Cultivate your love for forensic science at The 29th International Symposium on Human Identification this September.

Thought leaders from across the globe will convene in Phoenix, Arizona to discuss upcoming developments in the field of forensic DNA. Attend to 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 8.**

Learn more at: **ishinews.com**
It is my pleasure to welcome you to Seattle, Washington, to participate in the 70th Annual Scientific Meeting of the American Academy of Forensic Sciences.

The theme for the Seattle meeting is “Science Matters,” and the focus will be on broadening our horizons. This meeting is the final event addressing the three broad goals of my presidency: research, diversity, and communication.

**Research:** By emphasizing the mechanics of research, including funding, best practices, and collaboration, the annual meeting will focus on the integration of forensic science research into the broader scientific community. Unlike the discipline-specific meetings of our affiliates, the AAFS Annual Scientific Meeting offers a tremendous opportunity for cross-discipline collaboration. I encourage everyone to attend at least one presentation in each of our 11 disciplines to observe the great work being conducted by our colleagues and to gain new thoughts about your own methods and procedures.

**Diversity:** We are promoting diversity in all forms, including diversity of people, places, backgrounds, and ideas. Our goal is to ensure that everyone feels welcome and empowered at the annual meeting. A special welcome to our international attendees: we appreciate that immigration procedures can sometimes be burdensome, but we hope that you will enjoy the fellowship of the forensic science community as you expand your professional and scientific knowledge at the meeting.

**Communication:** Forensic science is well known, but is not well understood. Instead of the public image of forensic science based on TV shows or other fictionalized portrayals, the annual meeting will showcase what we actually do in forensic science. Promoting our work ensures that the justice system better understands science-based evidence and the fact that science is a process of endless inquiry. There will be several media outlets at the meeting; please take the time to share your work and perspectives on the value of forensic science. More importantly, take what you learn at the meeting and approach your local educational institutions, legislators, and media when you get home to improve their understanding of forensic science.

Two sessions of the meeting that I would like to highlight are the Plenary Session and the Tuesday Evening Session. The Plenary Session, “Science Matters,” on Wednesday morning, open to all meeting attendees, hosts Itiel Dror, PhD, Rush D. Holt, PhD, and a special presentation by Rod J. Rosenstein, Deputy Attorney General of the United States. DAG Rosenstein will speak on “The Department of Justice’s Commitment to Advancing Forensic Science.” Plenary Co-chairs Nikolas P. Lemos and James Downs worked for many months planning this exciting and topical session.

For a different take on the same topics of research and communication, attend the more informal Tuesday Evening Session, “Forensic Science in the Public Eye.” The session – also open to all attendees – has the unofficial tagline: “A reporter, an activist, and a producer walk into a bar to talk about forensic science.” Bring your own beverage and enjoy the session focusing on the media perception of forensic science and how that perception can be influenced to shape public policy. My personal thanks to the Program Co-Chairs Christine Funk, Lucy A. Davis, and Anjali A. Ranadive for putting together a diverse and entertaining session.

During this 70th anniversary of the Academy, please take the time to meet and talk with colleagues from other disciplines, other backgrounds, and other places. The sentiment expressed in the opening remarks of Rutherford B.H. Gradwohl, MD, at the first meeting in 1948 still guides the Academy today:

“To the end of coordination of all agencies and efforts, I wish to recommend to this group the formation of a central organization of a permanent nature, to meet annually. Its aims and purposes will be to become a clearinghouse for new ideas and developments, to support reforms in legislatures and courts, to study and recommend new methods of jurisprudence.”

~ R.B.H. Gradwohl, Opening Remarks, 1948, St. Louis, MO
# TABLE OF CONTENTS

About The AAFS ................................................................. 4
Officers & Officials ............................................................. 5
General Information ........................................................... 9
2018 Distinguished Fellow ................................................... 10
Awards & Receptions .......................................................... 11
Section Business Meetings ............................................... 13
Continuing Education .......................................................... 14
Financial Contributors ....................................................... 17
Guidebook Mobile App ....................................................... 18
Student Academy ............................................................. 19
Interdisciplinary Symposium .............................................. 20
Young Forensic Scientists Forum Special Session ............... 22
Forensic Science Education Programs Commission Session ... 27
Evening Session ................................................................. 28
Academy Cup ................................................................. 30
Plenary Session ............................................................... 31
Breakfast Seminars ............................................................. 33
Luncheon Seminars ............................................................ 42
Workshops ................................................................. 44
National Association of Medical Examiners ...................... 90
National Institute of Justice ............................................... 92
Organization of Scientific Area Committees ..................... 94

Scientific Sessions
 Anthropology ................................................................. 99
Criminalistics ............................................................... 115
Digital & Multimedia Sciences ........................................ 138
Engineering Sciences ...................................................... 143
General ................................................................. 148
Jurisprudence ............................................................... 159
Odontology ................................................................. 164
Pathology/Biology .......................................................... 169
Psychiatry & Behavioral Science ...................................... 185
Questioned Documents .................................................... 191
Toxicology ................................................................. 194
Last Word Society ............................................................ 202

Program Committee Financial Disclosure .................. 203
Presenting Author Financial Disclosure .................... 207
Key Word Index ............................................................ 227
Presenting Author Index .................................................. 241
For 70 years, the American Academy of Forensic Sciences (AAFS) has served a distinguished and diverse membership. Its 6,700+ members are divided into eleven 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 News Feed articles which 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 News Feed, 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 5,000 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 170 exhibitors showcase the cutting-edge technology and services of this ever-changing profession.

2019 AAFS Annual Meeting
February 18-23, 2019
The Baltimore Convention Center
Baltimore, MD

2020 AAFS Annual Meeting
February 17-22, 2020
Anaheim Convention Center
Anaheim, CA

2021 AAFS Annual Meeting
February 15-20, 2021
George R. Brown Convention Center
Houston, TX

2022 AAFS Annual Meeting
February 21-26, 2022
Washington State Convention Center
Seattle, WA

2023 AAFS Annual Meeting
February 13-18, 2023
Rosen Shingle Creek
Orlando, FL

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

Anne Warren, Executive Director
OFFICERS & OFFICIALS

Officers

President: Betty Layne DesPortes, JD, MS
President-Elect: Susan M. Ballou, MS
Past President: John E. Gerns, MFS
Vice President: David W. Baker, MFS
Vice President: Carl R. McClary, BA
Secretary: Jeri D. Ropero-Miller, PhD
Treasurer: Zeno J. Geradts, PhD

Directors

Anthropology: Laura C. Fulginiti, PhD
Criminalistics: C. Ken Williams, MS, 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: Christopher R. Thompson, MD
Questioned Documents: Thomas W. Vastrick, BS
Toxicology: Sarah Kerrigan, PhD

2018 Annual Scientific Meeting Program Committee

Program Chair: Christine Funk, JD
Program Co-Chairs: Lucy A. Davis, BHS; Anjali A. Ranadive, JD
Plenary Session: Nikolas P. Lemos, PhD; James Downs, MD
Poster Sessions: Michelle R. Hoffman, MS; Kristen Hartnett-McCann, PhD
Workshops: Karolyn L. Tontarski, MS; Claire E. Shepard, MS
Breakfast Seminars: Peter T. Ausili, MS; Sarah Kerrigan, PhD
Luncheon Seminars: Marie Samples, MS; Marla E. Carroll, BS
Last Word Society: Kenneth E. Melson, JD; Paula C. Brumit, DDS; James E. Starrs, LLM
Bring Your Own Slides: Michael M. Baden, MD; Joseph A. Prahlow, MD
Student Academy: Julie A. Howe, MBA; Marilyn T. Miller, EdD
Interdisciplinary Symposium: Linton Mohammed, PhD; Karen B. Rosenbaum, MD
Local Arrangements: Fiona J. Couper, PhD
Academy Cup: Laura L. Liptai, PhD; Winona J. Agbabiaka, JD; Carla Miller Noziglia, MS; Matthew R. Wood, PhD
Anthropology: Paul D. Emanovsky, PhD; Kristen Hartnett-McCann, PhD
Criminalistics: Patrick Buzzini, PhD; Noelle J. Umback, PhD
Digital & Multimedia Sciences: Mary F. Horvath, MFS; Douglas R. White, MS
Engineering Sciences: David Pienkowski, PhD; Sarah V. Hainsworth, PhD
General: Gina Londino-Smolar, MS; Steven L. Downs, MFS
Jurisprudence: Christine Haskell, JD; Julie Maxwell, JD
Odontology: Roger D. Metcalf, DDS, JD
Pathology/Biology: Chris Milroy, MD, LLB
Psychiatry & Behavioral Science: J. Paul Fedoroff, MD; Sebastien S. Prat, MD
Questioned Documents: Samiah Ibrahim, BSc; Kevin P. Kulbacki, MSFS
Toxicology: William R. Johnson, BA; Sherri L. Kacinko, PhD
<table>
<thead>
<tr>
<th>Past Presidents</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>*R.B.H. Gradwohl, MD</td>
<td>1949-51</td>
</tr>
<tr>
<td>*S.A. Levinson, MD, PhD</td>
<td>1951-52</td>
</tr>
<tr>
<td>*R.N. Harger, PhD</td>
<td>1952-53</td>
</tr>
<tr>
<td>*Louis P. Regan, MD, LLB</td>
<td>1953-54</td>
</tr>
<tr>
<td>*A.W. Freireich, MD</td>
<td>1954-55</td>
</tr>
<tr>
<td>*Fred E. Inbau, BS, LLB, LLM</td>
<td>1955-56</td>
</tr>
<tr>
<td>*Alan R. Moritz, MD</td>
<td>1956-57</td>
</tr>
<tr>
<td>*Val B. Satterfield, MD</td>
<td>1957-58</td>
</tr>
<tr>
<td>*John F. Williams, BS</td>
<td>1958-59</td>
</tr>
<tr>
<td>*Ordway Hilton, MA</td>
<td>1959-60</td>
</tr>
<tr>
<td>*Russel S. Fisher, MD</td>
<td>1960-61</td>
</tr>
<tr>
<td>*S.R. Gerber, MD, LLB</td>
<td>1961-62</td>
</tr>
<tr>
<td>*Milton Helpern, MD</td>
<td>1962-63</td>
</tr>
<tr>
<td>*Oliver C. Schroeder, Jr., JD</td>
<td>1963-64</td>
</tr>
<tr>
<td>*Dwight M. Palmer, MD</td>
<td>1964-65</td>
</tr>
<tr>
<td>*Robert B. Forney, PhD</td>
<td>1965-66</td>
</tr>
<tr>
<td>*Jack L. Sachs, JD</td>
<td>1966-67</td>
</tr>
<tr>
<td>*Charles S. Petty, MD</td>
<td>1967-68</td>
</tr>
<tr>
<td>*Maier I. Tuchler, MD</td>
<td>1968-69</td>
</tr>
<tr>
<td>*James W. Osterburg, MPA</td>
<td>1969-70</td>
</tr>
<tr>
<td>*Edwin C. Conrad, JD, PhD</td>
<td>1970-71</td>
</tr>
<tr>
<td>Cyril H. Wecht, MD, MD</td>
<td>1971-72</td>
</tr>
<tr>
<td>Douglas M. Lucas, MSc, DSc</td>
<td>1972-73</td>
</tr>
<tr>
<td>*Morton F. Mason, PhD</td>
<td>1973-74</td>
</tr>
<tr>
<td>*David A. Crown, DCrim</td>
<td>1974-75</td>
</tr>
<tr>
<td>*Robert J. Joling, JD</td>
<td>1975-76</td>
</tr>
<tr>
<td>*James T. Weston, MD</td>
<td>1976-77</td>
</tr>
<tr>
<td>*B. Edward Whittaker, BS</td>
<td>1977-78</td>
</tr>
<tr>
<td>*Kurt M. Dubowski, PhD</td>
<td>1978-79</td>
</tr>
<tr>
<td>*June K. Jones, MS</td>
<td>1979-80</td>
</tr>
<tr>
<td>Lowell J. Levine, DDS</td>
<td>1980-81</td>
</tr>
<tr>
<td>*Joseph H. Davis, MD</td>
<td>1981-82</td>
</tr>
<tr>
<td>*Anthony Longhetti, BA</td>
<td>1982-83</td>
</tr>
<tr>
<td>*George E. Gantner, MD</td>
<td>1983-84</td>
</tr>
<tr>
<td>Maureen Casey Owens, AB</td>
<td>1984-85</td>
</tr>
<tr>
<td>*Arthur D. Goldman, DMD</td>
<td>1985-86</td>
</tr>
<tr>
<td>*Don Harper Mills, JD, MD</td>
<td>1986-87</td>
</tr>
<tr>
<td>Yale H. Caplan, PhD</td>
<td>1987-88</td>
</tr>
<tr>
<td>Richard S. Frank, BS</td>
<td>1988-89</td>
</tr>
<tr>
<td>*Richard C. Froede, MD</td>
<td>1989-90</td>
</tr>
<tr>
<td>*Ellis R. Kerley, PhD</td>
<td>1990-91</td>
</tr>
<tr>
<td>*Homer R. Campbell, Jr., DDS</td>
<td>1991-92</td>
</tr>
<tr>
<td>Marina Stajić, PhD</td>
<td>1992-93</td>
</tr>
<tr>
<td>*Enrico N. Togneri, BA</td>
<td>1993-94</td>
</tr>
<tr>
<td>Steven C. Batterman, PhD</td>
<td>1994-95</td>
</tr>
<tr>
<td>Haskell M. Pitluck, JD</td>
<td>1995-96</td>
</tr>
<tr>
<td>Richard Rosner, MD</td>
<td>1996-97</td>
</tr>
<tr>
<td>Michael A. Peat, PhD</td>
<td>1997-98</td>
</tr>
<tr>
<td>Barry A. J. Fisher, MS, MBA</td>
<td>1998-99</td>
</tr>
<tr>
<td>Patricia J. McFeeley, MD</td>
<td>1999-00</td>
</tr>
<tr>
<td>John D. McDowell, DDS, MS</td>
<td>2000-01</td>
</tr>
<tr>
<td>Mary Fran Ernst, BLS</td>
<td>2001-02</td>
</tr>
<tr>
<td>Graham R. Jones, PhD</td>
<td>2002-03</td>
</tr>
<tr>
<td>Kenneth E. Melson, JD</td>
<td>2003-04</td>
</tr>
<tr>
<td>Ronald L. Singer, MS</td>
<td>2004-05</td>
</tr>
<tr>
<td>Edmund R. Donohue, MD</td>
<td>2005-06</td>
</tr>
<tr>
<td>James G. Young, MD</td>
<td>2006-07</td>
</tr>
<tr>
<td>Bruce A. Goldberger, PhD</td>
<td>2007-08</td>
</tr>
<tr>
<td>Carol E. Henderson, JD</td>
<td>2008-09</td>
</tr>
<tr>
<td>Thomas L. Bohan, PhD, JD</td>
<td>2009-10</td>
</tr>
<tr>
<td>Joseph P. Bono, MA</td>
<td>2010-11</td>
</tr>
<tr>
<td>Douglas H. Ubelaker, PhD</td>
<td>2011-12</td>
</tr>
<tr>
<td>Robert E. Barsley, DDS, JD</td>
<td>2012-13</td>
</tr>
<tr>
<td>Barry K. Logan, PhD</td>
<td>2013-14</td>
</tr>
<tr>
<td>Daniel A. Martell, PhD</td>
<td>2014-15</td>
</tr>
<tr>
<td>Victor W. Weedn, MD, JD</td>
<td>2015-16</td>
</tr>
<tr>
<td>John E. Gerns, MFS</td>
<td>2016-17</td>
</tr>
</tbody>
</table>

