 a.m. - 1:00 p.m.  J11  Writing Speed and Fluidity and Accuracy of Calls in High and Low Complexity Signature Comparisons  
Mara L. Merlino, PhD*; Mauricio Alvarez, PhD; Taleb A. Al Namer, BA; J. Guillermo Villalobos, MA; Charles Edwards, MA

11:30 a.m. - 1:00 p.m.  J12  Trends in Forensic Document Examination in Québec, Canada  
Mylene A. Signori, BSc*; Richard K. Van Gheluwe, BSc

11:30 a.m. - 1:00 p.m.  J13  The Examination of Crossed Lines for the Determination of Sequence of Strokes Using Laser Ablation-Inductively Coupled Plasma/Mass Spectrometry (LA-ICP/MS) and X-Ray Fluorescence (XRF)  
Samiah Ibrahim, BSc*; Julie Binette, BS*; Mario Larouche, BS

Moderator:  Jordan C. Brough, MFS  
Homeland Security Investigations Forensic Laboratory  
McLean, VA

1:00 p.m. - 1:20 p.m.  J14  The Comprehensive Analysis of Counterfeit Currency  
Irina Geiman, MS*

1:20 p.m. - 1:40 p.m.  J15  Assessing the Impacts of Induction Spatial Effects on Magnetic Flux Measurements of Toners  
Carrie Polston, BA*; David E. Thompson, PhD; Patrick Buzzini, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

1:40 p.m. - 2:00 p.m.  J16  Contested Estates: A Bloody Mess  
Khody R. Detwiler, BS*

2:00 p.m. - 2:15 p.m.  J17  A Comparative Study of Generation Y and Generation Z Signatures  
Nina A. Harnarine, BSc*

2:15 p.m. - 2:35 p.m.  J18  A Social Science Paradigm for Forensic Handwriting Identification  
Carole E. Chaski, PhD*

2:35 p.m. - 2:50 p.m.  Break

2:50 p.m. - 3:10 p.m.  J19  Seen and Unseen Evidence of the Shroud of Turin and Use of the VP-8 Image Analyzer  
Janis Winchester, MS*

*Presenting Author
QUESTIONED DOCUMENTS

3:10 p.m. - 3:40 p.m.  J20  The Discrimination of Primary and Secondary Impressions on the Second Page of Two-Part Carbonless Copy Paper Using VSC40: A Case Study
Muneeb H. Khan, MPhil*; Khurram W. Mahmood, MPhil*; Muhammad Irfan Ashiq, PhD*; Mohammad A. Tahir, PhD*

3:40 p.m. - 4:40 p.m.  J21  Contemporary Challenges, Expert’s Insights, and Judicial Perspectives on Forensic Document Examination Testimony
Jan Seaman Kelly, BA*; Stephanie Domitrovich, JD, PhD*

4:40 p.m. - 5:00 p.m.  Questions & Answers

Friday

Moderator: Donna O. Eisenberg, MFS
Homeland Security Investigations
Forensic Laboratory
Rockville, MD

8:30 a.m. - 8:55 a.m.  J22  Photo-Polymer Stamps: Their Examination and Identification
F.L. Jim Lee, Jr., MS*

8:55 a.m. - 9:10 a.m.  J23  Invisible Migration of Luminescent Components in Inks in Crossed-Line Intersections
Rhett Williamson, PhD; Daniela Djidrov ska, MS; Andrea Ledic, BS*; Vesna Antikj, MS; Stjepan Brzica, BS; Rolf Hofer, PhD; Jose R. Almirall, PhD

9:10 a.m. - 9:25 a.m.  J24  Reasons for Qualified Opinions in Forensic Document Examination
Jane A. Lewis, MFS*

9:25 a.m. - 9:45 a.m.  J25  The Admissibility of Hand Printing Identification in the United States Courts
Karen J. Nobles, BA *

9:45 a.m. - 10:00 a.m.  J26  Pairwise Comparison Scores for Handwritten Questioned Documents
Danica Ommen, PhD*; Cami Fuglsby, MS; Christopher P. Saunders, PhD; Michael Caligiuri, PhD; Linton Mohammed, PhD; JoAnn Buscaglia, PhD

10:00 a.m. - 10:15 a.m.  Break

10:15 a.m. - 10:45 a.m.  J27  The Evolution of Security Features in International Travel Documents
Carolyn Bayer-Broring, MFS*

10:45 a.m. - 11:00 a.m.  J28  Adding an Objective Approach to Questioned Document Examination Using Principal Component Analysis (PCA) and Mahalanobis Distance
Loren M. Williams, BS*; Lawrence Quarino, PhD; Morgan Mills, MSFS (FSF Emerging Forensic Scientist Award Paper Presentation)

11:00 a.m. - 11:20 a.m.  J29  An Exploratory Analysis of Handwriting Features: Investigating Numeric Measurements of Writing That Are Important for Statistical Modeling
Amy M. Crawford, MS*; Alicia L. Carriquiry, PhD

*Presenting Author
11:20 a.m. - 11:35 a.m.  J30  Toward Consensus in Describing the Component Parts of Handwriting  
*Diane Kruger, JD*

11:35 a.m. - 11:50 a.m.  Questions & Answers

11:50 a.m. - 1:00 p.m.  Lunch

**Poster Session**

11:30 a.m. - 1:00 p.m.  J31  A Comparison of Gaze Behavior in Sequential Versus Simultaneous Presentation of Signatures in a Handwriting Comparison Task  
*Mara L. Merlino, PhD*; *Chandler D. Al Namer, BA*; *Derek L. Hammond, BA*; *Robert S. Olson*; *Piarre Easley, BA*

11:30 a.m. - 1:00 p.m.  J32  Forensic Characterization and Discrimination of Manila Envelopes  
*Maria I. Sanchez-Melo, MS*; *Virginia M. Maxwell, DPhil*; *Irina Geiman, MS*; *Brooke W. Kammrath, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*

11:30 a.m. - 1:00 p.m.  J33  An Examination of the Influence of Various Parameters on the Quality of Laser Printer Printouts  
*Jasna Galekovic*

---

**Moderator:**  
Kevin P. Kulbacki, MSFS  
Internal Revenue Service  
National Forensic Laboratory  
Chicago, IL

1:00 p.m. - 3:00 p.m.  J34  Understanding the Impact of Human Factors on Forensic Examinations: Recommendations From the Expert Working Group for Human Factors in Handwriting Examination  
*Melissa K. Taylor, MA*; *Ted M. Burkes, BS*; *Emily J. Will, MA*; *Reinoud D. Stoel, PhD*

3:00 p.m. - 3:30 p.m.  Questions & Answers

*Presenting Author*
Wednesday

Toxicology Section Awardees Recognition (by invitation only)

6:30 p.m. - 7:30 p.m. Supported by: The Center for Forensic Science Research and Education at the
Fredric Rieders Family Foundation
Lemos Toxicology Services LLC
NMS Labs

Poster Session

<table>
<thead>
<tr>
<th>Moderator: Karen S. Scott, PhD</th>
<th>Co-Moderator: Sarah Urfer, MS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arcadia University</td>
<td>ChemaTox Laboratory, Inc</td>
</tr>
<tr>
<td>Glenside, PA</td>
<td>Boulder, CO</td>
</tr>
</tbody>
</table>

7:30 p.m. - 9:00 p.m. K1 An Improvement for High Sensitivity of Drug Screening by Thermal Desorption
and Pyrolysis Combined With Direct Analysis in Real Time-Mass Spectrometry
(TDP/DART*-MS)
Hiroko Abe, MA; Chikako Takei*; Motoshi Sakakura, PhD; Teruhisa Shiota; Kayako Suga;
Daixuke Yajima, MD; Hitoriaro Iwase, PhD

7:30 p.m. - 9:00 p.m. K2 New β2-Agonists in Sports Doping
Anil Aggrawal, MD*

7:30 p.m. - 9:00 p.m. K3 Screening and Quantitation of Pesticides in Biological Specimens
Muhammad Taimoor Chaudhary, MPhil*; Mohammed Sarwar, PhD;
Sardar Ali Wattoo, MPhil; Mohammad A. Tahir, PhD

7:30 p.m. - 9:00 p.m. K4 Elemental Analysis of Hair and Tissue by Open Vessel Digestion and Inductively
Coupled Plasma/Mass Spectrometry (ICP/MS) Analysis
Beth M. Slaybaugh, MPS*; Donna M. Papsun, MS; Riley Murphy, PhD; Joan Schemmer;
Lee M. Blum, PhD

7:30 p.m. - 9:00 p.m. K5 The Application of Carboxylic Acid Functionalized Multi-Walled Carbon
Nanotubes (COOH-MWCNTs) in the Extraction of Drugs in Plasma
Hee-Sun Chung, PhD*; Heesun Moon, BS

7:30 p.m. - 9:00 p.m. K6 The Simple and Fast Extraction of Pesticides Using Dried Blood Spot (DBS) and Liquid
Chromatography/Quadrupole Time-Of-Flight/Mass Spectrometry (LC/qTOF/MS)
Hee-Sun Chung, PhD*; Sohee Jung, BS

7:30 p.m. - 9:00 p.m. K7 The Analysis of Amino Acid in Vitreous Humor Using Liquid Chromatography/
Mass Spectrometry (LC/MS) for a Postmortem Interval (PMI) Potential Biomarker
Hee-Sun Chung, PhD*; Sujin Kim, BS

7:30 p.m. - 9:00 p.m. K8 Double-Suicide by Gamma-Butyrolactone (GBL) Ingestion: An Analysis by Headspace/
Solid-Phase Microextraction Coupled to Gas Chromatograph/Mass Spectrometer
(HS/SPME/GC/MS) and Tandem Columns
Brian Joseph Waters, MS*; Kenji Hara, PhD; Natsuki Ikematsu, BPharm; Mio Takayama, PhD;
Aya Matsusue, PhD; Masayuki Kashiwagi, PhD; Shin-ich Kubo, PhD

*Presenting Author
7:30 p.m. - 9:00 p.m. K9 Validation of the Neogen® Enzyme-Linked Immuno-Sorbent Assay (ELISA) Cocaine/Benzoylecgonine-2 Kit for Whole Blood and Urine Specimens
Nicholas B. Tiscione, MS*

7:30 p.m. - 9:00 p.m. K10 The Detection of Various Drugs in Human Urine Samples Via Total Vaporization-Solid Phase Microextraction (TV-SPME)
Kymeri E. Davis, BSc*; John V. Goodpaster, PhD

7:30 p.m. - 9:00 p.m. K11 The Postmortem Distribution of 3,4-Methylenedioxymethamphetamine (MDMA) and 3,4-Methylenedioxyamphetamine (MDA) From an Accidental Death Due to MDMA Intoxication
Danylle Kightlinger*; Victor W. Weeden, MD, JD; Lucas W. Zarwell, MFS

7:30 p.m. - 9:00 p.m. K12 The Detection and Quantitation of Ten Synthetic Cannabinoid Metabolites in Human Urine Using High-Performance Liquid Chromatography/Tandem Mass Spectrometry (HPLC/MS/MS)
Cassandra A. Swart, BS*; Daniel Lee, MS; Mikayla Caldwell, BS; Katherine N. Moore, MS; Nichole D. Bynum, MS; Sabra R. Botch-Jones, MS

7:30 p.m. - 9:00 p.m. K13 The Detection and Quantitation of 17 Synthetic Cannabinoids in Human Whole-Blood Using Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) Following Supported Liquid Extraction
Daniel Lee, MS; Shawn Foley, BS; Erika Phung, BS; Cassandra A. Swart, BS; Nichole D. Bynum, MS; Katherine N. Moore, MS; Sabra R. Botch-Jones, MS*

7:30 p.m. - 9:00 p.m. K14 An Analysis of Carboxyhemoglobin in Postmortem Blood and Epidemiology Data of Suicide Autopsy Cases From 2011–2016 in Taiwan
Chu-An Yang, MS*; Hsiu-Chuan Liu, MS; Ray H. Liu, PhD; Dong-Liang Lin, PhD

7:30 p.m. - 9:00 p.m. K15 An Imidacloprid Insecticide Fatal Poisoning: Gas Chromatography/Mass Spectrometry (GC/MS) Detection in Alternative Biological Matrices
Antonella Sorrentino, MD*; Biagio Solarino, PhD; Silvia Trotta; Quintino Mita, BS; Giuseppe Strisciullo, BES; Lucia Aventaggiato

7:30 p.m. - 9:00 p.m. K16 An Impaired Driving Case Involving Xylazine
Ilene K. Alford, MS*; Nicholas B. Tiscione, MS

7:30 p.m. - 9:00 p.m. K17 Liquid Chromatography/Quadrupole Time-Of-Flight (LC/qTOF) Screening for Fentanyl Analogs in Whole Blood and Oral Fluid
Kaitlyn B. Palmquist, BS*; Madeleine J. Swortwood, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

7:30 p.m. - 9:00 p.m. K18 Kava Impairment in Drivers
Ashley A. Gilbert, BS*; Justin Grodnitzky, PhD; Jonna Berry, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

7:30 p.m. - 9:00 p.m. K19 A Comparison of Multiple Extraction/Purification Methods for Novel Psychoactive Substances (NPS) From Biological Matrices
Ashley N. Kimble, BS*; Anthony P. DeCaprio, PhD

7:30 p.m. - 9:00 p.m. K20 Drunk Driving Detected by an Expiratory Alcohol Detector After Chewing Areca Catechu: A Case Report and Result Analysis
Jingjie Wu, PhD*
K21 The Detection and Quantification of 23 Drugs in Blood and Urine Following Solid Phase Extraction (SPE) Using Ultra Performance Liquid Chromatography-Tandem Mass Spectrometry (UPLC-MS/MS)
Courtney McGowan, BS; Kelsie L. Jenquine, BS; Michael Moretto, BS; Shawn Foley, BS; Nichole D. Bynum, MS; Katherine N. Moore, MS; Sabra R. Botch-Jones, MS

K22 Driving Under the Influence of Drugs (DUID) in Different Countries: An Overview
Aldo Di Nunzio; Michele Di Nunzio, BS; Antonello Crisci, MD; Ciro Di Nunzio, PhD

K23 The Impact of Storage Conditions, Sample Volume, and Collection Technique on Blood Alcohol Concentration (BAC) in Non-Decomposed Defibrinated Sheep's Blood
Christian T. Pascual; S. Sharee Lambert, BA; Carrie Hodges, MLS; Melissa M. Bailey, PhD

K24 In Silico Simulation of Fentanalog Raman Spectra
Madison R. Schackmuth, BS; Patrick Buzzini, PhD; Darren L. Williams, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)

K25 The Development of a Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) Analytical Method for Simultaneous Detection of Tetrahydrocannabinol (THC), Cannabidiol, Cannabinol, and 11-Nor-9-Carboxy-Tetrahydrocannabinol in Hair and Its Application to Authentic Hair Samples
Byungseok Cho, PhD; Han Soo Cho, MD; Sangwhan In, PhD; Eunmi Kim, PhD

K26 The Great Enigma of the Cause of Death in Burns: The Role of Forensic Toxicological Surveys—A Case Report and Review of the Literature
Isabella Aquila, MD; Santo Gratteri, MD; Roberto Raffaele, BS; Fabrizio Cordasco, MD; Francesco Sicilia, MD; Matteo A. Sacco, MD; Pietro Tarzia, MD; Simona Mongiardi; Pietrantonio Ricci, MD, PhD

K27 Metabolic Profiling of the Synthetic Cannabinoid AB-FUBINACA Using an Electrochemical Cell, Human Liver Microsomes, Cryopreserved Hepatocytes, and Liquid Chromatography/High Resolution Mass Spectrometry (LC/HRMS)
Eduardo M. Cardoso, MSc

K28 Methadone Overdose in Patients Following Methadone Maintenance Treatment: An Italian Issue
Matteo Favia; Ilaria Santiemina; Quintino Mita, BS; Giuseppe Strisciullo, BES; Francesco Introna, MD; Antonio De Donno, PhD

K29 Yohimbine Quantification in Postmortem Specimens: Two Case Reports
Matthew N. Newmeyer, PhD; Rebecca Jufer Phipps, PhD; Barry S. Levine, PhD; Zabiullah Ali, MD; John Stash, DO; David R. Fowler, MD (FSF Emerging Forensic Scientist Award Poster Presentation)

K30 Validation of an Assay for Amphetamines in Postmortem Samples Using Supported Liquid Extraction (SLE) and Biotage® Extrahera™ Automation Followed by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) Analysis
Heidy P. Rivera, BA; Kristen M. Bailey, MS; Lauren L. Richards-Waugh, PhD; James C. Kraner, PhD

K31 Method Validation for Simultaneous Identification and Quantification of Postmortem Volatiles in Whole Blood (WB), Vitreous Humor (VH), and Cerebrospinal Fluid (CSF) Using Gas Chromatography/Headspace/Flame Ionization Detector (GC/HS/FID)
Supriya Krishna, MSc; Om P. Murty, MD; Ashok K. Jaiswal, PhD; Tabin Millo, MD

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Event Title</th>
<th>Presenting Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 p.m.</td>
<td>Ethylenediamine Opioid Analogs, AH-7921, and U-47700 and Their Actions on Cloned Human OPRM1 Receptors</td>
<td>John L. Krstenansky, PhD*; Alexander C. Zambon, PhD; Thomas Hsu, PhD; Jayapal Mallareddy, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>The Extraction and Quantification of Cocaine and Its Metabolites From Fly Pupae</td>
<td>Shelby M. Sarginson*; Kerry Lynn Opel, MA, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>An Analysis of Alcohol Metabolites Ethyl Glucuronide and Ethyl Sulfate in Human Umbilical Cord Samples</td>
<td>Marykathryn Tynon Moody, MSFS*; Joseph Homan, MS; Denise Nicole Schiller, MSFS; Wendy R. Adams, PhD; Frederick Strathmann, PhD; Barry K. Logan, PhD; Robert A. Middleberg, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>2,4-Dinitrophenol (2,4-DNP)—An “Old New Drug”: A Gas Chromatography/ Mass Spectrometry (GC/MS) Method for Screening and Quantitation of 2,4-DNP in Postmortem Blood Specimens and Three Fatal Poisoning Cases Reports</td>
<td>Eduaardo G. de Campos, MSc*; Melissa Friscia, MSFS; Barry K. Logan, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Quantitation of Fentanyl and Metabolites From Lucilia Sericata Larvae and Liver Tissue Using a Modified Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) Extraction With Analysis by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)</td>
<td>Joseph A. Cox, MS*; Colby Ott, BS; Luis E. Arroyo, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Study of the Mu-, Kappa-, and Delta-Opioid Receptor Models and the Kratom Alkaloids</td>
<td>Reba E. Chamblee*; Caroline Spencer, BS; Pankaj Pandey, PhD; Robert J. Doerksen, PhD; Murrell Godfrey, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Electrochemical Tools for the Rapid Detection of Opioids and Novel Psychoactive Substances (NPS) With Confirmatory Analysis by Liquid Chromatography/Triple Quadrupole/Mass Spectrometry (LC/QqQ/MS)</td>
<td>Colby Ott, BS*; Joseph A. Cox, MS; Hugo Silva, MS; Julia Arcos-Martinez, PhD; Luis E. Arroyo, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>A Comprehensive Analysis of Synthetic Cannabinoids and Metabolites in Oral Fluid (OF) by Online Solid Phase Extraction (SPE) and Liquid Chromatography/ Triple Quadrupole/Mass Spectrometry (LC/QqQ/MS)</td>
<td>Carmen T. Mulet, BS*; Anamary Tarifa, PhD; Anthony P. DeCaprio, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Investigating the Binding of Fentanyl and Fentanyl Analogs to the Opioid Receptors</td>
<td>Marissa A. Teske*; Caroline Spencer, BS; Pankaj Pandey, PhD; Robert J. Doerksen, PhD; Murrell Godfrey, PhD</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Qualitative and Quantitative Analysis of Novel Psychoactive (Hallucinogenic) Drugs in Urine, Oral Fluids, and Blood for Forensic Toxicology</td>
<td>Rory M. Doyle, PhD*; Dominic Andrada, MS; Catherine P. Riley, MS</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Serum Albumin Binds Synthetic Cannabinoids and Model Compounds and Drugs</td>
<td>Oluseyi A. Vanderpuye, PhD*; Alexius K. Lampkin; Johnathan Jones, BS</td>
</tr>
<tr>
<td>7:30 p.m.</td>
<td>Postmortem Distribution of Nicotine and Cotinine in Suicidal Overdoses Following Transdermal and Oral Administration</td>
<td>Rebecca Jufer Phipps, PhD*; Saffia Ahmed Sakinedzad, MD; Mary G. Ripple, MD; Ling Li, MD; David R. Fowler, MD</td>
</tr>
</tbody>
</table>

*Presenting Author
TOXICOLOGY

7:30 p.m. - 9:00 p.m. K44 Surface Enhanced Raman Scattering (SERS) Analysis for Synthetic Opioids
Xuyang He*

7:30 p.m. - 9:00 p.m. K45 WITHDRAWN

Thursday

Annual Lectureship in Toxicology (Not Eligible for CE Credit)

Moderator: Sherri L. Kacinko, PhD
Willow Grove, PA

Co-Moderator: Sabra R. Botch-Jones, MS
Boston University School of Medicine
Biomedical Forensic Sciences
Boston, MA

8:30 a.m. - 9:45 a.m. The Path From Pharmacologist/Toxicologist to Medical Journalist
David J. Kroll, PhD*

9:45 a.m. - 10:00 a.m. Break
Supported by: The Center for Forensic Science Research and Education at the
Fredric Rieders Family Foundation
Lemos Toxicology Services LLC
NMS Labs

Drug Trends: Monitoring and Prevalence

Moderator: Erin L. Karschner, PhD
Armed Forces Medical Examiner System
Dover Air Force Base, DE

Co-Moderator: Robert D. Johnson, PhD
Tarrant County Medical Examiner’s Office
Fort Worth, TX

10:00 a.m. - 10:15 a.m. K46 The Interplay Between Forensic Analysis of Seized Drug and Medicolegal Death Investigation Toxicology in the Investigation of Clinical Intoxications to Support Public Health Preparedness and Response
Barry K. Logan, PhD*; Alex J. Krotulski, MS; Amanda L.A. Mohr, MSFS

10:15 a.m. - 10:30 a.m. K47 The Identification of Synthetic Cannabinoids in Forensic Toxicology Casework Using an Archived High Resolution Mass Spectrometry Data System
Amanda L.A. Mohr, MSFS*; Alex J. Krotulski, MS; Barry K. Logan, PhD

10:30 a.m. - 10:45 a.m. K48 Sample Mining: The Identification of Emerging Novel Psychoactive Substances (NPS) Through Reanalysis of Biological Extracts From Forensic Toxicology Casework
Alex J. Krotulski, MS*; Susan Varnum, PhD; Barry K. Logan, PhD

10:45 a.m. - 11:00 a.m. K49 Fringe Analogs: The Emergence of New Synthetic Drugs in Postmortem Cases in Miami
Elisa N. Shoff, BS*; George W. Hime, MS; Diane Boland, PhD

11:00 a.m. - 11:15 a.m. K50 A Carfentanil Outbreak in Florida in 2016
Chris Delcher, PhD; Yanning Wang, MS; Russell S. Vega, MD; Jessica Hvozdovich, BS*;
Chris W. Chronister, PhD; Bruce A. Goldberger, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

*Presenting Author
11:15 a.m. - 11:30 a.m.  K51  Examining Demographics and Emerging Drug Trends on Accidental Deaths Due to Intoxication in Washington, DC  
Samatha Tolliver, PhD*; Lucas W. Zarwell, MFS

11:30 a.m. - 11:45 a.m.  K52  Long-Term Phencyclidine (PCP) Usage Trends in the District of Columbia  
Kristin Jones, BS; Charis Wynn, MSc*; Lucas W. Zarwell, MFS

11:45 a.m. - 12:00 p.m.  K53  Determining the Prevalence of Gabapentin Abuse Among Opioid Users in Northern Virginia  
Alexa Genalo, MSc*

12:00 p.m. - 1:00 p.m.  Lunch

Analytical Testing and Interpretation

Moderator: Ashraf Mozayani, PharmD, PhD  
Texas Southern University  
Houston, TX

Co-Moderator: Michael R. Corbett, PhD, LLM  
University of Ontario  
Mississauga, ON, CANADA

1:00 p.m. - 1:15 p.m.  K54  The Use of Molecular Modeling to Investigate the Influence of Structural Characteristics on the Binding of Synthetic Cannabinoids to the CB1 Receptor  
Caroline Spencer, BS*; Pankaj Pandey, PhD; Robert J. Doerkson, PhD; Murrell Godfrey, PhD

1:15 p.m. - 1:30 p.m.  K55  Can Synthetic Urine Replace Authentic Urine to Cheat Drug Testing?  
Victor J. Kim, BBA*; Catherine K. Okano, PhD; Caroline Osborne, BS; Deanna Frank, BS; Christopher Meana, BS; Marisol Castaneto, MS

1:30 p.m. - 1:45 p.m.  K56  Detection of In Utero Ethanol Exposure Via Ethyl Glucuronide and Ethyl Sulfate Analysis in Placenta  
Jennifer Hanna; Ana De Castro, PhD; Elena Lendoiro, MD; Angelines Cruz-Landeira, PhD, MD; Manuel Lopez-Rivadulla, PhD; Marta Concheiro-Guisan, PhD*

1:45 p.m. - 2:00 p.m.  K57  Co-Reaction of Lactate/Lactate Dehydrogenase in an Enzymatic Ethanol Assay  
Julia C. Liebl, BA*; Robert H. Powers, PhD

2:00 p.m. - 2:15 p.m.  K58  The Application of Statistical Design of Experiments (DoE) to Assess External Decontamination Methods in Forensic Hair Analysis  
Jennett M. Cheevert, MS*; Anthony P. DeCaprio, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:15 p.m. - 2:30 p.m.  K59  An Evaluation of a Presumptive Screen in Urine as a Rapid Method of Determining Fentanyl-Related Deaths  
Aaron M. Shapiro, PhD*; Andrew Tu, PhD; Michael Moss, MBBS; Jatinder Baidwan, MBBS

2:30 p.m. - 2:45 p.m.  K60  Distinguishing Cyclopropylfentanyl From the Analogs Crotonylfentanyl and Methacrylfentanyl in Two Dimensions: The Utilization of Liquid Chromatography and Mass Spectrometry  
Svante Vikingsson, PhD*; Markus Roman, BS; Robert Kronstrand, PhD

2:45 p.m. - 3:00 p.m.  Break  
Sponsored by: The Center for Forensic Science Research and Education at the  
Fredric Rieders Family Foundation  
Lemos Toxicology Services LLC  
NMS Labs

*Presenting Author
Method Optimization for the Derivatization of 35 Drugs Commonly Reported in Driving Under the Influence of Drugs (DUID) Cases
Lexus R. Rutter, BS*; Jody Searfoss, BA; Kristina Fanning, MS; Danielle A. Mackowsky, MS; Karen S. Scott, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

A Case Report: Driving Under the Influence of Flubromazepam
Erin L. Karschner, PhD*; George F. Jackson, PhD; Jeff Walterscheid, PhD

Toxicological Findings in Driving Under the Influence Cases in Northeast Ohio: A Six-Year Study
Amanda J. Jenkins, PhD*; Kimberly Yacoub, MS; Douglas E. Rohde, MS

Inhalant Abuse: Cases Analyzed for Toluene Over a Three-Year Period
Justine M. Titko, MSFS*; Lee M. Blum, PhD; Dennis J. Miller; Ayako Chan-Hosokawa, MS

The Detection and Quantification of Amphetamine and Norephedrine in Rat Brain, Heart, and Liver Tissues at Different Stages of Decomposition After Internment
Christina Rose Mendralla, BS*; Jolene Bierly, MSFS; Heather L. Harris, JD; Karen S. Scott, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

The Stability of Antidepressants and Antipsychotics in Dried Blood Spots (DBS) in Postmortem Cases
Matteo Moretti, MD*; Francesca Freni, MSc; Silvia D. Visona, MD; Claudia Vignali; Angelo Groppi; Antonio M.M. Osculati, MD; Luca Morini
(FSF Emerging Forensic Scientist Award Paper Presentation)

A Rare Case Report on Sedative-Hypnotic Drug Screening in Homicidal Carbon Monoxide (CO) Poisoning
Linchuan Liao*

Medicinal Drug Suicide: A Six-Year Forensic Survey
Asit Kumar Sikary, MD*; Anu Sasidharan, MD; V.V. Pillay, MD; Chittaranjan Andrade, MD

Toxicology Open Forum (Not Eligible for CE Credit)

Supported by: Agilent Technologies, Inc.
Biotage
**Friday—Session I**

**Multidisciplinary Session: Pathology/Biology/Toxicology—Postmortem Forensic Toxicology, Part I**

**Moderator:** Rebecca Jufer Phipps, PhD  
Office of the Chief Medical Examiner  
Baltimore, MD

8:30 a.m. - 8:45 a.m.  H136  
**Trends in Novel Opioid Use in the United States From January 2014 Through April 2018 in Medicolegal Death Investigations (MDIs) and Strategies to Improve Early Identification, Detection, and Interpretation**  
Barry K. Logan, PhD*; Sherri L. Kacinko, PhD; Donna M. Papsun, MS; Amanda L.A. Mohr, MSFS

8:45 a.m. - 9:00 a.m.  H137  
**Acetaminophen Toxicity Deaths in New Mexico: 1990–2016**  
Lori A. Proe, DO*; Sarah Lathrop, DVM, PhD

9:00 a.m. - 9:15 a.m.  K69  
**Infant and Toddler Deaths Associated With Potent Opioid Exposure**  
Robert Hargrove, BS*; Sandra C. Bishop-Freeman, PhD*; Ruth E. Winecker, PhD

9:15 a.m. - 9:30 a.m.  H138  
**Comparative and Correlation Studies of Biochemical Substances in Vitreous Humor (VH) and Synovial Fluid (SF)**  
Supawan Srettabunjong, MD, MSc, MTox, LLB*; Wantawanop Thongphap, BSc*; Anchalee Chittamma*; Wanna Thongnopakhun*

9:30 a.m. - 9:45 a.m.  K70  
**A Comparison of Cannabinoid Concentrations in Central and Peripheral Postmortem Blood Samples**  
Daniel S. Isenschmid, PhD*; William H. Anderson, PhD; Barry K. Logan, PhD

9:45 a.m. - 10:00 a.m.  H139  
**The Outbreak of Fentanyl-Related Deaths in Cook County, Illinois, Between October 2015 and December 2017: A Retrospective Study and a Comparison With Previous Data**  
Lorenzo Gitto, MD*; Steven M. White, MD, PhD; Ponni Arunkumar, MD; Serenella Serinelli, MD*

10:00 a.m. - 10:15 a.m.  Break  

Sponsored by: The Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation  
Lemos Toxicology Services LLC  
NMS Labs

**Multidisciplinary Session: Pathology/Biology/Toxicology—Postmortem Forensic Toxicology, Part II**

**Moderator:** Laura M. Labay, PhD  
NMS Labs  
Willow Grove, PA

**Co-Moderator:** Douglas E. Rohde, MS  
Lake County Crime Laboratory  
Painesville, OH

10:15 a.m. - 10:30 a.m.  K71  
**A Comparison of Syringe Contents to Respective Biological Counterparts in 43 Medical Examiner Cases**  
Sophia Brathwaite, BSc*; Lucas W. Zarwell, MFS; Samantha Toller, PhD; Chikarlo R. Leak, PhD; Roger A. Mitchell, Jr.

10:30 a.m. - 10:45 a.m.  H140  
**Loperamide Intoxication: Case Reports and a Review of the Literature**  
Paul Uribe, MD*

*Presenting Author
### TOXICOLOGY

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:45 a.m.</td>
<td>K72</td>
<td>Suicide by Pesticide? A Case Study of Fenobucarb Ingestion</td>
<td>Marissa J. Finkelstein, MS*; Katherine L. Kenerson, MD; George W. Hime, MS; Diane Boland, PhD</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>H141</td>
<td>Cocaine as the Sole Intoxicant in an Unusual Suicidal Overdose</td>
<td>Michael Heninger, MD*</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>K73</td>
<td>Death Due to Acute Nicotine Intoxication</td>
<td>Tiffany A. Hollenbeck, DO*; Marius Tarau, MD; Lindsey J. Haldiman, DO</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H142</td>
<td>The Utilization of Preliminary Urine Drug Screens in Heroin- and Fentanyl-Related Deaths</td>
<td>Gerald Feigin, MD*</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Analytical Methods in Forensic Toxicology

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m.</td>
<td>K74</td>
<td>Validation of the Neogen® Enzyme-Linked Immuno-Sorbent Assay (ELISA)</td>
<td>Grayce Behnke, BS*; Nicholas B. Tiscione, MS; John Rakus, PhD; Lauren L. Richards-Waugh, PhD (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>1:15 p.m.</td>
<td>K75</td>
<td>Quantitative Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)</td>
<td>Marilyn A. Huestis, PhD*; Dominic Andrada, MS; Rory M. Doyle, PhD</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>K76</td>
<td>The Identification of Drug Metabolites in Adulterated Urine Samples Using Direct Analysis in Real Time-Time Of Flight/Mass Spectrometry (DART®-TOF/MS)</td>
<td>Bianca E. Olivieri*; Mark Maric, PhD; Candice Bridge, PhD</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>K77</td>
<td>The Quantification of 4-Fluoroamphetamine, 4-Fluoromethamphetamine, 4-Chloroamphetamine, and 4-Chloromethamphetamine in Postmortem Blood and Urine by Ultra High-Performance Liquid Chromatography-Tandem Mass Spectrometry (UHPLC-MS/MS)</td>
<td>Chu-An Yang, MS*; Hsiu-Chuan Liu, MS; Ray H. Liu, PhD; Dong-Liang Lin, PhD</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>K78</td>
<td>Staying Relevant in an Ever-Changing Climate: The Development and Validation of a Confirmatory Qualitative Synthetic Cannabinoid Using Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) Method in Human Whole-Blood</td>
<td>Rebecca A. Mastrovito, MS*; Stephanie Kumor, MA; Joseph Homan, MS; Parul Shah, BS; Denise Nicole Schiller, MSFS; Sherri L. Kacinko, PhD; Barry K. Logan, PhD</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>K79</td>
<td>The Development and Validation of an Analytical Method for the Identification of New Psychoactive Substances (NPS) Using the Retention Index and Gas Chromatography/Mass Spectrometry (GC/MS)</td>
<td>Gabriella H. Giudice, BSc; Angelo H. Lira Machado, DSc; Jorge I. Zacca*</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Presenting Author

**Sponsored by:**
- The Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation
- Lemos Toxicology Services LLC
- NMS Labs
### Pediatric Postmortem Toxicology

**Moderator:** Robert A. Middleberg, PhD  
NMS Labs  
Willow Grove, PA  

**Co-Moderator:** Nikolas P. Lemos, PhD  
University of California - San Francisco  
Palm Springs, CA  

3:00 p.m. - 5:00 p.m.  

K80  
**Postmortem Pediatric Forensic Toxicology**  
Robert A. Middleberg, PhD; Nikolas P. Lemos, PhD; Sarah E. Avedschmidt, MD*; Alexander Robert W. Forrest, LLM*; David R. Fowler, MD*; Greg Vincent, MD*

---

### Friday—Session II

#### Drug Surveillance in Public Health and Medicolegal Death Investigations (MDI)

**Moderator:** Jeri D. Ropero-Miller, PhD  
RTI International  
Research Triangle Park, NC  

**Co-Moderator:** DeMia P. Pressley, MS  
Drug Enforcement Administration  
Diversion Control Division (DRE)  
Springfield, VA  

Several national MDI stakeholder meetings have focused on multiple federal and state agency efforts within the MDI community. It is important to highlight what these agencies are doing, how their work ties together and how they are collaborating, and how MDI practitioners are finding value in and implementing better practices using data from these efforts. This session will provide valuable information from agency representatives (CDC, DEA, BJS, ONDCP, OCDETF, NGA) and MDI practitioners.

1:00 p.m. - 1:05 p.m.  

K81  
**Opening Remarks**  
Jeri D. Ropero-Miller, PhD*

1:05 p.m. - 1:17 p.m.  

K81  
**The High Intensity Drug Trafficking Areas**  
Kemp Chester, MA*

1:17 p.m. - 1:29 p.m.  

K81  
**Data Sharing Systems at the State and National Level for Opioids and Other NPS**  
M.J. Menendez, JD*

1:29 p.m. - 1:41 p.m.  

K81  
**Governors' Priorities for Addressing the Crisis Beginning With Opioids**  
Jeffrey R. Locke, JD*

1:41 p.m. - 1:53 p.m.  

K81  
**National Forensic Laboratory Information System MDI Expansion**  
DeMia P. Pressley, MS*

1:53 p.m. - 2:05 p.m.  

K81  
**Providing Statistical Information for the Nation's Criminal Justice Systems**  
Connor Brooks, MSc*

2:05 p.m. - 2:17 p.m.  

K81  
**Strengthening the Mortality Data Infrastructure**  
Margaret Warner, PhD*

2:17 p.m. - 2:29 p.m.  

K81  
**The Challenge of Investigating Drug-Related Fatalities—A Chief Medical Examiner’s Perspective**  
Andrew M. Baker, MD*

2:29 p.m. - 2:41 p.m.  

K81  
**Next Generation Drug Surveillance—A Forensic Toxicologist’s Perspective**  
Barry K. Logan, PhD*

2:41 p.m. - 3:00 p.m.  