* Deceased
OFFICERS & OFFICIALS

Section Officers

Anthropology
Chair: Kate Spradley, PhD
Secretary: Jennifer C. Love, PhD

Criminalistics
Chair: Vincent J. Desiderio, Jr., MS
Secretary: Kristy Kadash, PhD

Digital & Multimedia Sciences
Chair: Marcus Rogers, PhD
Secretary: Marla E. Carroll, BS

Engineering Sciences
Chair: Michelle R. Hoffman, MS
Secretary: Darren Franck, MSME

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

Jurisprudence
Chair: Stephanie Domitrovich, JD, PhD
Secretary: Pamela A.W. King, JD

Odontology
Chair: Raymond G. Miller, DDS
Secretary: Adam J. Freeman, DDS

Pathology/Biology
Chair: Joyce L. de Jong, DO
Secretary: David O. Carter, PhD

Psychiatry & Behavioral Science
Chair: Karen B. Rosenbaum, MD
Secretary: Dean M. De Crisce, MD

Questioned Documents
Chair: Linton Mohammed, PhD
Secretary: Jan Seaman Kelly, BA

Toxicology
Chair: Fiona J. Couper, PhD
Secretary: Nikolas P. Lemos, PhD

R.B.H. Gradwohl Laureates

*Deceased

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

* Milton Helpern, MD ................................. 1978
* Rolla N. Harger, PhD ................................. 1979
* James T. Weston, MD ................................. 1984
* Oliver C. Schroeder, Jr., JD .......................... 1987
Abel M. Dominguez, PhD ............................... 1993
Douglas M. Lucas, MSc, DSc ............................ 1995
Kenneth S. Field, MBA ................................. 1997
* Sidney Kaye, PhD ........................................ 1998
* Richard C. Froede, MD ................................. 2002
* Joseph H. Davis, MD ................................. 2005
Barry A.J. Fisher, MS, MBA ............................ 2008
* Kurt M. Dubowski, PhD .............................. 2011
James E. Starrs, LL.M. .................................... 2012
Thomas T. Noguchi, MD ............................... 2015
Robert E. Gaensslen, PhD ............................. 2017

Douglas M. Lucas Medalists

* Deceased
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. Gaenslen, 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 Finnegan, PhD .......................................... 2005
Andre A. Moenssens, JD, LLM ................................. 2005
*Kurt M. Dubowski, PhD ....................................... 2006
*Emanuel Tanay, MD ............................................. 2007
*Joseph L. Peterson, DDrCrim ................................. 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, DDrCrim .................................. 2017
Virginia A. Lynch, MSN ......................................... 2018

* Deceased

Past Presidents Council Early Career Achievement Award

Cliff Akikyama, MPH, MA ........................................ 2016
Kristina L. Hoffman, PSM ....................................... 2017
Lavina Iancu, PhD ................................................. 2018
**Registration Desk Hours**  
*Washington State Convention Center*

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday</td>
<td>February 18</td>
<td>1:00 p.m. - 5:00 p.m.</td>
</tr>
<tr>
<td>Monday</td>
<td>February 19</td>
<td>6:45 a.m. - 5:00 p.m.</td>
</tr>
<tr>
<td>Tuesday</td>
<td>February 20</td>
<td>6:45 a.m. - 6:00 p.m.</td>
</tr>
<tr>
<td>Wednesday</td>
<td>February 21</td>
<td>6:45 a.m. - 5:00 p.m.</td>
</tr>
<tr>
<td>Thursday</td>
<td>February 22</td>
<td>6:45 a.m. - 5:00 p.m.</td>
</tr>
<tr>
<td>Friday</td>
<td>February 23</td>
<td>6:45 a.m. - 4:00 p.m.</td>
</tr>
<tr>
<td>Saturday</td>
<td>February 24</td>
<td>7:30 a.m. - 12:00 p.m.</td>
</tr>
</tbody>
</table>

**Exhibit Hall Hours**  
*Washington State Convention Center*

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>February 21</td>
<td>11:30 a.m. - 4:00 p.m.</td>
</tr>
<tr>
<td>Thursday</td>
<td>February 22</td>
<td>9:00 a.m. - 2:00 p.m.</td>
</tr>
<tr>
<td>AAFS Reception</td>
<td>(Exhibits Open)</td>
<td>6:00 p.m. - 8:00 p.m.</td>
</tr>
<tr>
<td>Friday</td>
<td>February 23</td>
<td>9:00 a.m. - 1:00 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 Distinguished Fellow Award will be presented on Wednesday, February 21, 2018, during the AAFS Annual Business Meeting.

Virginia A. Lynch, MSN, RN, FCNS, DF-IAFN, FAAFS, FAAN

Virginia Lynch, AAFS member since 1986, was named Fellow in 1990. She is recognized as the founder of forensic nursing in the United States and internationally. She was asked to originally define the discipline of forensic nursing that was officially adopted by the General Section. The science of forensic nursing became the catalyst for the discipline’s acceptance within the Academy in 1991.

In 1984, Lynch initiated her forensic career as a medical death investigator for the Tarrant–Parker County Medical Examiner’s District in Fort Worth, Texas. She was certified as a coroner in the State of Georgia in 1992, and subsequently has promoted death investigation as a forensic nursing role. During graduate studies at the University of Texas, Arlington, she was credentialed as a Forensic Nurse Examiner in sexual assault examination.

In 1992, Virginia attended the organizational meeting of sexual assault nurses, an event that culminated in the formation of the International Association of Forensic Nurses (IAFN). Lynch was the founding president from 1993-1996. Using Lynch’s model and specialty descriptions, the American Nurses Association recognized forensic nursing as a distinct nursing specialty in 1995, paving the way for advanced practice education and credentialing.

In 1993, Lynch accepted a faculty position at the University of Colorado, Colorado Springs, and developed the first course in human rights for nurses. In 2000, she launched a global outreach program in forensic nursing science involving teaching, consulting, and social advocacy.

She has worked diligently within several endeavors of AAFS and the larger forensic science community. Virginia was the General Section’s Program Co-Chair in 1996, Chair of the Section’s Membership and Discipline Committee in 1999, and later served as International Liaison from 2002–2010. Lynch has been a member of the International Affairs Committee since 2011 and currently serves on the Humanitarian and Human Rights Resource Center’s Subcommittee on Education.

Lynch was the developer and principal author for the first medicolegal textbook for nurses, Forensic Nursing, published in 2006. That year, the American Association of Publishers, Inc., declared this text the Most Significant Scholarly/Professional Contribution to Nursing and Allied Health. The second edition of this landmark text, Forensic Nursing Science, was published in 2010.

This Academy Fellow was previously honored with the General Section’s John R. Hunt Award in 2016 and the AAFS Kenneth Field Outstanding Volunteer Service Award in 2014. Her advocacy role with military physicians and nurses was a significant catalyst for new legislation requiring aggressive programming within the Department of Defense to prevent and manage sexual violence. One of her most rewarding tributes has been the establishment of the Virginia A. Lynch Pioneer Award, which the IAFN presents annually to a member who has significantly contributed to the advancement of the forensic nursing specialty. Virginia lectures, conducts workshops, and serves as a consultant for professional societies and universities in several countries while she inspires and mentors the next generation of forensic nurses.

Congratulations, Virginia A. Lynch, on being named “Distinguished Fellow” of the American Academy of Forensic Sciences.
Section Awards will be presented during Section Business Meetings on Wednesday, February 21, 2018. The Section Award recipients will be acknowledged again before the entire membership during the AAFS Annual Business Meeting

2018 Section Award Honorees

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

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

Digital & Multimedia Sciences Section’s
Outstanding Research Award
Outstanding Case Study Award

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

General Section’s
Robert Gaffney Achievement Award
John R. Hunt Award
Paul W. Kehres Meritorious Service Award

Jurisprudence Section’s
Harold A. Feder Award

Odontology Section’s
Lester Luntz Award
Reidar F. Sognnaes Award of Excellence in Forensic Odontology

Pathology/Biology Section’s
Milton Helpern Award

Psychiatry & Behavioral Science Section’s
Richard Rosner, MD, Award for the Best Paper by a Fellow in Forensic Psychiatry or Forensic Psychology

AWARDS & RECEPTIONS (continued)
**Questioned Documents Section**

**Ordway Hilton Award**

Thomas W. Vastrick, BS


**Toxicology Section**

**Alexander O. Gettler Award**

Frederick W. Fochtman, PhD

**Rolla N. Harger Award**

Sarah Kerrigan, PhD

**Ray Abernethy Award**

Karl B. Scheidweiler, PhD

**Irving Sunshine Award**

Erin L. Karschner, PhD

The following awards will be presented on Wednesday, February 21, 2018, during the AAFS Annual Business Meeting. You will want to be present to congratulate recipients:

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

*Argentine Forensic Anthropology Team (Equipo Argentino de Antropologia Forense, EAAF)*

**AAFS Outstanding Early Career Achievement in Forensic Science Award:**  *Lavinia Iancu, PhD*

**FSF Emerging Forensic Scientist Award Honorees:**  *Lindsay Glicksberg, PhD*, and *D’Nisha D. Hamblin, MSFS*

**FSF Henry C. Lee Scholarship Recipient:**  *Muataz A. Al-Qazzaz, PhD*

**FSF Jan S. Bashinski Criminalistics Graduate Thesis Assistance Grant:**  *Logan D. Hickey, BSc*

**FSF/CRC Press Student Travel Grant:**  *Victoria M. Dominguez, MA*

**FSF Student Travel Grant:**  *Saskia Ammer, MSc; Kimber G. Cheek; Mary E. Cole, MA; Matthew C. Go, MA; Angela L. Harden, MA; Suzanna Michener, MSc; Jessica Shiffert, BA; and Nicole M. Weiss, MA*

**FSF Warren-Young Scholarship Recipient:**  *Betty H. Davis, BSEd*

---

**RECEPTION INFORMATION**

**Welcoming Reception — Tuesday, February 20 — 6:00 p.m. - 8:00 p.m.**

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

**AAFS 70th Annual Wine & Cheese Reception — Thursday, February 22 — 6:00 p.m. - 8:00 p.m.**

The AAFS Wine & Cheese Reception will be held to celebrate what promises to be an excellent 2018 program and to toast your return to the Academy’s 71st Annual Scientific Meeting in 2019 (Baltimore, MD)!
The Sections

The Sections of the American Academy of Forensic Sciences will hold their annual business meetings on Wednesday, February 21, 2018. Some of the sections will hold a luncheon prior to the start of the business meeting. 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>12:00 p.m. - 1:00 p.m.</td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Criminalistics *</td>
<td>12:00 p.m. - 1:30 p.m.</td>
<td>1:05 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Digital &amp; Multimedia Sciences **</td>
<td>12:00 p.m. - 1:45 p.m.</td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Engineering Sciences</td>
<td></td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>General **</td>
<td>12:00 p.m. - 1:45 p.m.</td>
<td>1:45 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Jurisprudence **</td>
<td></td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Odontology</td>
<td></td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Pathology/Biology **</td>
<td>12:00 p.m. - 1:15 p.m.</td>
<td>1:30 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Psychiatry &amp; Behavioral Science **</td>
<td>12:00 p.m. - 1:45 p.m.</td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Questioned Documents</td>
<td></td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
<tr>
<td>Toxicology **</td>
<td>12:00 p.m. - 1:45 p.m.</td>
<td>2:00 p.m. - 3:45 p.m.</td>
</tr>
</tbody>
</table>

* This luncheon requires pre-registration and is open only to members of the Criminalistics Section.
** These luncheons require pre-registration.

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

The Annual Business Meeting of the Fellows and Members of the AAFS will be held Wednesday, February 21, 2018, at 4:15 p.m., at the Washington State Convention Center in Seattle, WA. 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 2018-19 Officers, consideration of bylaw amendments, presentation of the Distinguished Fellow and AAFS 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 2019 AAFS Annual Scientific Meeting in Baltimore, MD.
CONTINUING EDUCATION

General Information

All meeting sessions are lectures with one or more speakers. Continuing professional education credits are 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 22. 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 generic 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 credits. 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 the various 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.

Objectives of the AAFS Continuing Education Program

To provide for multidisciplinary presentation, instruction, and discussion of relevant forensic science issues related to science, evidence and the law, and to research descriptive studies, technology and methods, diagnostics, interpretations, testimony, and administrative functions performed by forensic scientists in the disciplines of pathology, biology, odontology, anthropology, psychiatry & behavioral science, psychology, engineering sciences, toxicology, questioned document examination, criminalistics, jurisprudence, digital & multimedia sciences, and general forensic investigation.

Expected Outcome of Participation

A participant in the AAFS Continuing Education Program should: a) understand the perspectives and roles of the various forensic science disciplines; b) increase awareness of current forensic science issues; c) learn new technologies and methods; d) broaden diagnostic acumen; e) gain practical knowledge to modify current practices; f) affirm current concepts and practices; g) improve interpretative skills regarding evidence, observations, and information; h) interact with colleagues; and, i) expand one’s historical perspective on the forensic sciences.

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 2017-18 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.
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.


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.

Educational Objectives: Detailed individually in each workshop and special session announcement and description.

CE Credit: Varies from 1.5 credit hours to 16 credit hours depending on sessions.

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.

Educational Objectives: 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.

Educational Objectives: 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 2.5 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.

Educational Objectives: 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.

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

CE Credit: Designated for a maximum of 2.0 credit hours.
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 for this service 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 American Academy of Forensic Science.

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. Please contact Continuing Education Coordinator Kimberly Wrasse, kwrass@aaafs.org, no later than the January 24, 2018, pre-registration deadline if your state bar will not allow you to self-report. AAFS will apply for accreditation/approval from your state in this circumstance.