K81  
**Moderated Panel Discussion**  
DeMia P. Pressley, MS*
Thursday

Moderator: Kenneth E. Melson, JD
The George Washington University Law School
Montclair, VA

Co-Moderator: Paula C. Brumit, DDS
University of Texas Health Science Center
Nocona, TX

8:00 p.m. - 8:20 p.m.  LW1  Doyle: The Bitemark Case That Started It All!
Roger D. Metcalf, DDS, JD*; Janice W. Klim-Lemann, DDS

8:20 p.m. - 8:40 p.m.  LW2  Cosmic Forensics: Can the Sky Fall on Our Heads?
Annarita Franza, PhD*; Vincenzo Lusa, JD*; Mario Di Martino, PhD;
Vanni Moggi Cecchi, PhD

8:40 p.m. - 9:00 p.m.  LW3  The Epic of the World War II (WWII) Italian Submarine Macallè and the Death
of Carlo Acefalo: How Forensic Science Brought a Soldier’s Remains Back Home
Matteo Borrini, PhD*

9:00 p.m. - 9:20 p.m.  LW4  Three in One Homicide Fire Victims: Dental Identifications the Hard Way
Warren D. Tewes, DDS*

9:20 p.m. - 9:40 p.m.  LW5  A Modern Case of Pitt-Hopkins Syndrome With Comparison to a Historic Case
of a Feral Child Discovered in the Forest of Germany
Cristin Marie Rolf, MD*

9:40 p.m. - 10:00 p.m.  LW6  The Mystery of a 17th-Century Epidemic Solved Through Forensic Genealogy
Colleen M. Fitzpatrick, PhD*
**Wednesday**

**Anthropology**

<table>
<thead>
<tr>
<th>Time</th>
<th>Poster</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>Y1</td>
<td>WITHDRAWN</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Y2</td>
<td>The Persistence of Tool Marks on Bones After Burial</td>
<td>Cydnee A. Wolfe*</td>
</tr>
</tbody>
</table>

**Engineering Sciences**

<table>
<thead>
<tr>
<th>Time</th>
<th>Poster</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>Y3</td>
<td>A Multi-Instrumental Comparison of Trace Elements in Industrial Glasses</td>
<td>Jamie L. Weaver, PhD*; Nicholas E. Sharp, PhD*; Ruthmara Corzo, PhD; Eric B. Steel</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Y4</td>
<td>An Analysis of Upconverting Nanoparticles for Latent Fingerprint Detection</td>
<td>Hannah K. Weppner*; Sierra R. Rasmussen, BS; Jon Kellar, PhD; William Cross, PhD</td>
</tr>
</tbody>
</table>

**Pathology/Biology**

<table>
<thead>
<tr>
<th>Time</th>
<th>Poster</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>Y5</td>
<td>A Hemorrhage of the Cerebellum and Brainstem Due to Cervical Epidural Steroid Injection: A Case Report and Review of the Literature</td>
<td>Connie Bao*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Y6</td>
<td>Using Cell-Free DNA to Improve Short Tandem Repeat (STR) Analysis of Sweat Samples</td>
<td>Nathan R. McFadden*</td>
</tr>
</tbody>
</table>

**Thursday**

**Criminalistics**

<table>
<thead>
<tr>
<th>Time</th>
<th>Poster</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>Y7</td>
<td>The Detection of Undeclared Substances and Heavy Metals in Alternative Medicines by Chemical Analysis</td>
<td>Nicole Almeter, BS*; Jonathan Orr; Karen S. Scott, PhD; Shanan S. Tobe, PhD; Heather L. Harris, JD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Y8</td>
<td>The Analysis of Fentanyl Analogs by Gas Chromatography/Solid State Infrared Spectroscopy (GC/IR)</td>
<td>Emily Prisaznik, MS*; Thomas A. Brettell, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Y9</td>
<td>Are Intra-Alveolar Hemorrhage and Aspiration of Bacterial Colonies Pathognomonic in Asphyxia by Suffocation in Infancy?</td>
<td>Cara A. Mitrano*; L.J. Dragovic, MD; Andrew Hanosh, MD; Bernardino Pacris, MD; Ruben Ortiz-Reyes, MD; Kanubhai P. Virani, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Y10</td>
<td>A Comparison of Periodic Acid-Schiff Staining With Lugol's Iodine for the Detection of Vaginal Fluid in Dried Material</td>
<td>Melissa Rogers*; Lawrence Quarino, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>Y11</td>
<td>The Analysis of Fentanyl and Its Analogs and Metabolites in Postmortem Blood Using Biocompatible Solid-Phase Microextraction (BioSPME) and Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS)</td>
<td>Gabriella Smith, BS*; Thomas A. Brettell, PhD; Chandler Marie Grant, MS; Marianne E. Staretz, PhD; Thomas H. Pritchett, MS</td>
</tr>
</tbody>
</table>

*Presenting Author
General

11:30 a.m. - 1:00 p.m.  Y12  Optimization of a Liquid Chromatography Tandem Mass Spectrometry (LC-MS/MS) Method for the Separation and Identification of Synthetic Cannabinoids on Prison Mail Samples
Alyssa Hurd, BA*; Stephanie J. Wetzel, PhD

11:30 a.m. - 1:00 p.m.  Y13  The Effects of Household Cleaners and Paints on the Detection of Bloodstains Over Time
Katelin Vietri, BA*; Maria Cruz Blas; Kimberly S. Kobojeck, MS

Toxicology

11:30 a.m. - 1:00 p.m.  Y14  Analysis of Drugs Used in Crimes Using Solid Phase Extraction (SPE) and Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)
Kimberly E. LaGatta, BS*; Vadoud Niri, PhD; Shokouh Haddadi, PhD

Friday

Criminalistics

11:30 a.m. - 1:00 p.m.  Y15  Fingerprints and Ancestry: Is It All in the Details?
Jessica R. Ford*

11:30 a.m. - 1:00 p.m.  Y16  The Accuracy of Ammunition With the Addition of Luminescent Markers
Jared E. McAtee*

11:30 a.m. - 1:00 p.m.  Y17  A Comparison of Sol-Gel Adsorption Phases and Their Extraction Efficiencies of Explosives Using Closed Headspace Sampling Coupled With Capillary Microextraction of Volatiles (CMV)
Amy Salyards*; Michelle N. Torres, BS; Kelsey Patterson; Jose R. Almirall, PhD

11:30 a.m. - 1:00 p.m.  Y18  A New Assay for 1,3-Dimethylamylamine: An Emerging Drug of Abuse
Sandra M. Pieczonka*

11:30 a.m. - 1:00 p.m.  Y19  The Prevalence of Male DNA Under a Female's Fingernails
Alexis Baxter, BS*; Janine Kishbaugh, MS

11:30 a.m. - 1:00 p.m.  Y20  The Detection of Male DNA Using Y-Chromosomal Short Tandem Repeats (Y-STRs) in Post-Coital Samples of Vasectomized Males
Sarah Lighthart, BS*; Janine Kishbaugh, MS

11:30 a.m. - 1:00 p.m.  Y21  The Implementation of a Method for Rapid Direct Polymerase Chain Reaction (PCR)
Mallory Baud, BS*; Georgiana C. Gibson-Daw, PhD; Bruce R. McCord, PhD

General

11:30 a.m. - 1:00 p.m.  Y22  The Effect of Demographic Factors and Mortality-Related Health Conditions on Postmortem Biometric Data
Samantha Upton, BA*; Anielle Duncan, BA*; Elizabeth Albee, BA; Kelly Sauerwein, PhD; Dawnie W. Steadman, PhD

*Presenting Author
PROGRAM COMMITTEE
FINANCIAL DISCLOSURE

As a sponsor of continuing education, the American Academy of Forensic Sciences (AAFS) must ensure balance, independence, objectivity, and scientific rigor in all its educational activities. All faculty participating in a sponsoring activity are expected to disclose any significant financial interest or other relationship: (1) with the manufacturer(s) of any commercial product(s) and/or provider(s) of commercial services discussed in an educational presentation; and (2) with any commercial supporters of the activity. (Significant financial interest or other relationships can include such things as grants or research support, employee, consultant, major stockholder, member of speaker’s bureaus, etc.) AAFS has an established policy regarding conflicts of interest that includes decisions the Program Committee members may make in selecting content for the Annual Scientific Meeting Program. By serving on the committee, regardless of the role, each member has agreed to comply with Section 1.4.7. of the AAFS Policy and Procedure Manual.

To serve on the 2018-19 Program Committees, it is required that relevant AAFS staff members, program committee members, and/or reviewers complete a Financial Disclosure Form before being provided access to review submissions for the program. For continuing education accreditation purposes, the disclosed relationships are published below so learners are aware of the nature of any relationships that may impact the selection of presentations for the program. If a committee member failed to provide complete disclosure of a relevant financial interest or relationship, the committee member or reviewer was not allowed to serve. The executed Faculty Disclosure Forms are on file in the AAFS Office.

A
Robin A. Ainsworth, DDS – Reviewer
  Discloses no financial relationships with commercial entities.
Robert W. Allen, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Dan T. Anderson, MS – Reviewer
  Discloses no financial relationships with commercial entities.
William H. Anderson, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Peter T. Ausili, MS – Reviewer
  Discloses no financial relationships with commercial entities.

B
Virginia Barron, JD – Committee Member
  Discloses no financial relationships with commercial entities.
Carolyn Bayer-Broring, MFS – Committee Member
  Discloses no financial relationships with commercial entities.
Suzanne Bell, PhD – Reviewer
  CRC Press, Oxford University Press (Royalties), Journal of Forensic Sciences (Salary).
M. Eric Benbow, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Jonathan D. Bethard, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Brittany Beyer, MS – Reviewer
  Discloses no financial relationships with commercial entities.
Zain Bhaloo, MSc - Reviewer
  Discloses no financial relationships with commercial entities.
Jolene Bierly, MSFS – Reviewer
  NMS Labs (Salary).
Sabra R. Botch-Jones, MS – Committee Member
  Discloses no financial relationships with commercial entities.
Eileen M. Briley, MS – Reviewer
  Discloses no financial relationships with commercial entities.
Erin G. Brooks, MD – Committee Member, Reviewer
  Discloses no financial relationships with commercial entities.
Samuel I. Brothers, BBA – Committee Member
  Discloses no financial relationships with commercial entities.
Theresa B. Browning, MFS – Reviewer
  Discloses no financial relationships with commercial entities.
Paula C. Brumit, DDS – Committee Member
  Discloses no financial relationships with commercial entities.
Rebecca E. Bucht, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Sonya Bynoe, BBA – AAFS Staff
  Discloses no financial relationships with commercial entities.

C
Marla E. Carroll, BS – Committee Member
  Broward State Attorney’s Office (Consultant Fee), Nova Southeastern University [Spouse] (Salary).
Ayako Chan-Hosokawa, MS – Reviewer
  NMS Labs (Salary).
Joanna Collins, MFS – Committee Member
  Discloses no financial relationships with commercial entities.
Michael R. Corbett, PhD, LLM – Reviewer
  Discloses no financial relationships with commercial entities.

D
Terry A. Del Cason – Reviewer
  Discloses no financial relationships with commercial entities.
Lucy A. Davis, BHS – Committee Member
  Discloses no financial relationships with commercial entities.
Tracy Dawson Cruz, PhD – Reviewer
  Health Network Laboratories (Consultant Fee).
Dean Michael De Crisce, MD – Committee Member
  Discloses no financial relationships with commercial entities.
Sharon M. Derrick, PhD – Reviewer
  Broward State Attorney’s Office (Consultant Fee).
Peter J. Diaiczuk, BS – Reviewer
  Discloses no financial relationships with commercial entities.
Francisco J. Diaz, MD – Reviewer
  Discloses no financial relationships with commercial entities.
Taylor M. Dickerson III, MSFS – Reviewer
  American Registry of Pathology/ARP Sciences, LLC, Pace University (Salary).
Jeanne M. Dietrich, BS – Reviewer
  Discloses no financial relationships with commercial entities.
Sondra Doolittle, MS – AAFS Staff
 Discloses no financial relationships with commercial entities.
Jennifer L. Dorry, BS – Reviewer
  Discloses no financial relationships with commercial entities.
PROGRAM COMMITTEE
FINANCIAL DISCLOSURE

James J.C.U. Downs, MD – Committee Member
forensX, LLC (Salary/Owner).
Christopher Drake, BA – AAFS Staff
Discloses no financial relationships with commercial entities.

Kristen Hartnett-McCann, PhD – Committee Member
Discloses no financial relationships with commercial entities.

Bradford R. Hepler, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Jack Hietpas, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Mary E. Horvath, MFS – Committee Member
Discloses no financial relationships with commercial entities.

Kathy Howard – AAFS Staff
Discloses no financial relationships with commercial entities.

Julie A. Howe, MBA – Committee Member
Discloses no financial relationships with commercial entities.

Marilyn A. Huestis, PhD – Reviewer
Cannabix, Intelligent Fingerprinting, NMS Labs, Inc.,
Department of Transportation (Consultant Fees).

E

William P. Eber, MS – Reviewer
Discloses no financial relationships with commercial entities.

Kayla N. Ellefsen, PhD – Reviewer
Discloses no financial relationships with commercial entities.

F

Kenneth E. Ferslew, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Benjamin J. Figura, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Frederick W. Fochtmann, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Darren Franck, MSME – Committee Member
Discloses no financial relationships with commercial entities.

Adam J. Freeman, DDS – Committee Member
Westport Dental Associates (Salary/Owner).
Melissa Friscia, MSFS – Reviewer
Fredric Rieders Family Foundation (Salary).
Meredith A. Frank, MD – Reviewer
City and County of Denver, CO (Salary), Coroners’ Offices for
Adams/Broomfield and Boulder Counties, CO (Consultant Fee).

G

Stephen K. Gicale, MSFS – Reviewer
Discloses no financial relationships with commercial entities.

Michael E. Gorn, MS – Reviewer
Discloses no financial relationships with commercial entities.

Emily D. Gottfried, PhD – Committee Member
Discloses no financial relationships with commercial entities.

Teresa R. Gray, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Justin Grover, MS – Reviewer
Discloses no financial relationships with commercial entities.

H

Jeffrey Hackett, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Sarah V. Hainsworth, PhD – Committee Member
Discloses no financial relationships with commercial entities.

Heather L. Harris, MFS, JD – Reviewer
Discloses no financial relationships with commercial entities.

Sherri L. Kacinko, PhD – Committee Member
NMS Labs (Salary).

Philip M. Kemp, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Sarah Kerrigan, PhD – Committee Member, Reviewer
Discloses no financial relationships with commercial entities.

Janine Kishbaugh, MS – Reviewer
Discloses no financial relationships with commercial entities.

Jason C. Kolowski, PhD – Reviewer
Discloses no financial relationships with commercial entities.
CARL R. KRIEGEL, MA – Reviewer
Discloses no financial relationships with commercial entities.

ROBERT KRONSTRAND, PhD – Reviewer
Discloses no financial relationships with commercial entities.

ALEX J. KROTULSKI, MS – Committee Member, Reviewer
CFSRE at FRFF, NIJ (Salary).

KEVIN P. KULBACKI, MSFS – Committee Member
Discloses no financial relationships with commercial entities.

L
LAURA M. LABAY, PhD – Reviewer
NMS Labs (Salary).

AMRITA LAL-PATerson, MSFS – Reviewer
Discloses no financial relationships with commercial entities.

NATALIE R. LANGLEY, PhD – Reviewer
Discloses no financial relationships with commercial entities.

LORALIE LANGMAN, PhD – Reviewer
Discloses no financial relationships with commercial entities.

KRISTA E. LATHAM, PhD – Reviewer
Discloses no financial relationships with commercial entities.

JASON V. LE, MFS – Committee Member
Discloses no financial relationships with commercial entities.

MARC A. LEBEAU, PhD – Reviewer
Discloses no financial relationships with commercial entities.

NIKOLAOS P. LEmos, PhD – Reviewer
Discloses no financial relationships with commercial entities.

JASON R. LEWIS, PhD – Reviewer
Discloses no financial relationships with commercial entities.

JENNIFER F. LIMOGES, MS – Reviewer
Discloses no financial relationships with commercial entities.

GINA LONDINO-SMolar, MS – Committee Member
Discloses no financial relationships with commercial entities.

M
CHRISTINA A. MALONE, MFS – Reviewer
Discloses no financial relationships with commercial entities.

LAUREEN J. MARINETTI, PhD – Reviewer
Discloses no financial relationships with commercial entities.

MARK R. MCCoY, EdD – Reviewer
Discloses no financial relationships with commercial entities.

MARY S. MEGYESI, PhD – Reviewer
Discloses no financial relationships with commercial entities.

KENNETH E. MELSON, JD – Committee Member
Mainstay Forensics (Owner/Honorarium from NCSTL), National Clearinghouse for Science, Technology, and the Law (Honorarium).

TONI MERRITT – AAFS Staff
Discloses no financial relationships with commercial entities.

ROBERT A. MIDDLEBERG, PhD – Reviewer
Discloses no financial relationships with commercial entities.

AMY MILES, BS – Reviewer
Discloses no financial relationships with commercial entities.

AMANDA L.A. MOHR, MSFS – Reviewer
Fredric Rieders Family Foundation, National Institute of Justice (Salary).
<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Disclosures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helen R. Rafaniello, MS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Anjali A. Ranadive, JD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Tiffany Rodriguez, MS</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Sandra E. Rodriguez-Cruz, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Douglas E. Rohde, MS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Karen B. Rosenbaum, MD</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Sandra B. Sachs, PhD</td>
<td>Committee Member</td>
<td>Apple® [Spouse] (Salary, Stocks).</td>
</tr>
<tr>
<td>Marie Samples, MS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Robert M. Sanger, JD</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Carl J. Schmidt, MD</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jason L. Schroeder, MS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Andrew J. Schweighardt, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Karen S. Scott, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jan Seaman Kelly, BA</td>
<td>Committee Member, Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Sabrina S. Sehafer, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Season F. Seferyn, MSFS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Claire E. Shepard, MS</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Baneshwar Singh, PhD</td>
<td>Reviewer</td>
<td>Virginia Department of Forensic Science (Honorarium).</td>
</tr>
<tr>
<td>Michael L. Smith, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Angela Soler, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Erin A. Spargo, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Michael P. Stypa, MS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Denice M. Teem, BS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>NMS Labs (Salary).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MariaTeresa A. Tersigni-Tarrant, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jayne E. Thatcher, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Denise To, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Tatiana Trejos, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Noelle J. Umback, PhD</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Richard Vorder Bruegge, PhD</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Joseph Levi White, MS</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>C. Ken Williams, MS, JD</td>
<td>Committee Member</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Ruth E. Winecker, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Charlotte J. Word, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jom Chi-Chung Yu, PhD</td>
<td>Reviewer</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
</tbody>
</table>
PRESENTING AUTHOR

FINANCIAL DISCLOSURE

As an accredited provider of Continuing Medical Education, the American Academy of Forensic Sciences requires speakers to disclose any real or apparent conflict of interest they may have related to the content of their presentation(s). The existence of commercial or financial interest of authors related to the subject matter of their presentation(s) should not be construed as implying bias or decreasing the value of their presentation(s). However, disclosure should help participants form their own judgments. AAFS and the Program Committee review the submissions to ensure that the content is educational and not a commercial presentation for companies and their products. Participants may notify AAFS by email (abstracts@aafs.org) should any presentation be considered solely a commercial endorsement presentation. Notification should include presentation number/ID (e.g., BS10, E100, W30) and speaker name.

If an author failed to provide complete disclosure of the discussion of commercial products, a relationship with the manufacturer including employee/employer relationship, sources of support for the research project, and/or the discussion of unlabeled or unapproved uses of pharmaceuticals/medical devices, the presentation was not accepted. Authors are required to disclose at the beginning of each presentation any information disclosed and listed below. Copies of the executed disclosure forms are kept on file in the AAFS Office.

A

Patricia J. Aagaard, BS – W19
Discloses no financial relationships with commercial entities.
Daniela M. Abe – G10
Discloses no financial relationships with commercial entities.
Kemalettin Acar – H77
Discloses no financial relationships with commercial entities.
Nathaniel D. Adams, BS – B75
Discloses no financial relationships with commercial entities.
Kent M. Adamson, MSc – A52
Discloses no financial relationships with commercial entities.
James M. Adcock, PhD – B58
Discloses no financial relationships with commercial entities.
Charlene Admissions, BA – H22
Discloses no financial relationships with commercial entities.
Joe Adserias-Garriga, DDS, PhD – G41
Discloses no financial relationships with commercial entities.
Anil Aggrawal, MD – F48, I18, I43, K2
Discloses no financial relationships with commercial entities.
Irfan Ahmed, PhD – C41
Discloses no financial relationships with commercial entities.
Nicole B. Ahmed, BA – H188
Discloses no financial relationships with commercial entities.
Timothy J. Ainger, PhD – W01
Discloses no financial relationships with commercial entities.
Cliff Akiyama, MPH, MA – E71
Discloses no financial relationships with commercial entities.
Tomoko Akutsu, PhD – H35
Discloses no financial relationships with commercial entities.
Giuseppe Davide Albano, MD – H5, H60
Discloses no financial relationships with commercial entities.
Ilene K. Alford, MS – K16
Discloses no financial relationships with commercial entities.
Hussain J.H. Alghanim, MS – B55
4-CpGs Assay (Discussion of Unlabeled/Investigational Use of Product/Device)
Aisha Ali-Gombe, PhD – C27
Discloses no financial relationships with commercial entities.
Eugenio Alladio, PhD – B77
Discloses no financial relationships with commercial entities.
John L. Allen, PE – W18
Discloses no financial relationships with commercial entities.
Nicole Almeter, BS – Y7
Discloses no financial relationships with commercial entities.

Saeed Almheiri – B62
Discloses no financial relationships with commercial entities.
Jose R. Almirall, PhD – D30, S02
Discloses no financial relationships with commercial entities.
Alberto Amadasi, MD – A126, B194, H103
Discloses no financial relationships with commercial entities.
Maria Eduarda A. Amaral – F1
Discloses no financial relationships with commercial entities.
Joao Carlos L. Ambrosio, BA – B53, W12
Discloses no financial relationships with commercial entities.
Saska Ammer, MSc – A120
Discloses no financial relationships with commercial entities.
Janna M. Andronowski, PhD – A96
Discloses no financial relationships with commercial entities.
Ijaz Anwar, MPhil – B120
Discloses no financial relationships with commercial entities.
Isabella Aquila, MD – E91, E111, H150, H151, H152, I39, K26
Discloses no financial relationships with commercial entities.
Valerio Riccardo Aquila – I39
Discloses no financial relationships with commercial entities.
Adam C. Armstrong, MS – B195
Discloses no financial relationships with commercial entities.
Natalie Armstrong Hoskowitz, PhD – I27
Discloses no financial relationships with commercial entities.
Luis E. Arroyo, PhD – B55
Discloses no financial relationships with commercial entities.
Kenneth W. Aschheim, DDS – W12
Discloses no financial relationships with commercial entities.
Muhammad Irfan Ashiq, PhD – E86, J20
Discloses no financial relationships with commercial entities.
Susie C. Athey – A11
Discloses no financial relationships with commercial entities.
Dana Austin, PhD – A123
Discloses no financial relationships with commercial entities.
Sarah E. Avedschmidt, MD – K80
Discloses no financial relationships with commercial entities.

B

Kaley Babcock – H32
Discloses no financial relationships with commercial entities.
Kavita Babu, MD – W05
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Eric Bacino, MD – E75
Discloses no financial relationships with commercial entities.
Drew A. Bader, AB – B74
Discloses no financial relationships with commercial entities.
Mudassar Baig, MSc – E86
Discloses no financial relationships with commercial entities.
Christiane Baigent, MSc – A80
Discloses no financial relationships with commercial entities.
Christine Bailey, MA – A112
Discloses no financial relationships with commercial entities.
Andrew M. Baker, MD – BS7, H195, K81
Discloses no financial relationships with commercial entities.
Benedetta Baldari – H50
Discloses no financial relationships with commercial entities.
Marica Baldoni, MA – A7
Discloses no financial relationships with commercial entities.
Jack Ballantyne, PhD – W10
Discloses no financial relationships with commercial entities.
Sarah Bankston, MS – E117
Discloses no financial relationships with commercial entities.
Connie Bao - Y5
Cervical epidural steroid injection (Discussion of Unlabeled/Investigational Use of Product/Device)
Glenn K. Bard – C2, W19
Discloses no financial relationships with commercial entities.
Isabella C. Barnett, BA – B150
Discloses no financial relationships with commercial entities.
Eric J. Bartelink, PhD – A71
Discloses no financial relationships with commercial entities.
Ilias Batskos, BSc – C24
Discloses no financial relationships with commercial entities.
Sebastiano Battiato, PhD – C12, C28, F41
Discloses no financial relationships with commercial entities.
Mallory Baud, BS - Y21
Discloses no financial relationships with commercial entities.
Brooke R. Baumgarten, BS – B193
Discloses no financial relationships with commercial entities.
Alexis Baxter, BS – Y19
Discloses no financial relationships with commercial entities.
Anece Baxter-White, JD – W16
Discloses no financial relationships with commercial entities.
Carolyn Bayer-Broring, MFS – J27
Discloses no financial relationships with commercial entities.
Melanie M. Beasley, PhD – A61
Discloses no financial relationships with commercial entities.
Michelle L. Behan, JD – F22
Discloses no financial relationships with commercial entities.
Chittaranjan Behera, MD – H121
Discloses no financial relationships with commercial entities.
Grayce Behnke, BS – E54, K74
Discloses no financial relationships with commercial entities.
Ariel D. Belk, MS – H101
Discloses no financial relationships with commercial entities.
Michael D. Bell, MD – W04
Discloses no financial relationships with commercial entities.
M. Eric Benbow, PhD – S02
Discloses no financial relationships with commercial entities.
Abigail J. Bender, BS – B72, B158
Discloses no financial relationships with commercial entities.
Gregory E. Berg, PhD – A75, W14
Discloses no financial relationships with commercial entities.
John Berketa, PhD – G7, G37
Discloses no financial relationships with commercial entities.
William Bernet, MD – I41
Discloses no financial relationships with commercial entities.
Giuseppe Bertozzi, MD – E2, E4, E8, E62, H10
Discloses no financial relationships with commercial entities.
Marcus P. Besser, PhD – D11
Discloses no financial relationships with commercial entities.
Jonathan D. Bethard, PhD – A28, A35, A113, A137
Discloses no financial relationships with commercial entities.
Marianne E. Beynon, MD – H119
Discloses no financial relationships with commercial entities.
Zunnard Usman Bhutta, MS – E86
Discloses no financial relationships with commercial entities.
Mubarak A. Bidmos, PhD – A10
Discloses no financial relationships with commercial entities.
Frederick R. Bieber, PhD – F4
Discloses no financial relationships with commercial entities.
Hannah Elyse Bielamowicz, MD – H187
Discloses no financial relationships with commercial entities.
Stanislaw T.J. Bielouso, BS – E94
Discloses no financial relationships with commercial entities.
Julie Binette, BS – J13
Discloses no financial relationships with commercial entities.
Sandra C. Bishop-Freeman, PhD – K69
Discloses no financial relationships with commercial entities.
Chawki Bisker, MSc – E121, H99
Discloses no financial relationships with commercial entities.
Alissa L. Bjerkhoel, JD – F17
Discloses no financial relationships with commercial entities.
Scott Blair, JD – W17
Discloses no financial relationships with commercial entities.
Brooke H. Blake, MD – H190
Discloses no financial relationships with commercial entities.
Katie E. Blanar, BS – B31
Discloses no financial relationships with commercial entities.
Jesper A. Bordelon – W05
Discloses no financial relationships with commercial entities.
Marianne E. Beynon, MD – H119
Discloses no financial relationships with commercial entities.
Jonathan D. Bethard, PhD – A28, A35, A113, A137
Discloses no financial relationships with commercial entities.
Marianne E. Beynon, MD – H119
Discloses no financial relationships with commercial entities.
Zunnard Usman Bhutta, MS – E86
Discloses no financial relationships with commercial entities.
Mubarak A. Bidmos, PhD – A10
Discloses no financial relationships with commercial entities.
Frederick R. Bieber, PhD – F4
Discloses no financial relationships with commercial entities.
Hannah Elyse Bielamowicz, MD – H187
Discloses no financial relationships with commercial entities.
Stanislaw T.J. Bielouso, BS – E94
Discloses no financial relationships with commercial entities.
Julie Binette, BS – J13
Discloses no financial relationships with commercial entities.
Sandra C. Bishop-Freeman, PhD – K69
Discloses no financial relationships with commercial entities.
Chawki Bisker, MSc – E121, H99
Discloses no financial relationships with commercial entities.
Alissa L. Bjerkhoel, JD – F17
Discloses no financial relationships with commercial entities.
Scott Blair, JD – W17
Discloses no financial relationships with commercial entities.
Brooke H. Blake, MD – H190
Discloses no financial relationships with commercial entities.
Katie E. Blanar, BS – B31
Discloses no financial relationships with commercial entities.
Jesper A. Bordelon – W05
Discloses no financial relationships with commercial entities.
Marianne E. Beynon, MD – H119
Discloses no financial relationships with commercial entities.
Jonathan D. Bethard, PhD – A28, A35, A113, A137
Discloses no financial relationships with commercial entities.
John Berketa, PhD – G7, G37
Discloses no financial relationships with commercial entities.
William Bernet, MD – I41
Discloses no financial relationships with commercial entities.
Giuseppe Bertozzi, MD – E2, E4, E8, E62, H10
Discloses no financial relationships with commercial entities.
Marcus P. Besser, PhD – D11
Discloses no financial relationships with commercial entities.
Jonathan D. Bethard, PhD – A28, A35, A113, A137
Discloses no financial relationships with commercial entities.
John Berketa, PhD – G7, G37
Discloses no financial relationships with commercial entities.
William Bernet, MD – I41
Discloses no financial relationships with commercial entities.
Giuseppe Bertozzi, MD – E2, E4, E8, E62, H10
Discloses no financial relationships with commercial entities.
Marcus P. Besser, PhD – D11
Discloses no financial relationships with commercial entities.
Jonathan D. Bethard, PhD – A28, A35, A113, A137
Discloses no financial relationships with commercial entities.
John Berketa, PhD – G7, G37
Discloses no financial relationships with commercial entities.
William Bernet, MD – I41
Discloses no financial relationships with commercial entities.
Giuseppe Bertozzi, MD – E2, E4, E8, E62, H10
Discloses no financial relationships with commercial entities.
Marcus P. Besser, PhD – D11
Discloses no financial relationships with commercial entities.
Jonathan D. Bethard, PhD – A28, A35, A113, A137
Discloses no financial relationships with commercial entities.

<table>
<thead>
<tr>
<th>Author</th>
<th>Affiliation</th>
<th>Financial Relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amber Burns, MS</td>
<td>W23</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>David R. Bosch, PhD</td>
<td>D22, D27</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Caterina Bosco, MD</td>
<td>E11</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Sabra R. Botch-Jones, MS</td>
<td>K13</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Fatimah Bouderdaben</td>
<td>A149</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jennifer W. Bourgeois, MS</td>
<td>F39</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Derek A. Boyd, MA</td>
<td>A63</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Donna C. Boyd, PhD</td>
<td>A138</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Cody L. Braley</td>
<td>B33</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Helen M. Brandt, MS</td>
<td>A8</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Sophia Brathwaite, BSc</td>
<td>K71</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jennifer Gombos Breaux, MFS</td>
<td>W10</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Charles H. Brenner, PhD</td>
<td>B76</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Amber N. Bridges, MD</td>
<td>I2</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Kendra Broadwater, MS</td>
<td>W23</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Connor Brooks, MSc</td>
<td>K81</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Helmut G. Brosz, BSc</td>
<td>D28, D29, D32</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Catherine O. Brown, MSFS</td>
<td>B6</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Elizabeth A. Brown</td>
<td>W15</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Katherine M. Brown, PhD</td>
<td>E32, W15</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Melissa Ann Brown, MA</td>
<td>A27</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Tracy E. Brown</td>
<td>A66</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Joshua L. Brunty, MS</td>
<td>C20</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Lori Bruski, BS</td>
<td>W19</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Cynthia Brzozowski, DMD</td>
<td>G4</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Sydney R. Buchalter, BS</td>
<td>B179</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Kristi Bugajski, PhD</td>
<td>H89</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Brandon J. Bukovitz, BS</td>
<td>H65</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Ted M. Burkes, BS</td>
<td>J34</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Amber Burns, MS</td>
<td>W23</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>JoAnn Buscaglia, PhD</td>
<td>B95, B159</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Daniel C. Butler, MD</td>
<td>H169</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>John M. Butler, PhD</td>
<td>W10</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Nasir Butt, PhD</td>
<td>B184</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Patrick Buzzini, PhD</td>
<td>B166, J10</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Krystal T. Byrd, BSc</td>
<td>B138</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jennifer E. Byrnes, PhD</td>
<td>A131</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Joan A. Bytheway, PhD</td>
<td>A62</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Mary E. Cablk, PhD</td>
<td>F18</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Joaquin Cabrera, JD</td>
<td>W23</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Crystal Cafero, MFS</td>
<td>F11</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Matthew D. Cain, MD</td>
<td>H41</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Enrica Calabrese, MD</td>
<td>H84</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Cynthia Cale, MS</td>
<td>F8</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Melina Calmon Silva, MA</td>
<td>A130</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Annabelle C. Campbell, BSc</td>
<td>B81</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Justine Canales, MA</td>
<td>H127</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Meta Y. Candra, MSc</td>
<td>H1</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Kris C. Cano, MA</td>
<td>W12</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Erica Cantor, BS</td>
<td>B124</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Michael J. Caplan, MD</td>
<td>E31</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Fiorrella Caputo, MD</td>
<td>H63</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Felice F. Carabellese, MD</td>
<td>I1</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Matilde J. Carbia, JD</td>
<td>F40</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Eduardo M. Cardoso, MSc</td>
<td>K27</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Shelby Carlson</td>
<td>B10</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Douglas J. Carpenter, MS</td>
<td>D25</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Morgan N. Carpenter, BS</td>
<td>B136</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
</tbody>
</table>
Corinne D'Anjou, DMD – G12
Discloses no financial relationships with commercial entities.
Ronaldo C. da Silva, Jr., PhD – B192
Discloses no financial relationships with commercial entities.
Veronica B. Dahir, PhD – J2, J6
Discloses no financial relationships with commercial entities.
Bin B. Dai – H135
Discloses no financial relationships with commercial entities.
Kadri Dalgic, MAFS – I15
Discloses no financial relationships with commercial entities.
James Darnell, BS – W06
Discloses no financial relationships with commercial entities.
J. Tyler Davidson, MS – B171
Discloses no financial relationships with commercial entities.
Marion E. Davidson – A44
Discloses no financial relationships with commercial entities.
Kymeri E. Davis, BSc – K10
Discloses no financial relationships with commercial entities.
Lucy A. Davis, BHS – W12
Discloses no financial relationships with commercial entities.
Reed A. Davis, MSc – A55
Discloses no financial relationships with commercial entities.
Josep De Alcaraz-Fossoul, PhD – B69
Discloses no financial relationships with commercial entities.
Luigi De Aloe, MD – H152, I39
Discloses no financial relationships with commercial entities.
Hans H. De Boer, MD, PhD – A82, A83
Discloses no financial relationships with commercial entities.
Eduardo G. de Campos, MSc – K35
Discloses no financial relationships with commercial entities.
Dean Michael De Crisce, MD – I22, S02
Discloses no financial relationships with commercial entities.
Marco De Donno – B96
Discloses no financial relationships with commercial entities.
Peter R. De Forest, D.Crim – B199, B200
Discloses no financial relationships with commercial entities.
Gianni De Giorgio – E16
Discloses no financial relationships with commercial entities.
Stefania De Simone, MD – H10
Discloses no financial relationships with commercial entities.
Jannick De Tobel, MD – A111, G18
Discloses no financial relationships with commercial entities.
Maria Corazon Abogado De Ungria, PhD – B187
Discloses no financial relationships with commercial entities.
Alyssa Dean, MS – H174
Discloses no financial relationships with commercial entities.
Theresa DeAngelo, MS – W23
Discloses no financial relationships with commercial entities.
Joshua S. DeBord, PhD – B175
Discloses no financial relationships with commercial entities.
Summer J. Decker, PhD – H114
Discloses no financial relationships with commercial entities.
Fabrice Dedouit, MD, PhD – W07
Discloses no financial relationships with commercial entities.
Heather L. Deel – H94
Discloses no financial relationships with commercial entities.
Beatrice Defraia – H21
Discloses no financial relationships with commercial entities.
Heather H. Degnan, PhD – F43
Discloses no financial relationships with commercial entities.
Lauryn DeGreeff, PhD – E29, E30
Discloses no financial relationships with commercial entities.
Joyce L. de Jong, DO – H195
Discloses no financial relationships with commercial entities.
Alexia Delbreil – I11
Discloses no financial relationships with commercial entities.
Angela Dell'Aquila, MD – H80
Discloses no financial relationships with commercial entities.
John P. Demas, DDS – G3
Discloses no financial relationships with commercial entities.
Vaishali S. Deo, MD – H167
Discloses no financial relationships with commercial entities.
Randi Marie Depp, BS – A19
Discloses no financial relationships with commercial entities.
Victoria R. DePrimo, BS – B16
Discloses no financial relationships with commercial entities.
Shannon L. Dery – A51
Discloses no financial relationships with commercial entities.
Lynette Desjarlais, BA – H39
Discloses no financial relationships with commercial entities.
Josh Dettman – B152
Discloses no financial relationships with commercial entities.
Khody R. Detwiler, BS – J16
Discloses no financial relationships with commercial entities.
Aadhar R. Dhomecha, MD – I30
Discloses no financial relationships with commercial entities.
Mohan De Nunzio – K22
Discloses no financial relationships with commercial entities.
Ciro Di Nunzio, PhD – K22
Discloses no financial relationships with commercial entities.
Michele Di Nunzio, BS – K22
Discloses no financial relationships with commercial entities.
Maria Di Sanzo, MD – F32
Discloses no financial relationships with commercial entities.
Giancarlo Di Vella, MD, PhD – E3, E5, E11, E12, E14
Discloses no financial relationships with commercial entities.
Peter J. Diaczuk – B68, F47
Discloses no financial relationships with commercial entities.
Francis X. Diamond, BS – W05
Discloses no financial relationships with commercial entities.
Francisco J. Diaz, MD – E123
Discloses no financial relationships with commercial entities.
Gregory M. Dickinson, MD – H69
Discloses no financial relationships with commercial entities.
Elizabeth A. DiGangi, PhD – A20, A5, A45, A46
Discloses no financial relationships with commercial entities.
Dennis C. Dirksmaat, PhD – A65
Discloses no financial relationships with commercial entities.
Stephanie Diu, BA – H171
Discloses no financial relationships with commercial entities.
Lawrence A. Dobrini, DMD – W19
Discloses no financial relationships with commercial entities.
Julia A. Dolan, MS – W18
Discloses no financial relationships with commercial entities.
Michael J. Dolan, Jr., MS – B165
Discloses no financial relationships with commercial entities.
Matthew Domican, BA – W06
Discloses no financial relationships with commercial entities.
David Domingues Pavanelli, PhD – A12
Discloses no financial relationships with commercial entities.
Stephanie Domitrovich, JD, PhD – A24, A5, A45, A46
Discloses no financial relationships with commercial entities.
John Donahue, MA – A171
Discloses no financial relationships with commercial entities.
Francesca Donno, MD – A20, H19, H20
Discloses no financial relationships with commercial entities.
Meryle A. Dotson, MA – B197
Discloses no financial relationships with commercial entities.
Sarah Dowling, BS – B17
Discloses no financial relationships with commercial entities.
James J.C. Downs, MD – B56, W08, W11
Discloses no financial relationships with commercial entities.
Jay Doyle, PhD – C8
Discloses no financial relationships with commercial entities.
Rory M. Doyle, PhD – K41
Discloses no financial relationships with commercial entities.
Jasmine M. Drake, PhD – F39
Discloses no financial relationships with commercial entities.
Mark S. Dreyfuss, PhD – B101
Discloses no financial relationships with commercial entities.
Gwenola Drogou, DDS – G32
Discloses no financial relationships with commercial entities.
Lena M. Dubois, MSc – E32, H92
Discloses no financial relationships with commercial entities.
Beatrix Dudzik, PhD – A127
Discloses no financial relationships with commercial entities.
Alienne Duncan, BA – A127
Discloses no financial relationships with commercial entities.
Rhian Dunn, MS – A5
Discloses no financial relationships with commercial entities.
Tim G. Dunn, MS – A5
Discloses no financial relationships with commercial entities.
Tyler Dunn, MS – A2
Discloses no financial relationships with commercial entities.
Katherine E. Eames – B71
Discloses no financial relationships with commercial entities.
Lars C. Ebert, PhD – H114
Discloses no financial relationships with commercial entities.
Heather J.H. Edgar, PhD – A104
Discloses no financial relationships with commercial entities.
Suni M. Edson, MS – B39, B40
Discloses no financial relationships with commercial entities.
Christopher J. Ehrhardt, PhD – B164
Discloses no financial relationships with commercial entities.
Heidi Eldridge, MS – B201
Discloses no financial relationships with commercial entities.
Pedro M.S. Eleuterio, MSc – C13, C14
Discloses no financial relationships with commercial entities.
Kelly M. Elkins, PhD – B8
Discloses no financial relationships with commercial entities.
Alexandra L. Emmons, MA – A53
Discloses no financial relationships with commercial entities.
Sandra R. Enslow, BA – E37
Discloses no financial relationships with commercial entities.
Brandon Epstein, BS – C21
Discloses no financial relationships with commercial entities.
Mariana Eserman, MD – W20
Discloses no financial relationships with commercial entities.
Ashley Espinoza – A12
Discloses no financial relationships with commercial entities.
Massimiliano Esposito, MD – F33
Discloses no financial relationships with commercial entities.
Elizabeth A. Evangelou, MA – A20, A45, A46
Discloses no financial relationships with commercial entities.
Kierstyn L. Evans, BS – B145
Discloses no financial relationships with commercial entities.
Brandon V. Everhart, BS – E49
Discloses no financial relationships with commercial entities.
Shari G. Ex, BA – A128
Discloses no financial relationships with commercial entities.
Glenn P. Fahrig – B9
Discloses no financial relationships with commercial entities.
Anthony B. Falsetti, PhD – A48
Discloses no financial relationships with commercial entities.
SEM-EDX, Tescan, Vega 3 (Discussion of Unlabeled/Investigational Use of Product/Device).
Armin A. Farid, DMD – E72, G8
Discloses no financial relationships with commercial entities.
Amanda L. Farrell, PhD – W01
Discloses no financial relationships with commercial entities.
Diana K. Faugno, MSN – B37
Discloses no financial relationships with commercial entities.
Matteo Favia – K28
Discloses no financial relationships with commercial entities.
Gerald Feigin, MD – H142
Discloses no financial relationships with commercial entities.
Khalid S. Feras, MPhil – E26, E86
Discloses no financial relationships with commercial entities.
Joseph Ferencz, MD – I32
Discloses no financial relationships with commercial entities.
E
Morgan J. Ferrell – A113
Discloses no financial relationships with commercial entities.
Alessandro M. Ferrero, MSc – D21
Discloses no financial relationships with commercial entities.
Federica Fersini – I34
Discloses no financial relationships with commercial entities.
Martina Fichera, MD – F33
Discloses no financial relationships with commercial entities.
Marisa A. Fikiet, MS – E81
Discloses no financial relationships with commercial entities.
Costanza Filomena – E10, E28
Discloses no financial relationships with commercial entities.
Eric Frauenhofer – B56
Discloses no financial relationships with commercial entities.
Kelvin J. Frank, Jr., BS – B140
Discloses no financial relationships with commercial entities.
Harold Franck, MSEE – D20
Discloses no financial relationships with commercial entities.
Annarita Franz, PhD – F2, I3, LW2
Discloses no financial relationships with commercial entities.
Roger Frappier, MSc – W10
Discloses no financial relationships with commercial entities.
Eric Frauenhofer – B56
Discloses no financial relationships with commercial entities.

Jamie D. Fredericks, PhD – B3
Discloses no financial relationships with commercial entities.
Josh Friedman, MD, PhD – W03
Discloses no financial relationships with commercial entities.
Amanda N. Friend, MA – A116
Discloses no financial relationships with commercial entities.
Shuntaro Fujimoto, MS – B51
Discloses no financial relationships with commercial entities.
Christine Funk, JD – S02, W12
Discloses no financial relationships with commercial entities.
Sara M. Getz, PhD – A25, W24
Discloses no financial relationships with commercial entities.

Keylie M. Gibson, BS – B109
Discloses no financial relationships with commercial entities.

Mark A. Giffen, Jr., DO – H74, H75
Discloses no financial relationships with commercial entities.

Ashley A. Gilbert, BS – K18
Discloses no financial relationships with commercial entities.

Michael D. Gilchrist, PhD, DEng – D15
Discloses no financial relationships with commercial entities.

James R. Gill, MD – H46, H195
Discloses no financial relationships with commercial entities.

Rachel B. Gilmore – B48
Discloses no financial relationships with commercial entities.

Cinzia Gimelli, PsyD, PhD – I13
Discloses no financial relationships with commercial entities.

Lorenzo Gatto, MD – H55, H73, H116, H123, H125, H139
Discloses no financial relationships with commercial entities.

Oliver Giudice, PhD – C12, C23, C28, F41
Discloses no financial relationships with commercial entities.

Matthew C. Go, MA – A88
Discloses no financial relationships with commercial entities.

Timothy P. Gocha, PhD – A125
Discloses no financial relationships with commercial entities.

Zachary C. Goeker, MPS – B79
Discloses no financial relationships with commercial entities.

Mark Goff, BA – W09
Discloses no financial relationships with commercial entities.

Jae-mo Goh, PhD – D42
Discloses no financial relationships with commercial entities.

Vidia A. Gokool, BSc – B92
Discloses no financial relationships with commercial entities.

Bruce A. Goldberger, PhD – BS4, W08
Discloses no financial relationships with commercial entities.

Juliea Gomez Garcia-Donas – A29
Discloses no financial relationships with commercial entities.

John V. Goodpaster, PhD – B87
Discloses no financial relationships with commercial entities.

Jan M. Gorniak, DO – H48
Discloses no financial relationships with commercial entities.

Ludovica Gorza, MSc – G27
Discloses no financial relationships with commercial entities.

Emily D. Gottfried, PhD – I24
Discloses no financial relationships with commercial entities.

Lynsey E. Gozna, PhD – I31
Discloses no financial relationships with commercial entities.

Silke Grabherr, PhD – W07
Discloses no financial relationships with commercial entities.

Michael A. Graham, MD – H195
Discloses no financial relationships with commercial entities.

Abigail Jacqueline Grande, MPH – H122
Discloses no financial relationships with commercial entities.

Nadia A. Granger, MD – W20
Discloses no financial relationships with commercial entities.

Ignazio Grattagliano, PsyD – I4, I5, I14
Discloses no financial relationships with commercial entities.

Shayna L. Gray, BS – B151
Discloses no financial relationships with commercial entities.

Raquel Green, BS – B130
Discloses no financial relationships with commercial entities.

Tasha Zemrus Greenberg, MD – H17, H85, H149, H159, H172
Discloses no financial relationships with commercial entities.

Ellen M. Greytak, PhD – B105
Discloses no financial relationships with commercial entities.

Catalin Grigoras, PhD – C18, W28
Discloses no financial relationships with commercial entities.

Kyrsten M. Grimes, MA – I28
Discloses no financial relationships with commercial entities.

Lara R.S. Gris, MS – B26
Discloses no financial relationships with commercial entities.

Danielle Grootenboer, JD – W26
Discloses no financial relationships with commercial entities.

Justin Grover, MS – C14
Discloses no financial relationships with commercial entities.

Victoria Guillen, PhD – I12
Discloses no financial relationships with commercial entities.

Wendy M. Gunther, MD – H40
Discloses no financial relationships with commercial entities.

Avneesh Gupta, MD – H39
Discloses no financial relationships with commercial entities.

Judith A. Gustafson, BS – J1
Discloses no financial relationships with commercial entities.

Richard E. Gutierrez, PhD – D2, D4
Discloses no financial relationships with commercial entities.

Amanda R. Hale, MA – S02
Discloses no financial relationships with commercial entities.

Cory Hall, MS – C8
Discloses no financial relationships with commercial entities.

Syed W. Hamdani – B35
Discloses no financial relationships with commercial entities.

Meghan R. Hall, BA – H163
Discloses no financial relationships with commercial entities.

Anthony M. Hallatt – W17
Discloses no financial relationships with commercial entities.

Boyd Hamilton – W06
Discloses no financial relationships with commercial entities.

Breanne Hamlett – E25
Discloses no financial relationships with commercial entities.

Derek L. Hammond, MD – A25, W24
Discloses no financial relationships with commercial entities.

Keylie M. Gibson, BS – B109
Discloses no financial relationships with commercial entities.

Mark A. Giffen, Jr., DO – H74, H75
Discloses no financial relationships with commercial entities.

Ashley A. Gilbert, BS – K18
Discloses no financial relationships with commercial entities.

Michael D. Gilchrist, PhD, DEng – D15
Discloses no financial relationships with commercial entities.

James R. Gill, MD – H46, H195
Discloses no financial relationships with commercial entities.

Rachel B. Gilmore – B48
Discloses no financial relationships with commercial entities.

Cinzia Gimelli, PsyD, PhD – I13
Discloses no financial relationships with commercial entities.

Lorenzo Gatto, MD – H55, H73, H116, H123, H125, H139
Discloses no financial relationships with commercial entities.

Oliver Giudice, PhD – C12, C23, C28, F41
Discloses no financial relationships with commercial entities.

Matthew C. Go, MA – A88
Discloses no financial relationships with commercial entities.

Timothy P. Gocha, PhD – A125
Discloses no financial relationships with commercial entities.

Zachary C. Goeker, MPS – B79
Discloses no financial relationships with commercial entities.

Mark Goff, BA – W09
Discloses no financial relationships with commercial entities.

Jae-mo Goh, PhD – D42
Discloses no financial relationships with commercial entities.

Vidia A. Gokool, BSc – B92
Discloses no financial relationships with commercial entities.

Bruce A. Goldberger, PhD – BS4, W08
Discloses no financial relationships with commercial entities.

Juliea Gomez Garcia-Donas – A29
Discloses no financial relationships with commercial entities.

John V. Goodpaster, PhD – B87
Discloses no financial relationships with commercial entities.

Jan M. Gorniak, DO – H48
Discloses no financial relationships with commercial entities.

Ludovica Gorza, MSc – G27
Discloses no financial relationships with commercial entities.

Emily D. Gottfried, PhD – I24
Discloses no financial relationships with commercial entities.

Lynsey E. Gozna, PhD – I31
Discloses no financial relationships with commercial entities.

Silke Grabherr, PhD – W07
Discloses no financial relationships with commercial entities.

Michael A. Graham, MD – H195
Discloses no financial relationships with commercial entities.

Abigail Jacqueline Grande, MPH – H122
Discloses no financial relationships with commercial entities.

Nadia A. Granger, MD – W20
Discloses no financial relationships with commercial entities.

Ignazio Grattagliano, PsyD – I4, I5, I14
Discloses no financial relationships with commercial entities.

Shayna L. Gray, BS – B151
Discloses no financial relationships with commercial entities.

Raquel Green, BS – B130
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Greg Hampikian, PhD – B186
Discloses no financial relationships with commercial entities.
Brett E. Harding, MBA – E66
Discloses no financial relationships with commercial entities.
Robert Hargrove, BS – K69
Discloses no financial relationships with commercial entities.
Vikram Harichandran, MS – C3
Discloses no financial relationships with commercial entities.
Sathya Prakash Harihar – B41
Discloses no financial relationships with commercial entities.
Nina A. Harnarine, BSc – J17
Discloses no financial relationships with commercial entities.
LeAnn Michelle Harrel, BS – B119
Discloses no financial relationships with commercial entities.
Neal H. Haskell, PhD – W08
Discloses no financial relationships with commercial entities.
Susan Hatters-Friedman, MD – S01, W03
Discloses no financial relationships with commercial entities.
Jonathan Hayes, MD – H195, W19
Discloses no financial relationships with commercial entities.
Michael Alan Hays, MD – H72
Discloses no financial relationships with commercial entities.
Durdica Hazard, PhD – F46
Discloses no financial relationships with commercial entities.
Xuyang He – K44
Discloses no financial relationships with commercial entities.
Joseph T. Hefner, PhD – A101
Discloses no financial relationships with commercial entities.
Bruce J. Heidebrecht – W10
Discloses no financial relationships with commercial entities.
Kelly Heim, PhD – A107
Discloses no financial relationships with commercial entities.
Jakob Heimer, MD – H111
Discloses no financial relationships with commercial entities.
Michael Heninger, MD – H141
Discloses no financial relationships with commercial entities.
Daniella M. Hernandez – B141
Discloses no financial relationships with commercial entities.
Nicholas P. Herrmann, PhD – A122
Discloses no financial relationships with commercial entities.
Susan Seebode Hetzel, BA – D24
Discloses no financial relationships with commercial entities.
Charles M. Heurich, MFS – BS8
Discloses no financial relationships with commercial entities.
Sunil P.A. Hewage – A89
Discloses no financial relationships with commercial entities.
Terry-Dawn Hewitt, LLM – BS1, F27
Discloses no financial relationships with commercial entities.
R. Austin Hicklin, PhD – B95
Discloses no financial relationships with commercial entities.
Jack Hietpas, PhD – B89
Discloses no financial relationships with commercial entities.
Salina Hisham, MSc – A1
Discloses no financial relationships with commercial entities.
Valeria Hofer – E77, H107, H108, H155
Discloses no financial relationships with commercial entities.
Heike Hofmann, PhD – B100
Discloses no financial relationships with commercial entities.
Pamela M. Hofsaess, MS – S02
Discloses no financial relationships with commercial entities.
Kiana L. Holbrook, BS – B58
Discloses no financial relationships with commercial entities.
Tiffany A. Hollenbeck, DO – K73
Discloses no financial relationships with commercial entities.
Carley J. Holmes – H49
Discloses no financial relationships with commercial entities.
Anastasia Holobinko, PhD – W11
Discloses no financial relationships with commercial entities.
Emily L. Horrocks, MSc – B57, B139, E4
Discloses no financial relationships with commercial entities.
Mary E. Horvath, MFS – W06
Discloses no financial relationships with commercial entities.
Rachel M. Houston, PhD – B156
Discloses no financial relationships with commercial entities.
Jessica E. Hovingh – B72, B158
Discloses no financial relationships with commercial entities.
Marilyn A. Huestis, PhD – K75, W21
Discloses no financial relationships with commercial entities.
Lurena A. Huffman, BS – W01
Discloses no financial relationships with commercial entities.
Cris E. Hughes, PhD – A106
Discloses no financial relationships with commercial entities.
Nicolas R. Hughes, JD – F37
Discloses no financial relationships with commercial entities.
Courtney N. Hulse, MA – W11
Discloses no financial relationships with commercial entities.
Cheryl D. Hunter – S02
Discloses no financial relationships with commercial entities.
Alyssa Hurd, BA - Y12
Discloses no financial relationships with commercial entities.
Florence Hutner, JD – W26
Discloses no financial relationships with commercial entities.
Shivonne Hutson, MS – W19
Discloses no financial relationships with commercial entities.
Jessica Hvitzdovich, BS – K50
Discloses no financial relationships with commercial entities.
Jessica Hyde, MS – W06
Discloses no financial relationships with commercial entities.
James B. Hyzer, PhD – D19
Discloses no financial relationships with commercial entities.
I

Samiah Ibrahim, BSc – J13
Discloses no financial relationships with commercial entities.
Megan E. Ingvoldstad, PhD – A9
Discloses no financial relationships with commercial entities.
Keith Inman, MCrim – W10
Discloses no financial relationships with commercial entities.
Mariyam I. Isa, MA – A139
Discloses no financial relationships with commercial entities.
Carolyn V. Isaac, PhD – H145
Discloses no financial relationships with commercial entities.
Daniel S. Isenschmid, PhD – K70
Discloses no financial relationships with commercial entities.
Hariharan Iyer, PhD – W10
Discloses no financial relationships with commercial entities.
Discloses no financial relationships with commercial entities.

Ami L. Jackson, DO – H186
John P. Jackson, PhD – E73
Rebecca S. Jackson, MBA – E73
Barry Jansen – W25
Hannah C. Jarvis, MRCS – H69
Gulnaz T. Javan, PhD – B1, H95
Amanda J. Jenkins, PhD – K63
Antaya L. Jennings, BA – A145
Yangseung Jeong, PhD – A6
Karly L. Johannsen – H25
Bryan Johnson, MSFS – W19
Rudolph C. Johnson, PhD – W05
Kellie Jones, BA – A19
Sandra E. Jones, BS – H15
Michelle Jonika – H91
Rachel Joseph, MSc – A7
Raphaëlle Jouin – J
Chelsey A. Juarez, PhD – A121
Timothy Juedes, MS – E53
Rebecca Jufer Phipps, PhD – K43
Kun Won Jung, MD, PhD – E46

Sherri L. Kacinko, PhD – W27
Joseph B. Kadane, PhD – B93
Michal Kaliszan, PhD – H131
Brooke W. Kammarath, PhD – B169, B200
Fehmida Kanodarwala, PhD – B94
Umit Karabiyik, PhD – C32

Discloses no financial relationships with commercial entities.

K

Discloses no financial relationships with commercial entities.

Andrea Kardohely – E54, E9
Erin L. Karschner, PhD – K62
Sierra Kaszubinski, BS – H28
Daniel E. Katz, MFS – W23
Rohan P. Kedar, MD – I37
Sharon Kelley, PhD – E88
Philip M. Kemp, PhD – W21
Tyler Kennedy, BS – B154
Linda Kenney Baden, JD – W08
Michael W. Kenyhercz, PhD – A102, W14
Muineeb H. Khan, MPHil – J20
Shelby R. Khandasammy, BS – E107
Kazuhiro Kibayashi, MD – H57
Jennifer P. Kidd – B42
Bianna D. Kiesel, BA – B8
Danylle Kightlinger – K11
Eunmi Kim, PhD – K25
Joonyeong Kim, PhD – B143
Victor J. Kim, BBA – K55
Ashley N. Kimble, BS – K19
Sarah C. Kindschuh, PhD – A3
Robert Kirkby, MS – W23
Tetsushi Kitayama, PhD – B129
Alexandra R. Klales, PhD – A43
Megan K. Kleeschulte, MA – H47
Allison C. Klein, BA – H179
Kimberly S. Kobojek, MS – E114
Anthony Koertner, MS – E90, W13
Youngsu Kong – D31
Thomas G. Kopczynski, BS – E57

Discloses no financial relationships with commercial entities.
FINANCIAL DISCLOSURE

Sarah Lighthart, BS - Y20
  Discloses no financial relationships with commercial entities.
Evelyn S. Ligon – E27
  Discloses no financial relationships with commercial entities.
Jennifer F. Limoges, MS – W12
  Discloses no financial relationships with commercial entities.
Laura L. Liptai, PhD – W17
  Discloses no financial relationships with commercial entities.
Mark A. Listewnik, MA – W15
  Discloses no financial relationships with commercial entities.
Ginesse A. Listi, PhD – A98
  Discloses no financial relationships with commercial entities.
Steven J. Little, BS – E105
  Discloses no financial relationships with commercial entities.
Jianne Liu – B60
  Discloses no financial relationships with commercial entities.
Jeffrey R. Locke, JD – K81
  Discloses no financial relationships with commercial entities.
Tracy-Lynn E. Lockwood, BS – E97
  Discloses no financial relationships with commercial entities.
Barry K. Logan, PhD – B54, F20, H136, K46, K81, L1, W05, W08
  Discloses no financial relationships with commercial entities.
Holly Long – A42
  Discloses no financial relationships with commercial entities.
Cameron M. Longo – B29
  Discloses no financial relationships with commercial entities.
Kim M. Look, DDS – E73
  Discloses no financial relationships with commercial entities.
Afrin Lopa, MS – B135
  Discloses no financial relationships with commercial entities.
Dayanira Lopez, BS – A64
  Discloses no financial relationships with commercial entities.
Tamara L. Lottering, BSc – A81
  Discloses no financial relationships with commercial entities.
Jennifer C. Love, PhD – A72, S02
  Discloses no financial relationships with commercial entities.
Jiaqi M. Lu, MS – E61
  Discloses no financial relationships with commercial entities.
Victoria S. Lucas, PhD – G19
  Discloses no financial relationships with commercial entities.
Ashley M. Luebbers, MS – H71
  Discloses no financial relationships with commercial entities.
Francesco Lupiariello, MD – E12, E14
  Discloses no financial relationships with commercial entities.
Vincenzo Lusa, JD – F2, I3, LW2
  Discloses no financial relationships with commercial entities.
Zhou Lyu, PhD – H102
  Discloses no financial relationships with commercial entities.

Francesca Maglietta, MD – E4, E8, E9, E18, E62, E70, H58
  Discloses no financial relationships with commercial entities.
Khurram W. Mahmood, MPhil – J20
  Discloses no financial relationships with commercial entities.
Zahid Mahmood, MPhil – B20
  Discloses no financial relationships with commercial entities.
Christopher A. Maier, PhD – A117
  Discloses no financial relationships with commercial entities.
Sergey Mamedov, PhD – B167
  Discloses no financial relationships with commercial entities.
João Manata, MSc – E67
  Discloses no financial relationships with commercial entities.
Rachel Maragliano – B189
  Discloses no financial relationships with commercial entities.
Michael Marciano, MS – B157
  Discloses no financial relationships with commercial entities.
Marica Marrone, MD – G31
  Discloses no financial relationships with commercial entities.
Daniel A. Martell, PhD – S01
  Discloses no financial relationships with commercial entities.
Rosa M. Martinez, MD – H107, H108, H155
  Discloses no financial relationships with commercial entities.
Valeska Martinez, BA – A34
  Discloses no financial relationships with commercial entities.
Kelsey Mason, BS – H179
  Discloses no financial relationships with commercial entities.
Rebecca A. Mastrovito, MS – K78
  Discloses no financial relationships with commercial entities.
Nivia A.M. Mattias, MD – H160
  Discloses no financial relationships with commercial entities.
Wojciech Matkowski – C38, C39
  Discloses no financial relationships with commercial entities.
Tomotaka Matabara – D13
  Discloses no financial relationships with commercial entities.
Ashleigh K. Matzoll – B47
  Discloses no financial relationships with commercial entities.
Brendan P. Max, JD – F28
  Discloses no financial relationships with commercial entities.
Henry P. Maynard III, MSFS – E116
  Discloses no financial relationships with commercial entities.
Maria Carla Mazzotti, MD – E31
  Discloses no financial relationships with commercial entities.
Thomas C. McAndrew, MA – B58
  Discloses no financial relationships with commercial entities.
Jared E. McAtee - Y16
  Discloses no financial relationships with commercial entities.
Anna G. McDonald, MD – H13
  Discloses no financial relationships with commercial entities.
Gary McDonald, Jr., JD – F25
  Discloses no financial relationships with commercial entities.
Nathan R. McFadden - Y6
  Discloses no financial relationships with commercial entities.

M

Andrea Macarulla, MSc – C24
  Discloses no financial relationships with commercial entities.
William A. MacCrehan, PhD – B88
  Polymethylsiloxane (PDMS) (Discussion of Unlabeled/Investigational Use of Product/Device).
Mitsuyo Machida – E47
  Discloses no financial relationships with commercial entities.
Discloses no financial relationships with commercial entities.

James McGivney, DMD – G23
Discloses no financial relationships with commercial entities.

Courtney K. McGowan, BS – K21
Discloses no financial relationships with commercial entities.

Jonathan G. McGrath, PhD – E113
Discloses no financial relationships with commercial entities.

Wayne J. McKenna, LLB – B51
Discloses no financial relationships with commercial entities.

Heather E. McKiernan, MSFS – B80, L1
Discloses no financial relationships with commercial entities.

Patrick McLaughlin, BS – B114
Discloses no financial relationships with commercial entities.

Matteo Moretti, MD – K66
Discloses no financial relationships with commercial entities.
Presenting Author

Financial Disclosure

Tamyra R. Moretti, PhD – W10
Discloses no financial relationships with commercial entities.

Daniel J. Morgan, MS – E64
Discloses no financial relationships with commercial entities.

Michael A. Mosco, PhD – E55
Discloses no financial relationships with commercial entities.

Sharon K. Moses, PhD – E122
Discloses no financial relationships with commercial entities.

Nikki Mourtzinos, DO – H112
Discloses no financial relationships with commercial entities.

Pabalala M. Mthembi, MSc – B182
Discloses no financial relationships with commercial entities.

Autumn T. Muise – H29
Discloses no financial relationships with commercial entities.

Marzena H. Mulawka, MFS – E55
Discloses no financial relationships with commercial entities.

Carmen T. Mulet, BS – K39
Discloses no financial relationships with commercial entities.

Adam Munera – A133
Discloses no financial relationships with commercial entities.

Bala Muralikrishnan, PhD – C40
Discloses no financial relationships with commercial entities.

Daniel C. Murrie, PhD – E120
Discloses no financial relationships with commercial entities.

Rabi A. Musah, PhD – E124
Discloses no financial relationships with commercial entities.

Nidal Nabhan Abou, MD – I21
Discloses no financial relationships with commercial entities.

Harman Nahal, BSc – A140
Discloses no financial relationships with commercial entities.

Marcela Najarro, MFS – B202, W23
Discloses no financial relationships with commercial entities.

Aden G. Naka, MSc – W19
Discloses no financial relationships with commercial entities.

John B. Nase, DDS – G11, G25
Discloses no financial relationships with commercial entities.

Yolanda Nerkowski, BA – G40
Discloses no financial relationships with commercial entities.

Emily Neverett – H90
Discloses no financial relationships with commercial entities.

Janelle D.S. Newman, MD – B173
Discloses no financial relationships with commercial entities.

Jennifer Newman, PhD – C17
Discloses no financial relationships with commercial entities.

Kia K. Newman, MD – E94
Discloses no financial relationships with commercial entities.

Matthew N. Newmeyer, PhD – K29
Discloses no financial relationships with commercial entities.

Georgina R. Nicholls, MS – B180
Discloses no financial relationships with commercial entities.

John Nixon, MBA - D5, D6
Discloses no financial relationships with commercial entities.

Karen J. Nobles, BA – J25
Discloses no financial relationships with commercial entities.

Wanda Nocerino – F41
Discloses no financial relationships with commercial entities.

Francy Scarlett Nogales, BS – B130
Discloses no financial relationships with commercial entities.

Diana C. Nointin, MD – H3
Discloses no financial relationships with commercial entities.

Jessica T. Novak, BA – A19
Discloses no financial relationships with commercial entities.

Carolina Núñez-Vázquez, PhD – H34
Discloses no financial relationships with commercial entities.

W. Milton Nuzum III, JD – F44
Discloses no financial relationships with commercial entities.

Emilio Nuzzolese, PhD – G1, G9, G36, G39, G41
Discloses no financial relationships with commercial entities.

Kerry J. O'Connell, JD – F23
Discloses no financial relationships with commercial entities.

Craig O. O'Connor, PhD – W26
Discloses no financial relationships with commercial entities.

Heather M. O'Connor, DO – H64
Discloses no financial relationships with commercial entities.

Nicole R. Odom, BS – C20
Discloses no financial relationships with commercial entities.

Edwin O. Olaya Molina, BA – E33, E69
Discloses no financial relationships with commercial entities.

Fabio Oldoni, PhD – B108
Discloses no financial relationships with commercial entities.

Laura C. Oliver, MS – B84
Discloses no financial relationships with commercial entities.

Bianca E. Olivieri – K76
Discloses no financial relationships with commercial entities.

Stephanie A. Olson – E50
Discloses no financial relationships with commercial entities.

Ayomide Oludoyi, BSc – H174
Discloses no financial relationships with commercial entities.

Danica Ommen, PhD – B159, J26
Discloses no financial relationships with commercial entities.

Kelly C. O’Neill – B91
Discloses no financial relationships with commercial entities.

Kathryn L. Orton, BS – B176
Discloses no financial relationships with commercial entities.

Alessio Ostuni, MD – I35
Discloses no financial relationships with commercial entities.

Alessio Ostuni, MD – I35
Discloses no financial relationships with commercial entities.

Andrea Ost, MS – A38
Discloses no financial relationships with commercial entities.

Alessio Ostuni, MD – I35
Discloses no financial relationships with commercial entities.

Colby Ott, BS – K38
Discloses no financial relationships with commercial entities.

Stephen D. Ousley, PhD – A26, W24
Discloses no financial relationships with commercial entities.

Oriana Ovide – B19
Discloses no financial relationships with commercial entities.

Tyrish Y. Page, MA – E1
Discloses no financial relationships with commercial entities.

Chiara Palazzo, MD – H2
Discloses no financial relationships with commercial entities.
Presenting Author: Andrea Palmiotto, PhD – A13
Discloses no financial relationships with commercial entities.

Kaitlyn B. Palmequist, BS – K17
Discloses no financial relationships with commercial entities.

Ariana Pape, BA – H54
Discloses no financial relationships with commercial entities.

Donna M. Papsun, MS – W05
Discloses no financial relationships with commercial entities.

Antonino Paratore, MS – C12, F41
Discloses no financial relationships with commercial entities.

Manoj Bhauaheb Parchake, MD – H162
Discloses no financial relationships with commercial entities.

Dae-Kyoon Park, MD, PhD – E52
Discloses no financial relationships with commercial entities.

Kevin J. Parmelee, PhD – W25
Discloses no financial relationships with commercial entities.

Mandy Pascu – H27
Discloses no financial relationships with commercial entities.

Christian T. Pascual – K23
Discloses no financial relationships with commercial entities.

Nicholas V. Passalacqua, PhD – A69
Discloses no financial relationships with commercial entities.

Federico Patanè, MD – F49
Discloses no financial relationships with commercial entities.

Simmi Patel, BS – I38
Discloses no financial relationships with commercial entities.

Kate Luiza Queiroz, BA – E59
Discloses no financial relationships with commercial entities.

Giovanna Punzi – I38
Discloses no financial relationships with commercial entities.

Jane Pucher, JD – BS7
Discloses no financial relationships with commercial entities.

Meghan Prusinowski – B59, B133
Discloses no financial relationships with commercial entities.

Abigail J. Props, MS – H100
Discloses no financial relationships with commercial entities.

Keith E. Propp, PhD – E73
Discloses no financial relationships with commercial entities.

Deborah C. Pinto, PhD – A70
Discloses no financial relationships with commercial entities.

Haskell M. Plotkin, JD – W08
Discloses no financial relationships with commercial entities.

Sharon L. Plotkin, MS – W02
Discloses no financial relationships with commercial entities.

Mateus D.C. Polastro, MSc – C9, C11, C15
Discloses no financial relationships with commercial entities.

Adam Polhemus, BA – W05
Discloses no financial relationships with commercial entities.

Carrie Polston, BA – J15
Discloses no financial relationships with commercial entities.

Cristoforo Pomara, MD, PhD – F49
Discloses no financial relationships with commercial entities.

Katharine Chapman Pope, MA – H144
Discloses no financial relationships with commercial entities.

David J. Porta, PhD – D40
Discloses no financial relationships with commercial entities.

Vanessa Potkin, JD – B57
Discloses no financial relationships with commercial entities.

Mark C. Pozzi, MS – D18, D22, D27
Discloses no financial relationships with commercial entities.

Joseph A. Prahlow, MD – H191, H195
Discloses no financial relationships with commercial entities.

Sebastien S. Prat, MD – I6, I22
Discloses no financial relationships with commercial entities.

Rich Press, MSc – W10
Discloses no financial relationships with commercial entities.

DeMia P. Pressley, MS – B64, K81
Discloses no financial relationships with commercial entities.

Jana M. Price, PhD – W21
Discloses no financial relationships with commercial entities.

Mechthild K. Prinz, PhD – B113
Discloses no financial relationships with commercial entities.

Emily Prisaznik, MS - Y8
Discloses no financial relationships with commercial entities.

Noemi Procopio, PhD – A60
Discloses no financial relationships with commercial entities.

Lori A. Proe, DO – H137
Discloses no financial relationships with commercial entities.

Keith E. Propp, PhD – E73
Discloses no financial relationships with commercial entities.

Abigail J. Props, MS – H100
Discloses no financial relationships with commercial entities.

Meghan Prusinowski – B59, B133
Discloses no financial relationships with commercial entities.

Jane Pucher, JD – B57
Discloses no financial relationships with commercial entities.

Giovanna Punzi – I38
Discloses no financial relationships with commercial entities.

Lawrence Quarino, PhD – E118
Discloses no financial relationships with commercial entities.

Ana Luiza Queiroz, BA – E59
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Alissa M. Shida, BA – E17
Discloses no financial relationships with commercial entities.
Mary K. Shields, DMD – G38
Discloses no financial relationships with commercial entities.
Vivian Shnайдман, MD – I42
Discloses no financial relationships with commercial entities.
Elisa N. Shoff, BS – K49, S02
Discloses no financial relationships with commercial entities.
Francesco Sicilia, MD – H150, H151, K26
Discloses no financial relationships with commercial entities.
Sarah J. Sides, BS – H174
Discloses no financial relationships with commercial entities.
Mylene A. Signori, BSc – J12
Discloses no financial relationships with commercial entities.
Asit Kumar Sikary, MD – H134, H182, K68
Discloses no financial relationships with commercial entities.
Terrie Simmons-Ehrhardt, MA – A59
Discloses no financial relationships with commercial entities.
Alison G. Simon, PhD – B61, B162
Discloses no financial relationships with commercial entities.
Rochelle A. Simon, MD – H175
Discloses no financial relationships with commercial entities.
Baneshwar Singh, PhD – B154
Discloses no financial relationships with commercial entities.
Monika Singh, MSc – G29
Mitutoyo digital caliper (Discussion of Unlabeled/ Investigational Use of Product/Device).
Chiara Siodambro – H36
Discloses no financial relationships with commercial entities.
Edward Sisco, PhD – W23
Discloses no financial relationships with commercial entities.
Stephanie R. Sivak, MS – E79
Discloses no financial relationships with commercial entities.
Jennifer A. Sizemore – A136
Discloses no financial relationships with commercial entities.
Jessica Slater – E44
Discloses no financial relationships with commercial entities.
Beth M. Slaybaugh, MPS – K4
Discloses no financial relationships with commercial entities.
Alycia M. Smentkiewicz – E106
Fuji IR camera; Sirchie ALS Units (Discussion of Unlabeled/ Investigational Use of Product/Device).
Alexander J. Smith, BA – A56, W15
Discloses no financial relationships with commercial entities.
Daniel G. Smith, MA – W12
Discloses no financial relationships with commercial entities.
Erich D. Smith, MS – B99
Discloses no financial relationships with commercial entities.
Gabriella Smith, BS – Y11
Discloses no financial relationships with commercial entities.
Jeff M. Smith, MS – C25, W06
Discloses no financial relationships with commercial entities.
Juliette Smith – B52
Discloses no financial relationships with commercial entities.
LaQuida Smith, MA – J6
Discloses no financial relationships with commercial entities.
Patricia C. Smith, MSL – B52
Discloses no financial relationships with commercial entities.
Rachel E. Smith – A109
Discloses no financial relationships with commercial entities.
Nurtani Soedarsono, PhD – G2
Discloses no financial relationships with commercial entities.
Biagio Solarino, PhD – H68
Discloses no financial relationships with commercial entities.
Angela Soler, PhD – A105, W19
Discloses no financial relationships with commercial entities.
Tessa Somogyi, MA – A20, A45, A46
Discloses no financial relationships with commercial entities.
Antonella Sorrentino, MD – K15
Discloses no financial relationships with commercial entities.
Renee Sorrentino, MD – I22, W03
Discloses no financial relationships with commercial entities.
Miriam E. Soto Martinez, PhD – A141
Discloses no financial relationships with commercial entities.
Richard R. Souviron, DDS – G6
Discloses no financial relationships with commercial entities.
Patricia M. Speck, DNP – E13
Discloses no financial relationships with commercial entities.
Caroline Spencer, BS – K54
Discloses no financial relationships with commercial entities.
Monika Singh, MSc – G29
Discloses no financial relationships with commercial entities.
Kate Spradley, PhD – A144
Discloses no financial relationships with commercial entities.
Supawon Srettabunjong, MD – H138
Discloses no financial relationships with commercial entities.
Trevor I. Stamper, PhD – E23, H97
Discloses no financial relationships with commercial entities.
Sharon K. Stanford, BA – W12
Discloses no financial relationships with commercial entities.
Dawnie W. Steadman, PhD – A32
Discloses no financial relationships with commercial entities.
Becky Steffen, MS – B191
Discloses no financial relationships with commercial entities.
Paul Stein, PhD – B66, B70, E5, E21, E39, E99, F11
Discloses no financial relationships with commercial entities.
Hannah Stephen, BS – A55
Discloses no financial relationships with commercial entities.
Molly B. Still, BS – H31
Discloses no financial relationships with commercial entities.
Reinoud D. StoeI, PhD – J34
Discloses no financial relationships with commercial entities.
Andrew Stolbach, MD – W05
Discloses no financial relationships with commercial entities.
Anne Stone, PhD – B55
Discloses no financial relationships with commercial entities.
Jonah W.P. Stone, BS – B46
Discloses no financial relationships with commercial entities.
David A. Stoney, PhD – B97
Discloses no financial relationships with commercial entities.
Phoebe R. Stubblefield, PhD – A147
Discloses no financial relationships with commercial entities.
Emma L. Stuhmer, BS – B15
Discloses no financial relationships with commercial entities.
Aishwarya Subramanian – B45
Discloses no financial relationships with commercial entities.
Jolee T. Sudock, DO – H173
Discloses no financial relationships with commercial entities.
Roland Suliveras – W05
Discloses no financial relationships with commercial entities.

Khlea Sumnati, DMD – G35
Discloses no financial relationships with commercial entities.

Robert L. Sumwalt III, MS – W21
Discloses no financial relationships with commercial entities.

Eddie Surer, MD – H107
Discloses no financial relationships with commercial entities.

Joel D. Sutton, MSFS – W10
Discloses no financial relationships with commercial entities.

Cassandra A. Swart, BS – B34, K12
Discloses no financial relationships with commercial entities.

Mary C. Swearinger, MA – A114
Discloses no financial relationships with commercial entities.

Jenna K. Sweet – B11
Discloses no financial relationships with commercial entities.

Henry J. Swofford, MSFS – W13, W16
Discloses no financial relationships with commercial entities.

Steven A. Symes, PhD – H192, W08, W11
Discloses no financial relationships with commercial entities.

Sabrina C. Ta’ala, MA – A132
Discloses no financial relationships with commercial entities.

Daniela Tafur – E33
Discloses no financial relationships with commercial entities.

Mohammad A. Tahir, PhD – E26, E66, J10
Discloses no financial relationships with commercial entities.

Mio Takayama, PhD – H165
Discloses no financial relationships with commercial entities.

Chikako Takei – K1
Discloses no financial relationships with commercial entities.

Sean D. Tallman, PhD – A143
Discloses no financial relationships with commercial entities.

Jessica Tang, BS – B26
Discloses no financial relationships with commercial entities.

Zeying Tang, LLM – H102
Discloses no financial relationships with commercial entities.

Caroline Tanguay, MD – G12
Discloses no financial relationships with commercial entities.

Francesca Tarantino, MD – G31
Discloses no financial relationships with commercial entities.

Esiri Tasker, BA – B163
Discloses no financial relationships with commercial entities.

John Tavolacci, BS – C8
Discloses no financial relationships with commercial entities.

Jonee Taylor, MD – H81
Discloses no financial relationships with commercial entities.

Melissa K. Taylor, MA – J34, W10
Discloses no financial relationships with commercial entities.

Caryn E. Tegtmeier, PhD – A16
Discloses no financial relationships with commercial entities.

Keith-Dane H. Temporal, MS – B132
Discloses no financial relationships with commercial entities.

MariaTeresa A. Tersigni-Tarrant, PhD – A73, W20
Discloses no financial relationships with commercial entities.

Marissa A. Teske – K40
Discloses no financial relationships with commercial entities.

Chelsie N. Testerman, MS – B82
Discloses no financial relationships with commercial entities.

Warren D. Tewes, DDS – LW4
Discloses no financial relationships with commercial entities.

Inci Y. Tezbasan, BSc – E110, J36
Discloses no financial relationships with commercial entities.

Michael Thali, MD – H87, H104, H107, H108, H155
Discloses no financial relationships with commercial entities.

Patrick W. Thevissen, PhD – G1
Discloses no financial relationships with commercial entities.

Jeff Thomas, MBA – E1
Discloses no financial relationships with commercial entities.

Richard M. Thomas, PhD – W19
Discloses no financial relationships with commercial entities.

Christopher R. Thompson, MD – S01
Discloses no financial relationships with commercial entities.

Wanna Thongnoppakhun – H138
Discloses no financial relationships with commercial entities.

Wantaowanop Thongphap, BSc – H138
Discloses no financial relationships with commercial entities.

Drake Ryan Thrasher, BS – H78, H176
Discloses no financial relationships with commercial entities.

Nicholas A. Thurn – E103
Discloses no financial relationships with commercial entities.

Teresa M Tiedge – B107
Discloses no financial relationships with commercial entities.

Miranda R. Tilton, BA – C1
Discloses no financial relationships with commercial entities.

Taylor M. Tipton, BS – B161
Discloses no financial relationships with commercial entities.

Nicholas B. Tiscione, MS – K9
Discloses no financial relationships with commercial entities.

Justine M. Titko, MSFS – K64
Discloses no financial relationships with commercial entities.

Samantha Tolliver, PhD – K51
Discloses no financial relationships with commercial entities.

Jeffery K. Tomberlin, PhD – B57, E117
Discloses no financial relationships with commercial entities.

Joseph Toomey, PhD – I27
Discloses no financial relationships with commercial entities.

Jan J. Topoleski, MFS – A95
Discloses no financial relationships with commercial entities.

Mario Torreggianti, DDS – G39
Discloses no financial relationships with commercial entities.

Michelle N. Torres, BS – B147
Discloses no financial relationships with commercial entities.

Lauri Traub, JD – W25
Discloses no financial relationships with commercial entities.

Silvia Trotta – H68
Discloses no financial relationships with commercial entities.

Nilesh K. Tumram, MD – H6, H166
Discloses no financial relationships with commercial entities.

Sara Turco – E15, E65
Discloses no financial relationships with commercial entities.

Rachelle A. Turiello, MS – B4
Discloses no financial relationships with commercial entities.