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 American Academy of Forensic Science. 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 52 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 2018 AAFS 70th Annual Scientific Meeting:

A & M Forensics and Engineering, Inc.
Agilent Technologies, Inc.
American Polygraph Association
Anthropology Section
Cayman Chemical Company
Center for Forensic Science Research and Education
at the Fredric Rieders Foundation
Criminalistics Section
The Ellis R. Kerley Forensic Sciences Foundation
Engineering Sciences Section
General Section
Immunalysis Corporation
John Wiley & Sons
Jurisprudence Section
Laurelanne Bundens
Lemos Toxicology Services, LLC
Lipomed, Inc.
NMS Labs
Odontology Section
Pathology/Biology Section
PinPoint Testing, Inc.
Psychiatry & Behavioral Science Section
Thermo Fisher Scientific
UCT
UTAK Laboratories, Inc.
Waters Corporation
GUIDEBOOK MOBILE APP

AAFS 2018 Guidebook Mobile App

Get the most up-to-date meeting information. Download the AAFS 2018 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/aafs2018/.
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: 
Ginesse A. Listi, PhD
Louisiana State University
Baton Rouge, LA

Odontology: 
Robin A. Ainsworth, DDS
Gulfport, MS

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

Pathology/Biology: 
James Downs, MD
forensiX, LLC
Savannah, GA

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

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

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

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

General: 
Claire E. Shepard, MS
Louisiana Delta Community College
Monroe, LA

Toxicology: 
Sabra Botch, PhD
Boston University School of Medicine
Boston, MA

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

Philip Kemp, PhD
Civil Aerospace Administration
Oklahoma City, OK
Pre-Registration Required — $75

S1 Raising the Bar in Forensic Science

Tuesday, February 20, 2018  8:30 a.m. - 12:30 p.m.  3.75 CE Hours

Chair:
Linton Mohammed, PhD
Forensic Science Consultants, Inc
Burlingame, CA

Co-Chair:
Karen B. Rosenbaum, MD
New York, NY

Faculty:
Allison Campbell, PhD
American Chemical Society
Washington, DC

Vernon M. Neppe, MD, PhD
Pacific Neuropsychiatric Institute
Seattle, WA

Roger W. Falcone, PhD
University of California Berkeley
Berkeley, CA

Matthew F. Redle, JD
Sheridan, WY

Rick Jones, JD
National Association of Criminal Defense Lawyers
New York, NY

Christopher R. Thompson, MD
Los Angeles, CA

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

Educational Objective(s): The goals of the 2018 Interdisciplinary Symposium (IDS) are to provide attendees with an overview on how forensic science is viewed inside and outside the forensic arena and to present ideas on what the forensic science community can learn from the broader scientific community regarding transparency, research integrity, and a strong commitment to education.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with the perspectives of scientists from major scientific organizations inside and outside of forensic science and from attorneys from leading legal associations. Attendees will receive information on how to address strengths and weaknesses in the forensic sciences and should then be able to apply this knowledge in their own research and casework.

Program Description: The 2018 IDS will comprise several distinguished scientists from within and outside of forensic science. The speakers will address perceived research gaps in the forensic sciences and discuss how to close these gaps.

To complement the 2018 American Academy of Forensic Sciences theme, *Science Matters*, the theme of the 2018 IDS is *Raising the Bar*. This symposium will highlight collaboration with the broader scientific community as a means to strengthen forensic science. Popular television shows have had a generally positive impact (for forensic science) on how the public views forensic science and forensic scientists. Despite the public perception of the near-infallibility of forensic science to detect and solve crimes, there has been criticism of forensic science from the scientific and legal communities. The criticism often notes that there is too much emphasis on the forensic aspect of various disciplines and not enough emphasis on foundational sciences. The National Commission on Forensic Science (NCFS), in which many AAFS members were active, provided a forum for members of the broader scientific community to contribute to recommendations designed to foster the foundational sciences of forensic science and to strengthen the forensic science community. Although the NCFS was not renewed upon the expiration of its charter in the spring of 2017, collaboration with the broader scientific community remains an important objective of AAFS.
Pre-Registration Required — $75

S1 Raising the Bar in Forensic Science

Program Description cont.:

At the 2018 IDS, a distinguished panel of researchers and speakers from professional organizations in the broader scientific community will address their perceptions of the strengths and challenges of the forensic science community. The 2018 speakers include the current leaders of the American Chemical Society (ACS), the American Physical Society (APS), the American Academy of Psychiatry and the Law (AAPL), the National Association of Criminal Defense Lawyers (NACDL), the Criminal Justice Section of the American Bar Association (ABA), and an AAFS past president. These speakers will discuss the efforts of their respective organizations to strengthen forensic science and the importance of “outside” voices in the advancement of forensic science. For example, with the APS, that could involve a discussion of what forensic science can learn from the broader scientific community about transparency, research integrity, and a strong commitment to education.

The keynote speaker is Vernon M. Neppe, MD, Director of the Pacific Neuropsychiatric Institute in Seattle, WA, Adjunct Professor of Psychiatry and Human Behavior, St. Louis University School of Medicine, St. Louis, MO, and former Director, Division of Neuropsychiatry, University of Washington, Seattle, WA. Dr. Neppe has contributed internationally in the specialties of neuropsychiatry and behavioral neurology, psychopharmacology, forensic psychiatry, anomalistic psychology, and epileptology. A distinguished psychiatrist, author, playwright, and philosopher, Dr. Neppe’s presentation will highlight the importance of groundbreaking paradigm shifts to the advancement of scientific theory and practice.

Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m. - 8:35 a.m.</td>
<td>Opening Remarks&lt;br&gt;Linton Mohammed, PhD</td>
</tr>
<tr>
<td>8:35 a.m. - 9:35 a.m.</td>
<td>Applying Feasibility, Falsifiability, and Certainty in Scientific Method to Forensic Science&lt;br&gt;Vernon M. Neppe, MD, PhD</td>
</tr>
<tr>
<td>9:35 a.m. - 10:05 a.m.</td>
<td>Forensic Science and the American Chemical Society&lt;br&gt;Allison Campbell, PhD</td>
</tr>
<tr>
<td>10:05 a.m. - 10:35 a.m.</td>
<td>The Culture of Continuous Improvement, Science in the Public Interest, and the Preparation of Bench and Bar&lt;br&gt;Matthew F. Redle, JD</td>
</tr>
<tr>
<td>10:35 a.m. - 10:50 a.m.</td>
<td>Break</td>
</tr>
<tr>
<td>10:50 a.m. - 11:20 a.m.</td>
<td>Using X-Rays for High-Resolution Analysis of Chemical, Electronic, and Spatial Measurements&lt;br&gt;Roger W. Falcone, PhD</td>
</tr>
<tr>
<td>11:20 a.m. - 11:50 a.m.</td>
<td>Strengthening Forensic Science and Fulfilling the Duty to Correct and Notify&lt;br&gt;Rick Jones, JD</td>
</tr>
<tr>
<td>11:50 a.m. - 12:20 p.m.</td>
<td>Putting the Science in Forensic Behavioral Science: Advances in Forensic Psychiatry and Forensic Psychology&lt;br&gt;Christopher R. Thompson, MD; Daniel A. Martell, PhD</td>
</tr>
<tr>
<td>12:20 p.m. - 12:30 p.m.</td>
<td>Closing Remarks&lt;br&gt;Linton Mohammed, PhD; Karen B. Rosenbaum, MD</td>
</tr>
</tbody>
</table>
S2 Research in Science: How Young Scientists Can Shape a Better Future

Monday, February 20, 2018

8:30 a.m. - 5:00 p.m.

6.0 CE Hours

Educational Objective(s): After attending this presentation, attendees will better understand the novel research being conducted by both young and leading scientists within a variety of forensic science disciplines and how important that research is to the field.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by educating young scientists on the importance of scientific research and the effects it has on the community at large. This special session also provides students and scientists with the opportunity to network with professionals in a unique setting that focuses on bridging the gap between established professionals and researchers and those aspiring to enter and thrive in the field.

Program Description: Calling all students, young researchers, and those new to forensic science! The Young Forensic Scientists Forum (YFSF) focuses on providing young professionals and students continued education in different aspects of forensic science at each AAFS Annual Scientific Meeting. Registration for the YFSF Special Session includes a day-long session on Tuesday and a Breakfast Session on Thursday. The full-day special session will highlight the novel and exciting research being conducted by Academy members and students. The YFSF also hosts Bring Your Own Slides (BYOS) and Bring Your Own Posters (BYOP) sessions that provide young professionals and students with the opportunity to present their research.

The 2018 YFSF Special Session, entitled Research in Science: How Young Scientists Can Shape a Better Future, is a day-long session that will leave attendees invigorated and excited about the research being conducted by Academy members and students. Participants will have a more complete understanding of the variety of disciplines that make up the Academy. The selection of speakers represents nearly every AAFS section, which makes for a highly diverse and unique suite of presentations.

The morning session will include an assortment of topics ranging from how to become an AAFS member to how 3D imaging can be used to analyze fingerprints. Following a delicious lunch, included with registration, attendees will hear about the Innocence Network and case-driven research. This day-long session will conclude with a Q&A session in which attendees can engage speakers and panelists in an open discussion.
## Speakers

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gail S. Anderson, PhD</td>
<td>Simon Fraser University, School of Criminology, Burnaby, BC, CANADA</td>
</tr>
<tr>
<td>Alexandria Anstett, MS</td>
<td>Customs and Border Protection, Newark, NJ</td>
</tr>
<tr>
<td>Maria Susana Ciruzzi, PhD</td>
<td>Hospital Nacional de Pediatria Prof, Buenos Aires, ARGENTINA</td>
</tr>
<tr>
<td>Josep De Alcaraz-Fossoul, PhD</td>
<td>Arizona State University, West Campus - School of Math and Natural Sciences, Glendale, AZ</td>
</tr>
<tr>
<td>Ashley E. Foster, MAS</td>
<td>Texas Department of Public Safety, Austin, TX</td>
</tr>
<tr>
<td>Lindsay Glicksberg, BS</td>
<td>Sam Houston State University, Dept of Forensic Science, Huntsville, TX</td>
</tr>
<tr>
<td>Pierre M.M. Guyomarc'h, PhD</td>
<td>Université de Bordeaux, Allee George St Hilaire, Pessac, FRANCE</td>
</tr>
<tr>
<td>Greg Hampikian, PhD</td>
<td>Boise State University, Biology Department, Boise, ID</td>
</tr>
<tr>
<td>Erin L. Houston, MS</td>
<td>Columbus, OH</td>
</tr>
<tr>
<td>Cheryl D. Hunter</td>
<td>AAFS Staff, Colorado Springs, CO</td>
</tr>
<tr>
<td>Pamela L. Marshall, PhD</td>
<td>Southern University at New Orleans, New Orleans, LA</td>
</tr>
<tr>
<td>Michael A. Peat, PhD</td>
<td>JFS Editor-in-Chief, The Woodlands, TX</td>
</tr>
<tr>
<td>Joseph A. Prahow, MD</td>
<td>Western Michigan University, School of Medicine, Kalamazoo, MI</td>
</tr>
<tr>
<td>Dragan Primorac, MD, PhD</td>
<td>Orange, CT</td>
</tr>
<tr>
<td>Marcus Rogers, PhD</td>
<td>Purdue University, West Lafayette, IN</td>
</tr>
<tr>
<td>Elisa N. Shoff, BS</td>
<td>Miami-Dade Medical Examiner Department, Miami, FL</td>
</tr>
<tr>
<td>Peter R. Stout, PhD</td>
<td>Houston Forensic Science Center, Houston, TX</td>
</tr>
<tr>
<td>Thomas W. Vastrick, BS</td>
<td>Apopka, FL</td>
</tr>
<tr>
<td>Dante Webb, BS</td>
<td>Gaithersburg, MD</td>
</tr>
<tr>
<td>Sheila Willis, PhD</td>
<td>Forensic Science Ireland, Dublin, IRELAND</td>
</tr>
</tbody>
</table>

(continued)
The YFSF BYOS Session will take place the evening of Wednesday, February 21, 2018, and follows a format similar to the AAFS BYOS Session. The YFSF also hosts a BYOP Session that features selected research posters presented by young scientists and students. The BYOP Session will be held jointly with the University Fair in the AAFS Poster Hall the evening of Thursday, February 22, 2018, in conjunction with the Wine and Cheese Reception in the Exhibit Hall from 6:00 p.m. to 8:00 p.m. The BYOP and BYOS Sessions are two opportunities provided by the YFSF for students and young scientists to present their research. Attendance at both the BYOP and BYOS events are free and open to all meeting attendees. YFSF does not require presenters of YFSF BYOP and BYOS Sessions to be members of AAFS and does not require they attend the Special Session, but they are encouraged to do so.

The ultimate goal of this year’s YFSF events is to facilitate the growth and career progression of those seeking to enter or are new to the field of forensic science. This Special Session will remind students and young researchers that the research they conduct has an impact on the field and the community. The YFSF looks forward to hosting these unique, fun, and educational events in Seattle, WA. Don’t miss out on this valuable opportunity!

Program:

8:30 a.m. - 8:40 a.m. YFSF Introduction and Speaker Welcome
   Brianna B. Bermudez, BS

8:40 a.m. - 8:55 a.m. AAFS Membership
   Cheryl D. Hunter

8:55 a.m. - 9:20 a.m. Measuring the Frequency of Occurrence in Handwriting, Handprinting, and Numeral Characteristics
   Thomas W. Vastrick, BS

9:20 a.m. - 9:40 a.m. The Evolution of Digital Forensic Tools: How Research Has Shaped the Journey
   Marcus Rogers, PhD

9:40 a.m. - 10:00 a.m. Analyzing the Degradation of Fingerprints by 3D Imaging Technology
   Josep De Alcaraz-Fossoul, PhD

10:00 a.m. - 10:15 a.m. Synthetic Cathinone Stability in Blood Using Liquid Chromatography/Quadrupole Time-Of-Flight/Mass Spectrometry (LC/qTOF/MS)
   Lindsay Glicksberg, BS

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

10:30 a.m. - 10:50 a.m. The Development of Screening Methods for Synthetic Stimulants and Opioids in Postmortem Specimens Using Liquid Chromatography/Ion Trap/Mass Spectrometry (LC/Ion Trap/MSn)
   Elisa N. Shoff, BS

10:50 a.m. - 11:10 a.m. The Journal of Forensic Sciences: Past, Present, and Future
   Michael A. Peat, PhD
Pre-Registration Required — $75

S2  Research in Science: How Young Scientists Can Shape a Better Future

11:10 a.m. - 11:30 a.m.  With a Little Help From My Friends — Soft or Hard Science: Assessing the Legal, Social, or Medical Approach to Science Matters  
Maria Susana Ciruzzi, PhD

11:30 a.m. - 12:00 p.m.  Clarity Regarding the Role of Forensic Scientist Is Vital for Progress  
Sheila Willis, PhD

12:00 p.m. - 1:30 p.m.  Lunch

1:30 p.m. - 2:00 p.m.  Forensic Genetics: Past, Present, and Exciting Future  
Dragan Primorac, MD, PhD

2:00 p.m. - 2:20 p.m.  Life in the Practitioner Lab: Where Research Fits In  
Peter R. Stout, PhD

2:20 p.m. - 2:50 p.m.  Using New DNA Techniques to Free the Innocent: Lessons From the Innocence Network  
Greg Hampikian, PhD

2:50 p.m. - 3:10 p.m.  The Forensic Unit of the International Committee of the Red Cross: 15 Years of Promoting Humanitarian Forensic Action  
Pierre M.M. Guyomarc’h, PhD

3:10 p.m. - 3:25 p.m.  Break

3:25 p.m. - 3:45 p.m.  Optimizing Case Report Research Collaboration With Students and Young Forensic Scientists  
Joseph A. Prahlow, MD

3:45 p.m. - 4:15 p.m.  Case-Driven Research: Why Is It Important for the Future of Forensic Science Programs?  
Gail S. Anderson, PhD

4:15 p.m. - 4:30 p.m.  How Underrepresented Minority Students Are Helping Shape the Future of Forensic Science  
Pamela L. Marshall, PhD

4:30 p.m. - 5:00 p.m.  Group Discussion and Closing Remarks  
Amanda R. Hale, MA; Zain Bhaloo, MSc
Wednesday

February 21, 2018 — 6:00 p.m. – 7:00 p.m.