Jane W. Turner, PhD, MD – W20
Discloses no financial relationships with commercial entities.
Noelle J. Umback, PhD – W19
  Discloses no financial relationships with commercial entities.
Evi Untoro, MD – A91
  Discloses no financial relationships with commercial entities.
Petra Urbanová, PhD – E38
  Discloses no financial relationships with commercial entities.
Paul Uribe, MD – H140, H181
  Discloses no financial relationships with commercial entities.
Tugba Ünsal, PhD – B144
  Discloses no financial relationships with commercial entities.
Samantha Upton, BA – Y22
  Discloses no financial relationships with commercial entities.
Peter R. Valentin, MSFS – E35
  Discloses no financial relationships with commercial entities.
Julie L. Valentine, PhD – E74, E76
  Discloses no financial relationships with commercial entities.
Raymond Valerio, JD – F43
  Discloses no financial relationships with commercial entities.
Michael K. Valle, BS – B128
  Discloses no financial relationships with commercial entities.
Peter M. Vallone, PhD – W10
  Discloses no financial relationships with commercial entities.
Evan Van Leer Greenberg, JD – S01
  Discloses no financial relationships with commercial entities.
Valerie Van Leer Greenberg, JD – S01
  Discloses no financial relationships with commercial entities.
Rick R. Van Rijn, PhD – H105, H117
  Discloses no financial relationships with commercial entities.
Jan Peter van Zandwijk, PhD – H8
  Discloses no financial relationships with commercial entities.
Joshua Vandeburgh – H45
  Discloses no financial relationships with commercial entities.
Courtney H. Vander Pyl – B19
  Discloses no financial relationships with commercial entities.
Susan VanderPlas – E58
  Discloses no financial relationships with commercial entities.
 astounding Shoe Outsole Database (Discussion of Unlabeled/Investigational Use of Product/Device).
Oluseyi A. Vanderpuye, PhD – K42
  Discloses no financial relationships with commercial entities.
Jessica Vanhaebost – H52
  Discloses no financial relationships with commercial entities.
Jessica Vanhaebost – H110
  Discloses no financial relationships with commercial entities.
Angiofil (Discussion of Unlabeled/Investigational Use of Product/Device).
Elena Varotto – E9
  Discloses no financial relationships with commercial entities.
Thomas W. Vastrick, BS – J5, S02
  Discloses no financial relationships with commercial entities.
Mark Vecellio, MFS – E106
  Discloses no financial relationships with commercial entities.
Fuji IR camera; Sirchie ALS (Discussion of Unlabeled/Investigational Use of Product/Device).
Elvira Ventura Spagnolo, MD – H33
  Discloses no financial relationships with commercial entities.
Jennifer L. Webb, BS – A19
Discloses no financial relationships with commercial entities.
Alexis R. Weber, BS – B22
Discloses no financial relationships with commercial entities.
Nicholas Webster, MD – W21
Discloses no financial relationships with commercial entities.
Vicki Wedel, PhD – A18
Discloses no financial relationships with commercial entities.
Victor W. Weeden, MD, JD – BS4, F30, W17
Discloses no financial relationships with commercial entities.
Svenja Weise, PhD – W24
Discloses no financial relationships with commercial entities.
Katherine E. Weisense, PhD – A23
Discloses no financial relationships with commercial entities.
Kurt D. Weiss, MS – D36, D39
Discloses no financial relationships with commercial entities.
Steven Weitz, MS – B78
Discloses no financial relationships with commercial entities.
Karim E. Wells, BA – H23
Discloses no financial relationships with commercial entities.
Hannah K. Wepner - Y4
Discloses no financial relationships with commercial entities.
Joshua White, BS – H120
Discloses no financial relationships with commercial entities.
Teresa A. White, MA – W02
Discloses no financial relationships with commercial entities.
Ray Wickenheiser, MBA – W10
Discloses no financial relationships with commercial entities.
Emily F. Wiegars, MA – A21
Discloses no financial relationships with commercial entities.
Carl Wigren, MD – W03
Discloses no financial relationships with commercial entities.
Rachel E. Wiley, MFS – B86
Discloses no financial relationships with commercial entities.
Emily J. Will, MA – J34
Discloses no financial relationships with commercial entities.
David A. Williams, DDS – B36
Discloses no financial relationships with commercial entities.
Joyce P. Williams, DNP – B36
Discloses no financial relationships with commercial entities.
Loren M. Williams, BS – J28
Discloses no financial relationships with commercial entities.
Sheila Willis, PhD – W10
Discloses no financial relationships with commercial entities.
Taylor J. Willis – I26
Discloses no financial relationships with commercial entities.
Gregoreese Willocks – B14
Discloses no financial relationships with commercial entities.
Bailey M. Wills, BS – B111
Discloses no financial relationships with commercial entities.
Teresa V. Wilson, PhD – A97
Discloses no financial relationships with commercial entities.
Rebecca J. Wilson-Taylor, PhD – A16
Discloses no financial relationships with commercial entities.
Allysha P. Winburn, PhD – A145
Discloses no financial relationships with commercial entities.
Janis Winchester, MS – J19
Discloses no financial relationships with commercial entities.
VP-8 Image Analyzer (Discussion of Unlabeled/Investigational Use of Product/Device).
Agnes D. Winokur, MS – BS4
Discloses no financial relationships with commercial entities.
Andrew J. Winter, MS – B68
Discloses no financial relationships with commercial entities.
Eric D. Wish, PhD – W05
Discloses no financial relationships with commercial entities.
David Witzke, BA – G22
Discloses no financial relationships with commercial entities.
Michael Wixted, MA – W12
Discloses no financial relationships with commercial entities.
Denise Wohlhafurt, BS – B85, B130, H32
Discloses no financial relationships with commercial entities.
Emily Wolak, DO – H164
Discloses no financial relationships with commercial entities.
Cydnee A. Wolfe - Y2
Discloses no financial relationships with commercial entities.
Rebecca Wood, MFS – E123
Discloses no financial relationships with commercial entities.
Robert E. Wood, DDS, PhD – G5, G24, G40
Discloses no financial relationships with commercial entities.
Taylor A. Wood – B23
Discloses no financial relationships with commercial entities.
Grace S. Woods, BS – H133
Discloses no financial relationships with commercial entities.
Charlotte J. Word, PhD – F43, W10
Discloses no financial relationships with commercial entities.
Diana M. Wright, PhD – W12
Discloses no financial relationships with commercial entities.
Franklin D. Wright, DMD – G4
Discloses no financial relationships with commercial entities.
Patrick M. Wright – E106
Discloses no financial relationships with commercial entities.
Fuji IR camera; Sirchie ALS Lights (Discussion of Unlabeled/Investigational Use of Product/Device).
Jingjie Wu, PhD – K20
Discloses no financial relationships with commercial entities.
Sulin Wu, PhD – H183
Discloses no financial relationships with commercial entities.
Charis Wynn, MSc – K52
Discloses no financial relationships with commercial entities.
Yamsi Yadavalli, PhD – B125
Discloses no financial relationships with commercial entities.
Aylin Yallica Saribey, PhD – B13
Discloses no financial relationships with commercial entities.
Chu-An Yang, MS – K14, K77
Discloses no financial relationships with commercial entities.
Duygu Yavuz – F31
Discloses no financial relationships with commercial entities.
Dana M. Yenko, BS – B50
Discloses no financial relationships with commercial entities.
Hatice Yilmaz, BSc – F3
Discloses no financial relationships with commercial entities.
Leena Yoon – B12
Discloses no financial relationships with commercial entities.
Kenichi Yoshizawa, MPharm – E104
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

John L. Young, MD – I8
Discloses no financial relationships with commercial entities.

Elizabeth Young Laanemets, MSc - W5
Discloses no financial relationships with commercial entities.

Jorge J. Zacca – K79
Discloses no financial relationships with commercial entities.

Carlos J. Zambrano, PhD – H156
Discloses no financial relationships with commercial entities.

Victoria Zeger – E22
Discloses no financial relationships with commercial entities.

Ellyn A. Zeidman, BS – B44
Discloses no financial relationships with commercial entities.

Mengliang Zhang, PhD – B150
Discloses no financial relationships with commercial entities.

Mingchang Zhang – H184
Discloses no financial relationships with commercial entities.

Ning Zhang – D1
Discloses no financial relationships with commercial entities.

Shuangteng Zhang, PhD – C30, C34
Discloses no financial relationships with commercial entities.

Xiaoyu A. Zheng, MS – B99
Discloses no financial relationships with commercial entities.

Andrew D. Ziegler, BS – B83
Discloses no financial relationships with commercial entities.

Debra Prince Zinni, PhD – A68
Discloses no financial relationships with commercial entities.

James Zjalic, MSc – C33
Discloses no financial relationships with commercial entities.
# KEY WORD INDEX

**1**
1,3-Dimethylamylamine-Y18
Accidental-H162
Accidental Death-D37
Accreditation Program-A70
Accumulated Degree Days-A63
Accuracies-C40
Accuracy-A82, A83, Y16
Acetaminophen-H137
ACE-V-B145
Acquisition-C31
Acquisition Levels-C32
Acting Out-I11
Acute Poisoning-H152
Adhesive-B92
Adhesives-J7
Admissibility-F44, J21, J25
Admissibility Hearings-W26
Admission-I15
Adolescents-I9
Adsorption Enthalpies-B56
Adult Cardiac Pathology-H73
Advanced Decomposed Bodies-H158
Advanced Healthcare Directive-F13
Adverse Effect-E98
Aerial/Targeted Shooting-E86
AFIS-B96
Africa-A34
Age-At-Death-A113
Age-At-Death Estimation-A27, A28, A109, A112
Age Estimation-A1, A2, A3, A4, A25, A29, A30, A37, A38, A107, A111, C9, G12, G17, G18
Age-Reporting Strategies-A112
Aggression-I9
Aging-A114, B4
Aging Population-E17
AH-7921-K32
A-Helix-H135
Air Embolism-W04
Aircraft Deceleration-A13
Airway Obstruction-H16
Albumin-K42
Alcohol-W27
Alcohol Abuse-H41
Alcohol Testing-F21
Alcoholic Hepatitis-H71
Alcoholic Hepatomegaly-H71
Alcohol-Induced Liver Failure-H71
Alcoholism-H41
Alcoholometer-F31
ALS-E106
Alternate Light Source (ALS)-A66
Alternative Biological Matrices-K15
Alternative Dental Records Search-LW4
Aluminum Powder-B159
Alveolar Capillary Dysplasia-E5, H56
Amino Acid As Biomarker-K7

**16**
16S RDNA-B85, B154, H32
16S RRNA-H95
16S RRNA Gene-H30

**A**
AAD Estimation-A60
AAFS-A143
Abdominal Apoplexy-H69
Abdominal Trauma-H117
ABFA-A71
Abnormal Sexuality-F48, I43
Abstinence-F21
Academics-F14
Accelerants-B141
Accident-H179
Accidents-I8
Amino Acid Racemization Dating-B73
Ammunition-D6
Amphetamine-K65
Amphetamines-K30
AMR Codec-C36
Anabolic Androgenic Steroids (AAS)-E98
Anabolic Steroids-H171
Analogue-F20
Analysis-G6, G7, J8
Analytical Data-B22
Analytical Science-F37
Anaphylactic Shock-H83
Ancestry Assessment-A115
Ancestry Inference-B45, B108
Ancestry Prediction-B41
Android™-C14, C16, C27
Android™ Apps-C19
Animal Abuse-A137
Animal Cruelty-E84
Animal Models-H7
Anorexia-H86
Anthropophagy-I19
Anticoagulation-H23
Antidepressants-K66
Anti-Epileptic Drugs-K53
Antimeric Asymmetry-A9
Anti-Myoglobin Antibodies-H10
Antipsychotics-K66
Anti-Retroviral-B182
Aortic Arch Variants-H84
Apache Tracking Method-E39
Apple®-C18
Appliance-C31
Aquous Fluid-H169
Arc Melting-D42
carcGIS®-A23
Armed Conflict-A31
Arson-B136, B141, I10
Arson Investigation-D26
Arteriovenous Malformations-H64
Artificial Intelligence-E61
Asbestos-H62
ASD-H70
Asphyxia-H3, H16, H45, H80, Y9
Asphyxial Deaths-H53
Asphyxiation-D37, E4, H5
Assay-H164, Y18
Assessment-I6, I31
Associative Value-B97
ATCA-B131
Atherosclerosis-H128
Atomic Force Microscopy-B125
Atrial Septal Defect-H123
<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attorney Ethics-F38</td>
</tr>
<tr>
<td>Attributes of Elderly Drivers-D14</td>
</tr>
<tr>
<td>Attribution-B33</td>
</tr>
<tr>
<td>ATV-H22</td>
</tr>
<tr>
<td>Atypical Gunshot Wounds-H40</td>
</tr>
<tr>
<td>Audio-C18</td>
</tr>
<tr>
<td>Audio Forensics-C36</td>
</tr>
<tr>
<td>Augmented Reality-Hanging-H157</td>
</tr>
<tr>
<td>Auricular Surface-A38</td>
</tr>
<tr>
<td>Australia-A86</td>
</tr>
<tr>
<td>Authentication-F24</td>
</tr>
<tr>
<td>Autoerotic Asphyxiation (AeA)-Death-W02</td>
</tr>
<tr>
<td>Autofluorescence-B164</td>
</tr>
<tr>
<td>Autoimmune Disease-H182</td>
</tr>
<tr>
<td>Autoimmune Diseases-H76</td>
</tr>
<tr>
<td>AutoMate Express™-E44</td>
</tr>
<tr>
<td>Automated Dental Age Estimation-G16</td>
</tr>
<tr>
<td>Automated Tooth Development Staging-G16</td>
</tr>
<tr>
<td>Automatic Transfer Switch (ATS)-D31</td>
</tr>
<tr>
<td>Automation-B119, B200, K30</td>
</tr>
<tr>
<td>Autopsy-E20, E113, H116, H132, H164, H194, I34</td>
</tr>
<tr>
<td>Avtomat Kalashnikov-H11</td>
</tr>
<tr>
<td>Awareness-I36</td>
</tr>
<tr>
<td>Axonal Strain-D16</td>
</tr>
<tr>
<td>Azoopsermia-E81</td>
</tr>
</tbody>
</table>

**B**

<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAC-F35, K23</td>
</tr>
<tr>
<td>Background-W23</td>
</tr>
<tr>
<td>Backlog-B82, B192</td>
</tr>
<tr>
<td>Bacteria-B154</td>
</tr>
<tr>
<td>Bacterial Endocarditis-H72</td>
</tr>
<tr>
<td>Bacterial Myocarditis-H54</td>
</tr>
<tr>
<td>Ballistic-H192</td>
</tr>
<tr>
<td>Ballistic Trauma-A47</td>
</tr>
<tr>
<td>Ballistics-B68, H190</td>
</tr>
<tr>
<td>Ballistics Testing-H15</td>
</tr>
<tr>
<td>Barefoot Slip Resistance-D11</td>
</tr>
<tr>
<td>Bed Bugs-E51</td>
</tr>
<tr>
<td>Bedrail-D17</td>
</tr>
<tr>
<td>Behavioral Evidence-E69</td>
</tr>
<tr>
<td>Benzodiazepine-K74</td>
</tr>
<tr>
<td>Benzodiazepines-B20, E96</td>
</tr>
<tr>
<td>Best Practices-B58, F18</td>
</tr>
<tr>
<td>Bias-A84, A85, B201, E112, E120</td>
</tr>
<tr>
<td>Big Data-W17</td>
</tr>
<tr>
<td>Bilateral Carotid Artery Dissection-E3</td>
</tr>
<tr>
<td>Biochemical Marker-H121</td>
</tr>
<tr>
<td>Biodeterioration-A19</td>
</tr>
<tr>
<td>Bioethics-F42</td>
</tr>
<tr>
<td>Biohazard-C7</td>
</tr>
<tr>
<td>Bioinformatics-H28</td>
</tr>
<tr>
<td>Biological Fluids-B194</td>
</tr>
<tr>
<td>Biological Identification-A7</td>
</tr>
<tr>
<td>Biological Matrices-K41</td>
</tr>
<tr>
<td>Biological Profile-A3, A9, A25, A26, A37, A58, A112, W24</td>
</tr>
<tr>
<td>Biomarkers-H67</td>
</tr>
<tr>
<td>Biomechanics of Breathing-D37</td>
</tr>
<tr>
<td>Biometrics-C24, C38, C39, E39, Y22</td>
</tr>
<tr>
<td>Biopsies-H113</td>
</tr>
<tr>
<td>Biracial Sample-A148</td>
</tr>
<tr>
<td>Bitcoin Content Analysis-C23</td>
</tr>
<tr>
<td>Bitcoin Forensics-C23</td>
</tr>
<tr>
<td>Bitemark-G4, G5, G7, G8, LW1</td>
</tr>
<tr>
<td>Bitemark Research-G3</td>
</tr>
<tr>
<td>Bitemarks-G10</td>
</tr>
<tr>
<td>Black-A95</td>
</tr>
<tr>
<td>Blackout-D29</td>
</tr>
<tr>
<td>Black Powder Substitutes-B103</td>
</tr>
<tr>
<td>Blank Gun-B68</td>
</tr>
<tr>
<td>Blast Injuries-A13</td>
</tr>
<tr>
<td>Blast Suppression Foam-B63</td>
</tr>
<tr>
<td>Blending Markers-J3</td>
</tr>
<tr>
<td>Blood-J16</td>
</tr>
<tr>
<td>Blood Alcohol Concentration-J9, K20</td>
</tr>
<tr>
<td>Blood Decomposition VOCs-B58</td>
</tr>
<tr>
<td>Blood Degradation-B32</td>
</tr>
<tr>
<td>Blood Flow Pattern-E73</td>
</tr>
<tr>
<td>Blood, Oral Fluid, and Urine-K75</td>
</tr>
<tr>
<td>Blood Pattern Analysis-D3</td>
</tr>
<tr>
<td>Bloodborne Pathogens-C7</td>
</tr>
<tr>
<td>Bloodstain-E82, E83, H77, H103</td>
</tr>
<tr>
<td>Bloodstain Age-E83</td>
</tr>
<tr>
<td>Bloodstains-Y13</td>
</tr>
<tr>
<td>Blow Flies-B57, E49</td>
</tr>
<tr>
<td>Blow Fly-H189</td>
</tr>
<tr>
<td>Blunt Force-H178</td>
</tr>
<tr>
<td>Blunt Force Head Trauma-D36</td>
</tr>
<tr>
<td>Blunt Force Injuries-W11</td>
</tr>
<tr>
<td>Blunt Force Trauma-A124, A139, E3, H177</td>
</tr>
<tr>
<td>Body-Building Enhancers-H171</td>
</tr>
<tr>
<td>Body Donation-A145</td>
</tr>
<tr>
<td>Body Fluid ID-B85, B130</td>
</tr>
<tr>
<td>Body Fluid Identification-B44, B51, B81, B122, H25, H27, H35</td>
</tr>
<tr>
<td>Body Fluids-B127, H29</td>
</tr>
<tr>
<td>Body Physiology-B195</td>
</tr>
<tr>
<td>Bone-A48, B39, B119, H94</td>
</tr>
<tr>
<td>Bone Apatite-A74</td>
</tr>
<tr>
<td>Bone Biomechanics-H192</td>
</tr>
<tr>
<td>Bone Diagenesis-A52</td>
</tr>
<tr>
<td>Bone Dimensions-G19</td>
</tr>
<tr>
<td>Bone Histology-A29</td>
</tr>
<tr>
<td>Bone Mineral Density-A28, A45, A141</td>
</tr>
<tr>
<td>Bone Transplant-A54</td>
</tr>
<tr>
<td>Bones-Y2</td>
</tr>
<tr>
<td>Botanical Materials-B71</td>
</tr>
<tr>
<td>Botnets-C30</td>
</tr>
<tr>
<td>BrAC-F35</td>
</tr>
<tr>
<td>Brachial Artery-H68</td>
</tr>
<tr>
<td>Brain-I38</td>
</tr>
<tr>
<td>Brain Death-F42</td>
</tr>
<tr>
<td>Brand Discrimination-J32</td>
</tr>
<tr>
<td>Brazil-A87, L1</td>
</tr>
<tr>
<td>Breath Alcohol Concentration-J9</td>
</tr>
<tr>
<td>Bribe-E109</td>
</tr>
<tr>
<td>Brodifacoum-E95, H175</td>
</tr>
<tr>
<td>Buckle Rib Fracture-A125</td>
</tr>
<tr>
<td>Bullet Entry Hole-E99</td>
</tr>
<tr>
<td>Bullet Grain-Caliber-E99</td>
</tr>
<tr>
<td>Bullet Striations-B100</td>
</tr>
<tr>
<td>Bullets-B142</td>
</tr>
<tr>
<td>Bullying-H39</td>
</tr>
<tr>
<td>Burial-Y2</td>
</tr>
<tr>
<td>Buried Human Remains-A67, A132</td>
</tr>
<tr>
<td>Buried Remains-A133, K65</td>
</tr>
<tr>
<td>Burmese Python-A51</td>
</tr>
<tr>
<td>Burned Bone-A135</td>
</tr>
<tr>
<td>Burned Bones-A76</td>
</tr>
<tr>
<td>Burned/Cremated Bone-B55</td>
</tr>
<tr>
<td>Burns-K26</td>
</tr>
<tr>
<td>Burrage-F19</td>
</tr>
</tbody>
</table>

**C**

<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable Car-D31</td>
</tr>
<tr>
<td>Cable Ties-H188</td>
</tr>
<tr>
<td>Cadaver Decomposition-E121, H99</td>
</tr>
<tr>
<td>Cadaver Internal Organs-H95</td>
</tr>
<tr>
<td>Calcined-G33</td>
</tr>
<tr>
<td>Calliphoridae-H34</td>
</tr>
<tr>
<td>Calliphoridae–Muscidae-E53</td>
</tr>
<tr>
<td>Cambodia-A142</td>
</tr>
<tr>
<td>Camouflage-D19</td>
</tr>
<tr>
<td>Cancellous Bone-A96</td>
</tr>
<tr>
<td>Cancer Risk-F33</td>
</tr>
<tr>
<td>Canine-B153, P18</td>
</tr>
<tr>
<td>Canine Detection-B61, E30</td>
</tr>
<tr>
<td>Canine Detection and Identification-B146</td>
</tr>
<tr>
<td>Canine Training Aids-B88</td>
</tr>
<tr>
<td>Cannabinoid-K70</td>
</tr>
<tr>
<td>Cannabinoids-B176, H170, H175, K25, K42</td>
</tr>
<tr>
<td>Cannabis sativa-B155, B156</td>
</tr>
<tr>
<td>Cannibalism-I19, I20</td>
</tr>
<tr>
<td>Capacity Building-A35</td>
</tr>
<tr>
<td>Car Surfing-H104</td>
</tr>
<tr>
<td>Carbamate Pesticide Poisoning-K72</td>
</tr>
<tr>
<td>Carbonization-G32</td>
</tr>
<tr>
<td>Carbon- Less Copy-J20</td>
</tr>
<tr>
<td>Carboxyhemoglobin-K26</td>
</tr>
<tr>
<td>Carboxyhemoglobin (COHb)-K14</td>
</tr>
<tr>
<td>Cardiac Death-H52</td>
</tr>
<tr>
<td>Cardiac Erosion-H70</td>
</tr>
<tr>
<td>Cardiac Fibrosis-H52</td>
</tr>
<tr>
<td>Cardiac Lipoma-H58</td>
</tr>
<tr>
<td>Cardiac Pathology-H51</td>
</tr>
<tr>
<td>KEY WORD INDEX</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Cardiac Wounds-H12</td>
</tr>
<tr>
<td>Cardiomyopathy of Unknown Etiology-H55</td>
</tr>
<tr>
<td>Cardio-Pump-H12</td>
</tr>
<tr>
<td>Cardiotoxicity-H140</td>
</tr>
<tr>
<td>Carfentanil-K50</td>
</tr>
<tr>
<td>Carotid Artery Dissection-H4</td>
</tr>
<tr>
<td>Carrion Beetles-H102</td>
</tr>
<tr>
<td>Cartilage-A20</td>
</tr>
<tr>
<td>Cardiologic Cases-B9</td>
</tr>
<tr>
<td>Case Analysis-E23</td>
</tr>
<tr>
<td>Case-Based Analysis-H40</td>
</tr>
<tr>
<td>Case Report-H79, H81, A57, B103, C128, D1, E120, E161, Y12</td>
</tr>
<tr>
<td>Casework-A99</td>
</tr>
<tr>
<td>Casey Anthony-W08</td>
</tr>
<tr>
<td>Casting Media-B70</td>
</tr>
<tr>
<td>Cat Scavenging-A56</td>
</tr>
<tr>
<td>Cause of Death-H57, H121, H143</td>
</tr>
<tr>
<td>CB1 Receptor-K54</td>
</tr>
<tr>
<td>CBRN-B63</td>
</tr>
<tr>
<td>CBTP-I28</td>
</tr>
<tr>
<td>CE/MS and Proteomics-B73</td>
</tr>
<tr>
<td>Ceftriaxone-H83</td>
</tr>
<tr>
<td>Cell-Free DNA-Y6</td>
</tr>
<tr>
<td>Cell Separation-B128</td>
</tr>
<tr>
<td>Census Data-B35</td>
</tr>
<tr>
<td>Central Nervous System-H63</td>
</tr>
<tr>
<td>Ceramic Crown-G38</td>
</tr>
<tr>
<td>Cerebellar Hemorrhage-Y5</td>
</tr>
<tr>
<td>Cerebral Ischemia-H63</td>
</tr>
<tr>
<td>Certification-A71, A73, E89</td>
</tr>
<tr>
<td>Cervical Spinal Cord-H119</td>
</tr>
<tr>
<td>Cesarean Section-E15</td>
</tr>
<tr>
<td>Challenge-F26</td>
</tr>
<tr>
<td>Characteristics-I27</td>
</tr>
<tr>
<td>Characterization-B26, E54</td>
</tr>
<tr>
<td>Checklists-BS1</td>
</tr>
<tr>
<td>Cheese-LW1</td>
</tr>
<tr>
<td>Chemical Handling-B134</td>
</tr>
<tr>
<td>Chemiluminescence-Y13</td>
</tr>
<tr>
<td>Chemistry Forensic Laboratory-B134</td>
</tr>
<tr>
<td>Chemometrics-B135, B150, E103, E124</td>
</tr>
<tr>
<td>Chemotherapy-A50</td>
</tr>
<tr>
<td>Child-G10</td>
</tr>
<tr>
<td>Child Abuse-E11, E14, G1, H7, H8, H18, H105, H106, H117</td>
</tr>
<tr>
<td>Child Custody Evaluations-I41</td>
</tr>
<tr>
<td>Child Murder-W03</td>
</tr>
<tr>
<td>Child Pornography-C9, C13, I22</td>
</tr>
<tr>
<td>Child Psychiatry-I41</td>
</tr>
<tr>
<td>Child Sexual Abuse-E13</td>
</tr>
<tr>
<td>Children-H18</td>
</tr>
<tr>
<td>Chilean Cranio-Nastics-A41</td>
</tr>
<tr>
<td>Chloroplast DNA Barcoding-B155</td>
</tr>
<tr>
<td>Choking-H5, H45</td>
</tr>
<tr>
<td>Cholesterol-I8</td>
</tr>
<tr>
<td>Chronic Ethanol-H41</td>
</tr>
<tr>
<td>Chronic Traumatic Encephalopathy-H124</td>
</tr>
<tr>
<td>Chronology-H153</td>
</tr>
<tr>
<td>Churches-A36</td>
</tr>
<tr>
<td>Civil Aviator-H1</td>
</tr>
<tr>
<td>Civil Commitment-I30</td>
</tr>
<tr>
<td>Civil Law Systems-D21</td>
</tr>
<tr>
<td>Classification-B193</td>
</tr>
<tr>
<td>Classification Programs-W14</td>
</tr>
<tr>
<td>Clavicle-A111</td>
</tr>
<tr>
<td>Cleaning-B202</td>
</tr>
<tr>
<td>Climate-E53</td>
</tr>
<tr>
<td>Clinical Forensic Imaging-H107</td>
</tr>
<tr>
<td>Clinical Forensic Medicine-E75</td>
</tr>
<tr>
<td>Closed Head Injuries-H7, H8</td>
</tr>
<tr>
<td>Clostridium-H31, H187</td>
</tr>
<tr>
<td>CO Intoxication-E4</td>
</tr>
<tr>
<td>Coagulation-E65</td>
</tr>
<tr>
<td>Coagulopathy-H175</td>
</tr>
<tr>
<td>Coatings-B165</td>
</tr>
<tr>
<td>Cocaine-E92, H141, K9, K33</td>
</tr>
<tr>
<td>CODIS-B185</td>
</tr>
<tr>
<td>CODIS Hit-E78</td>
</tr>
<tr>
<td>Coefficient of Friction-D10</td>
</tr>
<tr>
<td>Correlation-E93</td>
</tr>
<tr>
<td>CofESE-E118</td>
</tr>
<tr>
<td>Cognition-W01</td>
</tr>
<tr>
<td>Cognitive Bias-A44</td>
</tr>
<tr>
<td>Cognitive Human Factors-J6</td>
</tr>
<tr>
<td>Cognitive Psychology-B201</td>
</tr>
<tr>
<td>Cold Case-H38</td>
</tr>
<tr>
<td>Cold Cases-A21, B58</td>
</tr>
<tr>
<td>Cold Electron Ionization-B104</td>
</tr>
<tr>
<td>Cold Electron Ionization/MS-B179</td>
</tr>
<tr>
<td>Collaboration-F43, L1</td>
</tr>
<tr>
<td>Collaborative Effort-H43</td>
</tr>
<tr>
<td>Collagen-A99</td>
</tr>
<tr>
<td>Collection Technique-K23</td>
</tr>
<tr>
<td>Collision Energy-B18</td>
</tr>
<tr>
<td>Collision Investigation-B72</td>
</tr>
<tr>
<td>Colorimetric Detection-B172</td>
</tr>
<tr>
<td>Columnar Thin Films-B107</td>
</tr>
<tr>
<td>Combined Dental and Skeletal-G18</td>
</tr>
<tr>
<td>Command &amp; Control Server-C30</td>
</tr>
<tr>
<td>Commanded Human Remains-A75</td>
</tr>
<tr>
<td>Commanded Remains-A17, A52</td>
</tr>
<tr>
<td>Commanding-A16, A54</td>
</tr>
<tr>
<td>Communication-F12, F43</td>
</tr>
<tr>
<td>Communication of Findings-F46</td>
</tr>
<tr>
<td>Comparison-G6, G25</td>
</tr>
<tr>
<td>Comparison Microscopes-B101</td>
</tr>
<tr>
<td>Competency-A73, F82</td>
</tr>
<tr>
<td>Complex Mixtures-B178</td>
</tr>
<tr>
<td>Complex Suicides-E62</td>
</tr>
<tr>
<td>Complications of Marijuana Usage-H78</td>
</tr>
<tr>
<td>Compromised Samples-B130</td>
</tr>
<tr>
<td>COMPS-B140</td>
</tr>
<tr>
<td>Computational Anthropology-A27</td>
</tr>
<tr>
<td>Computational Linguistics-D8</td>
</tr>
<tr>
<td>Computational Software-B109</td>
</tr>
<tr>
<td>Computed Tomography-H75, H194</td>
</tr>
<tr>
<td>Computed Tomography Scan</td>
</tr>
<tr>
<td>Projection-H156</td>
</tr>
<tr>
<td>Computer Forensics-C13</td>
</tr>
<tr>
<td>Concealed Corpses-E9</td>
</tr>
<tr>
<td>Concordance-B129</td>
</tr>
<tr>
<td>Conceussion-D15</td>
</tr>
<tr>
<td>Confession-F23</td>
</tr>
<tr>
<td>Confinement-E4</td>
</tr>
<tr>
<td>Congenital Heart Disease-H73</td>
</tr>
<tr>
<td>Congenital High Airway Obstruction-E12</td>
</tr>
<tr>
<td>Consanguinity-B120</td>
</tr>
<tr>
<td>Consensus Standards-B51, F27</td>
</tr>
<tr>
<td>Consent-F12</td>
</tr>
<tr>
<td>Conspiracy-D19</td>
</tr>
<tr>
<td>Consultancy-A99</td>
</tr>
<tr>
<td>Contact DNA-B114</td>
</tr>
<tr>
<td>Contaminant-B121</td>
</tr>
<tr>
<td>Contamination-E66</td>
</tr>
<tr>
<td>Context-A86</td>
</tr>
<tr>
<td>Contextual Effects-E112</td>
</tr>
<tr>
<td>Contextual Information-A85</td>
</tr>
<tr>
<td>Contingency Fees-F22</td>
</tr>
<tr>
<td>Continuing Education-F37</td>
</tr>
<tr>
<td>Contrast Agent-H112</td>
</tr>
<tr>
<td>Contributor-B76</td>
</tr>
<tr>
<td>Control Valves-D33</td>
</tr>
<tr>
<td>Controlled Substances-B137</td>
</tr>
<tr>
<td>Conventional X-Rays-H112</td>
</tr>
<tr>
<td>Conviction-G7</td>
</tr>
<tr>
<td>Copies-J24</td>
</tr>
<tr>
<td>Copper Degradation-B50</td>
</tr>
<tr>
<td>Core Competencies-A72</td>
</tr>
<tr>
<td>Coronary Artery-H128</td>
</tr>
<tr>
<td>Coronary Calcifications-H129</td>
</tr>
<tr>
<td>Coroners/Medical Examiner-E1</td>
</tr>
<tr>
<td>Correctional Facilities-B137</td>
</tr>
<tr>
<td>Corrosive-H162</td>
</tr>
<tr>
<td>Cosmetic Foundations-E100</td>
</tr>
<tr>
<td>Cosmic Forensics-LW2</td>
</tr>
<tr>
<td>Costal Cartilage-B1</td>
</tr>
<tr>
<td>Counterfeit Currency-J14</td>
</tr>
<tr>
<td>Counterfeit Pills-H173</td>
</tr>
<tr>
<td>Counterfeiting-J27</td>
</tr>
<tr>
<td>Counterfeits-J4</td>
</tr>
<tr>
<td>Courtroom Challenges-W26</td>
</tr>
<tr>
<td>Courts-I4</td>
</tr>
<tr>
<td>CPR-H12</td>
</tr>
<tr>
<td>Cranial Bone Histomorphology-H146</td>
</tr>
<tr>
<td>Cranial Fracture Healing-H146</td>
</tr>
<tr>
<td>Cranial Fractures-A126</td>
</tr>
<tr>
<td>Cranial Vault-H145</td>
</tr>
<tr>
<td>Craniofacial Identification-A59</td>
</tr>
<tr>
<td>Craniofacial Proportions-A115</td>
</tr>
<tr>
<td>Craniotomy Holes-A126</td>
</tr>
<tr>
<td>Crash Hazards-D27</td>
</tr>
<tr>
<td>KEY WORD INDEX</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Crash Reconstruction-C21</td>
</tr>
<tr>
<td>Cremated Bone-A135</td>
</tr>
<tr>
<td>Cremation-H46</td>
</tr>
<tr>
<td>Crime and Genealogy-F4</td>
</tr>
<tr>
<td>Crime Laboratories-F22</td>
</tr>
<tr>
<td>Crime Scene-B196, B199, E22, G8</td>
</tr>
<tr>
<td>Crime Scene Documentation-F36</td>
</tr>
<tr>
<td>Crime Scene Investigation-E, E8, E56</td>
</tr>
<tr>
<td>Crime Scene Reconstruction-E35</td>
</tr>
<tr>
<td>Crimes Against Humanity-F30</td>
</tr>
<tr>
<td>Criminal and Victim Identification-C38, C39</td>
</tr>
<tr>
<td>Criminal Behavior-E69</td>
</tr>
<tr>
<td>Criminal Behavior Analysis-E33</td>
</tr>
<tr>
<td>Criminal Justice-E41, F39</td>
</tr>
<tr>
<td>Criminal Organization-E70</td>
</tr>
<tr>
<td>Criminal Profiling-E34</td>
</tr>
<tr>
<td>Criminal Trials-F41</td>
</tr>
<tr>
<td>Criminalistics-B170</td>
</tr>
<tr>
<td>Crossed Line Intersections-J13</td>
</tr>
<tr>
<td>Crossing-Line Intersection-J23</td>
</tr>
<tr>
<td>Crotonylfentanyl-K60</td>
</tr>
<tr>
<td>Crucifixion-E73</td>
</tr>
<tr>
<td>Crushing Deaths-H177</td>
</tr>
<tr>
<td>Crystal Violet-J23</td>
</tr>
<tr>
<td>“CSI Effect”-E46</td>
</tr>
<tr>
<td>CT Image and Radiograph Comparison-H159</td>
</tr>
<tr>
<td>CT Imaging-H107</td>
</tr>
<tr>
<td>Cultural Anthropology-A32</td>
</tr>
<tr>
<td>Cultural Considerations-I33</td>
</tr>
<tr>
<td>Currency Analysis-J14</td>
</tr>
<tr>
<td>Current Status-A89, A90</td>
</tr>
<tr>
<td>Curriculm-B183</td>
</tr>
<tr>
<td>Cyanide Metabolite-B131</td>
</tr>
<tr>
<td>Cyberbullying-J13</td>
</tr>
<tr>
<td>Cyclopropylfentanyl-K60</td>
</tr>
<tr>
<td>DAE Database-G21</td>
</tr>
<tr>
<td>Damaged Devices-C6</td>
</tr>
<tr>
<td>DARLInG-G21</td>
</tr>
<tr>
<td>DART-HRMS-E124</td>
</tr>
<tr>
<td>DART-MS-B25, B103, B150</td>
</tr>
<tr>
<td>DART-TOF/MS-K76</td>
</tr>
<tr>
<td>Data-A130, F34</td>
</tr>
<tr>
<td>Data Center-D32</td>
</tr>
<tr>
<td>Data Mining-E61</td>
</tr>
<tr>
<td>Data Recovery-C20</td>
</tr>
<tr>
<td>Databank-F5</td>
</tr>
<tr>
<td>Database-A21, B193, E57, E58</td>
</tr>
<tr>
<td>Databasing-B5, B184</td>
</tr>
<tr>
<td>Daubert-F44, J21</td>
</tr>
<tr>
<td>DEA-B64</td>
</tr>
<tr>
<td>Death-H120, H183, H186, H191, Y5</td>
</tr>
<tr>
<td>Death Certification-H45</td>
</tr>
<tr>
<td>Death Investigation-H195</td>
</tr>
<tr>
<td>Death Investigators-W02</td>
</tr>
<tr>
<td>Deaths-H22, H42, H48</td>
</tr>
<tr>
<td>Death Scene Investigation-E19, E94, I34</td>
</tr>
<tr>
<td>Decalcification Methods-H146</td>
</tr>
<tr>
<td>Decapitation-A15, H178</td>
</tr>
<tr>
<td>Decision Accuracy-J11, J31</td>
</tr>
<tr>
<td>Decision-Making Confidence-B145</td>
</tr>
<tr>
<td>Decomposition-A50, A64, A128, B31, C37, G13, H2, H92, W08</td>
</tr>
<tr>
<td>Deep Learning-H114</td>
</tr>
<tr>
<td>Deepfakes-C25</td>
</tr>
<tr>
<td>Defense-F40</td>
</tr>
<tr>
<td>Definition-B76</td>
</tr>
<tr>
<td>Degradation-B69</td>
</tr>
<tr>
<td>Degraded DNA-B55, E47</td>
</tr>
<tr>
<td>Delayed Clinical Presentation-H23</td>
</tr>
<tr>
<td>Delayed Hypersensitivity Reaction-H186</td>
</tr>
<tr>
<td>Deletion 18q-LW5</td>
</tr>
<tr>
<td>Demographics-K51, Y22</td>
</tr>
<tr>
<td>Denial of Pregnancy-I16</td>
</tr>
<tr>
<td>Dental-G34, G40</td>
</tr>
<tr>
<td>Dental Age-G13</td>
</tr>
<tr>
<td>Dental Age Assessment-G11, G20</td>
</tr>
<tr>
<td>Dental Age Estimation-G14, G15, G21, G41</td>
</tr>
<tr>
<td>Dental Autopsy-G31, G39</td>
</tr>
<tr>
<td>Dental Cementum Increment Analysis-A18</td>
</tr>
<tr>
<td>Dental Crown Measurements-A102</td>
</tr>
<tr>
<td>Dental Development-A107</td>
</tr>
<tr>
<td>Dental Extraction-H83</td>
</tr>
<tr>
<td>Dental Histology-A18, A114</td>
</tr>
<tr>
<td>Dental Identification-A58, G24, G36, G38, H159, LW4</td>
</tr>
<tr>
<td>Dental IDs-G28</td>
</tr>
<tr>
<td>Dental Morphology-A104</td>
</tr>
<tr>
<td>Dental Non-Metrics-W22</td>
</tr>
<tr>
<td>Dental Records-G28</td>
</tr>
<tr>
<td>Dental Stone-Plaster of Paris-B70</td>
</tr>
<tr>
<td>Denver-H42</td>
</tr>
<tr>
<td>Depleted Uranium-F33</td>
</tr>
<tr>
<td>Depth Perception-D19</td>
</tr>
<tr>
<td>Derivatization-K61</td>
</tr>
<tr>
<td>Dermestes Maculatus-A51</td>
</tr>
<tr>
<td>Dermoscopy-E36</td>
</tr>
<tr>
<td>Designer-E96</td>
</tr>
<tr>
<td>Designer Drugs-B168</td>
</tr>
<tr>
<td>Desmosomal Mutation-H184</td>
</tr>
<tr>
<td>Destructive Device-D5</td>
</tr>
<tr>
<td>Detection Dogs-E80</td>
</tr>
<tr>
<td>Detection of False Positive Alcohol-F31</td>
</tr>
<tr>
<td>Development-B53, E49</td>
</tr>
<tr>
<td>Device Cleaning-C6</td>
</tr>
<tr>
<td>Device Components-B87</td>
</tr>
<tr>
<td>DFC-Y14</td>
</tr>
<tr>
<td>Diabetes Mellitus-H57</td>
</tr>
<tr>
<td>Diaphragmatic Eventration-H183</td>
</tr>
<tr>
<td>Diatoms-E125</td>
</tr>
<tr>
<td>Dichloromethane-E60</td>
</tr>
</tbody>
</table>
KEY WORD INDEX

Document Examination-J1, J12, J29
Documentation-E22
Documents-W09
DogFiler-B153
Domestic Violence-H111, I11
Donation-H48
Doping-K2
Dorsal Root Ganglia Hemorrhage-H119
Double Compression-C36
Double Quantization-C28
Double Suicide-E19
Dried Blood Spot-K6, K66
Dried Blood Spots-E48
D-Ring-D40
Driver Fatalities-H168
Driving Impairment-K22
Driving Under the Influence-K20, K63
Drones-B196
Drowning-E64, H3, H151, W04
Drug Abuse-H68
Drug Abuser-H165
Drug Analysis-B25, B54, B132, K33, W23
Drug Chemistry-B65
Drug Death-H174
Drug Early-Warning System-H136
Drug Evidence-F39
Drug Impairment-W21
Drug Intoxication-E28
Drug Overdose-K68, K81
Drug Recognition Expert (DRE)-K18
Drug Screen-H164
Drug Screening-K1
Drug Surveillance-K81
Drug Trends-B64, K51
Drug-Related Death-H136
Drugs-B20, B202, B203, H147, K10, K22
Drugs of Abuse-H9
Drum Defects-J4
Dry Vacuum Swabbing-E42
Duct Tape-B133
DUID-K18, K61, K62
Dust-D7
Duty to Correct-F15
DXAGE-A28
Dynamic Algorithm-E24

Education Models-J2
Educational Outreach-E116
Efficiency-B5
Ejection Fatality-D39
Elder Abuse-A138, E31
Elder Neglect-A138
Elderly-I5
Elderly Victims-H179
Electrical Grid-D29
Electrical Injury-D28
Electrical Tape-B59, B62
Electrocautery-H149
Electrochemical Cell-K27
Electrochemistry-B55, K38
Electrocution-D28, H6, H17
Electrolytes-H181
Electronic Cigarette-K73
Electronic Health Records-H49
Electronic Surveillance-F25
Electrophoresis-K42
Electrophoretic Separation-B178
Elemental-Y3
Elemental Characterization-B59
Elemental Mercury-E66
Elevator-H191
ELISA-K74
Elution Volume-B116
Emergency Response-A31
Emerging Technologies-W06
Emotional Manipulation-J12
Empirical Measurement-J6
Empirical Studies-G5
End of Life-F32
Endoglin-H64
Enhancement-B72
Entomology-E124, H91, H100
Entomotoxicology-E50, H100, K33
Entrapment-D17
Environmental Conditions-B17, B22
Environmental Damage Cost-D35
Enzymatic Ethanol Assay-K57
Enzyme-Linked Immuno-Sorbent
   Assay-H185, K9
Epidemic-LW6
Epidemiology-K14, K50
Epidermal Squamous Corneocytes-B117
Epigenetics-B122
Epiphysial Union-A110
Epithelial Skin Cells-B48
Equestrian Accidents-D15
Equivocal Death-W02
Error Rates-E120
Ethanol-K56
Ethanol Analysis-E93
Ethereum-C30
Ethics-A145, D20, F13, F15, F16, F22, I32
Ethyl Glucuronide-K34, K56
Ethyl Sulfate-K56
Eukaryote-H96
Europe-F29
European American-A104
European Australian-A104
Evaluation-E77
Evaporative Cooler-H6
Events Log File-C15
Evidence-C2, J19
Evidence Admissibility-F24
Evidence Collection-B13, B144, E76
Examiner Behavior-B95
Exercise-H181
Exhibitionism-I43
Exoneration-B186, BS7
Expert Evidence-F46
Expert Report-A94
Expert Testimony-F16, J25
Expert Witness-F14, I2
Experts-J21
Expirated-D3
Expiratory Alcohol Test-K20
Explosion-D34
Explosive Residue-B17
Explosives-B24, B29, B87, B104, B162,
   D24, Y17
Explosives Detection-E30
Extended-Release-H176
External Contamination-K58
Externally Visible Characteristics-B14
Extracellular DNA-B125
Extraction-B161, H29
Extraction Method-E48
Extraction Methods-K19
Extraction of Drugs-K5
Extrajudicial Executions-E33
Extra-Linguistic Investigation-D8
Extreme-I20
Eye Temperature-H131
Eye Tracking-B95

F

Fabric Impression-B158
Facial Approximation-A59
Facial Fracture-A139
Facial Reconstructions-E37
Failure-D32
Fake News-C11
Falls From Height-H150
False Conclusions-B203
False Confessions-F11
False Larynx Fractures-H189
False Positive-B71, K57
False Positives-B160
Family Reunification-E123
Fast Analysis-B54
KEY WORD INDEX

Fatal-H44
Fatal Arrhythmia-H58
Fatal Drug Overdoses-K50
Fatigue-H1
Federal Initiatives-E113
Federal Reserve Note-J14
Fellowship Training-A70
FEM Analysis-D13
Female-I10
Fenobucarb-K72
Fentanyl-B60, B93, B178, B197, F20, H139, H142, H167, H173, H174, K36, K40, K51, K59, Y8, Y11
Fentanyl Analogs-B174, B179, BS4, K17, K71, K75
Fentanyl-B21
Fetal-H110
Fetal Brain Damage-E15
Fetal Viability-G13
Feticide-I16
Fiber-B166
Fibers-B165, B167
Field-Deployable Instrumentation-B200
Field Experiment-D14
Fisicide-W03
Fisicide-Feticide-H166
Filtration-B47
Fingermak-B94
Fingermakks-B57, B139
Fingernail Clippings-Y19
Fingerprint-B13, B96, E90, W16
Fingerprint Analysis-B16
Fingerprint Detection-D1
Fingerprint Powder-E54
Fingerprintprints-B29, B63, B66, B93, B97, B112, B145, E36, F28, W13, Y15
Finite Element Head Model-D16
Fire-D25
Fire-Arsen-B66
Fire Death-H179
Fire Deaths-B203
Fire Debris-B23, B102, B136, D24, E103
Fire Debris Analysis-B147, D30
Fire Dynamics-W18
Fire Investigation-B51, D30, F27, W18
Fire Melting-D42
Fire Scene Investigation-D30
Fire Triad-H149
Firearm-B68, 115
Firearms-A47, B99, E85
Firearms and Tool Marks-B101
Firearms Examination-E105
Flocked Swabs-B50
Flurbiprofen-E27, K62
Fluorescence-E107
Fluvial Transport-A79
Fly Artifacts-H103
Football Helmet Retention-D18
Footwear Analysis-E57
Force Velocity Impact-A140
Forced Child Labor-B48, H90
Forces-D4
FORDISC®-A11, A41
Foreign Body Aspiration-H5
Forensic-B120, E115, G23, H38, H91, H191, I32, W28
Forensic 3D Scanning-C40
Forensic Analysis-H33
Forensic Analysts-E120
Forensic Archaeology-A, A34, A65, A132, E122
Forensic Art-E37
Forensic Artifacts-C34
Forensic Autopsy-B195
Forensic Biology-B164
Forensic Botany-B156, H150
Forensic Chemist-J3
Forensic Comparison-B175
Forensic Dental Identification-G26
Forensic DNA-B86, B191
Forensic Forensics-B156
Forensic Botany-B156, H150
Forensic Chemistry-J3
Forensic Comparison-B175
Forensic Dental Identification-G26
Forensic DNA-B86, B191, F9
Forensic DNA Phenotyping-B14
Forensic Dental Identification-G26
Forensic Dentistry-B75
Forensic Drug Chemistry-B174
Forensic Economics-E121
Forensic Engineering-D12, D20
Forensic Entomology-E49, E53, H34, H88, H89, H97, H102
Forensic Evaluation-E33
Forensic Evidence-E32
Forensic Facial Identification-E38
Forensic Fire Investigation-D26
Forensic Genealogy-LW6
Forensic Genetics-E59
Forensic Geochemistry-A76
Forensic Hair Analysis-K58
Forensic Handwriting Identification-J18
Forensic Identification-E55
Forensic Image Database-C17
Forensic Imaging-D1, E37, G22, H104
Forensic Infant Autopsy-E12
Forensic Intelligence-C26, E119
Forensic Investigation-E34, E86, H24
Forensic K-9 Units-E8
Forensic Linguistics-I12
Forensic Macro-Photography-H108, H155
Forensic Microbiology-H28
Forensic Multidisciplinary Approach-E9
Forensic Neuropathology-H118
Forensic Nurses-B37, E75
Forensic Nursing-E77
Forensic Odontology-G1, G2, G12, G14, G15, G16, G27, G32, H159
Forensic Pathology-B194, G12, H37, H98, H114, H127, H144, H157, H169, H195
Forensic Patient-I29
Forensic Photography-W25
Forensic Plant Science-B155
Forensic Podiatry-E56
Forensic Practice-A93
Forensic Professional Mental Health-W01
Forensic Psychiatric Treatment-I1
Forensic Psychiatry-I19, I22
Forensic Psychology-E40
Forensic Radiology-H156, H158
Forensic Reporting-A149, F45
Forensic Scene Recovery-A134
Forensic Science-B6, B80, B127, D8, D22, D23, E46, E91, E111, E114, F1, H98, H127, H150, H151, H152, H180, K22, K26, L1, S02
Forensic Science Education-E118
Forensic Sciences-A100, E21, E39, H163, I39
Forensic Scientists' Collaboration-LW4
Forensic Taphonomy-A65
Forensic Technique-E41
Forensic Toxicology-K13, K21, K34, K69
Forensic Video Analysis-C25
Forensics-C2, C14, H106, W15
Fountain Pen-J16
Fourier Transform Infrared (FTIR)-H135
Fractal Art-H17
Fracture-H145
Fracture Analysis-A125
Fracture Healing-A123, H106
Fracture Mechanics-D10
Fracture Patterns-A140
Fracture Risk Evaluation-D13
Fracture Surface Morphology-A124
Fractures-E14, H105
Fragmentation Mechanisms-B171
Fragmentor V-B18
Fragmentable Ammunition-H15
Freedom of Speech-I40
French-Speaking-J12
Frequency Occurrence-J5
Freshwater Bone-H30
Freshwater Decomposition-A78
Frontal Sinus-A57
Frye/Daubert-W26
FTA Elute Cards-B3
<table>
<thead>
<tr>
<th>KEY WORD INDEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Laundering-E102</td>
</tr>
<tr>
<td>Future Technologies-W06</td>
</tr>
<tr>
<td>Fuzzing-C35</td>
</tr>
<tr>
<td>Gabapentin Abuse-K53</td>
</tr>
<tr>
<td>Gallbladder Neoplasms-H180</td>
</tr>
<tr>
<td>Gamma-Butyrolactone-K8</td>
</tr>
<tr>
<td>Gamma-Hydroxybutyrate-K8</td>
</tr>
<tr>
<td>Gang Enhancement Laws-E71</td>
</tr>
<tr>
<td>Ganglia-H126</td>
</tr>
<tr>
<td>Gas Chromatography-E95, K10, K31, K35, Y8</td>
</tr>
<tr>
<td>Gas Chromatography/Mass Spectrometry-B174, K79</td>
</tr>
<tr>
<td>Gasoline Residues-B56</td>
</tr>
<tr>
<td>Gaussian-K24</td>
</tr>
<tr>
<td>GC/IR-B177</td>
</tr>
<tr>
<td>GC/MS-B15, B17, B27, B28, B40, B58, B60, B67, B71, B173, B182</td>
</tr>
<tr>
<td>GC/MS Analysis-K61</td>
</tr>
<tr>
<td>GC-VUV-B181</td>
</tr>
<tr>
<td>Gelatin-A95</td>
</tr>
<tr>
<td>Gender Equality-A146</td>
</tr>
<tr>
<td>Gender Neutral-A149</td>
</tr>
<tr>
<td>Genealogical-F5</td>
</tr>
<tr>
<td>Genealogy Databases-F4</td>
</tr>
<tr>
<td>Generation Y-J17</td>
</tr>
<tr>
<td>Generation Z-J17</td>
</tr>
<tr>
<td>Genetic Analysis-H24</td>
</tr>
<tr>
<td>Genetic Genealogy-B105</td>
</tr>
<tr>
<td>Genetic Investigation-H20</td>
</tr>
<tr>
<td>Genetic Testing-H55</td>
</tr>
<tr>
<td>Genetically Variant Peptides-B79, B117</td>
</tr>
<tr>
<td>Genetics-H91</td>
</tr>
<tr>
<td>Genetics Analysis-E8</td>
</tr>
<tr>
<td>Geneva-H143</td>
</tr>
<tr>
<td>Geographic Information Systems-A30, A57</td>
</tr>
<tr>
<td>Geographic Origin-A122</td>
</tr>
<tr>
<td>Geographical Profiling-E122</td>
</tr>
<tr>
<td>Geolocation-A121</td>
</tr>
<tr>
<td>Geometric Morphometrics-A39, A81</td>
</tr>
<tr>
<td>Geospatial-A118</td>
</tr>
<tr>
<td>Gerontophilia-G8</td>
</tr>
<tr>
<td>Glass Evidence-B160, E101</td>
</tr>
<tr>
<td>Graduate Outcomes-B183</td>
</tr>
<tr>
<td>Graduate Students-A144</td>
</tr>
<tr>
<td>Greece-A93</td>
</tr>
<tr>
<td>Groove-B142</td>
</tr>
<tr>
<td>Groping Cases-E76</td>
</tr>
<tr>
<td>Ground Penetrating Radar-A132, A133</td>
</tr>
<tr>
<td>Ground Truth-B23</td>
</tr>
<tr>
<td>Growth Patterns-A108</td>
</tr>
<tr>
<td>GSR-E106</td>
</tr>
<tr>
<td>Guidelines-F49</td>
</tr>
<tr>
<td>Gulf Coast-H82</td>
</tr>
<tr>
<td>Gunshot-W20</td>
</tr>
<tr>
<td>Gunshot Analysis-A45</td>
</tr>
<tr>
<td>Gunshot Residue-A48, B30, E105, E107, Y16</td>
</tr>
<tr>
<td>Gunshot Residue (GSR)-B19, B146, E108</td>
</tr>
<tr>
<td>Gunshot Residue/Biological Sample-B144</td>
</tr>
<tr>
<td>Gunshot Residues (GSR)-B55</td>
</tr>
<tr>
<td>Gunshot Trauma-A46</td>
</tr>
<tr>
<td>Gunshot Wound-H15, H194</td>
</tr>
<tr>
<td>Gunshot Wounds-H116</td>
</tr>
<tr>
<td>Habitat Equivalency Analysis-D35</td>
</tr>
<tr>
<td>Hair-A121, B79, B194</td>
</tr>
<tr>
<td>Hair Analysis-E28, K25</td>
</tr>
<tr>
<td>Hair Microbiome-H32</td>
</tr>
<tr>
<td>Hallucinogens-H172</td>
</tr>
<tr>
<td>Hand Grenades-D5</td>
</tr>
<tr>
<td>Hand Printing-J25</td>
</tr>
<tr>
<td>Handgun-D6</td>
</tr>
<tr>
<td>Handwriting-J1, J9, J16, J24, J26</td>
</tr>
<tr>
<td>Handwriting Comparisons-J28</td>
</tr>
<tr>
<td>Handwriting Examination-J34</td>
</tr>
<tr>
<td>Handwriting Terminology-J30</td>
</tr>
<tr>
<td>Haploinsufficiency-LW5</td>
</tr>
<tr>
<td>Hawaii-A131</td>
</tr>
<tr>
<td>Hazardous Vapor Generation-B162</td>
</tr>
<tr>
<td>Head Injury-D15</td>
</tr>
<tr>
<td>Head Injury Prediction Tool-D16</td>
</tr>
<tr>
<td>Head Injury Severity-D18</td>
</tr>
<tr>
<td>Head/Neck Injury-D17</td>
</tr>
<tr>
<td>Head Trauma-W17</td>
</tr>
<tr>
<td>Headspace Analysis-B61</td>
</tr>
<tr>
<td>Headspace Sampling-B147, Y17</td>
</tr>
<tr>
<td>Health Care-E17</td>
</tr>
<tr>
<td>Health Care Professionals-I36</td>
</tr>
<tr>
<td>Health-Related Vehicle Collisions-D14</td>
</tr>
<tr>
<td>Health Workers-E110</td>
</tr>
<tr>
<td>Hearsay-I2</td>
</tr>
<tr>
<td>Heart Remodeling-H123</td>
</tr>
<tr>
<td>Heat Shock Proteins-H10</td>
</tr>
<tr>
<td>Heavy Metals-Y7</td>
</tr>
<tr>
<td>Heavy Truck Fires-D27</td>
</tr>
<tr>
<td>Hefner Decision Tree-A119</td>
</tr>
<tr>
<td>Hemoglobin A1c-H77</td>
</tr>
<tr>
<td>Hemorrhage-H126</td>
</tr>
<tr>
<td>Henssge Nomogram-E52</td>
</tr>
<tr>
<td>Heparin-E65</td>
</tr>
<tr>
<td>Herbal Medicines-Y7</td>
</tr>
<tr>
<td>Heroin-B157, E26, H142, H167, H187</td>
</tr>
<tr>
<td>Heroin Bags-B93</td>
</tr>
<tr>
<td>Heroin Evidence-B175</td>
</tr>
<tr>
<td>HHT-H64</td>
</tr>
<tr>
<td>Hiatal Hernia-H79</td>
</tr>
<tr>
<td>High Altitude-A80</td>
</tr>
<tr>
<td>High Performance Computing-C35</td>
</tr>
<tr>
<td>High Resolution Melt-B8</td>
</tr>
<tr>
<td>High Resolution Melt Analysis-B44</td>
</tr>
<tr>
<td>Higher Education-B183</td>
</tr>
<tr>
<td>High-Mobility Group Protein (HMGB1)-H185</td>
</tr>
<tr>
<td>High-Throughput-E78</td>
</tr>
<tr>
<td>HIOA Deaths-E7</td>
</tr>
<tr>
<td>Hispanic-A103</td>
</tr>
<tr>
<td>Hispanic Ancestry-A117</td>
</tr>
<tr>
<td>Histological Findings-H11</td>
</tr>
<tr>
<td>Histology-H66, H113</td>
</tr>
<tr>
<td>Histopathology-E10, H56</td>
</tr>
<tr>
<td>History-LW1</td>
</tr>
<tr>
<td>HIV-H81</td>
</tr>
<tr>
<td>HMTD-B61</td>
</tr>
<tr>
<td>Hollow Volume Overlays-G3</td>
</tr>
<tr>
<td>Holographic Sensor-E92</td>
</tr>
<tr>
<td>Homeless-H42</td>
</tr>
<tr>
<td>Homelessness-A131, I30</td>
</tr>
<tr>
<td>Homemade Explosives-E29, E30</td>
</tr>
<tr>
<td>Homicidal CO Poisoning-K67</td>
</tr>
<tr>
<td>Homicide by Cyanide Injection-H163</td>
</tr>
<tr>
<td>Homicide Investigation-E61</td>
</tr>
<tr>
<td>Homicides-K3</td>
</tr>
<tr>
<td>Hospital Autopsy-H60</td>
</tr>
<tr>
<td>Hospital Murder-H19</td>
</tr>
<tr>
<td>Household Cleaners-Y13</td>
</tr>
<tr>
<td>How To Read Academic CV-F14</td>
</tr>
<tr>
<td>HPLC-H77</td>
</tr>
<tr>
<td>HRM-B84</td>
</tr>
<tr>
<td>HS/SPME-B143</td>
</tr>
<tr>
<td>Human Cremains-E123</td>
</tr>
<tr>
<td>Human Decomposition-A63, A80, A84</td>
</tr>
<tr>
<td>Human Decomposition Product-B135</td>
</tr>
<tr>
<td>Human Dental Identification-G27</td>
</tr>
<tr>
<td>Human Factors-B201, J34</td>
</tr>
<tr>
<td>Human Growth Hormone-E25</td>
</tr>
<tr>
<td>Human Hair-B154</td>
</tr>
<tr>
<td>(hu)MANid-W14</td>
</tr>
<tr>
<td>Human Identification-A57, G9, G36, LW3, W19</td>
</tr>
<tr>
<td>Human Identification (HID)-B38</td>
</tr>
<tr>
<td>Human Organs-H92</td>
</tr>
<tr>
<td>Human Performance-W21</td>
</tr>
<tr>
<td>Human Remains-G28</td>
</tr>
<tr>
<td>Human Rights-A24, A33, E111, F30, G9</td>
</tr>
<tr>
<td>Human Rights Investigations-A32</td>
</tr>
<tr>
<td>Humanitarian-A34</td>
</tr>
<tr>
<td>Humanitarian Exhumation-A33</td>
</tr>
<tr>
<td>Humanitarian Forensic Odontology-G9, G41</td>
</tr>
<tr>
<td>Humanitarian Forensics-A31</td>
</tr>
<tr>
<td>Huntington Collection-A12</td>
</tr>
</tbody>
</table>
### KEY WORD INDEX

<table>
<thead>
<tr>
<th>Key Word</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrocephalus</td>
<td>H120</td>
</tr>
<tr>
<td>Hydrochloric Acid</td>
<td>A64</td>
</tr>
<tr>
<td>Hydrolytic DNA Damage</td>
<td>B106</td>
</tr>
<tr>
<td>Hypertensive Changes</td>
<td>H182</td>
</tr>
<tr>
<td>Hypertension</td>
<td>E18, H10</td>
</tr>
<tr>
<td>Hypertrophic Cardiomyopathy</td>
<td>E10</td>
</tr>
<tr>
<td>Hyper-V Forensics</td>
<td>C29</td>
</tr>
<tr>
<td>Hyponatremia</td>
<td>H181, I37</td>
</tr>
<tr>
<td>Hypothermia</td>
<td>E67, H9</td>
</tr>
<tr>
<td>Hypoxia</td>
<td>H161, H13</td>
</tr>
<tr>
<td>ICP/MS</td>
<td>B30, B33, K4</td>
</tr>
<tr>
<td>Identification</td>
<td>A77, A98, A116, A135, B121, B142, B167, E72, G30, G33, G34, G35, G39, G40, H50</td>
</tr>
<tr>
<td>Ignitable Liquid Residues</td>
<td>B147</td>
</tr>
<tr>
<td>Ignitable Liquids</td>
<td>B150</td>
</tr>
<tr>
<td>Illegal Immigration</td>
<td>H151</td>
</tr>
<tr>
<td>Illicit Drug Deaths</td>
<td>E94</td>
</tr>
<tr>
<td>Illicit Drugs</td>
<td>B16</td>
</tr>
<tr>
<td>Illicit Drug Deaths</td>
<td>E94</td>
</tr>
<tr>
<td>Illicit Drug Deaths</td>
<td>E94</td>
</tr>
<tr>
<td>Illicit Drug Deaths</td>
<td>E94</td>
</tr>
<tr>
<td>Incarceration</td>
<td>I29</td>
</tr>
<tr>
<td>Indonesia</td>
<td>A91</td>
</tr>
<tr>
<td>Ink</td>
<td>J23</td>
</tr>
<tr>
<td>Ink Analysis</td>
<td>J3</td>
</tr>
<tr>
<td>Inkjet</td>
<td>J10</td>
</tr>
<tr>
<td>Inks on Paper</td>
<td>E87</td>
</tr>
<tr>
<td>Innocence Project</td>
<td>B187</td>
</tr>
<tr>
<td>Innocent</td>
<td>F17</td>
</tr>
<tr>
<td>Injury</td>
<td>E13</td>
</tr>
<tr>
<td>Injury</td>
<td>E13</td>
</tr>
<tr>
<td>Infrasound</td>
<td>H88</td>
</tr>
<tr>
<td>Instagram</td>
<td>C34</td>
</tr>
<tr>
<td>In vitro</td>
<td>B56, B143</td>
</tr>
<tr>
<td>IoT Trac</td>
<td>C22</td>
</tr>
<tr>
<td>iPhone</td>
<td>C33</td>
</tr>
<tr>
<td>Inosine</td>
<td>A77</td>
</tr>
<tr>
<td>Isomer Determination</td>
<td>B60</td>
</tr>
<tr>
<td>Isomer Identification</td>
<td>B177</td>
</tr>
<tr>
<td>Isopropyl U-47700</td>
<td>K48</td>
</tr>
<tr>
<td>Isotope</td>
<td>A77</td>
</tr>
<tr>
<td>Isotope Analysis</td>
<td>A76, A120, G11</td>
</tr>
<tr>
<td>Isotope Labeling</td>
<td>B171</td>
</tr>
<tr>
<td>Isotopes</td>
<td>A121</td>
</tr>
<tr>
<td>Isotopic Analysis</td>
<td>A74</td>
</tr>
<tr>
<td>ISS</td>
<td>E7</td>
</tr>
<tr>
<td>Italian Mafia</td>
<td>E70</td>
</tr>
<tr>
<td>Italian Mafia of Gargano</td>
<td>E9</td>
</tr>
<tr>
<td>Italy</td>
<td>D21</td>
</tr>
<tr>
<td>Interventional Medicine</td>
<td>H77</td>
</tr>
<tr>
<td>Integration</td>
<td>H49</td>
</tr>
<tr>
<td>Interagency Cooperation</td>
<td>E123</td>
</tr>
<tr>
<td>Inter-Laboratory Communication</td>
<td>B101</td>
</tr>
<tr>
<td>International</td>
<td>H74</td>
</tr>
<tr>
<td>International Collaboration</td>
<td>A35</td>
</tr>
<tr>
<td>International Criminal Court</td>
<td>F30</td>
</tr>
<tr>
<td>International Travel Documents</td>
<td>J27</td>
</tr>
<tr>
<td>Internship</td>
<td>E116</td>
</tr>
<tr>
<td>Interpretation</td>
<td>W27</td>
</tr>
<tr>
<td>Inter-Professional Development</td>
<td>H192</td>
</tr>
<tr>
<td>Inter-Rater Reliability</td>
<td>J18</td>
</tr>
<tr>
<td>Intersex</td>
<td>I3</td>
</tr>
<tr>
<td>Intracranial Bleeding</td>
<td>H125</td>
</tr>
<tr>
<td>Intramuscular Cytokine Injection</td>
<td>H163</td>
</tr>
<tr>
<td>Intraperitoneal Isotopic Variation</td>
<td>A75</td>
</tr>
<tr>
<td>Intra-Aleveolar Hemorrhage</td>
<td>Y9</td>
</tr>
<tr>
<td>Intra-Thyroid Hemorrhage</td>
<td>H80</td>
</tr>
<tr>
<td>Intravascular B-Cell Lymphoma</td>
<td>H63</td>
</tr>
<tr>
<td>Intravenous</td>
<td>H176</td>
</tr>
<tr>
<td>Inverse Gas Chromatography</td>
<td>B56, B143</td>
</tr>
<tr>
<td>Investigation</td>
<td>E21, E32, E64, F40, H44, H46</td>
</tr>
<tr>
<td>Investigations</td>
<td>D25, G37</td>
</tr>
<tr>
<td>Investigator</td>
<td>B49</td>
</tr>
<tr>
<td>Ion Correlations</td>
<td>E24</td>
</tr>
<tr>
<td>IoT Trac</td>
<td>C22</td>
</tr>
<tr>
<td>iPhone</td>
<td>C33</td>
</tr>
<tr>
<td>ISIH</td>
<td>H69</td>
</tr>
<tr>
<td>Isoperiority</td>
<td>B60</td>
</tr>
<tr>
<td>Isopropyl U-47700</td>
<td>K48</td>
</tr>
<tr>
<td>J</td>
<td>E40</td>
</tr>
<tr>
<td>Journal</td>
<td>E118</td>
</tr>
<tr>
<td>Juggler</td>
<td>A37</td>
</tr>
<tr>
<td>Juridification of Clinical Decision</td>
<td>E42</td>
</tr>
<tr>
<td>Jury</td>
<td>BS2</td>
</tr>
<tr>
<td>Justice</td>
<td>E74</td>
</tr>
<tr>
<td>Juveniles</td>
<td>F11</td>
</tr>
<tr>
<td>K</td>
<td>K18</td>
</tr>
<tr>
<td>Ketamine</td>
<td>E50</td>
</tr>
<tr>
<td>Khmer Rouge</td>
<td>A142</td>
</tr>
<tr>
<td>Klinefelter Syndrome</td>
<td>I7</td>
</tr>
<tr>
<td>K-Means Cluster Analysis</td>
<td>A103</td>
</tr>
<tr>
<td>Knee</td>
<td>A109</td>
</tr>
<tr>
<td>Knives</td>
<td>B139, D2</td>
</tr>
<tr>
<td>Knowledge Management</td>
<td>C4, E119</td>
</tr>
<tr>
<td>Korean</td>
<td>A6</td>
</tr>
<tr>
<td>Kovatz Retention Indices</td>
<td>K79</td>
</tr>
<tr>
<td>Kratom</td>
<td>B33, B169, K37</td>
</tr>
<tr>
<td>Laboratory Measurements</td>
<td>W18</td>
</tr>
<tr>
<td>Lactate Interference</td>
<td>K57</td>
</tr>
<tr>
<td>Ladder Logic</td>
<td>C41</td>
</tr>
<tr>
<td>LA-ICP/MS</td>
<td>B62, E101</td>
</tr>
<tr>
<td>Large Volume</td>
<td>H130</td>
</tr>
<tr>
<td>Larynx Anatomical Variants</td>
<td>H189</td>
</tr>
<tr>
<td>Laser Printer Identification</td>
<td>J4</td>
</tr>
<tr>
<td>Laser Printers</td>
<td>J33</td>
</tr>
<tr>
<td>Latent Fingerprints</td>
<td>B91, E87, Y4</td>
</tr>
<tr>
<td>Latent Print Examination</td>
<td>E88</td>
</tr>
<tr>
<td>Latent Print Examiners</td>
<td>E89</td>
</tr>
<tr>
<td>Latent Prints</td>
<td>B92, B95</td>
</tr>
<tr>
<td>Latino Gangs</td>
<td>E71</td>
</tr>
<tr>
<td>Law Enforcement</td>
<td>E79</td>
</tr>
<tr>
<td>Lawn Mower</td>
<td>H193</td>
</tr>
<tr>
<td>LC/MS Method Development</td>
<td>E25</td>
</tr>
<tr>
<td>Key Word</td>
<td>Page References</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>LC/MS/MS-E96, K25, K30, K41, K75, Y11, Y12</td>
<td>247</td>
</tr>
<tr>
<td>LC/QqQ/MS-K19</td>
<td>247</td>
</tr>
<tr>
<td>LC/qTOF-K47</td>
<td>247</td>
</tr>
<tr>
<td>LC/qTOF/MS-B28, K6</td>
<td>247</td>
</tr>
<tr>
<td>Learning Algorithms-B160</td>
<td>247</td>
</tr>
<tr>
<td>Legal-E17</td>
<td>247</td>
</tr>
<tr>
<td>Legal Medicine Institute-A130</td>
<td>247</td>
</tr>
<tr>
<td>Legislation-B54</td>
<td>247</td>
</tr>
<tr>
<td>Letters, Numbers, Symbols-J30</td>
<td>247</td>
</tr>
<tr>
<td>Liability-F2</td>
<td>247</td>
</tr>
<tr>
<td>Libraries-E117</td>
<td>247</td>
</tr>
<tr>
<td>Library-B173</td>
<td>247</td>
</tr>
<tr>
<td>LIBS-B19, B55, E108</td>
<td>247</td>
</tr>
<tr>
<td>Ligature Strangulation-H188</td>
<td>247</td>
</tr>
<tr>
<td>Likelihood Ratio-B77, E101, F6</td>
<td>247</td>
</tr>
<tr>
<td>Liquid Chromatography-Y14</td>
<td>247</td>
</tr>
<tr>
<td>Liquid Nicotine-K73</td>
<td>247</td>
</tr>
<tr>
<td>Litchenberg Figures-H6</td>
<td>247</td>
</tr>
<tr>
<td>Literacy-I26</td>
<td>247</td>
</tr>
<tr>
<td>Litigation-D23, D32, W16</td>
<td>247</td>
</tr>
<tr>
<td>Living Wills-F32</td>
<td>247</td>
</tr>
<tr>
<td>Load Marks-D38</td>
<td>247</td>
</tr>
<tr>
<td>Local Capacity-A88</td>
<td>247</td>
</tr>
<tr>
<td>Logistic Regression-B77</td>
<td>247</td>
</tr>
<tr>
<td>Logistic Regression Analyses-G29</td>
<td>247</td>
</tr>
<tr>
<td>Loperamide-H140</td>
<td>247</td>
</tr>
<tr>
<td>Low-Light Photography-W25</td>
<td>247</td>
</tr>
<tr>
<td>Low Copy Number-Y6</td>
<td>247</td>
</tr>
<tr>
<td>Low Template DNA-B112</td>
<td>247</td>
</tr>
<tr>
<td>Lucilia sericata-K36</td>
<td>247</td>
</tr>
<tr>
<td>Lung Aeration-H160</td>
<td>247</td>
</tr>
<tr>
<td>M</td>
<td>247</td>
</tr>
<tr>
<td>Maceration Methods-A20</td>
<td>247</td>
</tr>
<tr>
<td>Machine Learning-A27, A101, B102, C1, C37, E103, H101</td>
<td>247</td>
</tr>
<tr>
<td>Macromorphoscopic Trait Analysis-A101</td>
<td>247</td>
</tr>
<tr>
<td>Macromorphoscopic Traits-A115</td>
<td>247</td>
</tr>
<tr>
<td>Macro-Photography-W25</td>
<td>247</td>
</tr>
<tr>
<td>Madelung's Disease-H53</td>
<td>247</td>
</tr>
<tr>
<td>Mafia Murder-E70, H20</td>
<td>247</td>
</tr>
<tr>
<td>Mag-CNT/dSP-E-B131</td>
<td>247</td>
</tr>
<tr>
<td>Magnetic Flux-J15</td>
<td>247</td>
</tr>
<tr>
<td>Magnetic Resonance Imaging-A111, G18, H111</td>
<td>247</td>
</tr>
<tr>
<td>Magnetic Solid Phase Extraction-K5</td>
<td>247</td>
</tr>
<tr>
<td>Mahalanobis Distance-J28</td>
<td>247</td>
</tr>
<tr>
<td>Major Component-B78</td>
<td>247</td>
</tr>
<tr>
<td>Malaysia-A1</td>
<td>247</td>
</tr>
<tr>
<td>Male Victims-E11</td>
<td>247</td>
</tr>
<tr>
<td>Malpractice-E7</td>
<td>247</td>
</tr>
<tr>
<td>Managing Error-J34</td>
<td>247</td>
</tr>
<tr>
<td>Mandible-A40</td>
<td>247</td>
</tr>
<tr>
<td>Mandibles-W14</td>
<td>247</td>
</tr>
<tr>
<td>Manila Envelopes-J32</td>
<td>247</td>
</tr>
<tr>
<td>Manipulation-C24</td>
<td>247</td>
</tr>
<tr>
<td>Manner of Death-H116</td>
<td>247</td>
</tr>
<tr>
<td>Manual Large Volume-H130</td>
<td>247</td>
</tr>
<tr>
<td>Manufactured Fibers-B22</td>
<td>247</td>
</tr>
<tr>
<td>Manufacturer-J22</td>
<td>247</td>
</tr>
<tr>
<td>Marijuana-H170</td>
<td>247</td>
</tr>
<tr>
<td>Marital Conflicts-I4</td>
<td>247</td>
</tr>
<tr>
<td>Maritime Accidents-D12</td>
<td>247</td>
</tr>
<tr>
<td>Marketing-F12</td>
<td>247</td>
</tr>
<tr>
<td>Mass Disaster-H50</td>
<td>247</td>
</tr>
<tr>
<td>Mass Disasters-H24</td>
<td>247</td>
</tr>
<tr>
<td>Mass Fatality-G35</td>
<td>247</td>
</tr>
<tr>
<td>Mass Fatality Incidents-E55</td>
<td>247</td>
</tr>
<tr>
<td>Mass Shooting-H190</td>
<td>247</td>
</tr>
<tr>
<td>Mass Spectrometry-A127, B24, B29, E24</td>
<td>247</td>
</tr>
<tr>
<td>Mass Spectrometry Imaging-B91</td>
<td>247</td>
</tr>
<tr>
<td>Massacre-A24</td>
<td>247</td>
</tr>
<tr>
<td>Massively Parallel Sequencing-B12, B107, B129, B151, B156, B188</td>
<td>247</td>
</tr>
<tr>
<td>Match Error-F45</td>
<td>247</td>
</tr>
<tr>
<td>Match Estimation-B185</td>
<td>247</td>
</tr>
<tr>
<td>Match Probability-B120</td>
<td>247</td>
</tr>
<tr>
<td>Matrix-Matched-B176</td>
<td>247</td>
</tr>
<tr>
<td>MDA-K11</td>
<td>247</td>
</tr>
<tr>
<td>MDMA-K11</td>
<td>247</td>
</tr>
<tr>
<td>ME/C Office-H47</td>
<td>247</td>
</tr>
<tr>
<td>Measurements-E22</td>
<td>247</td>
</tr>
<tr>
<td>Meckel's Diverticulum-H74</td>
<td>247</td>
</tr>
<tr>
<td>Media-I40</td>
<td>247</td>
</tr>
<tr>
<td>Medibles-B176</td>
<td>247</td>
</tr>
<tr>
<td>Medical Examiner-H46, H49, H170</td>
<td>247</td>
</tr>
<tr>
<td>Medical Examiner/Coroner Office-H144</td>
<td>247</td>
</tr>
<tr>
<td>Medical Examiner's Office-A85</td>
<td>247</td>
</tr>
<tr>
<td>Medical History-B56</td>
<td>247</td>
</tr>
<tr>
<td>Medical Malpractice-F49</td>
<td>247</td>
</tr>
<tr>
<td>Medicolegal-H190</td>
<td>247</td>
</tr>
<tr>
<td>Medicolegal Death Investigations-K81</td>
<td>247</td>
</tr>
<tr>
<td>Mediterranean Populations-A29</td>
<td>247</td>
</tr>
<tr>
<td>Memory-C27</td>
<td>247</td>
</tr>
<tr>
<td>Memory Forensics-C14, C35</td>
<td>247</td>
</tr>
<tr>
<td>Meningoencephalitis-H81</td>
<td>247</td>
</tr>
<tr>
<td>Mens Rea-F2</td>
<td>247</td>
</tr>
<tr>
<td>Mental Disorders-I35</td>
<td>247</td>
</tr>
<tr>
<td>Mental Health-C10, F38, I2</td>
<td>247</td>
</tr>
<tr>
<td>Mental Illness-I15</td>
<td>247</td>
</tr>
<tr>
<td>Mesenteric Ischemia-H60</td>
<td>247</td>
</tr>
<tr>
<td>Mesodiverticular Band-H74</td>
<td>247</td>
</tr>
<tr>
<td>Mesothelioma-H62</td>
<td>247</td>
</tr>
<tr>
<td>Messaging Apps-C11</td>
<td>247</td>
</tr>
<tr>
<td>Metabolites-K12</td>
<td>247</td>
</tr>
<tr>
<td>Metabolomics-A127, E83</td>
<td>247</td>
</tr>
<tr>
<td>Metals Analysis-K4</td>
<td>247</td>
</tr>
<tr>
<td>Metapodials-A55</td>
<td>247</td>
</tr>
<tr>
<td>Meteorite-IW2</td>
<td>247</td>
</tr>
<tr>
<td>Methacrylfentanyl-K60</td>
<td>247</td>
</tr>
<tr>
<td>Methadone-E18, K28</td>
<td>247</td>
</tr>
<tr>
<td>Methadone Maintenance Treatment-K28</td>
<td>247</td>
</tr>
<tr>
<td>Method Optimization-B123</td>
<td>247</td>
</tr>
<tr>
<td>Method Validation-B102</td>
<td>247</td>
</tr>
<tr>
<td>Methodology-J7</td>
<td>247</td>
</tr>
<tr>
<td>Methylation-B4</td>
<td>247</td>
</tr>
<tr>
<td>Metric Method-A5</td>
<td>247</td>
</tr>
<tr>
<td>Metric Sex Estimation-A82</td>
<td>247</td>
</tr>
<tr>
<td>Mexican Population-A119</td>
<td>247</td>
</tr>
<tr>
<td>Miami Sector-A116</td>
<td>247</td>
</tr>
<tr>
<td>Micro-Computed Tomography-A55</td>
<td>247</td>
</tr>
<tr>
<td>Microbial Ecology-A53</td>
<td>247</td>
</tr>
<tr>
<td>Microbial-Vac System (M-Vac)-B67</td>
<td>247</td>
</tr>
<tr>
<td>Microbiology-H122</td>
<td>247</td>
</tr>
<tr>
<td>Microbiome-B85, B130, B198, H94, H101</td>
<td>247</td>
</tr>
<tr>
<td>Microcrystalline Tests-B168</td>
<td>247</td>
</tr>
<tr>
<td>MicroFLOQ’-B163</td>
<td>247</td>
</tr>
<tr>
<td>Microhaplotype-B4</td>
<td>247</td>
</tr>
<tr>
<td>Microhaplotypes-B12, B45, B74, B109</td>
<td>247</td>
</tr>
<tr>
<td>Micromorphometry-B159</td>
<td>247</td>
</tr>
<tr>
<td>MicroRNA-B51, B81, H29</td>
<td>247</td>
</tr>
<tr>
<td>MicroRNAs-H25</td>
<td>247</td>
</tr>
<tr>
<td>Microscope-D7</td>
<td>247</td>
</tr>
<tr>
<td>Microspectrophotometry-B166</td>
<td>247</td>
</tr>
<tr>
<td>Migrants-G36, G41</td>
<td>247</td>
</tr>
<tr>
<td>Migration-A118, A128</td>
<td>247</td>
</tr>
<tr>
<td>Military Casualties-A58</td>
<td>247</td>
</tr>
<tr>
<td>Mineral-A49</td>
<td>247</td>
</tr>
<tr>
<td>Mining-H44</td>
<td>247</td>
</tr>
<tr>
<td>Minutiae-Y15</td>
<td>247</td>
</tr>
<tr>
<td>Miranda Warning-F11</td>
<td>247</td>
</tr>
<tr>
<td>MiRNA-B127, E98</td>
<td>247</td>
</tr>
<tr>
<td>Misalignment of Pulmonary Veins-H56</td>
<td>247</td>
</tr>
<tr>
<td>Misinterpretation-H134</td>
<td>247</td>
</tr>
<tr>
<td>Missing Migrants-A36</td>
<td>247</td>
</tr>
<tr>
<td>Missing Persons-A97, G31, W19</td>
<td>247</td>
</tr>
<tr>
<td>Mitochondrial DNA-A106, B106, B188</td>
<td>247</td>
</tr>
<tr>
<td>Mitochondrial DNA Ancestry Database-A105</td>
<td>247</td>
</tr>
<tr>
<td>Mitragynine-B169</td>
<td>247</td>
</tr>
<tr>
<td>Mixed Probit-A108</td>
<td>247</td>
</tr>
<tr>
<td>Mixture-B76, B78</td>
<td>247</td>
</tr>
<tr>
<td>Mixture Deconvolution-B74, B108</td>
<td>247</td>
</tr>
<tr>
<td>Mixture Validation-F45</td>
<td>247</td>
</tr>
<tr>
<td>Mixtures-B189</td>
<td>247</td>
</tr>
<tr>
<td>Mobile Application-H97</td>
<td>247</td>
</tr>
<tr>
<td>Mobile Devices-C32</td>
<td>247</td>
</tr>
<tr>
<td>Mobile Digital Database-A22</td>
<td>247</td>
</tr>
<tr>
<td>Mobile Forensics-C6, C15, C16, C19</td>
<td>247</td>
</tr>
<tr>
<td>Mock Fingerprint-B126</td>
<td>247</td>
</tr>
<tr>
<td>Model-E90</td>
<td>247</td>
</tr>
<tr>
<td>Modified Cardioectomy-E1</td>
<td>247</td>
</tr>
<tr>
<td>Molecular Modeling-K37, K40, K54</td>
<td>247</td>
</tr>
<tr>
<td>Molecularly Imprinted Polymers-E102</td>
<td>247</td>
</tr>
<tr>
<td>Molten Mark-D41</td>
<td>247</td>
</tr>
<tr>
<td>Moratorium-G4, G5</td>
<td>247</td>
</tr>
<tr>
<td>Morphine-H100</td>
<td>247</td>
</tr>
</tbody>
</table>
KEY WORD INDEX