YFSF Bring Your Own Slides

(Open to All Meeting Attendees)

Thursday

February 22, 2018 — 7:00 a.m. – 10:00 a.m.

AAFS Breakfast Session #4

(Pre-registration for B4 Required to Attend)

On Thursday morning, February 22, 2018, the YFSF will host an Academy-wide Breakfast Session and everyone attending the YFSF Tuesday session is encouraged to register to attend Breakfast Session #4, YFSF’s Wake Up to Professional Development ... and Bacon! This Breakfast Session will feature two speakers addressing early career success and development as a scientist, as well as how to excel in the interview process. This Breakfast Session will conclude with a Q&A session and a résumé review.

The résumé review is a rare opportunity for young professionals and students to discuss and improve their résumés with established professionals and leaders in the field of forensic science! Attendees of the breakfast session must register separately for this Breakfast Session.

Thursday

February 22, 2018 — 7:00 p.m. – 8:00 p.m.

YFSF Bring Your Own Posters

(Open to All Meeting Attendees)
Pre-Registration Not Required — Open to All Meeting Attendees

Accreditation of Forensic Science Academic Programs Through the FEPAC

Tuesday
February 20, 2018 — 8:30 a.m. - 12:45 p.m.

Educational Objectives: 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.

Chair: Matthew R. Wood, PhD
Ocean County Sheriff’s Department
Forensic Science Laboratory
Toms River, NJ

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

Commissioner: Daniel E. Katz, MFS
Maryland State Police
Forensic Science Division
Pikesville, MD

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 (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
Matthew R. Wood, PhD

9:00 a.m. - 9:30 a.m.  Module 2: Overview of FEPAC Process, Policies, and Procedures
Daniel E. Katz, MFS

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

10:45 a.m. - 11:15 a.m.  Module 5: Questions and Answers
Matthew R. Wood, PhD; Daniel E. Katz, MFS; Jeffrey K. Tomberlin, PhD

11:15 a.m. - 11:45 a.m.  Module 6: The Role of the On-Site Evaluator
Daniel E. Katz, MFS

11:45 a.m. - 12:15 p.m.  Module 7: Scenario and Evaluation
Matthew R. Wood, PhD; Daniel E. Katz, MFS; Jeffrey K. Tomberlin, PhD

12:15 p.m. - 12:45 p.m.  Questions and Answers
FEPAC Commissioners and Director of Accreditation
Registration Not Required — Pre-Registration Not Required — Open to All Meeting Attendees

Forensic Science in the Public Eye: Diversity, Research, and Communication

Tuesday, February 20, 2018 — 8:00 p.m. - 10:00 p.m.

Speakers

Chair:
Christine Funk, JD*
Saint Paul, MN

Lucy A. Davis, BHS
LDH Consultants, LLC
Pikeville, KY

Ryan Gabrielson*
ProPublica
Oakland, CA

Aretha Marshall, BA*
Peacock Productions NBC News
New York, NY

Kevin Oliver, BA*
WNorml
Seattle, WA

Anjali A. Ranadive, JD
SciLawForensics, Ltd
Brookings, SD

Michelle Richmond, BA*
New York City, NY

Educational Objective(s): The goal of this presentation is to provide information, based on the experience of national leaders in media, activism, and advocacy, regarding how the use of communication, research, and a commitment to diversity can move the objectives forward and enhance the view of forensic science in the public eye.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by revealing how the national news media and political activists influence public opinion. The community can apply the experiences, perspectives, and skills demonstrated to implement new methods of accurately presenting the work of forensic scientists in a manner lay people can understand.

Program Description: “A reporter, an activist, and a producer walk into a bar … ” Please join us for a slightly different twist on this year’s meeting theme, Science Matters. The focus of the AAFS 2018 program is diversity, research, and communication in forensic science. By tapping resources from other professions, this presentation seeks to broaden the understanding of how media plays a pivotal role in the general public’s perception of forensic science and the criminal justice system. This session’s speakers come to the table (or bar) bringing their unique experiences regarding how to communicate the work of forensic scientists, their research, and their diversity to affect change in society.

Ryan Gabrielson is a journalist with the independent, non-profit investigative newsroom ProPublica that was awarded the 2017 Pulitzer Prize for public service. Mr. Gabrielson won the 2009 Pulitzer Prize for stories that exposed how immigration enforcement in Maricopa County, AZ, undermined both emergency response and law enforcement investigations. Mr. Gabrielson’s reporting has called attention to the apparent failure of the criminal justice system to understand the difference between a presumptive roadside drug test kit and the certainty of confirmatory testing. This lack of communication between science, law enforcement, and the courts has resulted in countless people being unnecessarily detained, as well as documented cases of wrongful conviction. Mr. Gabrielson’s work has resulted in changes in policy and procedures in the criminal justice system throughout the country.
Pre-Registration Not Required — Open to All Meeting Attendees

Forensic Science in the Public Eye: Diversity, Research, and Communication

Aretha Marshall is an executive producer at Peacock Productions, NBC’s non-fiction production company, and is responsible for all aspects of talent development, casting for content, and programming. She previously worked as the managing editor for Dateline, winning the 2010 Emmy for Outstanding Coverage of a Breaking News Story in a News Magazine. Ms. Marshall’s recent work as Executive Producer of Booking on the History Channel’s Navy Seals: America’s Secret Warriors demonstrates the importance of having appropriate, knowledgeable people supplying facts to televised documentaries.

Kevin Oliver is a Washington state cannabis activist. Mr. Oliver is the executive director of the Washington state National Organization for the Reform of Marijuana Laws (NORML) and Political Action Committee (PAC). NORML’s mission is to move public opinion sufficiently to legalize the responsible use of marijuana. During his career, Mr. Oliver has relied on grassroots organizing and providing information, based on data and research, to achieve legal reform and to ensure that consumers have access to safe, convenient, and affordable marijuana. In advocating individual legal rights, law reform, and best practices, he brings a different perspective to the forensic science point of view of cannabis identification and toxicology.

Michelle Richmond is a television news producer specializing in legal, crime, and justice news shows. She provided editorial guidance and post-production review for such non-fiction programs as MSNBC’s O.J. Simpson Chasing Freedom and Lifetime’s JonBenet’s Mother: Victim or Killer to ensure the accuracy and quality of the productions. She also covered the Casey Anthony trail, analyzing witness testimony, motions, closing arguments, and jury instructions for news packages on Good Morning America, World News Tonight, and Nightline. Ms. Richmond routinely attends forensic conferences to develop storylines and content for news productions and brings in-depth knowledge regarding how forensic science is presented in the media.
Pre-Registration Not Required — Open to All Meeting Attendees

Wednesday
February 21, 2018 — 8:00 a.m. – 8:45 a.m.

A Quiz Game to Test Your Knowledge of AAFS

The AAFS 2018 Academy Cup will take place on Wednesday, February 21, 2018, before the Plenary Session. Teams meet at 8:00 a.m., an hour before the Plenary Session, for instructions and team strategy. The game will begin at 8:15 a.m. and consists of multiple-choice and true-or-false questions projected onto a screen to test each section’s knowledge.

Each section’s team is comprised of up to 11 members, including Past President/Past Vice President, Board Member and/or Officer, 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 at the YFSF Special Session. Teams will have 15 minutes to answer questions. Once all sections have turned in their answers, the answers to the questions will be presented.

The winning team will be announced and the 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 and should be available at the conclusion to have a group photo taken.

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

Academy Cup Committee:

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

Academy Cup Team Leaders:

Anthropology: Kate Spradley, PhD; Jennifer C. Love, PhD
Criminalistics: Vincent J. Desiderio, Jr., MS; Kristy Kadash, PhD
Digital & Multimedia Sciences: Marcus Rogers, PhD; Marla E. Carroll, BS
Engineering Sciences: Michelle R. Hoffman, MS; Darren Franck, MSME
General: Joanna L. Collins, MFS; Steven C. Clark, PhD
Jurisprudence: Stephanie Domitrovich, JD, PhD; Pamela A.W. King, JD
Odontology: Raymond G. Miller, DDS; Adam J. Freeman, DDS
Pathology/Biology: Joyce L. deJong, DO; James L. Caruso, MD
Psychiatry & Behavioral Science: Dean M. De Crisce, MD; Christopher R. Thompson, MD
Questioned Documents: Linton Mohammed, PhD; Jan Seaman Kelly, BA
Toxicology: Fiona J. Couper, PhD; Nikolas P. Lemos, PhD

Program:
8:00 a.m. - 8:15 a.m. Instructions, Introductions of Team Leaders, and Team Strategizing
8:15 a.m. - 8:30 a.m. PowerPoint® Questions and Team Answer Sheet Turned In
8:30 a.m. - 8:45 a.m. PowerPoint® Answers
Overview:
Forensic science is undergoing a dramatic shift. In contrast to just a few years ago when the role of the human examiner was basically non-existent as an issue in forensic science, today there is an understanding that the human examiner plays a critical role in forensic work. In most forensic domains, it is the human examiner who is the instrument of analysis, and the forensic result is dependent on his/her cognitive processing (e.g., perception, judgment, interpretation, and decision making). A whole range of cognitive issues underpin various aspects of forensic work, across many forensic disciplines. These are combined under the umbrella of the emerging field of cognitive forensics, the new frontier in forensic science. These include selection during recruitment, training, crime scene investigation, forensic decision making, verification, conflict resolution, reporting, the role of the forensic examiner, presentation in court, and judicial decisions. The scope and relevance of cognitive forensics will be presented, and the relevant research will be summarized to demonstrate its implication to forensic practice.

We are living in perilous times for science when ideological assertions are crowding out scientifically obtained evidence in public discussions of policy. This makes for perilous times for all undertakings that depend on evidence, including forensic science. The traditional American reverence for evidence is eroding. In much of public life, little distinction is made between opinion, wishful thinking, assertion, and methodically verified evidence. Nowhere is the importance of scientifically based evidence more important than in forensic methods and practice. Determinations derived through forensic methodology must be based on sound scientific process. When findings of guilt, innocence, or even life or death are poorly grounded in science, it is cause for alarm. In its 2009 Report, the National Research Council of the National Academies of Sciences, Engineering, and Medicine concluded that too often forensic science, as currently practiced, has “little systematic research to validate the discipline’s basic premises and techniques.” Fortunately, since 2009, there has been progress. The National Institute of Standards and Technology (NIST) has established the Organization of
Pre-Registration Not Required — Open to All Meeting Attendees

Science Matters

Overview cont.:

Scientific Area Committees (OSACs) to set standards for forensic practice. The American Association for the Advancement of Science (AAAS) has published thorough evaluations of the current status of fire investigation and latent fingerprint examination, pointing out gaps in our knowledge. In 2016, the President’s Council of Advisors on Science and Technology (PCAST) examined the strengths and weaknesses of six investigative techniques. The National Commission on Forensic Science, before its elimination, promoted important reform techniques in the criminal justice system. As part of the necessary effort to restore public appreciation of the value of evidence in public policy and judicial procedures, steps must be taken to ensure that all people involved in forensic science and practice understand the importance of establishing the validity and reliability of forensic techniques.

Program:

9:00 a.m. - 9:05 a.m.  Welcoming Remarks  
*AAFS President Betty Layne DesPortes, JD, MS*

9:05 a.m. - 9:30 a.m.  The Department of Justice’s Commitment to Advancing Forensic Science  
*Rod J. Rosenstein, JD*

9:30 a.m. - 10:20 a.m.  What Can Cognitive Neuroscience Contribute to Forensic Science?  
The New Cognitive Forensics  
*Itiel Dror, PhD*

10:20 a.m. - 11:10 a.m.  Show Me The Evidence  
*Rush D. Holt, PhD*

11:10 a.m. - 11:30 a.m.  Panel Discussion  
*Betty Layne DesPortes, JD, MS; Itiel Dror, PhD; Rush D. Holt, PhD*
REAKFAST SEMINARS

Pre-Registration Required — $50

Monday

#1 Analytical Thinking Skills: Essential Training for 21st-Century Forensic Scientists

February 19, 2018 7:00 a.m. - 8:30 a.m. .75 CE Hour

Mary Ellen O’Toole, PhD* Joseph A. DiZinno, DDS
George Mason University Alexandria, VA
Fairfax, VA

Educational Objective(s): The goals of this presentation are to: (1) provide attendees with an overview on creating a stand-alone analytical thinking course in graduate curriculums; (2) instruct attendees on structuring a course to address real-world forensic science problems; and, (3) inform attendees on teaching students a specific methodology to break down complex problems.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing students the skills for working in the field in the 21st century.

Forensic science can be considered a three-pronged science designed to train students in theory, research, and application; however, students can face particularly significant challenges without analytical thinking skills and understanding how to apply them to real-world forensic problems.

While analytical thinking skills are important for all scientists, they are particularly critical for forensic science students who must be able to comprehend complex scientific theories, principles, and methodologies, synthesize all of their knowledge, and apply it in real-world situations with unpredictable challenges. To complicate this challenge, many forensic scientists are regularly expected to testify, under oath in court, as to the analytical thinking process they applied to the problem. A weakness or flaw in their analytical thinking or in the application of the science to real-world problems, and the subsequent flawed or weak explanations to the trier of fact, could result in a serious appellate issue for the case, which could summarily damage or even end a young scientist’s career.1

Forensic scientists are also often asked to serve on multidisciplinary commissions, panels, etc., to collaborate on specific forensic science problems, identify causation, and recommend viable solutions.