Morphological Sex Estimation-A83
Morphometrics-B69
Mortality-E16, H167, Y22
Mortality Rate-E63
Mosquitoes-B151
Motorcycle Accident-E3
Motorcycle Helmet Retention-D18
MPS-B41, B45
MPS of Microhaplotypes-B108
MtDNA Forensic Database-B188
Multi-Agency Collaboration-F10
Multicide-E68
Multidisciplinary-LW6
Multidisciplinary Approach-E62
Multidisciplinary Evaluation-E14
Multi-Drug Analysis-K21
Multimedia-W28
Multimedia Analysis-C8
Multimedia Forensics-C10, C12, C25, C28
Multinodular Goiter-H80
Multiple Congenital Abnormalities-E12
Multiple Symmetric Lipomatosis-H53
Multiple Transfers-B16
Multistage Mass Spectrometry (MSn)-B171
Multi-Wall Carbon Nanotube-K5
Mummification-E6
Murder-E69
Murder by Proxy-I17
Muscle Activity-D11
Muscle Tissue Decomposition-A61
Myocarditis-E10, H51
Myotonic Dystrophy-H183
Neurofilament Light-H67
Neuropathology-H165
New Mexico-H137
New Psychoactive Substances-B172, K79
New Psychoactive Substances (NPS)-B26
Newborn Skull Fractures-E15
Next Generation Sequencing-B109, B110, E59, H25, H96
NFLIS-B64
NFPA 921-F27
NGRI-S01
Nicotine-K43
Nicotine Intoxication-K73
Nitrous Oxide-H161
No Value for Identification-B97
Noise-B110
Non-Accidental Injury-A137, A138
Non-Carious Lesions-A129
Non-Fatal Strangulation-E32
Non-Scientists-E115
Normalization-H133
Nose Genetics-B148
Novel Opioids-K46, K48, W05
Novel Psychoactive Substance (NPS)-E27
Novel Psychoactive Substances-B132, K19, K78, W05
NPS-K38, K48, K62
NTSB-W21
Oxycodone-H176
Oxycodeone-K173
Overdose-H141, H173, H174, K28, K29, K43, K64
Overdose Death-F19
Overkill-I17
Over-the-Counter Drugs-K68
Oviposition-H89
Oxidative Hair Dye-B161
Paradoxical Undressing-B195
Paraphenylenediamine-H186
Partnerships-E113
Passports-C24
Password Breaking-C16
Patience Breaking-C16
Pathogens-H26
<table>
<thead>
<tr>
<th>Key Word Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pathology-E125, F44, W20</td>
<td></td>
</tr>
<tr>
<td>Patients-E16</td>
<td></td>
</tr>
<tr>
<td>Pattern Evidence-C1</td>
<td></td>
</tr>
<tr>
<td>PD-1 Inhibitors-H51</td>
<td></td>
</tr>
<tr>
<td>PDM5-B88</td>
<td></td>
</tr>
<tr>
<td>Pediatric-E51, K80</td>
<td></td>
</tr>
<tr>
<td>Pediatric Poisoning Deaths-K69</td>
<td></td>
</tr>
<tr>
<td>Pediatric Skull Fracture-A123</td>
<td></td>
</tr>
<tr>
<td>Pediatrics-H125</td>
<td></td>
</tr>
<tr>
<td>Pedophilia-C13, I23</td>
<td></td>
</tr>
<tr>
<td>Pedophilic Disorder-I22</td>
<td></td>
</tr>
<tr>
<td>Pelvic Scarring-A8</td>
<td></td>
</tr>
<tr>
<td>Penal Process Evidence-F1</td>
<td></td>
</tr>
<tr>
<td>Penetrating Head and Neck Trauma-H14</td>
<td></td>
</tr>
<tr>
<td>Penetration Resistance-D4</td>
<td></td>
</tr>
<tr>
<td>Penetration-E13</td>
<td></td>
</tr>
<tr>
<td>Penile Plethysmography (PPG)-I24</td>
<td></td>
</tr>
<tr>
<td>Periodic Acid-Schiff-Y10</td>
<td></td>
</tr>
<tr>
<td>Periodontal Ligament Visibility-G19</td>
<td></td>
</tr>
<tr>
<td>Permeation Rate-B140</td>
<td></td>
</tr>
<tr>
<td>Perpetrators-I14</td>
<td></td>
</tr>
<tr>
<td>Persistence-B42, B100</td>
<td></td>
</tr>
<tr>
<td>Persistent Pulmonary Hypertension-E5</td>
<td></td>
</tr>
<tr>
<td>Personal Identification-E6, E56</td>
<td></td>
</tr>
<tr>
<td>Personality-E40, I25</td>
<td></td>
</tr>
<tr>
<td>Personality Disorder-I16</td>
<td></td>
</tr>
<tr>
<td>Personality Disorders-I17</td>
<td></td>
</tr>
<tr>
<td>Perversion-I21</td>
<td></td>
</tr>
<tr>
<td>Pesticides-K3, K6</td>
<td></td>
</tr>
<tr>
<td>Pet Theories-D22</td>
<td></td>
</tr>
<tr>
<td>Pharmaceutical Drugs-K68</td>
<td></td>
</tr>
<tr>
<td>Pharyngeal Spray Treatment-F31</td>
<td></td>
</tr>
<tr>
<td>Phased and Sequenced Haplotypes-B12</td>
<td></td>
</tr>
<tr>
<td>Phencyclidine-K52</td>
<td></td>
</tr>
<tr>
<td>Phenethylamines-B180, B181</td>
<td></td>
</tr>
<tr>
<td>Phenolphthaen-E109</td>
<td></td>
</tr>
<tr>
<td>Phenomenology-B152</td>
<td></td>
</tr>
<tr>
<td>Phenotype-B111</td>
<td></td>
</tr>
<tr>
<td>Phenotype Profile-E82</td>
<td></td>
</tr>
<tr>
<td>Phenotyping-B4, B148</td>
<td></td>
</tr>
<tr>
<td>Phenylethylamine Derivatives-K77</td>
<td></td>
</tr>
<tr>
<td>Philippines-A8</td>
<td></td>
</tr>
<tr>
<td>Photo and Video Documentation-B196</td>
<td></td>
</tr>
<tr>
<td>Photo Polymer-J22</td>
<td></td>
</tr>
<tr>
<td>Photogrammetry-A67, A134, H115</td>
<td></td>
</tr>
<tr>
<td>Photoshop*-G22, G25</td>
<td></td>
</tr>
<tr>
<td>Physical and Chemical Analysis-J32</td>
<td></td>
</tr>
<tr>
<td>Physical Injuries-G1</td>
<td></td>
</tr>
<tr>
<td>Physical Match-B133</td>
<td></td>
</tr>
<tr>
<td>Pipe Bomb-B163</td>
<td></td>
</tr>
<tr>
<td>Pitt-Hopkins Syndrome-LW5</td>
<td></td>
</tr>
<tr>
<td>Placenta Percreta-H75</td>
<td></td>
</tr>
<tr>
<td>Plakophilin-2-H184</td>
<td></td>
</tr>
<tr>
<td>PLOT-Cryoadsorption-B141</td>
<td></td>
</tr>
<tr>
<td>PMI-H31</td>
<td></td>
</tr>
<tr>
<td>PMI Estimation-A60</td>
<td></td>
</tr>
<tr>
<td>PMSI-H2</td>
<td></td>
</tr>
<tr>
<td>Pneumoconiosis-H65</td>
<td></td>
</tr>
<tr>
<td>Poisoning-E91, H162</td>
<td></td>
</tr>
<tr>
<td>Polymer-Coated Drug-E26</td>
<td></td>
</tr>
<tr>
<td>Polymers-D38</td>
<td></td>
</tr>
<tr>
<td>Population Structure-B118</td>
<td></td>
</tr>
<tr>
<td>Population Variation-A43, A107</td>
<td></td>
</tr>
<tr>
<td>Populations-B99</td>
<td></td>
</tr>
<tr>
<td>Porous Materials-B3</td>
<td></td>
</tr>
<tr>
<td>Portable GC/MS-B27, B169</td>
<td></td>
</tr>
<tr>
<td>Portable X-Ray Fluorescence (pXRF)-A52</td>
<td></td>
</tr>
<tr>
<td>Portal Vein Thrombosis-H60</td>
<td></td>
</tr>
<tr>
<td>Positional Isomer-E27</td>
<td></td>
</tr>
<tr>
<td>Positional Isomers-B15, B180</td>
<td></td>
</tr>
<tr>
<td>Positive Identification-A136, H156</td>
<td></td>
</tr>
<tr>
<td>Post-Coital Interval (PCI)-B34</td>
<td></td>
</tr>
<tr>
<td>Post-Conviction-F10</td>
<td></td>
</tr>
<tr>
<td>Postgraduate Program-G2</td>
<td></td>
</tr>
<tr>
<td>Postmortem-H131, H168, K8, K43, K69, K70, K71, K77, K80</td>
<td></td>
</tr>
<tr>
<td>Postmortem Alcohols-K31</td>
<td></td>
</tr>
<tr>
<td>Postmortem Artifact-H134</td>
<td></td>
</tr>
<tr>
<td>Postmortem Biochemistry-H138</td>
<td></td>
</tr>
<tr>
<td>Postmortem Blood Specimen-K14</td>
<td></td>
</tr>
<tr>
<td>Postmortem Blood-K17</td>
<td></td>
</tr>
<tr>
<td>Postmortem Change-H134</td>
<td></td>
</tr>
<tr>
<td>Postmortem Chemistry-H138</td>
<td></td>
</tr>
<tr>
<td>Postmortem Computed Tomography-A110, H109, H154, H158, H160</td>
<td></td>
</tr>
<tr>
<td>Postmortem CT-H21</td>
<td></td>
</tr>
<tr>
<td>Postmortem CT Angiography-H87</td>
<td></td>
</tr>
<tr>
<td>Postmortem Distribution-K11</td>
<td></td>
</tr>
<tr>
<td>Postmortem Fingerprint Recovery-E55</td>
<td></td>
</tr>
<tr>
<td>Postmortem Genetic Testing-W07</td>
<td></td>
</tr>
<tr>
<td>Postmortem Imaging-H129</td>
<td></td>
</tr>
<tr>
<td>Postmortem Interval-A19, A127, E52, H94, H96, H101, H102, K7</td>
<td></td>
</tr>
<tr>
<td>Postmortem Interval Estimation-A61</td>
<td></td>
</tr>
<tr>
<td>Postmortem Microbial Community-H93</td>
<td></td>
</tr>
<tr>
<td>Postmortem Microbiology-H33</td>
<td></td>
</tr>
<tr>
<td>Postmortem Microbiome-H28, H98</td>
<td></td>
</tr>
<tr>
<td>Postmortem Radiology-W07</td>
<td></td>
</tr>
<tr>
<td>Postmortem Scavenging-A56</td>
<td></td>
</tr>
<tr>
<td>Postmortem Submersion Interval-E125, H30, H36</td>
<td></td>
</tr>
<tr>
<td>Postmortem Tissue-K65</td>
<td></td>
</tr>
<tr>
<td>Postmortem Toxicology-K29, K35, K49, K59, K72</td>
<td></td>
</tr>
<tr>
<td>Postpartum-H61</td>
<td></td>
</tr>
<tr>
<td>Post-Reconstruction-A24</td>
<td></td>
</tr>
<tr>
<td>Post-Traumatic Epilepsy-H135</td>
<td></td>
</tr>
<tr>
<td>Practice in Europe-A94</td>
<td></td>
</tr>
<tr>
<td>Prediction-B111</td>
<td></td>
</tr>
<tr>
<td>Pregnancy-H85</td>
<td></td>
</tr>
<tr>
<td>Preliminary Drug Screen-H142</td>
<td></td>
</tr>
<tr>
<td>PrepFiler* Express BTA*-E44</td>
<td></td>
</tr>
<tr>
<td>Presentation Context-J31</td>
<td></td>
</tr>
<tr>
<td>Presentation Order-J31</td>
<td></td>
</tr>
<tr>
<td>Pressure Cycling Technology-B43, B115</td>
<td></td>
</tr>
<tr>
<td>Presumptive Color Testing-B43, B115</td>
<td></td>
</tr>
<tr>
<td>Pretensioner-D40</td>
<td></td>
</tr>
<tr>
<td>Prevention-D12, E31, E63</td>
<td></td>
</tr>
<tr>
<td>Primary and Secondary Impressions-J20</td>
<td></td>
</tr>
<tr>
<td>Principal Component Analysis-J28</td>
<td></td>
</tr>
<tr>
<td>Printout Quality-J33</td>
<td></td>
</tr>
<tr>
<td>Prison-I5</td>
<td></td>
</tr>
<tr>
<td>Prison Mail-Y12</td>
<td></td>
</tr>
<tr>
<td>Privacy-F25</td>
<td></td>
</tr>
<tr>
<td>Probabilistic Genotyping-B74, B75, B78, B185, B186, F6</td>
<td></td>
</tr>
<tr>
<td>Probability-B98, W13</td>
<td></td>
</tr>
<tr>
<td>Probable Cause-F18</td>
<td></td>
</tr>
<tr>
<td>Problem-Oriented Policing-E119</td>
<td></td>
</tr>
<tr>
<td>Process Management-B192</td>
<td></td>
</tr>
<tr>
<td>Processes-W15</td>
<td></td>
</tr>
<tr>
<td>Professional Development-J2</td>
<td></td>
</tr>
<tr>
<td>Professional Liability-F49</td>
<td></td>
</tr>
<tr>
<td>Professional Practice-A73</td>
<td></td>
</tr>
<tr>
<td>Professional Training-J2</td>
<td></td>
</tr>
<tr>
<td>Proficiency-A92</td>
<td></td>
</tr>
<tr>
<td>Proficiency Testing-E88, F28</td>
<td></td>
</tr>
<tr>
<td>Profiling-G1</td>
<td></td>
</tr>
<tr>
<td>Program Development-F37</td>
<td></td>
</tr>
<tr>
<td>Propane Explosion-D33</td>
<td></td>
</tr>
<tr>
<td>Prosecution-F19</td>
<td></td>
</tr>
<tr>
<td>Prosecutor-F17</td>
<td></td>
</tr>
<tr>
<td>Prosecutorial Bias-D26</td>
<td></td>
</tr>
<tr>
<td>Protein Identification-E25</td>
<td></td>
</tr>
<tr>
<td>Proteomics-A60, B6, B47, B79, B80, B117</td>
<td></td>
</tr>
<tr>
<td>Pseudoaneurysm-H68, H125</td>
<td></td>
</tr>
<tr>
<td>Psychiatric Defense-F23</td>
<td></td>
</tr>
<tr>
<td>Psychiatry-J32, S01</td>
<td></td>
</tr>
<tr>
<td>Psychoactive Phenethylamines-H172</td>
<td></td>
</tr>
<tr>
<td>Psychoactives-K41</td>
<td></td>
</tr>
<tr>
<td>Psychogenic Polydipsia-I37</td>
<td></td>
</tr>
<tr>
<td>Psychological Autopsy-I39</td>
<td></td>
</tr>
<tr>
<td>Psychological Violence-I12</td>
<td></td>
</tr>
<tr>
<td>Psychopathology-I7</td>
<td></td>
</tr>
<tr>
<td>Psychopathy-I6, I7</td>
<td></td>
</tr>
<tr>
<td>Pubic Symphysis-A1, A2, A3</td>
<td></td>
</tr>
<tr>
<td>Public Health-I13</td>
<td></td>
</tr>
<tr>
<td>Public Survey-E46</td>
<td></td>
</tr>
<tr>
<td>Publishing-W15</td>
<td></td>
</tr>
<tr>
<td>Pucnachen-H34</td>
<td></td>
</tr>
<tr>
<td>Pulmonary Alveolar Microlithiasis-H66</td>
<td></td>
</tr>
<tr>
<td>Pulmonary Emboli-H76</td>
<td></td>
</tr>
<tr>
<td>Pulmonary Hypertension-H123</td>
<td></td>
</tr>
<tr>
<td>Pulmonary Thromboembolii-H85</td>
<td></td>
</tr>
<tr>
<td>Puppe's Rule-A126</td>
<td></td>
</tr>
<tr>
<td>Pyomyositis-H54</td>
<td></td>
</tr>
<tr>
<td>Pyrolysis-B165</td>
<td></td>
</tr>
<tr>
<td>Pyrosequencing-B5</td>
<td></td>
</tr>
<tr>
<td>Q</td>
<td>Reflective Ultraviolet-G6</td>
</tr>
<tr>
<td>---</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Q Exactive™-B24</td>
<td>Refusal of Medical Care-I30</td>
</tr>
<tr>
<td>Qiime™ 2-B198</td>
<td>Regulation-F29</td>
</tr>
<tr>
<td>qPCR-B81, B84, B190, H133</td>
<td>Religious Considerations-I33</td>
</tr>
<tr>
<td>Quadrat-B10</td>
<td>Removal-J7</td>
</tr>
<tr>
<td>Qualifications-A69, F26</td>
<td>REMS-I1</td>
</tr>
<tr>
<td>Qualified Opinion-J24</td>
<td>Repair-B106</td>
</tr>
<tr>
<td>Quality Assurance-A22, E79</td>
<td>Reports-B98</td>
</tr>
<tr>
<td>Quality Control (QC)-A74</td>
<td>Reports and Court Testimony-J30</td>
</tr>
<tr>
<td>Quality Metrics-E88</td>
<td>Reports/Testimony-F43</td>
</tr>
<tr>
<td>Quantification-B126, B202</td>
<td>Repressed Memory-I42</td>
</tr>
<tr>
<td>Quantifier™ Trio-B49</td>
<td>Research-A92, E116</td>
</tr>
<tr>
<td>Quantitation-K44</td>
<td>Resolution-B189</td>
</tr>
<tr>
<td>Quantitative Method-B62</td>
<td>Resources-E113</td>
</tr>
<tr>
<td>Quantitative PCR-B51, B190</td>
<td>Respiratory Infections-H122</td>
</tr>
<tr>
<td>Quantitative Recovery-B116</td>
<td>Resuscitation-H126</td>
</tr>
<tr>
<td>Quantitative Ultrasound-A141</td>
<td>Retinal Hemorrhages-H13</td>
</tr>
<tr>
<td>QuEChERS-K36</td>
<td>Re-Trial-G34</td>
</tr>
<tr>
<td>Questioned Documents-J3, J10, J13, J15</td>
<td>Retroactive Study-K52</td>
</tr>
<tr>
<td>R</td>
<td>Revenge-I31</td>
</tr>
<tr>
<td>Race and Ancestry-A145</td>
<td>Ridge Width-B69</td>
</tr>
<tr>
<td>Radiating Fracture Analysis-A45</td>
<td>Rigid Body and Finite Element Model-H8</td>
</tr>
<tr>
<td>Radiographic Analysis-G38</td>
<td>Rio de Janeiro-A130</td>
</tr>
<tr>
<td>Radiographic Maxillary Sinus-G27</td>
<td>Risk-I31</td>
</tr>
<tr>
<td>Radiography-A109</td>
<td>Risk Assessment-I1, I23</td>
</tr>
<tr>
<td>Radiologic Imaging-H114</td>
<td>Risk Factors-E31</td>
</tr>
<tr>
<td>Radiology-H105</td>
<td>RNA-Seq-I38</td>
</tr>
<tr>
<td>Raman-B167, J10</td>
<td>Robotic DNA Extraction-B116, B123</td>
</tr>
<tr>
<td>Raman Microscopy-B168</td>
<td>Rodenticides-B25</td>
</tr>
<tr>
<td>Raman Spectroscopy-E81, E100, E107, K24</td>
<td>Root Pulp Visibility (RPV)-G19</td>
</tr>
<tr>
<td>Rampage-E68</td>
<td>Rorschach Test-I14</td>
</tr>
<tr>
<td>Random Forest Classification-A102</td>
<td>Rubber Stamps-J22</td>
</tr>
<tr>
<td>Randomly Acquired Characteristics-E57</td>
<td>Rule-Based Methods-B23</td>
</tr>
</tbody>
</table>
| Rape-I18 | S

Sabotage-D29
Sadism-I21
Safer Viewing-C8
Safety-H22
SALigAE-B42
Saliva-B42, H15, Y21
Salmonella Urosepsis-H61
Sample Collection-B7
Sampling-B10
Sampling Sequence-B144
Sanctions of Suicide Inducement-F3
SCADA Forensics-C41
Scanning Electron Microscope-H62
Scanning Electron Microscopy-H136
Scanning Electron Microscopy (SEM)-H103
Scavenger Succession-A80
Scene Investigation-B56
Scent Detection Canines-E51
Scheduling-F20
Schizophrenia-I28
Science Continuing Education-E117
Scientific-W16
Scientific and Engineering Ethics-D22
Scientific Investigation-B199
Scientific Methods-E23
Scientific Reasoning-B199
Scissor Jack-D36
Score-H2
Score Likelihood Ratios-B133
Scores-J26
SCRAM-F21
ScreenClust-B44
Screening-H117
Screwdriver-H19
SCUBA Diving-W04
Search and Recovery-A66
Searches-F25
Season at Death-A18
Seat Belt-D38, D40
Secular Change-A12
Security Features-J27
Seized Drugs-B27, B170
Self-Determination-F32
SEM-J8
SEM/EDX-A48, B30
Semien-E81
Sentencing Outcomes-F39
Sepsis-H33
Septic Embolism-H59
Sequencing-B2, B111
Serial Killer-B35
Serial Killers-I21
Serology-B6, B164, E82, Y10
Serotonin-I9
Serotonin Syndrome-E18
SERS-B21, K44
Service Learning-A23
Sex Crimes-F48, I18, I43
Sex Determination-A41, A44
Sex Estimation-A40, A42, A43
Sex Offenders-J23
Sexual Abuse-E11, G10, I42
Sexual Assault-B52, B80, B82, B83, C8, E45, H132, Y20
Sexual Assault Collection Kit-B34
Sexual Assault Evidence Collection-B37
Sexual Assault Kits-B11, B47, E74
Sexual Deviation-I18
Sexual Dimorphism-A8, A81
Sexual Discrimination-A146
Sexual Harassment-A146
Sexual Lubricants-B193
Sexual Offenders-I24, I25, I26
Sexually Violent Predators-I24, I26
Shared Anchor-D39
Sharp Force-A15
Sharp Force Injury-H148 |
<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharpness-D2</td>
</tr>
<tr>
<td>Shoe Print-C1</td>
</tr>
<tr>
<td>Shooting Distance-E99</td>
</tr>
<tr>
<td>Short Tandem Repeat-B1, B129, B153, E47</td>
</tr>
<tr>
<td>Short Tandem Repeat Profiles-Y6</td>
</tr>
<tr>
<td>Short Tandem Repeats-B119</td>
</tr>
<tr>
<td>Shotgun-H190</td>
</tr>
<tr>
<td>Shoulder-A113</td>
</tr>
<tr>
<td>Shroud of Turin-E73, J19</td>
</tr>
<tr>
<td>Sickle Cell-H61</td>
</tr>
<tr>
<td>Signature Complexity-J11</td>
</tr>
<tr>
<td>Signatures-J17</td>
</tr>
<tr>
<td>Silicon Oxide-B94</td>
</tr>
<tr>
<td>Silicosis-H65</td>
</tr>
<tr>
<td>Simulation-H115</td>
</tr>
<tr>
<td>Single Nucleotide Polymorphism-B105, B118</td>
</tr>
<tr>
<td>Single Nucleotide Polymorphisms-B14</td>
</tr>
<tr>
<td>Skeletal Age Estimation-A26, W24</td>
</tr>
<tr>
<td>Skeletal Asymmetry-A16</td>
</tr>
<tr>
<td>Skeletal DNA-A53</td>
</tr>
<tr>
<td>Skeletal Histology-A30</td>
</tr>
<tr>
<td>Skeletal Preservation-A95</td>
</tr>
<tr>
<td>Skeletal Remains-H153</td>
</tr>
<tr>
<td>Skeletal Trauma-A142</td>
</tr>
<tr>
<td>Skeletal Trauma Analysis-A124</td>
</tr>
<tr>
<td>Skeletonization-A51</td>
</tr>
<tr>
<td>Skeletonized Remains-B38, B40</td>
</tr>
<tr>
<td>Skin Texture-C38</td>
</tr>
<tr>
<td>Skull-A10</td>
</tr>
<tr>
<td>Slip, Trip, or Misstep-D10</td>
</tr>
<tr>
<td>Small Molecule-E48</td>
</tr>
<tr>
<td>Small Particles Reagent-B143</td>
</tr>
<tr>
<td>Small Unmanned Aerial System-B152</td>
</tr>
<tr>
<td>Smarthome Forensic Analysis-C22</td>
</tr>
<tr>
<td>Smell of Fear-E80</td>
</tr>
<tr>
<td>Smile Photographs-G26</td>
</tr>
<tr>
<td>Smokeless Powder-B89</td>
</tr>
<tr>
<td>Smothering-E67</td>
</tr>
<tr>
<td>Smuggling-E26, E72</td>
</tr>
<tr>
<td>SNPs-B86</td>
</tr>
<tr>
<td>Social Anthropology-A33</td>
</tr>
<tr>
<td>Social Identifiers-A148</td>
</tr>
<tr>
<td>Social Media-F24</td>
</tr>
<tr>
<td>Social Media Ballistics-C12</td>
</tr>
<tr>
<td>Social Networks-C11, I13</td>
</tr>
<tr>
<td>Social Science-J18</td>
</tr>
<tr>
<td>Socio-Economic Status-A108</td>
</tr>
<tr>
<td>Socrates’ Death-E91</td>
</tr>
<tr>
<td>Sodium Carbonate-E109</td>
</tr>
<tr>
<td>Software-A39</td>
</tr>
<tr>
<td>Soil-B197, B198</td>
</tr>
<tr>
<td>Soil Composition-A62</td>
</tr>
<tr>
<td>Soil Microbial Communities-E121, H99</td>
</tr>
<tr>
<td>Sol-Gel-Y17</td>
</tr>
<tr>
<td>Solid Phase Extraction-K21, Y14</td>
</tr>
<tr>
<td>Solid-Phase Microextraction (SPME)-H26, K10</td>
</tr>
<tr>
<td>Solvent Yellow 124-E102</td>
</tr>
<tr>
<td>Source Identification-C12</td>
</tr>
<tr>
<td>Sources-G30</td>
</tr>
<tr>
<td>Spectroscopy-B13</td>
</tr>
<tr>
<td>Sperm DNA Recovery-B83</td>
</tr>
<tr>
<td>Spinal Nerve Root Hemorrhages-H13</td>
</tr>
<tr>
<td>Spleen Attenuation-H154</td>
</tr>
<tr>
<td>Spleen Weight-H154</td>
</tr>
<tr>
<td>SPME-K76</td>
</tr>
<tr>
<td>Spondyloarthritis-A136</td>
</tr>
<tr>
<td>Spontaneous Hemoperitoneum-H69</td>
</tr>
<tr>
<td>Sports-K2</td>
</tr>
<tr>
<td>Spree Killer-E68</td>
</tr>
<tr>
<td>S Q L i t e - C 2 7</td>
</tr>
<tr>
<td>Sri Lanka-A89</td>
</tr>
<tr>
<td>SRM 2372a-B190</td>
</tr>
<tr>
<td>Stab Wound-H21</td>
</tr>
<tr>
<td>Stabbing-D2</td>
</tr>
<tr>
<td>Stability-K45</td>
</tr>
<tr>
<td>Stable Isotopes-A122</td>
</tr>
<tr>
<td>Stable Nitrogen Isotope Ratios-A61</td>
</tr>
<tr>
<td>Staging-E33</td>
</tr>
<tr>
<td>Stakeholders-A36</td>
</tr>
<tr>
<td>Staking-D4</td>
</tr>
<tr>
<td>Stalking-F48, I20</td>
</tr>
<tr>
<td>Standard Developing Organizations-W12</td>
</tr>
<tr>
<td>Standard Reference Material-B191</td>
</tr>
<tr>
<td>Standardization-A22</td>
</tr>
<tr>
<td>Standards-B26, BS3, C3, C40, E35, F29, W12</td>
</tr>
<tr>
<td>Standards Developing Organizations-B33</td>
</tr>
<tr>
<td>Statistical Comparison-B15</td>
</tr>
<tr>
<td>Statistical Design of Experiments-K58</td>
</tr>
<tr>
<td>Statistics-B98, B99, E90, J5, J29, W13</td>
</tr>
<tr>
<td>Stature-A9, A10, A122</td>
</tr>
<tr>
<td>Stature Estimation-A11</td>
</tr>
<tr>
<td>Stature Methods-A12</td>
</tr>
<tr>
<td>Statute of Limitations-I42</td>
</tr>
<tr>
<td>Steganalysis-C17</td>
</tr>
<tr>
<td>Steganography-C17</td>
</tr>
<tr>
<td>Sternosis-H128</td>
</tr>
<tr>
<td>Steroid Injection-Y5</td>
</tr>
<tr>
<td>Steroid Therapy-H182</td>
</tr>
<tr>
<td>Storage Condition-K23</td>
</tr>
<tr>
<td>STR Markers-B191</td>
</tr>
<tr>
<td>Strangulation-E20, H4, H111</td>
</tr>
<tr>
<td>Stress-H1</td>
</tr>
<tr>
<td>Stroke-H4</td>
</tr>
<tr>
<td>Student Training-A92</td>
</tr>
<tr>
<td>Subadult Age Estimation-A110</td>
</tr>
<tr>
<td>Subdural Hematoma-H23, H72</td>
</tr>
<tr>
<td>Subperiosteal Bone Formation-A123</td>
</tr>
<tr>
<td>Subperiosteal New Bone Formation-A141</td>
</tr>
<tr>
<td>Substance Abuse-H161</td>
</tr>
<tr>
<td>Sudden Cardiac Death-H129, W07</td>
</tr>
<tr>
<td>Sudden Death-H52, H55, H58, H66, H73, H79, I37</td>
</tr>
<tr>
<td>Sudden Death in Epilepsy-H121</td>
</tr>
<tr>
<td>Sudden Infant Deaths-E28</td>
</tr>
<tr>
<td>Sudden Unexpected Death-H84</td>
</tr>
<tr>
<td>Sudden Unexplained Death-H184</td>
</tr>
<tr>
<td>Sufficiency and Complexity-J6</td>
</tr>
<tr>
<td>Suffocation-E72, H3</td>
</tr>
<tr>
<td>Suicide Inducement-F3</td>
</tr>
<tr>
<td>Suicide Notes-E21</td>
</tr>
<tr>
<td>Suicide Pact-E19</td>
</tr>
<tr>
<td>Suicide-Peticide-I34</td>
</tr>
<tr>
<td>Suicides-K3</td>
</tr>
<tr>
<td>Superglue-B57</td>
</tr>
<tr>
<td>Superimposition-G25</td>
</tr>
<tr>
<td>Supply Chain-E97</td>
</tr>
<tr>
<td>Supported Liquid Extraction-K12, K13, K45</td>
</tr>
<tr>
<td>Surgical Alterations-E38</td>
</tr>
<tr>
<td>Surveillance-W05</td>
</tr>
<tr>
<td>Surveillance Cameras-F41</td>
</tr>
<tr>
<td>Suspected Shooter-B146</td>
</tr>
<tr>
<td>SUV-D36</td>
</tr>
<tr>
<td>SWGDRUG-B17</td>
</tr>
<tr>
<td>Synthetic Cannabinoid-K54</td>
</tr>
<tr>
<td>Synthetic Cannabinoids-B137, E95, K12, K13, K27, K39, K45, K46, K47, K78, Y12</td>
</tr>
<tr>
<td>Synthetic Drugs-B177</td>
</tr>
<tr>
<td>Synthetic Opioids-B54, H139, K32</td>
</tr>
<tr>
<td>Synthetic Urine-K55</td>
</tr>
<tr>
<td>Systematic-I10</td>
</tr>
<tr>
<td>Systemic Calcification-H85</td>
</tr>
</tbody>
</table>

T

| Tandem Mass Spectrometry-B65          |
| Tape-B92                              |
| Tape Lifts-B113                       |
| Taphonomy-A14, A53, A56, A62, A78, A79, C37, H93 |
| Target Enrichment-B86                 |
| Task Relevance-E112                   |
| TATP-B88                              |
| Tau Protein-H67                       |
| Tauopathy-H124                        |
| TDP/DART®-MS-E104, K1                 |
| Technical Experts-D21                 |
| Technology-B200, W17                  |
| Teeth-A129                            |
| Temperature-B90                       |
| Terminal Performance-D6               |
| Testimony-F15                         |
| Testing-D23                           |
| Tests-F4                              |