Dr. Richard Bloom, a well-known psychologist and educator, created the Taxonomy of Educational Objectives Book, which identified levels of cognition ranging from basic comprehension of scientific theories and principles to much more complicated levels of cognition.1 Later revised, the book identified analytical thinking, creativity, and evaluation as the highest levels of cognition requiring specific teaching methodologies in order to develop and maintain these skills.2

In their 1992 paper presented at the annual meeting of the American Educational Research Association, Franklin and Theall noted that college instructors in soft disciplines utilized a wider range of teaching behaviors than those utilized by instructors in science disciplines.3 Twenty-two years later, Benton and Cashen opined that Science, Technology, Engineering, and Math (STEM) instructors relied predominately on lectures in their courses, rather than more advanced levels of instructional behaviors to help students reach higher levels of cognition, including analytical and creative thinking.4 This study conducted a review of ten forensic science graduate programs. Five programs were Forensic Science Education Programs Accreditation Commission (FEPAC) -accredited, and five were not. Results indicated none of these programs included a stand-alone analytical thinking course in their curriculums.

This presentation is designed to provide attendees with the structure, content, and outline to create a stand-alone analytical thinking course for graduate students in a forensic science program. Attendees will learn how to introduce students to analytical thinking concepts in a one-semester course.

*Presenting Author

(continued)
Part 1: Demonstrate how to break down a real-life forensic science problem into its most basic component parts in order to identify causation. Students will see that most real-life forensic science problems are complicated and multilayered, and they need a method to break the problem into manageable parts.

Part 2: Students will learn how to develop hypotheses to test causation using research methodologies, both qualitative and quantitative.

Part 3: Using a collaborative and multidisciplinary framework, students will learn how to use analytical and creative skills to identify relevant conclusions and, from those conclusions, develop creative but scientifically sound recommendations for solutions.

Currently, many graduate forensic science programs do not offer stand-alone analytical thinking courses. These skills are either not directly taught or are minimally covered in other courses. Without a solid understanding of analytical thinking skills, forensic science students are not being adequately equipped to face career challenges in the 21st century.

Reference(s):
Educational Objective(s): The goal of this presentation is to educate attendees on the processes that occur in the creation of a crime drama episode and why certain aspects of the “reality” of forensic science do not necessarily get translated to the screen. This presentation will discuss the real-life experiences of a forensic science consultant for such television shows as: *CSI: Crime Scene Investigation; CSI: Miami; Law and Order; BONES; Killer Instinct; Vanished; The Mob Doctor; Rizzoli and Isles; Drop Dead Diva; The Blacklist;* and, *Rosewood.* Clips from various episodes of these shows will be presented with a discussion on what is real and what is “Hollywood Real.” Attendees will be taken on a virtual tour of what happens in the writers’ room and on the set.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing attendees with a better understanding of the reason forensic science is portrayed in a certain manner on television crime dramas.

For the disciplines of forensic science, these television shows created a wave — perhaps a tsunami — of interest. Young people suddenly began to seriously look at career paths in forensic science. Colleges and universities began seriously looking at either creating or expanding programs in forensic science. During the 2000s, forensic science was in vogue. It was cool to work in a crime lab or be a crime scene investigator. Crime labs were seeing a tremendous uptick in applications for criminalist positions. Colleges and universities began to develop curricula to meet Forensic Science Education Program Accreditation Commission (FEPAC) guidelines. With success comes criticism, and, not surprisingly, the legal community and its allies in the legal educational community began their quest to diminish forensic science. The specter of the “CSI Effect” was raised because it was felt that forensic scientists, when testifying as expert witnesses, were seen as too believable by juries. Juries had unreasonable expectations when forensic science was not introduced in certain trials. Then, many disciplines were being questioned as to whether they were scientific or employing valid scientific techniques. Forensic science was now under the microscope.
For the past 17 years, I have served as a forensic consultant to such television shows as *CSI: Crime Scene Investigations*, *CSI: Miami*, *BONES*, *Rizzoli and Isles*, *Law and Order*, *Rosewood*, and *The Blacklist*, in addition to appearing on several forensic science-themed docudramas. As a television consultant, I would either respond to email questions from writers and producers, review scripts, work on-set advising the director or the set dresser, or explain how to perform a technique to the actors. While most of these shows have now been canceled, they do appear on cable television networks and appear to have a strong following. Binge watching these shows can be accomplished by live streaming or DVD rental. While no longer in the forefront of television series lineups, forensic science appears as an ancillary subject in television crime dramas, such as *The Blacklist* and *Lucifer*. So, to an extent, I still keep somewhat busy. Through the use of personal stories and video clips from some of these shows, this presentation will reveal both the real and farcical aspects of television crime dramas.
Educational Objective(s): The goal of this presentation is to reinforce the nature of science as transparent and objective. The legal system will ultimately turn to recognized criteria based in the scientific method and academic science to judge the utility and validation of forensic science. Forensic science can profit from associations that will quantify and qualify the limits of forensic examinations. This argues that there is no valid basis to resist examination of forensic science practice by traditional science and legal scholars.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating that it is ultimately the law and law-trained persons who determine the criteria for admissibility of forensic science evidence in court.

In 1923, the Frye case judged a challenge to a nascent technology purporting to detect deception in a subject. Frye held that evidence produced from novel techniques based in scientific supposition must be judged by the general acceptance of a relevant scientific community related to the technique in question to be admitted. Polygraphy was sidelined; “general acceptance by a relevant community” became a criterion for the admissibility of novel scientific evidence. Physiologists and psychologists were considered the relevant touchstone for “expert testimony deduced from the discovery, development, and experiments thus far made.” Polygraphy is still judged by these objective disciplines, but not so much the polygraphers themselves. The law has a suspicion of self-referenced validation.

In 2009 and 2016, failures of forensic claims to validity and reliability in their theories, applications, and results caused two blue-ribbon commissions to review the state of forensic science, and various pattern-matching disciplines specifically. In the latter, the President’s Council of Advisors on Science and Technology (PCAST) identified two gaps for these disciplines: (1) the need for clarity regarding the scientific standards for the validity and reliability of forensic methods; and, (2) the need to evaluate specific forensic methods to determine whether they have been scientifically established to be valid and reliable. It cast these concepts as “foundational validity” and “validity as applied.”

Forensic practitioners criticized these reports as reflecting the views of persons from outside the practice of forensic science. Citing “unprecedented (and unrelenting) challenges from legal professionals, research academics, and the popular press” promotes an idea that only those who practice the particular discipline can establish or judge its validity, not statisticians or scientists from academia, and most particularly, not lawyers. These critics do not recall that forensic science itself is a collection of applied disciplines whose goal is to explain case phenomena in ways relevant and helpful to a court. For years, forensic science escaped much critical evaluation because its genesis, practitioners, and proponents in court were, for the most part, on the same side. This changed in the 1990s when an academically validated and objective scientific technique — DNA analysis — was used not to convict, but exonerate persons who had been wrongfully convicted. In half of those cases, false and overstated forensic opinions contributed to the injustice. At that point, the legal profession began looking to objective scientific evaluation of claims to legitimacy to which some more subjective (i.e., pattern-matching) disciplines of forensic science laid claim. Prosecutors paid attention to avoid reversals and defense attorneys to call “foul” on unsupported testimony.
Wrongful convictions are a stain on the judicial system, which is self-policing. In cases in which trust in forensic science has been shaken, the law looks to established scientific practice to evaluate and change it. The Los Alamos National Laboratories teaches judges that foremost, science is an open process in which theories and methods must be open to testing by any interested party. The manner in which statistics can validate investigative conclusions compels the use of likelihood ratios, and expressions of limitations on conclusions become requisite to expert testimony. Academic scientists, therefore, inform us as to what validity, repeatability, and reliable process is, and what should be used in the important work of administering justice.

The practice and fate of the forensic sciences is in the hands of lawyers, who are its end consumers, and who are awakening to the need to validate forensic specialties that have been shown susceptible to bias, subjectivity, and lack of enforceable standards for practice. Admissibility of forensic results is in the hands of judges, who look to statisticians, behavioral scientists, and academic disciplines to quantify and qualify validity and reliability of forensic techniques and results. For forensic scientists to keep their research cards close to the vest ignores the open nature of science and sacrifices collaboration with academic scientists to develop acceptable standards for the practice. Forensics’ validity in court can be admitted as valid and reliable within its limits, so long as the limits are properly expressed. A bunker mentality that closes out scrutiny and validation can only result in the march of the law going around the bunker.

Reference(s):
5. Id., Note 4 at x.
7. E.g., United States v. Monteiro, 407 F. Supp. 2d 351 (D. Mass. 2006) (holding although tool mark analysis is sufficiently valid and reliable to be admissible, the expression of results was not in accord with standards and was excluded).
Thursday

#4 YFSF’s Wake Up to Professional Development … and Bacon!

February 22, 2018

Pre-Registration Required — $50

7:00 a.m. - 10:00 a.m.

.75 CE Hour

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

Amanda L.A. Mohr, MSFS*
The Center for Forensic Science Research & Education
Willow Grove, PA

Barbara L. Hovanec*
NMS Labs
Willow Grove, PA

Brianna B. Bermudez, BS
Albuquerque, NM

**Educational Objective(s):** After attending this presentation, attendees will have gained knowledge pertaining to professional development and understand how to better prepare themselves for a career in forensic science. Additionally, attendees will be informed of practical applications by professionals established within several disciplines of forensic science.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by educating young scientists on the importance of personal and professional developments and on the positive effects they can have on the forensic science community. This breakfast seminar provides students and scientists with the opportunity to network with professionals in a unique setting that focuses on bridging the gap between established professionals and young scientists, both in higher education and in the beginning of their careers.

The Young Forensic Scientists Forum (YFSF) Breakfast Session is a morning session that will leave attendees motivated and enthusiastic about their future successes and accomplishments. This session will focus on bridging the gap between academics and early career growth. The goal is to provide young forensic scientists, whether students, near-graduates, or recent employees, with practical skills and knowledge associated with this transition period. Topics of interest will include the application and interview processes, early success and development as a scientist in a respective field, and the overall feelings and emotions that can often overwhelm young scientists. The speaker presentations will conclude with an open Q & A session, where attendees will be able to interact with the speakers to gain additional information.

The YFSF Breakfast Session will conclude, as always, with the popular résumé review session, pioneered by Academy scientists and peers from across several disciplines and career paths. This session is a rare opportunity for young professionals and students to discuss and improve their résumés with established professionals and leaders in the fields of forensic science. Attendees will sit down one-on-one with résumé reviewers to gain imperative knowledge regarding important aspects and areas to highlight or improve upon within their achievements and qualifications.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 a.m.</td>
<td>YFSF Breakfast and Introductions</td>
</tr>
<tr>
<td></td>
<td><em>Alex J. Krotulski, MS</em></td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>Self-Marketing and Early Management: Applying and Interviewing for Your First Job</td>
</tr>
<tr>
<td></td>
<td><em>Barbara L. Hovanec</em></td>
</tr>
<tr>
<td>8:20 a.m.</td>
<td>Starting Your Career on a Successful Note: Growth and Development as an Early Professional</td>
</tr>
<tr>
<td></td>
<td><em>Amanda L.A. Mohr, MSFS</em></td>
</tr>
<tr>
<td>8:40 a.m.</td>
<td>Questions and Answers</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>Résumé Review</td>
</tr>
</tbody>
</table>

*Presenting Author
**BREAKFAST SEMINARS**

*Pre-Registration Required — $50*

**Friday**

#5  **The Making of an Opioid Crisis in America? Why Research, Policy, and Practice Matter**

<table>
<thead>
<tr>
<th>February 23, 2018</th>
<th>7:00 a.m. - 8:30 a.m.</th>
<th>.75 CE Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Andrew M. Baker, MD</strong>*</td>
<td>Michael F. Rieders, PhD***</td>
<td></td>
</tr>
<tr>
<td>Hennepin County Medical Examiner’s Office</td>
<td>NMS Labs</td>
<td></td>
</tr>
<tr>
<td>Minneapolis, MN</td>
<td>Willow Grove, PA</td>
<td></td>
</tr>
<tr>
<td><strong>Sabra R. Botch-Jones, MS, MA</strong>*</td>
<td>Jeri D. Ropero-Miller, PhD***</td>
<td></td>
</tr>
<tr>
<td>Boston University School of Medicine</td>
<td>RTI International</td>
<td></td>
</tr>
<tr>
<td>Biomedical Forensic Sciences</td>
<td>Research Triangle Park, NC</td>
<td></td>
</tr>
<tr>
<td>Boston, MA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bruce A. Goldberger, PhD</strong>*</td>
<td>Agnes D. Winokur, MS***</td>
<td></td>
</tr>
<tr>
<td>University of Florida College of Medicine</td>
<td>DEA/Southeast Laboratory</td>
<td></td>
</tr>
<tr>
<td>Gainesville, FL</td>
<td>Miami, FL</td>
<td></td>
</tr>
<tr>
<td><strong>Barry K. Logan, PhD</strong>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NMS Labs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Center for Forensic Science Research &amp; Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willow Grove, PA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Educational Objective(s):** After attending this presentation, attendees will be able to analyze and discuss the features and characteristics of the opioid crisis in the United States. Attendees will also be able to summarize successful implementation of policies and practices at the federal, state, and local levels.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing an open forum for forensic practitioners of many disciplines to discuss the impacts of the opioid crisis to the criminal justice system and how improved reporting, surveillance, research, analytical testing, technology, and policy can help mitigate the challenges of use and misuse of these drugs.

Nearly three million Americans reported a substance use disorder to prescription pain relievers or heroin in 2015, fueling a steady increase in fatalities to an estimated 91 United States deaths daily. These rates are not slowing. In fact, alarming increases in 2015 also resulted in drug overdoses becoming the leading cause of accidental death in the United States, with more than half attributed to heroin and prescription pain relievers (33,091 of 52,404 total drug overdoses). Effective strategies begin with understanding the factors that drive the interrelated problems our nation faces with the ever-increasing opioid crisis in public health and the criminal justice system.

Law enforcement, medical professionals, laboratories, and legal agencies are battling with unmanageable caseloads, economic shortfalls, and challenges for safety, analytical preparedness, and basic education and training. Confronted with the fast-paced emerging drug life cycles, reliable surveillance and intelligence are needed more than they have ever been. The legislative quagmire is just as burdensome, as policy change cannot happen without the data to support change.

This breakfast seminar is an ongoing effort of the National Institute of Justice’s Forensic Technology Center for Excellence and the American Academy of Forensic Sciences Synthetic Opioids Ad Hoc Committee to heighten awareness in our communities and encourage working together to bring about necessary research and positive changes to policy and practice. This seminar will offer...
a multifaceted perspective to the manner in which diverse criminal justice disciplines are addressing these challenges, sharing their knowledge, and advancing science, technology, and law. Dealing with the impacts of the opioid crisis to the criminal justice system requires better reporting, surveillance, research, technology, and policy than are currently in use. This type of forum is the kind of effective public safety strategies identified by the National Governors Association to reduce the illicit supply of and demand for opioids by implementing best practices and ensuring inter-governmental cooperation in criminal and death investigations, as well as establishing and enhancing stakeholder coalitions.² The need to understand the epidemic and its effects goes beyond knowing your own profession — it takes a global perspective to fully act and make a difference.

Reference(s):


LUNCHEON SEMINARS

Pre-Registration Required — $55

Thursday

#1 Post-Conviction DNA Testing in an Ever-Advancing DNA World

February 22, 2018 12:00 p.m. - 1:30 p.m. 1.0 CE Hour

Lisa Mertz, MS*
Office of the Chief Medical Examiner
Department of Forensic Biology
New York, NY

Rachel S. Singer, JD*
Kings County District Attorney’s Office
Brooklyn, NY

Heather Nelson, MS*
Office of the Chief Medical Examiner
New York, NY

Educational Objective(s): After attending this presentation, attendees will better understand the complexities and challenges faced in processing post-conviction DNA cases and will be presented with real-life case examples.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showcasing the need for the continued processing of post-conviction cases so forensic science can, through the development and deployment of new technologies, continue to serve both the criminal justice system and society.

DNA testing has become one of the most important forensic tools available in solving, prosecuting, and preventing crime. It is relied upon heavily in the justice system to aid in convicting the guilty and freeing the innocent; however, the usefulness of DNA testing has only been routinely demonstrated within the past decade because of advancements in DNA technology. Such advancements have led to a renewed interest in wrongful convictions. This interest is especially strong in those cases in which convictions are based solely on eyewitness accounts. With the implementation of new DNA technology, physical evidence at crime scenes can be reassessed to see what is possible in terms of examining evidence for biological fluids and/or biological material.

Post-conviction investigations face many of the same basic challenges as new investigations in terms of DNA testing; however, there are additional complexities. Processing a post-conviction case involves greater cooperation among law enforcement, the crime laboratory, and the district attorney’s office. This is due to the fact that simply locating the items of evidence to be processed can be both time-consuming and challenging. Just as time-consuming and challenging is locating previous reports and previous laboratory testing results. From past reports and considering previously tested and untested pieces of evidence, if they are found, the crime laboratory can make a determination as to what DNA testing or additional testing is now plausible. Challenges are then faced in the processing of evidence that is old and may only result in the recovery of degraded DNA. Difficulties also arise when dealing with items of evidence that may have been unknowingly contaminated at the scene in a pre-DNA world where there was less emphasis on proper protective equipment. A DNA profile may be able to be recovered from the item of evidence tested; however, obtaining these elimination samples from witnesses or law enforcement personnel, who may have come into contact with the item, may be impossible. Oftentimes, processing post-conviction cases can encounter obstacles in obtaining funding. Laboratories are frequently backlogged with current cases and often do not have the funding to look back, vet, and process old cases.

With all the hurdles faced by crime laboratories, several post-conviction cases remain dormant, their probative evidence locked in unprocessed DNA to this day. The wrongfully convicted continue to serve their sentences in jail, harboring the hope that DNA will one day help them in their quest for justice. Similarly, the families of victims of violent crimes, in too many instances, remain deprived of the closure of knowing the true identities of actual perpetrators. This Luncheon Seminar will present post-conviction case examples that will highlight the challenges faced in processing such cases. This seminar will also showcase the need for the continued processing of post-conviction cases so forensic science can, through the development and deployment of new technologies, continue to serve the criminal justice system and society.

*Presenting Author
LUNCHEON SEMINARS

Pre-Registration Required — $55

Friday

#2 Understanding the Impact of Human Factors on Forensic Science: Case Studies in Fingerprint and Handwriting Examination

February 23, 2018 12:00 p.m. - 1:30 p.m. 1.0 CE Hour

Ted M. Burkes, BS*
Federal Bureau of Investigation Laboratory
Quantico, VA

David Kaye, JD*
Penn State Law
University Park, PA

Melissa Gische, MFS*
Federal Bureau of Investigation
Quantico, VA

Melissa K. Taylor, BA*
Gaithersburg, MD

Emily J. Will, MA*
Raleigh, NC

Educational Objective(s): After attending this presentation, attendees will better understand: (1) the general themes of human factors and organizational theory; and, (2) the findings and recommendations of the Expert Working Groups on Human Factors in Latent Print and Handwriting Examinations.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by helping forensic professionals understand the impact of human factors on every aspect of the evidence examination process.

Forensic science plays a vital role in the criminal justice system by providing scientifically based information through the analysis of physical evidence; however, several high-profile cases in the United States and abroad have highlighted the fact that human errors can occur. Human error is an inevitable part of everyday life; however, in certain endeavors, such as forensic analysis, in which errors may lead to the loss of life or liberty, error prevention is imperative. Human factors analysis can advance the understanding of the nature of errors in complex work settings. The study of human factors is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system and is the profession that applies theory, principles, data, and other methods to design in order to optimize human well-being and overall system performance. The forensic science community can benefit from the application of the substantial body of human factors research to advance the understanding of the nature of errors, enhance productivity and quality in forensic examinations, and reduce the consequences and likelihood of human error in the interpretation of evidence.

The National Institute of Justice and the National Institute of Standards and Technology have partnered to sponsor a series of expert working groups to examine the effects of human factors in forensic analyses and recommend practices to reduce the likelihood of error. Each discipline-specific working group will be comprised of experts from relevant forensic disciplines, statisticians, psychologists, researchers, and other scientific experts, in addition to representatives from the legal community, professional organizations, and other identified stakeholder groups. To date, reports, including recommendations, have been published in the areas of fingerprint and handwriting examinations. The next working groups in this series will focus on DNA mixture interpretation and tool mark examinations.

This presentation will provide the general themes of human factors and organizational theory. The findings and recommendations of the Expert Working Groups on Human Factors in Latent Print and Handwriting Examinations will be presented. A range of issues affecting forensic science disciplines in the areas of work environment, training, emerging technology, and research needs will also be covered.

This presentation will further assist forensic examiners in understanding the purposes and value of reporting and documenting examinations and will provide recommendations for standardizing the content of these materials. Presenters will discuss methods to improve trial and pretrial communications between relevant parties — the experts, lawyers, judges, and juries.

*Presenting Author
#1  Proposed Revisions to the Federal Bureau of Investigation (FBI) Quality Assurance Standards — DNA

Monday, February 19, 2018  8:30 a.m. – 12:00 p.m.  3.25 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will be informed of the proposed changes to the FBI Quality Assurance Standards for Casework and Databasing laboratories. Laboratory personnel will be aware of any changes to policies and procedures that may be necessary in order to comply with the new standards.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing an opportunity to learn about the proposed changes to these quality standards in advance. All National DNA Index System (NDIS) -participating laboratories are required to adhere to and be audited against the revised standards when these standards become effective.

**Program Description:** This session is being offered as an opportunity to learn about the proposed changes to the FBI Quality Assurance Standards that all NDIS-participating DNA casework and database labs must meet. These standards have not been substantially updated since 2009, but the methods, technologies, and interpretation approaches have certainly evolved in that time. The presenters will highlight all changes and focus on areas that may have the greatest impact on laboratory work and management practices. This session provides an advance notice to the community of the revised standards before they take effect.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>Introduction, History, and Overview of FBI Quality Assurance Standards</td>
</tr>
<tr>
<td></td>
<td><em>Jocelyn R. Carlson, MS; Kristy Kadash, PhD</em></td>
</tr>
<tr>
<td>8:40 a.m.</td>
<td>Standards 3 Through 6</td>
</tr>
<tr>
<td></td>
<td><em>Jocelyn R. Carlson, MS; Kristy Kadash, PhD</em></td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>Standards 7 Through 10</td>
</tr>
<tr>
<td></td>
<td><em>Jocelyn R. Carlson, MS; Kristy Kadash, PhD</em></td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td>Break</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>Standards 11 Through 14</td>
</tr>
<tr>
<td></td>
<td><em>Jocelyn R. Carlson, MS; Kristy Kadash, PhD</em></td>
</tr>
<tr>
<td>11:25 a.m.</td>
<td>Standards 15 Through 17</td>
</tr>
<tr>
<td></td>
<td><em>Jocelyn R. Carlson, MS; Kristy Kadash, PhD</em></td>
</tr>
</tbody>
</table>

**Targeted Audience:** Criminalistics

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

**Expected Handout Length:** 10 Pages
#2 Heavy Petting: A Forensic Expert’s Guide to Bestiality and Zoophilia

**Educational Objective(s):** After attending this presentation, attendees will understand the history of human-animal sexual intercourse in various cultures across time as well as the development of law around the world to prosecute this behavior. Attendees will learn current conceptualizations of bestiality and the related diagnosis of zoophilia from the psychiatric perspective. Lastly, attendees will be able to describe current approaches to the evaluation of bestiality cases from the point of view of a forensic pathologist and law enforcement officer.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by improving the understanding of bestiality, a rarely discussed sexual behavior, and its relevance to the fields of forensic mental health, forensic pathology, and criminal investigation.

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

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

**Faculty:**
John Allgire, BS  
Whatcom County Sheriff’s Office  
Bellingham, WA

Sara Moore, PsyD  
Institute for Sexual Wellness  
Weymouth, MA

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

Renee Sorrentino, MD  
Institute for Sexual Wellness  
Weymouth, MA

Brian J. Holoyda, MD  
Saint Louis University  
Department of Psychiatry & Behavioral Neuroscience  
St. Louis, MO

**Program Description:** This multidisciplinary session featuring forensic mental health experts, a forensic pathologist, and a law enforcement officer will educate attendees about bestiality (i.e., human-animal sexual intercourse). The history of bestiality across cultures, as well as the development of legislation to prosecute this behavior will be described. The body of literature on individuals who engage in bestiality will be reviewed, providing practical recommendations for psychiatric and medical evaluation and treatment. The Enumclaw horse sex case will be reviewed from a forensic pathologist’s perspective and current practices and examples of the forensic investigation of such cases will be described.

(continued)
#2  Heavy Petting: A Forensic Expert’s Guide to Bestiality and Zoophilia

**Pre-Registration Required — $100 w/registration; $125 workshop only**

## Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m. - 8:55 a.m.</td>
<td>Historical and Cultural Background</td>
<td>Sara Moore, PsyD</td>
</tr>
<tr>
<td>8:55 a.m. - 9:25 a.m.</td>
<td>Evaluation and Treatment</td>
<td>Renee Sorrentino, MD</td>
</tr>
<tr>
<td>9:25 a.m. - 9:55 a.m.</td>
<td>Bestiality and the Law</td>
<td>Brian J. Holoyda, MD</td>
</tr>
<tr>
<td>9:55 a.m. - 10:25 a.m.</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:25 a.m. - 10:55 a.m.</td>
<td>Ethical Issues</td>
<td>Susan Hatters-Friedman, MD</td>
</tr>
<tr>
<td>10:55 a.m. - 11:20 a.m.</td>
<td>Bestiality and Forensic Pathology</td>
<td>Carl Wigren, MD</td>
</tr>
<tr>
<td>11:20 a.m. - 12:05 p.m.</td>
<td>Criminal Investigation of Bestiality Cases</td>
<td>John Allgire, BS</td>
</tr>
</tbody>
</table>

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

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

**Expected Handout Length:** 6 Pages
#3  Alternate Light Source (ALS) Photography: Ultraviolet (UV), Infrared Radiation (IR), Lights, and Filters

Pre-Registration Required — $100 w/registration; $125 workshop only

## Educational Objective(s):
After attending this presentation, attendees will understand how to properly image trace evidence by ALS, utilizing a Digital Single Lens Reflex (DSLR) cameras, ALS kits, and filters.

## Impact on the Forensic Science Community:
Professionals charged with processing crime scenes and forensic evidence are often expected to understand, but are not properly trained in, the use of ALS, including UV and IR. This presentation will impact the forensic science community by providing a broad understanding of the capabilities of standard and modified DSLR cameras in their ability to image evidence outside the visible spectrum.

### Chair:
David G. Pauly, MFS  
Methodist University Forensic Science Program  
TruForensics, LLC  
Fayetteville, NC

### Co-Chair:
Mark Vecellio, MFS  
Sanford, NC

### Faculty:
David Alford, BS  
Sirchie  
Youngsville, NC  

Steven L. Downs, MFS  
Methodist University  
Applied Forensic Science  
Fayetteville, NC  

### Program Description:
While most crime scene and evidence photography is conducted in the visible spectrum of light, much of the most valuable evidence (biological fluids, trace hair/fibers, firearms/explosive residue, inks, etc.) must be visualized and thus imaged outside of the visible spectrum. This ALS photography session will expose attendees to UV and IR photography through instruction and hands-on practical exercises on the use of DSLR cameras, ALS, and specialized filters.

### Program:

<table>
<thead>
<tr>
<th>Time</th>
<th>Activities</th>
</tr>
</thead>
</table>
| 8:30 a.m.  | Visible Light Photography Review and Tour of DSLR  
*David G. Pauly, MFS* |
| 9:00 a.m.  | ALS — Background  
*Dyer Bennett, MS* |
| 9:30 a.m.  | Exercise: Search and Image Bodily Fluids With UV/ALS  
*David Alford, BS* |
| 10:15 a.m. | Break |
| 10:30 a.m. | Exercise: Imaging Latent Prints and Trace Evidence Using UV and ALS  
*Mark Vecellio, MFS; Steven L. Downs, MFS* |
| (continued) | |

(continued)
Pre-Registration Required — $100 w/registration; $125 workshop only

#3 Alternate Light Source (ALS) Photography: Ultraviolet (UV), Infrared Radiation (IR), Lights, and Filters

Program cont.:

11:15 a.m. - 11:45 a.m. Exercise: IR to Image Blood and Gun Shot Residue (GSR) on Dark Surfaces
\hspace{1cm} Dyer Bennett, MS; Steven L. Downs, MFS

11:45 a.m. - 12:15 p.m. Exercise: Documents Under UV, IR, and ALS
\hspace{1cm} David G. Pauly, MFS; Dyer Bennett, MS;

12:15 p.m. - 12:30 p.m. Questions and Answers
\hspace{1cm} David G. Pauly, MFS; Mark Vecellio, MFS; Dyer Bennett, MS; David Alford, BS;
\hspace{1cm} Steven L. Downs, MFS

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

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

Expected Handout Length: 12 Pages

Participants are encouraged to bring a work or personal camera to the workshop.
#4 Applications of Raman Spectroscopy for Trace Evidence Examinations

Monday, February 19, 2018 8:30 a.m. – 12:30 p.m. 3.25 CE Hours

Educational Objective(s): This presentation focuses on applications of Raman spectroscopy for the analysis of various types of materials that may be encountered as trace evidence. This presentation is intended to provide trace evidence examiners with a better understanding of this underutilized analytical method, which has seen significant developments in instrument technology in the past couple of decades. After attending this presentation, attendees will gain: (1) a better understanding of the theory, principles, and instrumentation of Raman spectroscopy; and, (2) a greater appreciation of Raman spectroscopy’s capabilities and limitations for the characterization, comparison, and identification of various types of trace evidence.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by increasing participant knowledge and information as well as providing a framework upon which examiners can better utilize this method for casework and to correctly interpret the spectral data of their evidence.