251
<table>
<thead>
<tr>
<th>Textiles-A19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thanatochemistry-H138</td>
</tr>
<tr>
<td>Thanatomicrobiome-H31, H95</td>
</tr>
<tr>
<td>Third Molar-G20</td>
</tr>
<tr>
<td>Third Molar Impaction-G14</td>
</tr>
<tr>
<td>Thoracic Aortic Aneurysm-H84</td>
</tr>
<tr>
<td>Thrombi-H76</td>
</tr>
<tr>
<td>Thromboembolism-H180</td>
</tr>
<tr>
<td>Thrombotic Thrombocytopenic Purpura-H78</td>
</tr>
<tr>
<td>Time of Death-BS7</td>
</tr>
<tr>
<td>Time-of-Death Estimation-H131</td>
</tr>
<tr>
<td>Time Since Death-A63, E6, H99, H185</td>
</tr>
<tr>
<td>Time Since Intercourse (TSI)-B34</td>
</tr>
<tr>
<td>Time-Since-Injury-H145</td>
</tr>
<tr>
<td>Tin Man-H20</td>
</tr>
<tr>
<td>Tissue Procurement-E1</td>
</tr>
<tr>
<td>Tissue Recovery-H43</td>
</tr>
<tr>
<td>TNT-B67</td>
</tr>
<tr>
<td>Tobacco Smoking-B53</td>
</tr>
<tr>
<td>Toenail Clippings-B46</td>
</tr>
<tr>
<td>Toluene-K64</td>
</tr>
<tr>
<td>Toner-J8, J15</td>
</tr>
<tr>
<td>Tool Marks-Y2</td>
</tr>
<tr>
<td>Tool Testing And Validation-C5</td>
</tr>
<tr>
<td>Tooth-Pulp Area Ratios-G15</td>
</tr>
<tr>
<td>Topographic Analyses-A4</td>
</tr>
<tr>
<td>Total Body Score-A50, A84, H97</td>
</tr>
<tr>
<td>Total Body Trauma Pattern-W11</td>
</tr>
<tr>
<td>Touch DNA-B48, B126, E42, H90</td>
</tr>
<tr>
<td>Toxicity-H137, H139</td>
</tr>
<tr>
<td>Toxicological Analysis-K67</td>
</tr>
<tr>
<td>Toxicology-D25, H140, H147, K2, K63, K80, Y11</td>
</tr>
<tr>
<td>Toxicology Trends-H168</td>
</tr>
<tr>
<td>Trace-Y3</td>
</tr>
<tr>
<td>Trace DNA-B115, B125</td>
</tr>
<tr>
<td>Trace Elements-B175</td>
</tr>
<tr>
<td>Trace Evidence-B32, B166, E86, E100</td>
</tr>
<tr>
<td>Trace Organic Additive-E104</td>
</tr>
<tr>
<td>Trace Vapor Detection-B162</td>
</tr>
<tr>
<td>Tractor-H193</td>
</tr>
<tr>
<td>Traffic Accident-E2</td>
</tr>
<tr>
<td>Traffic Disaster-G32</td>
</tr>
<tr>
<td>Training-A35, A69, E89</td>
</tr>
<tr>
<td>Training and Practice-A91</td>
</tr>
<tr>
<td>Training Modules-G2</td>
</tr>
<tr>
<td>Transcatheter Closure-H70</td>
</tr>
<tr>
<td>Transfer DNA-B124, F8</td>
</tr>
<tr>
<td>Transgender-A149, H148</td>
</tr>
<tr>
<td>Transition Analysis-A25, A26, A38, W24</td>
</tr>
<tr>
<td>Transportation-F13</td>
</tr>
<tr>
<td>Transporting Remains-A68</td>
</tr>
<tr>
<td>Trauma-A13, A14, H118, W01</td>
</tr>
<tr>
<td>Trauma Analysis-A46, A125, A139</td>
</tr>
<tr>
<td>Traumatic Asphyxia-H177, H193</td>
</tr>
<tr>
<td>Traumatic Brain Injury-H57, H124</td>
</tr>
<tr>
<td>Treatment Outcomes-I28</td>
</tr>
<tr>
<td>Trend-J12</td>
</tr>
<tr>
<td>Trends-B132</td>
</tr>
<tr>
<td>Triadic Death-H166</td>
</tr>
<tr>
<td>Triage Tool-H109</td>
</tr>
<tr>
<td>Trial Consultants-BS2</td>
</tr>
<tr>
<td>Triticale Cartilage-H1189</td>
</tr>
<tr>
<td>Troubleshooting-E78</td>
</tr>
<tr>
<td>TrueAllele®-B186</td>
</tr>
<tr>
<td>TrueAllele® Technology-B184</td>
</tr>
<tr>
<td>Tumbling-H11</td>
</tr>
<tr>
<td>U</td>
</tr>
<tr>
<td>United States-Mexico Border-A106, A128</td>
</tr>
<tr>
<td>United States Population-B2</td>
</tr>
<tr>
<td>U-47700-B138, K32</td>
</tr>
<tr>
<td>U-49900-B138</td>
</tr>
<tr>
<td>U-51754-B138</td>
</tr>
<tr>
<td>Ugi Ligand-E92</td>
</tr>
<tr>
<td>UHPLC-MS/MS-K77</td>
</tr>
<tr>
<td>UHPLC-TOF/MS-B161, B180</td>
</tr>
<tr>
<td>Umbilical Cord-K34</td>
</tr>
<tr>
<td>Uncertainty-F34, F35</td>
</tr>
<tr>
<td>Unconventional-G40</td>
</tr>
<tr>
<td>Undeclared Substances-K7</td>
</tr>
<tr>
<td>Undergraduate Education-E23</td>
</tr>
<tr>
<td>Undergraduate Research-A23, E114</td>
</tr>
<tr>
<td>Underwater-B57, B139</td>
</tr>
<tr>
<td>Undetermined-B66</td>
</tr>
<tr>
<td>Undocumented Border Crossers-A116, A118, A120</td>
</tr>
<tr>
<td>Unexpected Death-H59</td>
</tr>
<tr>
<td>Unexplained Death-E51</td>
</tr>
<tr>
<td>Unidentifiable-A77</td>
</tr>
<tr>
<td>Unidentified Decedents-W19</td>
</tr>
<tr>
<td>Unidentified Remains-A97, A105</td>
</tr>
<tr>
<td>Universal Detection Calibrator-B140</td>
</tr>
<tr>
<td>Upconversion-Y4</td>
</tr>
<tr>
<td>Unperceived Pregnancy-J36</td>
</tr>
<tr>
<td>Unresolved Homicides-B8</td>
</tr>
<tr>
<td>Unusual Cases-G37</td>
</tr>
<tr>
<td>Urine-B10, K55</td>
</tr>
<tr>
<td>Urine Adulterants-K76</td>
</tr>
<tr>
<td>Urine and Blood-K1</td>
</tr>
<tr>
<td>Urine Screening-K59</td>
</tr>
<tr>
<td>UT-Age-G20</td>
</tr>
<tr>
<td>Uterine Rupture-H75</td>
</tr>
<tr>
<td>V</td>
</tr>
<tr>
<td>Vacuum-B7</td>
</tr>
<tr>
<td>Vacuum Ultraviolet-B104, B179</td>
</tr>
<tr>
<td>Vacuum Ultraviolet Detection-B181</td>
</tr>
<tr>
<td>Vaginal Fluid-Y10</td>
</tr>
<tr>
<td>Vagus Nerve-H14</td>
</tr>
<tr>
<td>Validation-B75, E85, K9, K31, K74, K78</td>
</tr>
<tr>
<td>Vapor Delivery-E29</td>
</tr>
<tr>
<td>Vapor Detection-E29</td>
</tr>
<tr>
<td>Variability-K70</td>
</tr>
<tr>
<td>Variable Parameters-J33</td>
</tr>
<tr>
<td>Vascular Injuries-H112</td>
</tr>
<tr>
<td>Vascular Malformation-H110</td>
</tr>
<tr>
<td>Vehicle Fuel Systems-D27</td>
</tr>
<tr>
<td>Vehicle-Pedestrian Collision-B158</td>
</tr>
<tr>
<td>Velocity Trauma-A140</td>
</tr>
<tr>
<td>Venous Thrombosis-I35</td>
</tr>
<tr>
<td>Ventilation-B90</td>
</tr>
<tr>
<td>Ventriculoperitoneal Shunt-H120</td>
</tr>
<tr>
<td>Vertebrae-A6</td>
</tr>
<tr>
<td>Vertebral Arteries-E2</td>
</tr>
<tr>
<td>Vertebral Column-A5</td>
</tr>
<tr>
<td>Veterinary Diagnostic-E84</td>
</tr>
<tr>
<td>Veterinary Forensics-A137, E84</td>
</tr>
<tr>
<td>Vibrioaceae-H82</td>
</tr>
<tr>
<td>Vibriosis-H82</td>
</tr>
<tr>
<td>Video Analysis-C21, C33</td>
</tr>
<tr>
<td>Video and Audio-W28</td>
</tr>
<tr>
<td>Video Authentication-C33</td>
</tr>
<tr>
<td>Video Spectral Comparator-J20</td>
</tr>
<tr>
<td>Violence-I6, I18, I25</td>
</tr>
<tr>
<td>Violence Prevention-E110</td>
</tr>
<tr>
<td>Virtsopsy-H87, H104, H107, H108, H109, H155</td>
</tr>
<tr>
<td>Virtual Forensic Anthropology-A82, A83</td>
</tr>
<tr>
<td>Vitreous Fluid-H169</td>
</tr>
<tr>
<td>Vitreous Humor-K7</td>
</tr>
<tr>
<td>VMware Forensics-C29</td>
</tr>
<tr>
<td>Void Analysis-D41</td>
</tr>
<tr>
<td>Voir Dire-B52, F36</td>
</tr>
<tr>
<td>Volatile Organic Compounds (VOCs)-B32, E51, H92, H93</td>
</tr>
<tr>
<td>Volatolomics-H26</td>
</tr>
<tr>
<td>VP-8 Image Analyzer-J19</td>
</tr>
<tr>
<td>W</td>
</tr>
<tr>
<td>Walker Method-A43</td>
</tr>
<tr>
<td>Walker Traits-A42</td>
</tr>
<tr>
<td>Waste Production-B134</td>
</tr>
<tr>
<td>Water-A49</td>
</tr>
<tr>
<td>Water Heater-D33</td>
</tr>
<tr>
<td>WD-XRF and Pulp-Tooth Area Ratio-G17</td>
</tr>
<tr>
<td>Wear-E8</td>
</tr>
<tr>
<td>Wearable Devices-C20</td>
</tr>
<tr>
<td>Weather-Related Death-H9</td>
</tr>
<tr>
<td>Weathered Gasoline-B136</td>
</tr>
<tr>
<td>Weight of Evidence Pre-Assessment-B96</td>
</tr>
<tr>
<td>Wet Fingerprints-B149</td>
</tr>
<tr>
<td>WhatsApp-C15</td>
</tr>
</tbody>
</table>
KEY WORD INDEX

Whiplash-E2
White Code-E110
Whole Genome Amplification-E47
Wild Mice-D31
Wildlife Traffic-E59
Wildlife-E43
Wilson Method-A11
Windows Systems-C34
Winthropping-E122
Wood Burning-H17
Workplace Drug Testing-K55
Wormwood-B8
Wounds-W20
Wrist-C39
Writing Features-J29
Writing Speed-J11
Wrongful Conviction-G3
Wrongful Convictions-B187, G4
WWII Soldiers-LW3

X

XPS-A96
X-Ray Fluorescence-B59
X-Rays-D42
Y-STR-Y19
X-STR Loci-B2
Xylazine-E50, K16

Y

Y-Chromosome Short Tandem Repeat-Y20
YFSF-S02
Yohimbine-K29
Young-H39
Youth Violence-E71
Y-Screen-B49
Y-STR-Y19

Z

Zealous Advocacy-F16
ZyGEM® PDQeX-B43
The presenting author index can provide a quick reference to find when and in what section presenting authors are scheduled to present at the 2019 Annual Scientific Meeting. The reference table below assists you in finding the section in which the presentation will be given. Letters correspond to the scientific discipline/section in which the presentation is being made while the number corresponds to the numerical sequence of the presentation within the section.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Section</th>
<th>Presenting Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Anthropology</td>
<td>Aagaard, Patricia J. - W19</td>
</tr>
<tr>
<td>B</td>
<td>Criminalistics</td>
<td>Babcock, Kailey - H32</td>
</tr>
<tr>
<td>C</td>
<td>Digital &amp; Multimedia Sciences</td>
<td>Babu, Kavi - W5</td>
</tr>
<tr>
<td>D</td>
<td>Engineering Sciences</td>
<td>Baccino, Eric - E75</td>
</tr>
<tr>
<td>E</td>
<td>General</td>
<td>Bader, Drew A. - B74</td>
</tr>
<tr>
<td>F</td>
<td>Jurisprudence</td>
<td>Baig, Mudassar - E86</td>
</tr>
<tr>
<td>G</td>
<td>Odontology</td>
<td>Baigent, Christiane - A80</td>
</tr>
<tr>
<td>H</td>
<td>Pathology/Biology</td>
<td>Bailey, Christine - A112</td>
</tr>
<tr>
<td>I</td>
<td>Psychiatry &amp; Behavioral Science</td>
<td>Baker, Andrew M. - B57, H195, K81</td>
</tr>
<tr>
<td>J</td>
<td>Questioned Documents</td>
<td>Baldari, Benedetta - H50</td>
</tr>
<tr>
<td>K</td>
<td>Toxicology</td>
<td>Baldoni, Marica - A7</td>
</tr>
<tr>
<td>L</td>
<td>LW Last Word Society</td>
<td>Ballantyne, Jack - W10</td>
</tr>
<tr>
<td>M</td>
<td>ES Evening Session</td>
<td>Bankston, Sarah - E117</td>
</tr>
<tr>
<td>N</td>
<td>S Special Session</td>
<td>Bao, Connie - Y5</td>
</tr>
<tr>
<td>O</td>
<td>W Workshop</td>
<td>Bard, Glenn K. - C2, W19</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td>Barnett, Isabella C. - B150</td>
</tr>
<tr>
<td>Q</td>
<td></td>
<td>Bartelink, Eric J. - A71</td>
</tr>
<tr>
<td>R</td>
<td></td>
<td>Batksos, Ilias - C24</td>
</tr>
<tr>
<td>S</td>
<td></td>
<td>Battiato, Sebastiano - C12, C28, F41</td>
</tr>
<tr>
<td>T</td>
<td></td>
<td>Baud, Mallory - Y21</td>
</tr>
<tr>
<td>U</td>
<td></td>
<td>Baumgarten, Brooke R. - B193</td>
</tr>
<tr>
<td>V</td>
<td></td>
<td>Baxter, Alexander - Y19</td>
</tr>
<tr>
<td>W</td>
<td></td>
<td>Baxter-White, Anece - W16</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td>Bayer-Broring, Carolyn - J27</td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td>Beasley, Melanie M. - A61</td>
</tr>
<tr>
<td>Z</td>
<td></td>
<td>Behan, Michelle L. - F22</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Behera, Chittaranjan - H121</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Behnke, Grayce - E54, K74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Belk, Aerial D. - H101</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bell, Michael D. - W4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Benbow, M. Eric - S2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bender, Abigail J. - B72, B158</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berg, Gregory E. - A75, W14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Berker, John - G7, G37</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bernet, William - I41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bertozzi, Giuseppe - E2, E4, E8, E62, H10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bertsch, Ingrid - I25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Besser, Marcus P. - D11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bethard, Jonathan D. - A28, A35, A113, A137</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Beynon, Marianne E. - H119</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bhutta, Zumrad Usman - E86</td>
</tr>
</tbody>
</table>

<p>|        | Young Forensic Scientists Forum  | Bidmos, Mubarak A. - A10 |
|        |                                  | Bieber, Frederick R. - F4 |
|        |                                  | Bielamowicz, Hannah Elysse - H187 |
|        |                                  | Bielous, Stanislav T.J. - E94 |
|        |                                  | Binette, Julie - J13 |
|        |                                  | Bishop-Freeman, Sandra C. - K69 |
|        |                                  | Bisker, Chawki - E121, H99 |
|        |                                  | Bjerkhoel, Alissa L. - F17 |
|        |                                  | Blair, Scott - W17 |
|        |                                  | Blake, Brooke H. - H190 |
|        |                                  | Blanar, Katie E. - B31 |
|        |                                  | Blessing, Melissa M. - H118 |
|        |                                  | Bodwal, Jatin - D34 |
|        |                                  | Boldsen, Jesper L. - W24 |
|        |                                  | Bolhofner, Katelyn L. - A135 |
|        |                                  | Bollé, Timothy - C26 |
|        |                                  | Bonato, Omar - E20 |
|        |                                  | Boon, Julian C.W. - I20 |
|        |                                  | Bordelon, Jason A. - W5 |
|        |                                  | Borja, Trevor A. - B117 |
|        |                                  | Borrini, Matteo - LW3 |
|        |                                  | Borsuk, Lisa - B2 |
|        |                                  | Bosch, David R. - D22, D27 |
|        |                                  | Bosco, Caterina - E11 |
|        |                                  | Botch-Jones, Sabra R. - K13 |
|        |                                  | Bouderabon, Fatimah - A149 |
|        |                                  | Bourgeois, Jennifer W. - F39 |
|        |                                  | Boyd, Derek A. - A63 |
|        |                                  | Boyd, Donna C. - A138 |
|        |                                  | Braley, Cody L. - B33 |
|        |                                  | Brandt, Helen M. - A8 |
|        |                                  | Brathwaite, Sophia - K71 |
|        |                                  | Breaux, Jennifer Gombos - W10 |
|        |                                  | Brenner, Charles H. - B76 |
|        |                                  | Bridges, Amber N. - I2 |
|        |                                  | Broadwater, Kendra - W23 |
|        |                                  | Brooks, Connor - K81 |
|        |                                  | Bross, Helmut G. - D28, D29, D32 |
|        |                                  | Brown, Catherine O. - B6 |
|        |                                  | Brown, Elizabeth A. - W15 |
|        |                                  | Brown, Katherine M. - E32, W15 |
|        |                                  | Brown, Melissa Ann - A27 |
|        |                                  | Brown, Tracy E. - A66 |</p>
<table>
<thead>
<tr>
<th>Author Name</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunty, Joshua L.</td>
<td>C20</td>
</tr>
<tr>
<td>Bruski, Lori</td>
<td>W19</td>
</tr>
<tr>
<td>Brzozowski, Cynthia</td>
<td>G4</td>
</tr>
<tr>
<td>Buchalter, Sydney R.</td>
<td>B179</td>
</tr>
<tr>
<td>Bugajski, Kristi</td>
<td>H89</td>
</tr>
<tr>
<td>Bukovitz, Brandon J.</td>
<td>H65</td>
</tr>
<tr>
<td>Burkes, Ted M.</td>
<td>J34</td>
</tr>
<tr>
<td>Burns, Amber</td>
<td>W23</td>
</tr>
<tr>
<td>Buscaglia, JoAnn</td>
<td>B95, B159</td>
</tr>
<tr>
<td>Butler, Daniel C.</td>
<td>H169</td>
</tr>
<tr>
<td>Butler, John M.</td>
<td>W10</td>
</tr>
<tr>
<td>Butt, Nasir</td>
<td>B184</td>
</tr>
<tr>
<td>Buzzini, Patrick</td>
<td>B166, J10</td>
</tr>
<tr>
<td>Byrd, Krystal T.</td>
<td>B138</td>
</tr>
<tr>
<td>Byrnes, Jennifer F.</td>
<td>A131</td>
</tr>
<tr>
<td>Bytheway, Joan A.</td>
<td>A62</td>
</tr>
<tr>
<td>Cablk, Mary E.</td>
<td>F18</td>
</tr>
<tr>
<td>Cabrera, Joaquin</td>
<td>W23</td>
</tr>
<tr>
<td>Cafiero, Crystal</td>
<td>F11</td>
</tr>
<tr>
<td>Cain, Matthew D.</td>
<td>H41</td>
</tr>
<tr>
<td>Calabrese, Enrica</td>
<td>H84</td>
</tr>
<tr>
<td>Cale, Cynthia</td>
<td>F8</td>
</tr>
<tr>
<td>Calmon Silva, Melina</td>
<td>A130</td>
</tr>
<tr>
<td>Campbell, Annabelle C.</td>
<td>B81</td>
</tr>
<tr>
<td>Canales, Justine</td>
<td>H127</td>
</tr>
<tr>
<td>Castellani, Rudy J.</td>
<td>H124, S2</td>
</tr>
<tr>
<td>Chao, Sarah</td>
<td>F15</td>
</tr>
<tr>
<td>Chasen, Lesley A.</td>
<td>A74</td>
</tr>
<tr>
<td>Chatterjee, David W.</td>
<td>H147</td>
</tr>
<tr>
<td>Chávez, David</td>
<td>D35</td>
</tr>
<tr>
<td>Chartrand, James</td>
<td>K10</td>
</tr>
<tr>
<td>Chaturvedi, Abhishek</td>
<td>H195</td>
</tr>
<tr>
<td>Chawla, Archit</td>
<td>J26</td>
</tr>
<tr>
<td>Chaudhary, Muhammad Taimoor</td>
<td>E26, K3</td>
</tr>
<tr>
<td>Chediak, Yael</td>
<td>K13</td>
</tr>
<tr>
<td>Chen, Chao-Chun</td>
<td>C19</td>
</tr>
<tr>
<td>Chesney, Abigail</td>
<td>H130</td>
</tr>
<tr>
<td>Christensen, Alexander F.</td>
<td>A58</td>
</tr>
<tr>
<td>Christensen, Angi M.</td>
<td>A54</td>
</tr>
<tr>
<td>Christopher, Sheresa</td>
<td>I33</td>
</tr>
<tr>
<td>Church, Elizabeth</td>
<td>A134</td>
</tr>
<tr>
<td>Chute, Dennis J.</td>
<td>H177</td>
</tr>
<tr>
<td>Ciruzi, Maria Susana</td>
<td>F42</td>
</tr>
<tr>
<td>Clark, Michelle S.</td>
<td>H132</td>
</tr>
<tr>
<td>Clark, Randall</td>
<td>B177</td>
</tr>
<tr>
<td>Clemmons, Chauneise</td>
<td>A148</td>
</tr>
<tr>
<td>Coates, David W.</td>
<td>H147</td>
</tr>
<tr>
<td>Cole, Michael D.</td>
<td>F6</td>
</tr>
<tr>
<td>Cocking, Jill H.</td>
<td>B198</td>
</tr>
<tr>
<td>Collins, Alex J.</td>
<td>H167</td>
</tr>
<tr>
<td>Collins, Kerry A.</td>
<td>F10</td>
</tr>
<tr>
<td>Conca, Giuseppe</td>
<td>J31</td>
</tr>
<tr>
<td>Conte, Jillian</td>
<td>E125</td>
</tr>
<tr>
<td>Cook, Emilie</td>
<td>H61</td>
</tr>
<tr>
<td>Coppone, Mauro</td>
<td>E20</td>
</tr>
<tr>
<td>Cordasco, Fabrizio</td>
<td>H151, 139</td>
</tr>
<tr>
<td>Corey, Tracey S.</td>
<td>H195</td>
</tr>
<tr>
<td>Cornelison, Jered B.</td>
<td>H146</td>
</tr>
<tr>
<td>Corro, Helen G.</td>
<td>E63, H76</td>
</tr>
<tr>
<td>Corrin, Louise K.</td>
<td>A108</td>
</tr>
<tr>
<td>Corzo, Ruthmaria</td>
<td>E101</td>
</tr>
<tr>
<td>Cotton, Robin W.</td>
<td>M10</td>
</tr>
<tr>
<td>Coudert, Curtis B.</td>
<td>W17</td>
</tr>
<tr>
<td>Cox, Joseph A.</td>
<td>K36</td>
</tr>
<tr>
<td>Crawford, Amy M.</td>
<td>129</td>
</tr>
<tr>
<td>Crompton, Mark W.</td>
<td>G13</td>
</tr>
<tr>
<td>Cuadra-Rodriguez, Luis A.</td>
<td>B54</td>
</tr>
<tr>
<td>Cuchara, Breanna M.</td>
<td>E63, H76</td>
</tr>
<tr>
<td>Cunha, Eugenia</td>
<td>A94</td>
</tr>
<tr>
<td>Curti, Serena Maria</td>
<td>K36</td>
</tr>
<tr>
<td>Curtotti, Donatella</td>
<td>F41</td>
</tr>
<tr>
<td>Cunha, Eugenia</td>
<td>K36</td>
</tr>
<tr>
<td>( \text{da Silva, Ronaldo C., Jr.}</td>
<td>B192</td>
</tr>
<tr>
<td>Davidson, J. Tyler</td>
<td>B171</td>
</tr>
<tr>
<td>Davidson, Marion E.</td>
<td>A44</td>
</tr>
<tr>
<td>Davis, Kymeri E.</td>
<td>K10</td>
</tr>
<tr>
<td>Davis, Lucy A.</td>
<td>W12</td>
</tr>
<tr>
<td>Davis, Reed A.</td>
<td>A55</td>
</tr>
<tr>
<td>De Alcaraz-Fossoul, Josep</td>
<td>B69</td>
</tr>
<tr>
<td>De Aloe, Luigi</td>
<td>H152, 139</td>
</tr>
<tr>
<td>De, Alyssa</td>
<td>H174</td>
</tr>
<tr>
<td>DeAngelis, Theresa</td>
<td>W23</td>
</tr>
<tr>
<td>DeBord, Joshua S.</td>
<td>B175</td>
</tr>
<tr>
<td>DeBoer, Hans H.</td>
<td>A82, A83</td>
</tr>
<tr>
<td>De Campos, Eduardo G.</td>
<td>K35</td>
</tr>
<tr>
<td>Decker, Summer J.</td>
<td>H114</td>
</tr>
<tr>
<td>De Cresce, Dean Michael</td>
<td>I22, S02</td>
</tr>
<tr>
<td>De Donno, Marco</td>
<td>B96</td>
</tr>
<tr>
<td>Dedouit, Fabrice</td>
<td>W7</td>
</tr>
<tr>
<td>Dell, Heather L.</td>
<td>H94</td>
</tr>
<tr>
<td>DeForest, Peter R.</td>
<td>B199, B200</td>
</tr>
<tr>
<td>DeFraia, Beatrice</td>
<td>H21</td>
</tr>
<tr>
<td>De Giorgi, Gianni</td>
<td>B16</td>
</tr>
<tr>
<td>Degnan, Heather H.</td>
<td>F43</td>
</tr>
<tr>
<td>DeGreeff, Lauryn</td>
<td>E29, E30</td>
</tr>
<tr>
<td>de Jong, Joyce L.</td>
<td>H195</td>
</tr>
<tr>
<td>Delbruck, Alexia</td>
<td>F11</td>
</tr>
<tr>
<td>dell’Aquila, Massimiliano</td>
<td>H80</td>
</tr>
<tr>
<td>Demas, John P.</td>
<td>G3</td>
</tr>
<tr>
<td>Deo, Vaishali S.</td>
<td>H167</td>
</tr>
<tr>
<td>Depp, Randy Marie</td>
<td>A19</td>
</tr>
<tr>
<td>DePrimo, Victoria R.</td>
<td>B16</td>
</tr>
<tr>
<td>Dery, Shannon L.</td>
<td>A51</td>
</tr>
<tr>
<td>De Simone, Stefania</td>
<td>H10</td>
</tr>
<tr>
<td>Desjarlais, Lynette</td>
<td>H39</td>
</tr>
<tr>
<td>DeTobie, Jannick</td>
<td>A111, G18</td>
</tr>
<tr>
<td>Dettman, Josh</td>
<td>B152</td>
</tr>
<tr>
<td>Detwiler, Khody R.</td>
<td>J16</td>
</tr>
<tr>
<td>De Ungria, Maria Corazon Abogado</td>
<td>B187</td>
</tr>
<tr>
<td>De Wilde, Delilah</td>
<td>B174</td>
</tr>
<tr>
<td>Dhomecha, Aadhar R.</td>
<td>B130</td>
</tr>
<tr>
<td>Dicazuk, Peter J.</td>
<td>B68, F47</td>
</tr>
<tr>
<td>Diamond, Francis X.</td>
<td>W5</td>
</tr>
<tr>
<td>Diaz, Francisco J.</td>
<td>E123</td>
</tr>
<tr>
<td>Dickinson, Gregory M.</td>
<td>H69</td>
</tr>
<tr>
<td>DiGangi, Elizabeth A.</td>
<td>A20, A35, A45, A46</td>
</tr>
<tr>
<td>Di Nunzio, Aldo</td>
<td>K22</td>
</tr>
<tr>
<td>Di Nunzio, Carlo</td>
<td>K22</td>
</tr>
<tr>
<td>Di Nunzio, Michele</td>
<td>K22</td>
</tr>
<tr>
<td>Dirkmaat, Dennis C.</td>
<td>A65</td>
</tr>
<tr>
<td>Di Sanzio, Mariantonio</td>
<td>F32</td>
</tr>
<tr>
<td>Diu, Stephanie</td>
<td>H171</td>
</tr>
<tr>
<td>Di Vella, Giancarlo</td>
<td>E3, E5, E11, E12, E14</td>
</tr>
<tr>
<td>Dobrin, Lawrence A.</td>
<td>W19</td>
</tr>
<tr>
<td>Dolan, Julia A.</td>
<td>W18</td>
</tr>
<tr>
<td>Dolan, Michael J., Jr.</td>
<td>B165</td>
</tr>
<tr>
<td>Domianic, Matthew</td>
<td>W6</td>
</tr>
<tr>
<td>Dominguez Pavanelli, David</td>
<td>D35</td>
</tr>
<tr>
<td>Domitrovich, Stephanie</td>
<td>F24, F44, J21, S1, W17</td>
</tr>
<tr>
<td>Donahue, John</td>
<td>B185</td>
</tr>
</tbody>
</table>
Donno, Francesca - F13, H19, H20
Dotson, Meryle A. - E19
Dowling, Sarah - B197
Downs, James J.C.U. - BS6, W08, W11
Doyle, Jay - C8
Doyle, Rory M. - K41
Drake, Jasmine M. - F39
Dreyfuss, Mark S. - B101
Drogou, Gwenola - G32
Dubois, Lena M. - B32, H92
Dudzik, Beatrix - A127
Duncan, Anielle-Y22
Dunn, Rhian - A5
Dunn, Tim G. - D33
Dunn, Tyler E. - A2
Eames, Katherine E. - B71
Ebert, Lars C. - H114
Edgar, Heather J.H. - A104
Edson, Suni M. - B38, B40
Ehrhardt, Christopher J. - B164
Eldridge, Heidi - B201
Eleuterio, Pedro M.S. - C13, C16
Elkins, Kelly M. - B8
Emmons, Alexandra L. - A53
Ensow, Sandra R. - E37
Epstein, Brandon - C21
Eserman, Marianna - W20
Espinoza, Ashley - A12
Esposito, Massimiliano - F33
Evangelou, Elizabeth A. - A20, A45, A46
Evans, Kierstyn L. - B145
Ex, Shari G. - A128
Fahrig, Glenn P. - B9
Falsetti, Anthony B. - A48
Farid, Armin A. - E72, G8
Farrell, Amanda L. - W01
Faugno, Diana K. - B37
Favia, Matteo - K28
Feigin, Gerald - H142
Feras, Khalid S. - E26, E86
Ferencz, Joseph - I32
Ferrero, Alessandro M. - D21
Fersini, Federica - I34
Fichera, Martina - F33
Fikiet, Marisa A. - E81
Filomena, Costanza - E10, E28
Finegan, Oran - A31
Finkelstein, Marissa J. - K72
Finlayson, Janet E. - A115
Fiorentin, Taís R. - B27
Fisher-Hubbard, Amanda O. - H193
Fitzpatrick, Colleen M. - LW6
Fleischman, Julie M. - A85, A142
Flores, Allie - B5
Flor-Stagnato, Kathleen - A67
Foley, Megan M. - B49
Forbes, Thomas P. - B103, B178
Ford, Jessica R.-Y15
Forger, Lisa - H96
Forrest, Alexander Robert W. - K80
Forwith, Allegra N. - E45
Frank, Kelvin J., Jr. - B140
Franza,anna - F2, I3, LW2
Frappier, Roger - W10
Fauquier, Eric - B56
Fredericks, Jamie D. - B3
Friend, Amanda N. - A116
Fujimoto, Shuntaro - B51
Funk, Christine - S02, W12

G
Gadison, Davette N. - A24
Galekovic, Jasna - J4, J33
Gallagher, Tim - W2
Gallegos, Shawna F. - H26
Gammill, Charles M. - H48
Garavaglia, Jan C. - W8
Garcia, Sara N. - A56
Garcia, Zoe S. - B127
Gardner, Brett O. - E112
Gardner, Taylor L. - G40
Garofano, Luciano - B196, E34, I13
Garton, Nathan M. - B142
Garvin, Heather M. - A40
Garza, Shelby - A50
Gastone Sanchez, Sidney - B106
Gatto, Vittorio - H79
Gauthier, Quentin T. - B122
Geimian, Irina - J14
Genalo, Alexa - K53
Geoghegan, Patrick H. - D3
George, Rebecca L. - W22
George, Charles E. - G32
Gerads, Zeno J. - C24, W17, W28
Gerhardt, Krysalin C. - B73
Getz, Sara M. - A25, W24
Gibson, Keylie M. - B109
Giffen, Mark A., Jr. - H74, H75
Gilbert, Ashley A. - K18
Gilchrist, Michael D. - D15
Gill, James R. - H46, H195
Gilmore, Rachel B. - B48

H
Hackman, Lucina - A99
Hagerty, Alexa - A33
Hainsworth, Sarah V. - D2, D4
Hale, Amanda R. - S2
Hall, Cory - C8
Hall, Megan R. - H163
Hallett, Anthony M. - W17
Hamdani, Syed W. - B35
Hamilton, Boyd - W6
Hamlett, Breanne - E25
Hammond, Derek L. - J6
Hampikian, Greg - B186
Harding, Brett E. - E66
Hargrove, Robert - K69
Harichandran, Vikram - C3
Harinarine, Nina A. - J17
Harrel, LeAnn Michelle - B119
Hasert, Anita Roman - E60
Haskell, Neal H. - W8
Hatters-Friedman, Susan - S1, W3
Hayes, Jonathan - H195, W19
Hays, Michael Alan - H72
Hazard, Durdica - F46
He, Xuyang - K44
Hefner, Joseph T. - A101
Heidebrecht, Bruce J. - W10
Heim, Kelly - A107
Heninger, Michael - H141
Hernandez, Daniella M. - B141
Herrmann, Nicholas P. - A122
Hetzel, Susan Seebode - D24
Heim, Jonathan - H195
Heimer, Jakob - H111
Henry, Brandon - H103
Hepburn, Anthony - H90
Heurich, Charles M. - BS8
Hewage, Sunil P. A. - A89
Hewitt, Terry-Dawn - BS1, F27
Hicklin, R. Austin - B95
Hietpas, Jack - B89
Hijaz, Salina - A1
Hofer, Valeria - E77, H107, H108, H155
Hofmann, Heike - B100
Hofsass, Pamela M. - S2
Holbrook, Tiffany A. - K73
Holmes, Carley J. - H49
Holobinko, Anastasia - W11
Horrocks, Emily L. - B57, B139, E43
Horvat, Maris J. - H49
Holobinko, Anastasia - W11
Holmes, Carley J. - H49
Horrocks, Emily L. - B57, B139, E43
Horvat, Mary F. - W6
Houston, Rachel M. - B156
Hovingh, Jessica E. - B72, B158
Huebner, Barbara - H101
Huddleston, Emily A. - K72, W21
Huffman, Warren - H105
Hull, Mike - W26
Hutson, Shuvonne - W19
Hvozdovich, Jessica - K50
Hyde, Jessica - A11
Hyzer, James B. - D19

I
Ibrahim, Samiah - J13
Ingvaldstad, Megan E. - A9
Inman, Keith - W10
Isa, Mariyam I. - A139
Isaac, Carolyn V. - H145
Isern, Daniel S. - K70
Iyer, Hariharan - W10

J
Jackson, Ami L. - H186
Jackson, John P. - E73
Jackson, Rebecca S. - E73
Jansen, Barry - W25
Jarvis, Hannah C. - H69
Javan, Gulnaz T. - B1, H95
Jenkins, Amanda L. - K63
Jennings, Antaya L. - A145
Jeong, Yangseung - A6
Johanssen, Karly L. - H25
Johnson, Bryan - W19
Johnson, Rudolph C. - W5
Jones, Kellie - A19
Jones, Sandra E. - H15
Jonik, Michelle - H91
Joseph, Rachel - A7
Jouin, Raphaelle - I7
Juarez, Chelsey A. - A121
Juedes, Timothy - E53
Jufer Phipps, Rebecca - K43
Jung, Kun Won - E46
K
Kacinko, Sherri L. - W27
Kadane, Joseph B. - B93
Kalizar, Michelle - H131
Kammrath, Brooke W. - B169, B200
Kanodarwala, Fehmida - B94
Karabiyik, Umit - C32
Kardohely, Andrea - E54, E93
Karschner, Erin L. - K62
Kaszubinski, Sierra - A73
Katz, Daniel E. - W23
Kedar, Rohan P. - I73
Kelley, Sharon - A88
Kemp, Philip M. - W21
Kennedy, Tyler - B154
Kenney Baden, Linda - W8
Kenyercher, Michael W. - A102, W14
Khan, Muneeb S. - B20
Khandasammy, Shelby R. - E107
Kibayashi, Kazuhiko - H57
Kidd, Jennifer P. - B42
Kiel, Brianna D. - B9
Kightlinger, Danylle - K11
Kim, Eunmi - K12
Kim, Joonyeong - B143
King, Victor J. - K55
Kimble, Ashley N. - K19
Kindschuh, Sarah C. - A3
Kirby, Robert - W23
Kitayama, Tetsushi - B129
Klages, Alexandra R. - A43
Kleeschulte, Megan K. - H47
Klein, Allison C. - H179
Kobojek, Kimberly S. - E114

Koertner, Anthony - E90, W13
Kong, Youngsu - D31
Kopczynski, Thomas G. - E57
Korolija, Marina - B188
Kranoti, Helena - A93
Krechti, Kacy - H44
Kreher, Rachel M. - A41, B46
Kresl, Nico - C6
Krishan, Kewal - E56
Krishna, Supriya - K31
Kronstrand, Robert - W27
Krotulski, Alex J. - K48, S2, W5
Krstansky, John L. - K32
Kruger, Diane - J30
Kuk, Raymond - W18
Kulbacki, Kevin P. - J7
Kumar, Shauna - H42
Kwiatkowski, Sam - B13
Kyllonen, Kelsey - B63
Kyriakou, Xenia Paula - A136