Chair:
Christopher S. Palenik, PhD
Microtrace
Elgin, IL

Co-Chair:
Edward M. Suzuki, PhD
Washington State Patrol Crime Lab
Seattle, WA

Faculty:
Andrew M. Bowen, MS
United States Postal Inspection Service
Dulles, VA

Patrick Buzzini, PhD
Sam Houston State University
Chemistry/Forensic Science Building
Huntsville, TX

Program Description: The applications of Raman spectroscopy for the analysis of trace evidence are presented in this session, which emphasizes spectral interpretation. This technique has seen several significant instrument developments recently, which have served not only to make it more sensitive, but also more applicable to the wide variety of materials that may be examined as evidence. Because it requires little sample preparation, permits very small areas to be probed in a non-destructive manner, provides structural information about analytes, and produces data that complements those obtained using traditional methods, Raman spectroscopy is ideally suited for the examination of certain types of trace evidence.

Program:

8:30 a.m. - 9:20 a.m.
Principles of Raman Spectroscopy — A Comparison of Infrared and Raman Methods of Analysis
Edward M. Suzuki, PhD

9:20 a.m. - 9:30 a.m.
Break

9:30 a.m. - 10:20 a.m.
The Identification and Classification of Pigments, Nanoparticles, and Other Fine Traces in Forensic Casework
Christopher S. Palenik, PhD

10:20 a.m. - 10:40 a.m.
Break

(continued)
WORKSHOPS

Pre-Registration Required — $100 w/registration; $125 workshop only

#4 Applications of Raman Spectroscopy for Trace Evidence Examinations

Program cont.:

10:40 a.m. - 11:30 a.m. The Complementary Nature of Raman Micro-Spectroscopy and Polarized Light
Andrew M. Bowen, MS

11:30 a.m. - 11:40 a.m. Break

11:40 a.m. - 12:30 p.m. The Characterization and Discrimination of Textile Fiber Dyes
Patrick Buzzini, PhD

Targeted Audience: Criminalistics, Engineering Sciences, General, Questioned Documents

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

Expected Handout Length: 25 Pages
#5 Ohio’s Assertive Approach to Scheduling Opioids and Fentanyl Analogs

**Monday, February 19, 2018**

8:30 a.m. – 12:30 p.m.

3.5 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will: (1) recognize the role of state government in the scheduling of drugs; (2) understand the importance of rapid scheduling of drugs for law enforcement purposes; (3) identify the parts of the molecular structure of drugs that are responsible for pharmacological interactions; and, (4) realize the importance of communication and cooperation between forensic laboratories and government entities.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing an in-depth examination of how one state is combating the opioid epidemic.

**Chair:**
Douglas E. Rohde, MS
Lake County Crime Laboratory
Painesville, OH

**Co-Chair:**
Eric S. Lavins, BS
Cuyahoga County Medical Examiner’s Office
Toxicology Department
Cleveland, OH

**Faculty:**

**Joseph A. Felo, DO**
Cuyahoga County Medical Examiner’s Office
Cleveland, OH

**Jon E. Sprague, PhD**
Center for the Future of Forensic Science
Bowling Green State University
Bowling Green, OH

**Erin C. Reed, JD**
State of Ohio Board of Pharmacy
Columbus, OH

**Stanton W. Wheasler, BS**
Ohio Bureau of Criminal Investigation
London, OH

**Program Description:** This workshop will highlight several forensic disciplines and their integrated response to the opioid epidemic in Ohio. Session topics will include a review of opioid deaths, the legal processes of drug scheduling on a state level, identification of fentanyl analogs in toxicology and drug chemistry casework, and pharmacophore definition and application in drug scheduling.

**Program:**

- 8:30 a.m. - 8:45 a.m. Welcome and Overview  
  *Douglas E. Rohde, MS; Eric S. Lavins, BS*

- 8:45 a.m. - 9:00 a.m. U-47700 Identification in a Fatality  
  *Douglas E. Rohde, MS*

- 9:00 a.m. - 10:00 a.m. Emergency Scheduling of U-47700  
  *Erin C. Reed, JD*

- 10:00 a.m. - 10:15 a.m. Fentanyl Analogs in Postmortem Examinations  
  *Joseph A. Felo, DO*

(continued)
#5  Ohio’s Assertive Approach to Scheduling Opioids and Fentanyl Analogs

Program cont.:

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

10:30 a.m. - 10:45 a.m.  Fentanyl Analogs in Toxicology Examinations  
  Eric S. Lavins, BS

10:45 a.m. - 11:00 a.m.  Fentanyl Analogs in Drug Chemistry Examinations  
  Stanton W. Wheasler, BS

11:00 a.m. - 12:00 p.m.  The Pharmacophore Rule for Fentanyl Analogs  
  Jon E. Sprague, PhD

12:00 p.m. - 12:15 p.m.  Ohio’s Continued Response  
  Erin C. Reed, JD

12:15 p.m. - 12:30 p.m.  Questions and Answers  
  Douglas E. Rohde, MS; Eric S. Lavins, BS; Erin C. Reed, JD; Jon E. Sprague, PhD; 
  Joseph A. Felo, DO

Targeted Audience: Criminalistics, Jurisprudence, Pathology/Biology, Toxicology

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

Expected Handout Length: 85 Pages
#6  Machine-Readable Technologies in Travel and Identity Documents

Monday, February 19, 2018  
8:30 a.m. – 4:30 p.m.  
6.25 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will understand how contemporary machine-readable technologies used in travel and identity documents function and the circumstances under which the encoded data can be accessed using software and/or hardware readers.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by describing novel travel and identity documents examination methods that revolve around document reader technology instead of microscopic and other conventional methods for the examination of questioned documents.

**Chair:**  
Linda L. Mitchell, BS  
Forensic QDE Lab, LLC  
Escondido, CA

**Co-Chair:**  
Linton Mohammed, PhD  
Forensic Science Consultants, Inc  
Burlingame, CA

**Faculty:**  
Joel A. Zlotnick, MSFS  
United States Department of State  
Washington, DC

**Program Description:** Passports, visas, birth records, identity cards, and other identity and travel documents have been manufactured with a diverse array of machine-readable technologies that are capable of very different functions. These include optical character recognition fonts, machine-readable text zones, magnetic stripes, barcodes, optical strips, and both contact and contactless smart chips. Many machine-readable features can be decoded using inexpensive equipment ranging from small magnetic stripe readers to commercial barcode software to a variety of smartphone applications. The goals of this session are to describe the basics of machine-readable document technologies and to outline some straightforward methods for accessing machine-readable document features using low-cost techniques.

**Program:**

- **8:30 a.m. - 9:20 a.m.**  
  Introduction and Magnetic Stripes  
  Joel A. Zlotnick, MSFS

- **9:20 a.m. - 9:30 a.m.**  
  Break

- **9:30 a.m. - 10:20 a.m.**  
  Barcodes and Optical Stripes  
  Joel A. Zlotnick, MSFS

- **10:20 a.m. - 10:30 a.m.**  
  Break

- **10:30 a.m. - 11:30 a.m.**  
  Smart Cards and Radio Frequency Identification  
  Joel A. Zlotnick, MSFS

- **11:30 a.m. - 12:30 p.m.**  
  Lunch
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#6 Machine-Readable Technologies in Travel and Identity Documents

Program cont.:

12:30 p.m. - 1:20 p.m.  The Technical Evolution of Passports
Joel A. Zlotnick, MSFS

1:20 p.m. - 1:30 p.m.  Break

1:30 p.m. - 2:20 p.m.  Public Key Cryptography and Electronic Security
Joel A. Zlotnick, MSFS

2:20 p.m. - 2:30 p.m.  Break

2:30 p.m. - 3:20 p.m.  REAL ID, Enhanced Driver’s Licenses, and Trusted Traveler Program Cards
Joel A. Zlotnick, MSFS

3:20 p.m. - 3:30 p.m.  Break

3:30 p.m. - 4:30 p.m.  International Cards, e-Government, and Course Summary
Joel A. Zlotnick, MSFS

Targeted Audience:  Questioned Documents

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

Expected Handout Length:  100 Pages
#7 Data Standards, Archiving, and Analytics in Forensic Anthropology

**Educational Objective(s):** After attending this presentation, attendees will understand the benefits of a unified data architecture and ontology of forensic anthropology data, which enables the development and implementation of software applications for data analytics. Attendees of this session will join a community of users and will gain access to open source software for recording and managing biometric data in forensic anthropology.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing access to an ecosystem of software applications for forensic anthropology that facilitates casework analyses. Casework efficiencies are realized through a common ontology, enabling data sharing and opportunities for new methods. The ecosystem of applications is based on open source software that fosters collaboration and community engagement via appropriate interfaces and Application Programming Interfaces (APIs).

**Chair:**
Franklin E. Damann, PhD  
Defense POW/MIA Accounting Agency  
Central Identification Laboratory  
Offutt AFB, NE

**Co-Chair:**
Nicholas P. Herrmann, PhD  
Texas State University  
Department of Anthropology  
San Marcos, TX

**Faculty:**
Felix Engel, MA  
Albert Ludwigs University Freiburg  
Freiburg, GERMANY

Sachin Pawaskar, PhD  
University of Nebraska Omaha  
Omaha, NE

Alexandria Frye, MA  
San Marcos, TX

Stefan Schlager, PhD  
Albert Ludwigs University Freiburg  
Freiburg, GERMANY

Jeffrey James Lynch, MSc  
Omaha, NE

Carl M. Stephan, PhD  
The University of Queensland  
School of Biomedical Sciences  
Saint Lucia, AUSTRALIA

**Program Description:** Presentations of a unified data architecture and ontology for recording and managing biometric data in forensic anthropology will be presented in this session.
#7 Data Standards, Archiving, and Analytics in Forensic Anthropology

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter(s)</th>
</tr>
</thead>
</table>
| 8:30 a.m.  - 9:45 a.m. | Information Management, Project Pipelines, and the Commingled Remains and Analytics Platform  
Sachin Pawaskar, PhD |                                                                                       |
| 9:45 a.m.  - 10:00 a.m. | Break                                                                                     |                                                        |
| 10:00 a.m. - 11:30 a.m. | Knowledge Management and Ontology of Forensic Anthropology Research Data From Texas State  
Felix Engel, MA; Stefan Schlager, PhD |                                                                                       |
| 11:30 a.m. - 12:30 p.m. | Hands-On Exercise: The R-Programming Environment and Its Application to Biometric Data and Analytics in Forensic Anthropology  
Sachin Pawaskar, PhD; Carl N. Stephan, PhD |                                                                                       |
| 12:30 p.m. - 1:30 p.m. | Lunch                                                                                     |                                                        |
| 1:30 p.m.  - 2:00 p.m. | Skelet-O Matic: A Macro-Enabled Inventory Application  
Carl N. Stephan, PhD |                                                                                       |
| 2:00 p.m.  - 3:00 p.m. | Osteosort: Lecture, Demonstration, and Hands-On Tutorial  
Jeffrey James Lynch, MSc |                                                                                       |
| 3:00 p.m.  - 3:15 p.m. | Break                                                                                     |                                                        |
| 3:15 p.m.  - 4:15 p.m. | FORDISC® Updates and Demonstration  
Stephen D. Ousley, PhD |                                                                                       |
| 4:15 p.m.  - 5:00 p.m. | TDStats for Automating Facial Soft Tissue Thickness Analysis  
Carl N. Stephan, PhD |                                                                                       |

**Targeted Audience:** Anthropology, General, Odontology, Pathology/Biology

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

**Expected Handout Length:** 50 Pages

*Attendees should bring their own laptop or tablet for participation in the workshop.*
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#8 Innovative Teaching With Active Learning Methods — Implementation in Forensic Science Education

Monday, February 19, 2018 8:30 a.m. – 5:00 p.m. 6.5 CE Hours

Educational Objective(s): After attending this presentation, attendees will be able to: (1) describe general principles of learning, including examples related directly to scientific disciplines; (2) identify and describe a variety of active learning methods; (3) distinguish between active and non-active learning methods; (4) cite examples of useful teaching methods dependent on the environment; (5) evaluate innovative teaching styles that could be incorporated into their classroom; and, (6) generate lesson plans that could be integrated into their classroom.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by exploring a variety of teaching strategies to gain insight into a broader scope of active learning methods useful in forensic science teaching. Attendees will learn how these teaching methods can help forensic science instructors adapt their lesson plans to rapidly changing learning environments. By discussing multiple learning techniques and the application of teaching methods in forensic science education, attendees will be able to incorporate new tools into their forensic science classroom.

Chair: Amy N. Brodeur, MFS
Boston University School of Medicine
Biomedical Forensic Sciences
Boston, MA

Co-Chair: Matthew R. Wood, PhD
Ocean County Sheriff’s Department
Forensic Science Laboratory
Toms River, NJ

Faculty:
Adrienne L. Brundage, PhD
Bryan, TX

Sandra Haddad, PhD
Bay Path University
Longmeadow, MA

Gina Londino-Smolar, MS
Indiana University – Purdue University Indianapolis
Indianapolis, IN

Mark R. McCoy, EdD
University of Central Oklahoma
Forensic Science Institute
Edmond, OK

Caitlin E. Porterfield, MS
Forensic Science Institute
University of Central Oklahoma
Edmond, OK

Catherine G. Rushton, EdD
Marshall University Forensic Science Program
Huntington, WV

John A. Williams, PhD
Western Carolina University
Department of Anthropology and Sociology
Cullowhee, NC

Mark Windschitl, PhD
University of Washington
Seattle, WA

Program Description: Many instructors still teach the way they were taught — lecture and test — without realizing that more active learning methods exist. This session, organized jointly by the Council of Forensic Science Educators (COFSE) and the Forensic Science Education Programs Accreditation Commission (FEPAC), will explore innovative teaching strategies currently being used in science education.

(continued)
Pre-Registration Required — $200 w/registration; $250 workshop only

#8 Innovative Teaching With Active Learning Methods — Implementation in Forensic Science Education

Program Description cont.:
The active learning methods presented are applicable to undergraduate and graduate-level forensic science programs, educational workshops for forensic science practitioners, and forensic laboratory trainees. Active learning methods improve a student’s critical thinking skills, problem-solving abilities, and long-term retention of the material. Such methods include flipped classroom techniques, large lecture teaching methods, service-based learning, gamed-based learning, direct experimentation, and a writing-based approach to scientific learning. Each discussion will include actual classroom examples of how the teaching method is implemented within the forensic curriculum and how to apply the teaching methods to any discipline.