L
Labay, Laura M. - W27
L'Abbe, Ericka N. - A92, W11
Lacambre, Mathieu - I23
LaGatta, Kimberly E. - Y14
LaGoy, Alexis M. - A20, A45, A46
Lai, Jeffrey - W5
Lam, Vienna C. - A78
Lambrigger, Taylor - A77
Lamy, Shannon - B17
Lane, Rachel - E96
Lanfanchi, Michela - H104, H107
Langley, Natalie R. - A73
Larson, S.B. Addison - D26
Lasinska, Anna - J8
Latten, Bartholomeus G. H. - H113
Lawrence, Troy - C32
Leahy, R. Ryan - I9
Ledic, Andrea - J9, J23
Lednev, Igor K. - E82
Lee, Henry C. - W8
Lee, F.L. Jim, Jr. - J22
Lee, You-Rim - E48, E83
LeGarde, Carrie B. - A14
LeMere, Ben - W6
Lemieux, Carolyn E. - H86
Lemos, Nikolaos P. - S2, W27
Lemos, Yara V. - A87
Letters, John J. - B90, F26
Leo, Janelle - B123
Letts, Brandon C. - W19
LeVaughn, Mark M. - H18, H43, H82, H148, W11
Lewis, Jane A. - J24
Lewis, Joseph L., III - E39
Lewis, Russell - W21
Li, Richard - B121
<table>
<thead>
<tr>
<th>Author</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Li, Sun Yi</td>
<td>B131</td>
</tr>
<tr>
<td>Liao, Linchuan</td>
<td>K67</td>
</tr>
<tr>
<td>Liberto, Aldo</td>
<td>F33</td>
</tr>
<tr>
<td>Liebl, Julia C.</td>
<td>K57</td>
</tr>
<tr>
<td>Lien, Eugene Y.</td>
<td>W10</td>
</tr>
<tr>
<td>Ligthart, Sarah-Y</td>
<td>Y20</td>
</tr>
<tr>
<td>Ligon, Evelyn S.</td>
<td>E27</td>
</tr>
<tr>
<td>Limoges, Jennifer F.</td>
<td>W12</td>
</tr>
<tr>
<td>Listewnik, Mark A.</td>
<td>W15</td>
</tr>
<tr>
<td>Listi, Ginesse A.</td>
<td>A98</td>
</tr>
<tr>
<td>Little, Steven J.</td>
<td>E105</td>
</tr>
<tr>
<td>Liu, Jianmei</td>
<td>B60</td>
</tr>
<tr>
<td>Locke, Jeffrey R.</td>
<td>K81</td>
</tr>
<tr>
<td>Lockwood, Tracy-Lynn E.</td>
<td>E97</td>
</tr>
<tr>
<td>Logan, Barry K.</td>
<td>B54, F20, H136, K46, K81, L1, W5, W8</td>
</tr>
<tr>
<td>Long, Holly</td>
<td>A42</td>
</tr>
<tr>
<td>Longo, Cameron M.</td>
<td>B29</td>
</tr>
<tr>
<td>Look, Kim M.</td>
<td>E73</td>
</tr>
<tr>
<td>Lopa, Afrin</td>
<td>B135</td>
</tr>
<tr>
<td>Lopez, Dayanira</td>
<td>A64</td>
</tr>
<tr>
<td>Lottering, Tamara L.</td>
<td>A81</td>
</tr>
<tr>
<td>Love, Jennifer C.</td>
<td>A72, S2</td>
</tr>
<tr>
<td>Lu, Jiaqi M.</td>
<td>E61</td>
</tr>
<tr>
<td>Lucas, Victoria S.</td>
<td>G19</td>
</tr>
<tr>
<td>Luebbers, Ashley M.</td>
<td>H71</td>
</tr>
<tr>
<td>Lupariello, Francesco</td>
<td>E12, E14</td>
</tr>
<tr>
<td>Lusa, Vincenzo</td>
<td>F2, I3, LW2</td>
</tr>
<tr>
<td>Lyu, Zhou</td>
<td>H102</td>
</tr>
<tr>
<td>Macarulla, Andrea</td>
<td>C24</td>
</tr>
<tr>
<td>MacCrehan, William A.</td>
<td>B88</td>
</tr>
<tr>
<td>Machida, Mitsuyo</td>
<td>E47</td>
</tr>
<tr>
<td>Maglietta, Francesca</td>
<td>E4, E8, E9, E18, E62, E70, H58</td>
</tr>
<tr>
<td>Mahmood, Khurram W.</td>
<td>J20</td>
</tr>
<tr>
<td>Mahmood, Zahid</td>
<td>B20</td>
</tr>
<tr>
<td>Maier, Christopher A.</td>
<td>A117</td>
</tr>
<tr>
<td>Mamedov, Sergey</td>
<td>B167</td>
</tr>
<tr>
<td>Manata, Joao</td>
<td>E67</td>
</tr>
<tr>
<td>Maragliano, Rachel</td>
<td>B189</td>
</tr>
<tr>
<td>Marciano, Michael</td>
<td>B157</td>
</tr>
<tr>
<td>Mares, Mollie</td>
<td>B137</td>
</tr>
<tr>
<td>Marinho, Luisa</td>
<td>A49</td>
</tr>
<tr>
<td>Markey, Michael A.</td>
<td>H170</td>
</tr>
<tr>
<td>Markushevski, Mike</td>
<td>D38</td>
</tr>
<tr>
<td>Marrone, Maricla</td>
<td>G31</td>
</tr>
<tr>
<td>Martell, Daniel A.</td>
<td>S1</td>
</tr>
<tr>
<td>Martinez, Rosa M.</td>
<td>H107, H108, H155</td>
</tr>
<tr>
<td>Martinez, Valeska</td>
<td>A34</td>
</tr>
<tr>
<td>Mason, Kelsey</td>
<td>H179</td>
</tr>
<tr>
<td>Mastrovito, Rebecca A.</td>
<td>K78</td>
</tr>
<tr>
<td>Matias, Nivia A.M.</td>
<td>H160</td>
</tr>
<tr>
<td>Matkowski, Wojciech</td>
<td>C38, C39</td>
</tr>
<tr>
<td>Matsubara, Tomotaka</td>
<td>D13</td>
</tr>
<tr>
<td>Matzoll, Ashleigh K.</td>
<td>B47</td>
</tr>
<tr>
<td>Max, Brendan P.</td>
<td>F28</td>
</tr>
<tr>
<td>Mazzotti, Maria Carla</td>
<td>E31</td>
</tr>
<tr>
<td>Maynard III, Henry P.</td>
<td>E116</td>
</tr>
<tr>
<td>McAndrew, Thomas C.</td>
<td>B88</td>
</tr>
<tr>
<td>McAttee, Jared E.</td>
<td>Y16</td>
</tr>
<tr>
<td>McDonald, Anna G.</td>
<td>H13</td>
</tr>
<tr>
<td>McDonald, Gary, Jr.</td>
<td>F25</td>
</tr>
<tr>
<td>McFadden, Nathan R.</td>
<td>Y6</td>
</tr>
<tr>
<td>McFarland, Jessica</td>
<td>E100</td>
</tr>
<tr>
<td>McGivney, James</td>
<td>G23</td>
</tr>
<tr>
<td>McGowan, Courtney K.</td>
<td>K21</td>
</tr>
<tr>
<td>McGrath, Jonathan G.</td>
<td>E113</td>
</tr>
<tr>
<td>McKenna, Wayne J.</td>
<td>B51</td>
</tr>
<tr>
<td>McKiernan, Heather E.</td>
<td>B80, L1</td>
</tr>
<tr>
<td>McLaughlin, Patrick B.</td>
<td>B114</td>
</tr>
<tr>
<td>McPhilpen, Chelsey C.</td>
<td>C6</td>
</tr>
<tr>
<td>Meffert, Chris H.</td>
<td>C14</td>
</tr>
<tr>
<td>Mehnert, Samantha A.</td>
<td>E24</td>
</tr>
<tr>
<td>Mele, Federica</td>
<td>I17</td>
</tr>
<tr>
<td>Melloni, Niccolò D.</td>
<td>E3</td>
</tr>
<tr>
<td>Menchhoff, Sydney B.</td>
<td>B112</td>
</tr>
<tr>
<td>Mendel, Julian L.</td>
<td>B7</td>
</tr>
<tr>
<td>Mendes-Kramer, Vera</td>
<td>H39</td>
</tr>
<tr>
<td>Mendie, Edidiong</td>
<td>E41</td>
</tr>
<tr>
<td>Mendralla, Christina R.</td>
<td>K65</td>
</tr>
<tr>
<td>Menendez, M.J.</td>
<td>F19, F20, K81</td>
</tr>
<tr>
<td>Menking-Hoggatt, Korina</td>
<td>E108</td>
</tr>
<tr>
<td>Mercer, Stephen B.</td>
<td>E5</td>
</tr>
<tr>
<td>Mercuri, Elena E.</td>
<td>H36</td>
</tr>
<tr>
<td>Merdietio Boedi, Rizky</td>
<td>G16</td>
</tr>
<tr>
<td>Merlino, Mara L.</td>
<td>J2, J6, J11, J31</td>
</tr>
<tr>
<td>Mesa, Rodolfo</td>
<td>B140</td>
</tr>
<tr>
<td>Mesli, Vadim</td>
<td>H115</td>
</tr>
<tr>
<td>Messer, Diana L.</td>
<td>H106</td>
</tr>
<tr>
<td>Messner, Mitchell H.</td>
<td>H128</td>
</tr>
<tr>
<td>Metcalf, Roger D.</td>
<td>L1W</td>
</tr>
<tr>
<td>Meyer, Abigail L.</td>
<td>E95</td>
</tr>
<tr>
<td>Michaud, Katarzyna H.</td>
<td>H129, W7</td>
</tr>
<tr>
<td>Michener, Suzanna A.</td>
<td>A30</td>
</tr>
<tr>
<td>Miles, Suzanne E.</td>
<td>E74, E76</td>
</tr>
<tr>
<td>Miller, Jessica B.</td>
<td>B124</td>
</tr>
<tr>
<td>Miller, Lauren I.</td>
<td>I27</td>
</tr>
<tr>
<td>Millette, James D.</td>
<td>E7</td>
</tr>
<tr>
<td>Milligan, Colleen F.</td>
<td>A79</td>
</tr>
<tr>
<td>Milner, George R.</td>
<td>W24</td>
</tr>
<tr>
<td>Milnthorp, Heather V.</td>
<td>B116</td>
</tr>
<tr>
<td>Mitchell, Randolph L.</td>
<td>G30</td>
</tr>
<tr>
<td>Mitran, Cara A.</td>
<td>Y9</td>
</tr>
<tr>
<td>Mittenzei, Rhonda M.</td>
<td>H56</td>
</tr>
<tr>
<td>Mizell, Summer M.</td>
<td>A42</td>
</tr>
<tr>
<td>Miziara, Carmen Silvia</td>
<td>G10</td>
</tr>
<tr>
<td>Mockus, Audris</td>
<td>C37</td>
</tr>
<tr>
<td>Moe, Mariah E.</td>
<td>A125</td>
</tr>
<tr>
<td>Mohr, Amanda L.</td>
<td>K47</td>
</tr>
<tr>
<td>Mojica Sanchez, Gruschenka</td>
<td>H168</td>
</tr>
<tr>
<td>Mokdad, Benjamin</td>
<td>E36</td>
</tr>
<tr>
<td>Mondello, Cristina</td>
<td>H33</td>
</tr>
<tr>
<td>Montana, Angelo</td>
<td>H83</td>
</tr>
<tr>
<td>Montero, Denise B.</td>
<td>B104</td>
</tr>
<tr>
<td>Montoriol, Romain</td>
<td>B30</td>
</tr>
<tr>
<td>Moody, Marykathryn Tynon</td>
<td>K34</td>
</tr>
<tr>
<td>Moore, Clarra G.</td>
<td>J3</td>
</tr>
<tr>
<td>Mora, Franco</td>
<td>A34</td>
</tr>
<tr>
<td>Moraitis, Konstantinos</td>
<td>A17, A93</td>
</tr>
<tr>
<td>Morel, Jessica</td>
<td>I22</td>
</tr>
<tr>
<td>Morello, Sarah V.</td>
<td>E106</td>
</tr>
<tr>
<td>Moretti, Matteo</td>
<td>K66</td>
</tr>
<tr>
<td>Moretti, Tamyra R.</td>
<td>W10</td>
</tr>
<tr>
<td>Morgan, Daniel J.</td>
<td>E64</td>
</tr>
<tr>
<td>Mosco, Michael A.</td>
<td>E55</td>
</tr>
<tr>
<td>Moses, Sharon K.</td>
<td>E122</td>
</tr>
<tr>
<td>Mourtzinos, Nikki H.</td>
<td>H112</td>
</tr>
<tr>
<td>Mthembu, Pabalala M.</td>
<td>B182</td>
</tr>
<tr>
<td>Muise, Autumn T.</td>
<td>B26</td>
</tr>
<tr>
<td>Mulawka, Marzena H.</td>
<td>E55</td>
</tr>
<tr>
<td>Mulet, Carmen T.</td>
<td>K39</td>
</tr>
<tr>
<td>Munera, Adam</td>
<td>A133</td>
</tr>
<tr>
<td>Muralikrishnan, Bala</td>
<td>C40</td>
</tr>
<tr>
<td>Murrie, Daniel C.</td>
<td>E120</td>
</tr>
<tr>
<td>Musah, Rabi A.</td>
<td>E124</td>
</tr>
</tbody>
</table>

N

Nabhan Abou, Nidal - I21
Nahal, Harman - A140
Najarro, Marcela - B202, W23
Naka, Aden G. - W19
Nase, John B. - G11, G25
Nerkowski, Yolanda - G40
Neverett, Emily - H90
Newman, Janelle D.S. - B173
Newman, Jennifer - C17
Newman, Kia K. - E94
Newmeyer, Matthew N. - K29
Nicholls, Georgina R. - B180
Nixon, John - D5, D6
Nobles, Karen J. - J25
Nocerino, Wanda - F41
Nogales, Francy Scarlett - B130
Nointin, Diana C. - H3
Novak, Jessica T. - A19
Núñez-Vázquez, Carolina - H34
Nuzzum, W. Milton - F44
Nuzzolese, Emilio G. - G9, G31, G36, G39, G41

O

O'Connell, Kerry J. - F23
O'Connor, Craig O. - W26
O'Connor, Heather M. - H64
Odom, Nicole R. - C20
Olaya Molina, Edwin O. - E33, E69
Oldoni, Fabio - B108
Oliver, Laura C. - B84
Olivieri, Bianca E. - K76
Olson, Stephanie A. - E50
Oludoyi, Ayomide - H174
Ommen, Danica - B159, J26
<table>
<thead>
<tr>
<th>Name</th>
<th>Authors</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>O'Neill, Kelly C.</td>
<td>B91</td>
<td></td>
</tr>
<tr>
<td>Orton, Kathryn L.</td>
<td>B176</td>
<td></td>
</tr>
<tr>
<td>Ost, Andrea</td>
<td>A38</td>
<td></td>
</tr>
<tr>
<td>Ostuni, Alessio</td>
<td>I35</td>
<td></td>
</tr>
<tr>
<td>Ott, Colby</td>
<td>K38</td>
<td></td>
</tr>
<tr>
<td>Ousley, Stephen D.</td>
<td>A26, W24</td>
<td></td>
</tr>
<tr>
<td>Ovide, Oriana</td>
<td>B19</td>
<td></td>
</tr>
<tr>
<td>O'Neill, Kelly C.</td>
<td>B91</td>
<td></td>
</tr>
<tr>
<td>Orton, Kathryn L.</td>
<td>B176</td>
<td></td>
</tr>
<tr>
<td>Ost, Andrea</td>
<td>A38</td>
<td></td>
</tr>
<tr>
<td>Ostuni, Alessio</td>
<td>I35</td>
<td></td>
</tr>
<tr>
<td>Ott, Colby</td>
<td>K38</td>
<td></td>
</tr>
<tr>
<td>Ousley, Stephen D.</td>
<td>A26, W24</td>
<td></td>
</tr>
<tr>
<td>Ovide, Oriana</td>
<td>B19</td>
<td></td>
</tr>
<tr>
<td>Page, Tyrish Y.</td>
<td>E1</td>
<td></td>
</tr>
<tr>
<td>Palazzo, Chiara</td>
<td>H2</td>
<td></td>
</tr>
<tr>
<td>Palmiotti, Andrea</td>
<td>A13</td>
<td></td>
</tr>
<tr>
<td>Palmquist, Kaitlyn B.</td>
<td>K17</td>
<td></td>
</tr>
<tr>
<td>Pape, Ariana</td>
<td>H54</td>
<td></td>
</tr>
<tr>
<td>Papsun, Donna M.</td>
<td>W5</td>
<td></td>
</tr>
<tr>
<td>Paratore, Antonino</td>
<td>C12, F41</td>
<td></td>
</tr>
<tr>
<td>Parchake, Manoj</td>
<td>H162</td>
<td></td>
</tr>
<tr>
<td>Park, Dae-Kyoon</td>
<td>E52</td>
<td></td>
</tr>
<tr>
<td>Parmelee, Kevin J.</td>
<td>W25</td>
<td></td>
</tr>
<tr>
<td>Pape, Ariana</td>
<td>H54</td>
<td></td>
</tr>
<tr>
<td>Papsun, Donna M.</td>
<td>W5</td>
<td></td>
</tr>
<tr>
<td>Paratore, Antonino</td>
<td>C12, F41</td>
<td></td>
</tr>
<tr>
<td>Parchake, Manoj</td>
<td>H162</td>
<td></td>
</tr>
<tr>
<td>Palmiotti, Andrea</td>
<td>A13</td>
<td></td>
</tr>
<tr>
<td>Palmquist, Kaitlyn B.</td>
<td>K17</td>
<td></td>
</tr>
<tr>
<td>Paratore, Antonino</td>
<td>C12, F41</td>
<td></td>
</tr>
<tr>
<td>Parchake, Manoj</td>
<td>H162</td>
<td></td>
</tr>
<tr>
<td>Park, Dae-Kyoon</td>
<td>E52</td>
<td></td>
</tr>
<tr>
<td>Parmelee, Kevin J.</td>
<td>W25</td>
<td></td>
</tr>
<tr>
<td>Pascal, Mandy</td>
<td>H27</td>
<td></td>
</tr>
<tr>
<td>Pascual, Christian T.</td>
<td>K23</td>
<td></td>
</tr>
<tr>
<td>Passalacqua, Nicholas V.</td>
<td>A69</td>
<td></td>
</tr>
<tr>
<td>Patané, Federico</td>
<td>F49</td>
<td></td>
</tr>
<tr>
<td>Patel, Simmi</td>
<td>129</td>
<td></td>
</tr>
<tr>
<td>Peat, Michael A.</td>
<td>W15</td>
<td></td>
</tr>
<tr>
<td>Pechal, Jennifer L.</td>
<td>H98</td>
<td></td>
</tr>
<tr>
<td>Peek, Kimberly</td>
<td>E13</td>
<td></td>
</tr>
<tr>
<td>Perez, Dorianis</td>
<td>A103</td>
<td></td>
</tr>
<tr>
<td>Perlin, Mark W.</td>
<td>B186, F45</td>
<td></td>
</tr>
<tr>
<td>Perrault, Kateyln A.</td>
<td>E51, H93</td>
<td></td>
</tr>
<tr>
<td>Peterson, Diane C.</td>
<td>W20</td>
<td></td>
</tr>
<tr>
<td>Petetta, Caterina</td>
<td>E3, E5</td>
<td></td>
</tr>
<tr>
<td>Peyron, Pierre-Antoine</td>
<td>H67</td>
<td></td>
</tr>
<tr>
<td>Pham, Amy</td>
<td>A51</td>
<td></td>
</tr>
<tr>
<td>Phillips, Angelina I.</td>
<td>E1, H51</td>
<td></td>
</tr>
<tr>
<td>Phillips, Richard</td>
<td>A36</td>
<td></td>
</tr>
<tr>
<td>Pieczonka, Sandra M.</td>
<td>Y18</td>
<td></td>
</tr>
<tr>
<td>Piel, Jennifer</td>
<td>S01</td>
<td></td>
</tr>
<tr>
<td>Pienkowski, David</td>
<td>D37</td>
<td></td>
</tr>
<tr>
<td>Pilloud, Marin A.</td>
<td>A146, W22</td>
<td></td>
</tr>
<tr>
<td>Pinheiro, Joao E.S.</td>
<td>H189</td>
<td></td>
</tr>
<tr>
<td>Pink, Christine M.</td>
<td>A22</td>
<td></td>
</tr>
<tr>
<td>Pinto, Deborrah C.</td>
<td>A70</td>
<td></td>
</tr>
<tr>
<td>Pitluck, Haskell M.</td>
<td>W08</td>
<td></td>
</tr>
<tr>
<td>Plotkin, Sharon L.</td>
<td>W2</td>
<td></td>
</tr>
<tr>
<td>Polastro, Mateus D.C.</td>
<td>C9, C11, C15</td>
<td></td>
</tr>
<tr>
<td>Polhemus, Adam</td>
<td>W5</td>
<td></td>
</tr>
<tr>
<td>Polston, Carrie</td>
<td>J15</td>
<td></td>
</tr>
<tr>
<td>Pomara, Cristoforo</td>
<td>F49</td>
<td></td>
</tr>
<tr>
<td>Pope, Katharine Chapman</td>
<td>H144</td>
<td></td>
</tr>
<tr>
<td>Porta, David J.</td>
<td>D40</td>
<td></td>
</tr>
<tr>
<td>Potkin, Vanessa</td>
<td>B57</td>
<td></td>
</tr>
<tr>
<td>Pozzi, Mark C.</td>
<td>D18, D22,D23, D27</td>
<td></td>
</tr>
<tr>
<td>Prahlow, Joseph A.</td>
<td>H191, H195</td>
<td></td>
</tr>
<tr>
<td>Prat, Sebastien S.</td>
<td>I6, I22</td>
<td></td>
</tr>
<tr>
<td>Press, Rich</td>
<td>W10</td>
<td></td>
</tr>
<tr>
<td>Pressley, DeMia P.</td>
<td>B64, K81</td>
<td></td>
</tr>
<tr>
<td>Price, Jana M.</td>
<td>W21</td>
<td></td>
</tr>
<tr>
<td>Prinz, Mechthild K.</td>
<td>B113</td>
<td></td>
</tr>
<tr>
<td>Prisaznik, Emily-Y</td>
<td>F45</td>
<td></td>
</tr>
<tr>
<td>Procopio, Noemi</td>
<td>A60</td>
<td></td>
</tr>
<tr>
<td>Proe, Lori A.</td>
<td>H137</td>
<td></td>
</tr>
<tr>
<td>Propp, Keith E.</td>
<td>E73</td>
<td></td>
</tr>
<tr>
<td>Props, Abigail J.</td>
<td>H100</td>
<td></td>
</tr>
<tr>
<td>Prusinowski, Meghan</td>
<td>B59, B133</td>
<td></td>
</tr>
<tr>
<td>Pucher, Jane</td>
<td>B57</td>
<td></td>
</tr>
<tr>
<td>Punzi, Giovanna</td>
<td>I38</td>
<td></td>
</tr>
<tr>
<td>Quarino, Lawrence</td>
<td>E118</td>
<td></td>
</tr>
<tr>
<td>Queiroz, Ana Luiza</td>
<td>E59</td>
<td></td>
</tr>
<tr>
<td>Quinn, Matthew</td>
<td>B168</td>
<td></td>
</tr>
<tr>
<td>Quiz, Jan Ynac T.</td>
<td>H70</td>
<td></td>
</tr>
<tr>
<td>Rachakonda, Prem</td>
<td>C40</td>
<td></td>
</tr>
<tr>
<td>Raffaele, Roberto</td>
<td>E91, H152, I39, K26</td>
<td></td>
</tr>
<tr>
<td>Rainwater, Christopher W.</td>
<td>A124</td>
<td></td>
</tr>
<tr>
<td>Ramos, Imron G.</td>
<td>E21</td>
<td></td>
</tr>
<tr>
<td>Rasmell, Donald J.</td>
<td>F21</td>
<td></td>
</tr>
<tr>
<td>Ramsland, Katherine</td>
<td>E68, W2</td>
<td></td>
</tr>
<tr>
<td>Ranadive, Anjali A.</td>
<td>W8</td>
<td></td>
</tr>
<tr>
<td>Raquin, Isabelle R.</td>
<td>F5</td>
<td></td>
</tr>
<tr>
<td>Raul, Jean-Sébastien</td>
<td>D16</td>
<td></td>
</tr>
<tr>
<td>Ravoori, Manasa</td>
<td>G15</td>
<td></td>
</tr>
<tr>
<td>Raymond, Sophie</td>
<td>I19</td>
<td></td>
</tr>
<tr>
<td>Razaq, Abdul</td>
<td>E26, E86</td>
<td></td>
</tr>
<tr>
<td>Reaves, Walter M.</td>
<td>F16</td>
<td></td>
</tr>
<tr>
<td>Reczek, Karen</td>
<td>B53</td>
<td></td>
</tr>
<tr>
<td>Reed, Stacey L.</td>
<td>H11, H16</td>
<td></td>
</tr>
<tr>
<td>Reesu, Govri V.</td>
<td>G26</td>
<td></td>
</tr>
<tr>
<td>Reid, Jacqueline S.</td>
<td>G34</td>
<td></td>
</tr>
<tr>
<td>Reisinger, Christoph</td>
<td>E72</td>
<td></td>
</tr>
<tr>
<td>Rendine, Marcello</td>
<td>B146, E80</td>
<td></td>
</tr>
<tr>
<td>Riach, Kevin</td>
<td>F40</td>
<td></td>
</tr>
<tr>
<td>Riaz, Hammad</td>
<td>C29</td>
<td></td>
</tr>
<tr>
<td>Rice, Kiegan</td>
<td>E85</td>
<td></td>
</tr>
<tr>
<td>Ricke, Jason D.</td>
<td>F38</td>
<td></td>
</tr>
<tr>
<td>Rieders, Michael F.</td>
<td>B54</td>
<td></td>
</tr>
<tr>
<td>Riezzo, Irene</td>
<td>H11</td>
<td></td>
</tr>
<tr>
<td>Riman, Sarah</td>
<td>B110</td>
<td></td>
</tr>
<tr>
<td>Rippy, Michelle</td>
<td>E115</td>
<td></td>
</tr>
<tr>
<td>Rivera, Heidy P.</td>
<td>K30</td>
<td></td>
</tr>
<tr>
<td>Rivers, David B.</td>
<td>H88</td>
<td></td>
</tr>
<tr>
<td>Rizor, Leann G.</td>
<td>F7</td>
<td></td>
</tr>
<tr>
<td>Rizzi, Vittorio</td>
<td>F41</td>
<td></td>
</tr>
<tr>
<td>Roberson, Zackery</td>
<td>B181</td>
<td></td>
</tr>
<tr>
<td>Roberts, Graham J.</td>
<td>G21</td>
<td></td>
</tr>
<tr>
<td>Robinson, Elizabeth</td>
<td>B25</td>
<td></td>
</tr>
<tr>
<td>Rock, Haley</td>
<td>B46</td>
<td></td>
</tr>
<tr>
<td>Rodriguez-Cruz, Sandra E.</td>
<td>B170</td>
<td></td>
</tr>
<tr>
<td>Rogers, Marcus</td>
<td>S2</td>
<td></td>
</tr>
<tr>
<td>Rogers, Melissa-Y</td>
<td>Y10</td>
<td></td>
</tr>
<tr>
<td>Roig, Meghan N.</td>
<td>B43, B115</td>
<td></td>
</tr>
<tr>
<td>Rolf, Cristin Marie</td>
<td>LW5</td>
<td></td>
</tr>
<tr>
<td>Rollins, Maxwell O.</td>
<td>H9</td>
<td></td>
</tr>
<tr>
<td>Roman, Madeline G.</td>
<td>B155</td>
<td></td>
</tr>
<tr>
<td>Romano, Megan</td>
<td>E84</td>
<td></td>
</tr>
<tr>
<td>Romosos, Erica L.</td>
<td>B190</td>
<td></td>
</tr>
<tr>
<td>Ronco, Valentina</td>
<td>F12, H24</td>
<td></td>
</tr>
<tr>
<td>Rood, Catherine</td>
<td>H177</td>
<td></td>
</tr>
<tr>
<td>Ropero-Miller, Jeri D.</td>
<td>K81</td>
<td></td>
</tr>
<tr>
<td>Rosenbaum, Karen B.</td>
<td>S1</td>
<td></td>
</tr>
<tr>
<td>Rosenblatt, Terri</td>
<td>F43</td>
<td></td>
</tr>
<tr>
<td>Ross, Ann H.</td>
<td>A39</td>
<td></td>
</tr>
<tr>
<td>Roux, Claude</td>
<td>E119</td>
<td></td>
</tr>
<tr>
<td>Rowbotham, Samantha K.</td>
<td>A86</td>
<td></td>
</tr>
<tr>
<td>Rubin, Katie M.</td>
<td>A15</td>
<td></td>
</tr>
<tr>
<td>Ruchti, Jacqueline</td>
<td>B67</td>
<td></td>
</tr>
<tr>
<td>Ruffolo, Ralph A.</td>
<td>D32</td>
<td></td>
</tr>
<tr>
<td>Rutter, Lexus R.</td>
<td>K61</td>
<td></td>
</tr>
<tr>
<td>Ryman, Colby</td>
<td>E57</td>
<td></td>
</tr>
<tr>
<td>Sabatasso, Sara</td>
<td>W7</td>
<td></td>
</tr>
<tr>
<td>Sacco, Matteo A.</td>
<td>E91, E111, H150, H152, K26</td>
<td></td>
</tr>
<tr>
<td>Sachdeva, Geetanjali</td>
<td>E109</td>
<td></td>
</tr>
<tr>
<td>Safarik, Mark E.</td>
<td>E68</td>
<td></td>
</tr>
<tr>
<td>Sago, William</td>
<td>H178</td>
<td></td>
</tr>
<tr>
<td>Sakuragawa, Tomoya</td>
<td>D14</td>
<td></td>
</tr>
<tr>
<td>Salahuddin, Zenasat</td>
<td>B148</td>
<td></td>
</tr>
<tr>
<td>Salerno, Monica</td>
<td>E7, E70, F49</td>
<td></td>
</tr>
<tr>
<td>Salyards, Amy Y17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanchez-Melo, M.</td>
<td>Isabel- J32</td>
<td></td>
</tr>
<tr>
<td>San Pietro, David</td>
<td>B200</td>
<td></td>
</tr>
<tr>
<td>Santioemma, Ilaria</td>
<td>E6, H153, I16</td>
<td></td>
</tr>
<tr>
<td>Santurro, Alessandro</td>
<td>H158</td>
<td></td>
</tr>
<tr>
<td>Saputri, Rosalina I.</td>
<td>G14</td>
<td></td>
</tr>
<tr>
<td>Sarajlija, Hrvoje</td>
<td>E102</td>
<td></td>
</tr>
<tr>
<td>Sarancha, Julianne J.</td>
<td>A76</td>
<td></td>
</tr>
<tr>
<td>Sare, Laura</td>
<td>E117</td>
<td></td>
</tr>
<tr>
<td>Sarginson, Shelby M.</td>
<td>K33</td>
<td></td>
</tr>
<tr>
<td>Sauder, Adrienne E.</td>
<td>H66</td>
<td></td>
</tr>
<tr>
<td>Sauerwein, Kelly</td>
<td>A84</td>
<td></td>
</tr>
<tr>
<td>Saunders, Christopher P.</td>
<td>B159</td>
<td></td>
</tr>
<tr>
<td>Saw, Yih Ling</td>
<td>E42</td>
<td></td>
</tr>
<tr>
<td>Sawyer, Samantha J.</td>
<td>E117</td>
<td></td>
</tr>
<tr>
<td>Scallon, Christopher J.</td>
<td>W1</td>
<td></td>
</tr>
<tr>
<td>Scantlebury, Juliette</td>
<td>W20</td>
<td></td>
</tr>
<tr>
<td>Schackmuth, Madison R.</td>
<td>K24</td>
<td></td>
</tr>
<tr>
<td>Schelling, Kristin</td>
<td>W26</td>
<td></td>
</tr>
<tr>
<td>Schiermeier-Wood, Lisa C.</td>
<td>W10</td>
<td></td>
</tr>
<tr>
<td>Schmid, John D.</td>
<td>W26</td>
<td></td>
</tr>
<tr>
<td>Schmit, Gregory</td>
<td>H52</td>
<td></td>
</tr>
<tr>
<td>Schneeweis, Lynn A.</td>
<td>F10</td>
<td></td>
</tr>
<tr>
<td>Schuerman, Leigh Ann</td>
<td>G20</td>
<td></td>
</tr>
<tr>
<td>Schwark, Thorsten</td>
<td>H161</td>
<td></td>
</tr>
<tr>
<td>Schweighardt, Andrew J.</td>
<td>B39</td>
<td></td>
</tr>
</tbody>
</table>
PRESENTING AUTHOR INDEX

Scopetti, Matteo - H37
Scott, G. Richard - W22
Scotti, Veronica - F34, F35
Seaman Kelly, Jan - J21
Sehrawat, Jagmahender Singh - A90, G17
Seidel, Andrew C. - A4
Seigfried-Spellar, Kathryn C. - C10
Sepulveda, Elizabeth M. - H139
Serinelli, Serenella - H55, H73, H116, H123, H125, H139
Sessa, Francesco - E8, E9, E80, E98, G36
Setia, Puneet - H185
Setser, Casandra Hernandez - B118
Shahmirza, Arian Dokht - C35
Shaller, Nathan S. - H126
Shapiro, Aaron M. - K59
Sharp, Nicholas E.-Y3
Sheil, Amy T. - ES1
Shelton, Donald E. - F4
Shields, Mary K. - G38
Shnaidman, Vivian - I42
Shoff, Elisa N. - K49, S02
Sicilia, Francesco - H150, H151, K26
Sides, Sarah J. - H174
Sigman, Michael E. - B102
Sikary, Asit Kumar - H134, H182, K68
Simmons-Ehrhardt, Terrie - A59
Simon, Alison G. - B61, B162
Simon, Rochelle A. - H175
Singh, Baneshwar - B154
Singh, Monika - G29
Siodambro, Chiara - H36
Sisco, Edward - W23
Sivak, Stephanie R. - E79
Sizemore, Jennifer A. - A136
Slater, Jessica - E44
Slaybaugh, Beth M. - K4
Smentkiewicz, Alcya M. - E106
Smith, Alexander J. - A56
Smith, Alexander J. - W15
Smith, Daniel G. - W12
Smith, Erich D. - B99
Smith, Gabriella-Y11
Smith, Jeff M. - C25, W06
Smith, Juliette - B52
Smith, LaQuida - J6
Smith, Patricia C. - B52
Smith, Rachel E. - A109
Soedarsono, Nurtami - G2
Solarino, Biagio - H68
Soler, Angela - A105, W19
Somogyi, Tessa - A20, A45, A46
Sorrentino, Antonella - K15
Sorrentino, Renee - I22, W3
Soto Martinez, Miriam E. - A141
Souviron, Richard R. - G6
Speck, Patricia M. - E13
Spencer, Caroline - K54
Spiros, Micayla C. - A100
Spradley, Kate - A144
Srettabunjong, Supawon - H138
Stamper, Trevor L. - E23, H97
Stanford, Sharon K. - W12
Steadman, Dawnie W. - A32
Steffen, Becky - B191
Stephen, Hannah - A55
Still, Molly B. - H31
Stoel, Reinoud D. - J34
Stolbach, Andrew - W5
Stone, Anne - B55
Stone, Jonah W.P. - B46
Stoney, David A. - B97
Subblefield, Phoebe R. - A147
Stuhmer, Emma L. - B15
Subramanian, Aishwaryaa - B45
Suddock, Jolee T. - H173
Sulliveras, Roland - W5
Sumani, Khlea - G35
Sumwalt, Robert L., III - W21
Surer, Eddie - H107
Sutton, Joel D. - W10
Swart, Cassandra A. - B34, K12
Swearenger, Mary C. - A114
Sweet, Jenna K. - B11
Swofford, Henry J. - W13, W16
Symes, Steven A. - H192, W8, W11
T
Tacka, Sabrina C. - A132
Tafur, Daniela - E33
Tahir, Mohammad A. - E26, E86, J20
Takayama, Mio - H165
Takei, Chikako - K1
Tallman, Sean D. - A143
Tang, Jessica - B126
Tang, Zeying - H102
Tanguay, Caroline - G12
Tarantino, Francesca - G31
Tasker, Esiri - B163
Tavelacci, John - C8
Taylor, Janee - H81
Taylor, Melissa K. - J34, W10
Tegtmeyer, Caryn E. - A16
Temporal, Keith - Dane H. - B132
Tersigni-Tarrant, MariaTeresa A. - A73, W20
Teske, Marissa A. - K40
Testerman, Chelsie N. - B82
Tewes, Warren D. - LW4
Tezbasan, Inci Y. - E110, I36
Thali, Michael - H87, H104, H107, H108, H155
Thevissen, Patrick W. - G1
Thomas, Jeff - E1
Thomas, Richard M. - W19
Thompson, Christopher R. - S1
Thongnopakhun, Wanna - H138
Thongphap, Wantawanop - H138
Thrasher, Drake Ryan - H78, H176
Thurn, Nicholas A. - E103
Tiedge, Teresa M - B107
Tilton, Miranda R. - C1
Tipton, Taylor M. - B161
Tiscone, Nicholas B. - K9
Titko, Justine M. - K64
Tolliver, Samantha - K51
Tomberlin, Jeffery K. - B57, E117
Toomey, Joseph - I27
Topoleski, Jan J. - A95
Torreggianti, Mario - G39
Torres, Michelle N. - B147
Traub, Lauri - W25
Trotta, Silvia - H68
Tumram, Niles K. - H6, H166
Turco, Sara - E15, E65
Turiello, Rachelle A. - B4
Turner, Jane W. - W20
U
Umback, Noelle J. - W19
Ünsal, Tugba - B144
Untoro, Evi - A91
Upton, Samantha - Y22
Urbanová, Petra - E38
Uribe, Paul - H140, H181
V
Vaglio, Roberto - H19
Valentin, Peter R. - E35
Valentine, Julie L. - E74, E76
Valerio, Raymond - F43
Valle, Michael K. - B128
Vallone, Peter M. - W10
Vandeburgh, Joshua - H45
VanderPlas, Susan - E58
Vander Pyl, Courtney H. - B19
Vanderpuye, Oluseyi A. - K42
Vanhaebost, Jessica - H52, H110
Van Leer Greenberg, Evan - S1
Van Leer Greenberg, Valerie - S1
Van Rijn, Rick R. - H105, H117
van Zandwijk, Jan Peter - H8
Varotto, Elena - E9
Vastrick, Thomas W. - J5, S2
Vecellio, Mark - E106
Ventura Spagnolo, Elvira - H33
Vester, Marloes E.M. - H7, H194
Vidoli, Giovanna M. - F36
Vietri, Katelin - Y13
Vikingsson, Svante - K60
Vincent, Greg - K80
Visona, Silvia D. - H62
Vo, Eleanor B. - I22
Vogelsberg, Caitlin C.M. - A118, F9
Volpini, Laura - E34
Vuille, Joelle V. - F29, F46
Wagoner, Crystal L. - E89
Waldo, Mark A. - E99
Walker, Stewart - B203
Walls, Mackenzie - A119
Walter, Britanny S. - A37
Walton, Leah - W21
Walton, Rachel Hamilton - W15
Wang, Alick - I10
Wang, Amber R. - H4
Wang, Ling - B21
Warner, Margaret - K81
Washington, Dione - E40
Waters, Brian Joseph - K8
Watson, Jenna M.S. - A57
Watson, Steven B. - C7, W6
Waxse, Rebecca A. - S2
Weaver, Jamie L. - Y3
Webb, Jennifer L. - A19
Weber, Alexis R. - B22
Webster, Nicholas - W21
Wedel, Vicki - A18
Weeden, Victor W. - B54, F30, W17
Weise, Svenja - W24
Weisensee, Katherine E. - A23
Weiss, Kurt D. - D36, D39
Weitz, Steven - B78
Wells, Karin E. - H23
Weppner, Hannah K. - Y4
White, Joshua - H120
White, Teresa A. - W2
Wickheiser, Ray - W10
Wiegers, Emily F. - A21
Wigren, Carl - W3
Wiley, Rachel E. - B86
Will, Emily J. - J34
Williams, David A. - B36
Williams, Joyce P. - B36
Williams, Loren M. - J28
Willis, Sheila - W10
Willis, Taylor J. - I26
Willocks, Gregoreese - B14
Wills, Bailey M. - B111
Wilson, Teresa V. - A97
Wilson-Taylor, Rebecca J. - A16
Winburn, Allysha P. - A145
Winchester, Janis - J19
Winokur, Agnes D. - B34
Winter, Andrew J. - B68
Wish, Eric D. - W5
Witzke, David - G22
Wixted, Michael - W12
Wohlfahrt, Denise - B85, B130, H32
Wolak, Emily - H164
Wolfe, Cynthea A. - Y2
Wood, Rebecca - E123
Wood, Robert E. - G5, G24, G40
Wood, Taylor A. - B23
Woods, Grace S. - H133
Word, Charlotte J. - F43, W10
Wright, Diana M. - W12
Wright, Franklin D. - G4
Wright, Patrick M. - E106
Wu, Jingjie - K20
Wu, Sulin - H183
Wynn, Charis - K52

Y

Yadavalli, Vamsi - B125
Yalçın Saribey, Aylin - B13
Yang, Chu-An - K14, K77
Yavuz, Duygu - F31
Yenko, Dana M. - B50
Yilmaz, Hatice - F3
Yoon, Leena - B12
Yoshizawa, Kenichi - E104
Young, John L. - I8
Young Laanemets, Elizabeth - W5

Z

Zacca, Jorge J. - K79
Zambrano, Carlos J. - H156
Zeger, Victoria - E22
Zeidman, Ellyn A. - B44
Zhang, Mengliang - B150
Zhang, Mingchang - H184
Zhang, Ning - D1
Zhang, Shuangteng - C30, C34
Zheng, Xiaoyu A. - B99
Ziegler, Andrew D. - B83
Zinni, Debra Prince - A68
Zjalic, James - C33
Dear colleagues,

As the Editors-in-Chief, we would like to declare the good news that after being included in the Directory of Open Access Journals (DOAJ), ProQuest and Scopus, Forensic Sciences Research is now included by PubMed Central (PMC)! We warmly welcome you to submit your work to our journal, which is a trusty international platform, to disseminate your research and viewpoints.

**Available Special Issues:**
- **Forensic Imaging** Vol.2 Issue 2 *(Silke Grahberr)*
- **Forensic Entomology** Vol.3 Issue 1 *(Jens Amendt)*
- **Forensic Genetics** Vol.3 Issue 2 *(Chengtao Li)*
- **Digital Forensics** Vol.3 Issue 3 *(Zeno Geradts)*

**Author Benefits:**
- Professional and precise peer review
- Free of charge for publication
- International visibility and open access
- Efficient and high-quality service

In the upcoming 2019 special issue, we are focusing on “Modern advances in the technological approach to disaster victim identification”

Submissions are currently open. Please visit our homepage:

www.tandfonline.com/tfsr
SALIgAE®
For the Forensic and Crime Scene Identification of Saliva

Qualitative and Quantitative

- 10 minute test ✓
- Requires only 2µl-10µl of sample ✓
- No reagent prep required, ready to use ✓

Visit saligae.com for more details

Serving the forensic community since 1996

Abacus Diagnostics - 6520 Platt Ave #220 - West Hills, CA 91307 - USA
Phone (818) 716-4735 · Toll Free (877) 225-9900 · Fax (818) 716-9471
Email: CustomerService@abacusdiagnostics.com · www.abacusdiagnostics.com