Program:

8:30 a.m. - 8:40 a.m. Welcome and Introduction
   Amy N. Brodeur, MFS

8:40 a.m. - 9:35 a.m. Principles of Learning
   Mark Windschitl, PhD

9:35 a.m. - 10:30 a.m. Flipped Classroom
   Sandra Haddad, PhD

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

10:45 a.m. - 11:40 a.m. Large Lecturing Teaching
   Gina Londino-Smolar, MS

11:40 a.m. - 1:00 p.m. Lunch

1:00 p.m. - 1:55 p.m. Service-Based Learning
   Mark R. McCoy, EdD; Caitlin E. Porterfield, MS

1:55 p.m. - 2:50 p.m. Game-Based Learning
   Catherine G. Rushton, EdD

2:50 p.m. - 3:00 p.m. Break

3:00 p.m. - 3:55 p.m. Directed Experimentation
   John A. Williams, PhD

3:55 p.m. - 4:50 p.m. A Writing-Based Approach
   Adrienne L. Brundage, PhD

4:50 p.m. - 5:00 p.m. Closing Remarks
   Matthew R. Wood, PhD

Targeted Audience: All Disciplines

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

Expected Handout Length: 100 Pages
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#9 Putting the Expert on Trial

Monday, February 19, 2018  8:30 a.m. – 5:00 p.m.  6.75 CE Hours

Educational Objective(s): After attending this presentation, attendees will: (1) recognize and understand the significance of various pediatric injuries; (2) understand the process of discerning inflicted from accidental injuries causing death; (3) appreciate the effective use of consultants in certain pediatric deaths; (4) realize the potential legal risks of providing opinions as practitioners and consultants; and, (5) be informed about appropriate practices to follow in the event of subsequent allegations of improperly practicing the forensic sciences and providing opinions.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by clarifying the recognition and significance of various pediatric injuries, improving the determination of inflicted from accidental injuries, and preparing practitioners and experts for potential litigation against them for providing their opinions.

Chair:       Co-Chair:
Joyce L. deJong, DO     Rudy J. Castellani, MD
Western Michigan University    Center for Neuropathology
Homer Stryker MD School of Medicine    Kalamazoo, MI
Department of Pathology
Kalamazoo, MI

Faculty:
Carl J. Schmidt, MD     Michael L. VanErp, JD
Wayne County MEO    Johnson & Wyngaarden, PC
University of Michigan    Okemos, MI
Detroit, MI

Program Description: Through the thorough analysis of the traumatic death of a child, this session will provide a review of common injuries in fatal child abuse, the determination of inflicted injuries, the effective use of consultants, and recommendations for the provision of informal and formal opinions to the legal and law enforcement community. Using the same case, this session will provide a careful analysis of subsequent litigation against the experts who formulated and provided their opinions, when the accused filed a civil lawsuit against these experts after authorities dropped the criminal charges.

Program:

8:30 a.m. - 8:45 a.m.  Welcome and Introductions
Joyce L. deJong, DO

8:45 a.m. - 9:45 a.m.  Pediatric Death: The Investigation and Autopsy
Joyce L. deJong, DO

9:45 a.m. - 10:45 a.m.  Neuropathology and Ocular Pathology Findings: The Current Case and a Review of Inflicted Pediatric Head and Eye Trauma
Rudy J. Castellani, MD

10:45 a.m. - 11:00 a.m.  Break

(continued)
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#9 Putting the Expert on Trial

Program cont.:

11:00 a.m. - 12:00 p.m. Inflicted Injuries: Features of Inflicted Injuries, Determination of Manner of Death, and Injury Timing
Carl J. Schmidt, MD

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

1:00 p.m. - 2:00 p.m. Events: Opinions, Conversations, Emails, Preliminary Testimony, Daubert Hearing, Consultants, Depositions, Department of Human Services (DHS) Hearing, and Decisions to Dismiss
Joyce L. deJong, DO; Rudy J. Castellani, MD; Carl J. Schmidt, MD

2:00 p.m. - 3:00 p.m. A Civil Lawsuit Against the Physicians: A Complaint in the United States District Court for the Western District of Michigan, Initial Disclosure of Information, Fact Witness Depositions, Expert Consults, Expert Depositions, and Motion for Dismissal
Michael L. VanErp, JD

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

3:15 p.m. - 4:15 p.m. Lessons Learned: Appropriated Practices to Avoid Being Sued and Guidance on How to Proceed if You Are
Michael L. VanErp, JD

4:15 p.m. - 5:00 p.m. Questions and Answers
Joyce L. deJong, DO; Rudy J. Castellani, MD; Carl J. Schmidt, MD;
Michael L. VanErp, JD

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

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

Expected Handout Length: 30 Pages
#10  A Multidisciplinary Approach to Dogfighting Cases

Monday, February 19, 2018  
8:30 a.m. – 5:20 p.m.  
7.25 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will: (1) possess a basic understanding of dogfighting within the United States, including the breeds of dogs utilized, housing, breeding, training and conditioning of dogs, the rules and procedures of a fight, and recognition of paraphernalia associated with this crime; (2) be familiar with investigative techniques specific to dogfighting; (3) recognize the unique aspects of dogfighting crime scenes; (4) understand evidence analyses typically associated with dogfighting case work; (5) recognize the pattern of injury and animal behavior consistent with dogs utilized in organized dogfighting; (6) understand the link between dogfighting and other violent crimes; and, (7) better understand major legal issues in dogfighting investigations and prosecutions.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by enabling recognition of this clandestine crime and elucidating the most current research and techniques utilized when investigating and prosecuting dogfighting. Additionally, this presentation will illustrate the benefits of a multidisciplinary approach for the most favorable outcome to dogfighting criminal cases.

**Chair:**  
Rachel Touroo, DVM  
Gainesville, FL

**Co-Chair:**  
Amanda Fitch, MS  
American Society for Prevention of Cruelty to Animals  
Gainesville, FL

**Faculty:**  
Jennifer Chin, JD  
American Society for Prevention of Cruelty to Animals  
New York, NY

Randall Lockwood, PhD  
American Society for Prevention of Cruelty to Animals  
Falls Church, VA

Terry Mills  
American Society for Prevention of Cruelty to Animals  
New York, NY

Pamela Reid, PhD  
American Society for Prevention of Cruelty to Animals  
New York, NY

**Program Description:** This session will enable participants to: (1) recognize the clandestine crime of dogfighting; (2) highlight the most current research and techniques utilized in investigating and prosecuting this crime; and, (3) illustrate the benefits of a multidisciplinary approach.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>Introduction to Dogfighting and Investigative Techniques</td>
</tr>
<tr>
<td></td>
<td><em>Terry Mills</em></td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>Dogfighting Paraphernalia</td>
</tr>
<tr>
<td></td>
<td><em>Randall Lockwood, PhD; Terry Mills</em></td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Break</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>Documentation and Evidence Analyses for Dogfighting Crime Scenes</td>
</tr>
<tr>
<td></td>
<td><em>Amanda Fitch, MS</em></td>
</tr>
</tbody>
</table>
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#10 A Multidisciplinary Approach to Dogfighting Cases

Program cont.:

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:35 a.m. - 12:05 p.m.</td>
<td>The Role of the Forensic Veterinarian and Behaviorist on Scene</td>
</tr>
<tr>
<td></td>
<td>Rachel Touroo, DVM; Pamela Reid, PhD</td>
</tr>
<tr>
<td>12:05 p.m. - 1:05 p.m.</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:05 p.m. - 2:05 p.m.</td>
<td>Veterinary Forensic Medical Examination of Fighting Dogs</td>
</tr>
<tr>
<td></td>
<td>Rachel Touroo, DVM</td>
</tr>
<tr>
<td>2:05 p.m. - 3:05 p.m.</td>
<td>Forensic Behavioral Evaluation of Fighting Dogs</td>
</tr>
<tr>
<td></td>
<td>Pamela Reid, PhD</td>
</tr>
<tr>
<td>3:05 p.m. - 3:20 p.m.</td>
<td>Break</td>
</tr>
<tr>
<td>3:20 p.m. - 4:20 p.m.</td>
<td>Dogfighting Investigations and Prosecutions: Legal Perspectives</td>
</tr>
<tr>
<td></td>
<td>Jennifer Chin, JD</td>
</tr>
<tr>
<td>4:20 p.m. - 5:20 p.m.</td>
<td>Federal Bureau of Investigation (FBI) Tracking of Organized Animal Abuse and the LINK</td>
</tr>
<tr>
<td></td>
<td>Randall Lockwood, PhD</td>
</tr>
</tbody>
</table>

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

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

Expected Handout Length: 150 Pages
Pre-Registration Required — $200 w/registration; $250 workshop only

#11 Some Like It Hot: A Forensic Analysis of Burnt Remains

Monday, February 19, 2018  8:30 a.m. – 5:45 p.m.  7.5 CE Hours

Educational Objective(s): After attending this presentation, attendees will: (1) be introduced to fire scene investigation involving burnt human remains and their recovery; (2) recognize the micro- and macroscopical changes undergone by the body, skeletal, and dental hard tissues when subjected to fire; (3) understand the different techniques, approaches, and challenges for the identification of burnt human remains, including the practical issues; (4) learn what additional information about the incineration event can be gained through burnt bone analysis; and, (5) gain insights through the discussion of forensic casework.

Impact on the Forensic Science Community: This presentation will impact the forensic science community through the presentation of multidisciplinary and innovative approaches to tackle complex cases of burnt human remains with a more holistic approach to not only facilitate the identification of remains, but to also glean insight into the reconstruction of the incineration conditions.

Chair:
Sara C. Zapico, PhD  
Florida International University  
Department of Chemistry and Biochemistry  
Miami, FL

Co-Chair:
Sarah Ellingham, PhD  
International Committee of the Red Cross  
Baghdad Delegation  
Baghdad, IRAQ

Faculty:
Joe Adserias-Garriga, DDS, PhD  
Barcelona, SPAIN

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

John Berketa, PhD 
University of Adelaide  
Norwood, AUSTRALIA

Douglas H. Ubelaker, PhD  
Smithsonian Institution  
Department of Anthropology  
Washington, DC

Ericka N. L'Abbe, PhD  
University of Pretoria  
Pretoria, SOUTH AFRICA

Christopher W. Schmidt, PhD  
University of Indianapolis  
Department of Anthropology  
Indianapolis, IN

Program Description: This workshop will illustrate the multidisciplinary process of identification of burnt remains and fire scene reconstruction. This will be explained from the recovery of burnt human remains from the scene as well as the analysis of these remains at different levels: macroscopic, microscopic/biochemical, and genetic in order to facilitate the identification of the victims by applying anthropological, odontological, and genetic techniques to finally illustrate the discussed approach and challenges through practical case studies.

Program:

8:30 a.m. - 8:45 a.m.  Welcome and Introduction  
Sara C. Zapico, PhD; Sarah Ellingham, PhD; Joe Adserias-Garriga, DDS, PhD

8:45 a.m. - 9:45 a.m.  Biochemical and Structural Changes to the Bone Matrix When Exposed to Fire  
Sarah Ellingham, PhD  
(continued)
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#11 Some Like It Hot: A Forensic Analysis of Burnt Remains

Program cont.:

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:45 a.m. - 10:00 a.m.</td>
<td>Break</td>
</tr>
</tbody>
</table>
| 10:00 a.m. - 11:00 a.m. | Practical Aspects in the Recovery of Burnt Human Remains From the Fire Scene to Maximize Postmortem Information  
                       | John Berketa, PhD                                                       |
| 11:00 a.m. - 11:45 a.m. | Forensic Analysis of Incinerated Bones and Teeth                         
                       | Joe Adserias-Garriga, DDS, PhD                                          |
| 11:45 a.m. - 12:45 p.m. | Lunch                                                                   |
| 12:45 p.m. - 2:45 p.m.  | Fleshed, Wet, and Dry Burn Patterns to Bone                               
                       | Steven A. Symes, PhD; Ericka N. L’Abbe, PhD; Christopher W. Schmidt, PhD |
| 2:45 p.m. - 3:00 p.m.   | Break                                                                    |
| 3:00 p.m. - 3:45 p.m.   | Using Analytical Techniques to Determine the Exposure Temperature From Burnt Bone  
                       | Sarah Ellingham, PhD                                                     |
| 3:45 p.m. - 4:30 p.m.   | Genetic Analysis of Burnt Human Remains: Issues, Challenges, and Approaches  
                       | Sara C. Zapico, PhD                                                     |
| 4:30 p.m. - 5:30 p.m.   | Analysis of Burnt Remains: Case Applications                              
                       | Douglas H. Ubelaker, PhD                                                |
| 5:30 p.m. - 5:45 p.m.   | Closing Remarks                                                          
                       | Sara C. Zapico, PhD; Sarah Ellingham, PhD; Joe Adserias-Garriga, DDS, PhD; Douglas H. Ubelaker, PhD; John Berketa, PhD; Steven A. Symes, PhD; Ericka N. L’Abbe, PhD; Christopher W. Schmidt, PhD |

Targeted Audience: Anthropology, Criminalistics, Odontology, Pathology/Biology

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

Expected Handout Length: 50 Pages
Pre-Registration Required — $150 w/registration; $175 workshop only

#12 Eric Zimmerman’s Open Source Forensic Tools Library

Monday, February 19, 2018 1:00 p.m. – 4:00 p.m. 2.0 CE Hours

Educational Objective(s): After participating in this workshop, attendees will better understand the challenges facing digital forensic software developers to both design and maintain open source tools and will understand how to prepare and use an open source digital forensic toolkit to conduct examinations. Attendees will better understand the relative advantages of commercial forensic packages and open source tools and where they can be used in concert to impact the work of digital forensic examiners. Those attending will learn the specific capabilities and methods of use of one of the most well-known open source libraries of digital forensic software. Issues vital to those who would develop and maintain forensic software, such as architecting through plugins to evolve functionality as opposed to monolithic executables, will be discussed as well as how that architecture can allow forensic examiners to expand the tools’ capabilities by developing plugins to meet their particular casework needs and challenges. Finally, this session will help forensic examiners better understand how growing complexity and evidence volumes are making the ability to perform triage and focus on those elements most likely to be relevant to the investigation. This session will help the forensic community understand the balance between thoroughness and timeliness that is the hallmark of real-world cases that our examiner community faces every day.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating that freely available, open source forensic tools and forensic libraries can help both public and private sector organizations.

Chair: Alan E. Brill, MBA
Kroll Cyber Security
Secaucus, NJ

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

Faculty:
Eric Zimmerman, BS
Kroll Associates, Inc.
New York, NY

Program Description: This workshop will be presented in two parts. The first part will be discussion of the challenges facing examiners and the need to strike a balance between thoroughness and timeliness, and how open source software may be key in improving our ability to conduct investigative triage in the real world of personnel and financial limitations on examiners and their organizations. The second part of the session will focus on a toolset that participants and their organizations can investigate and use (at no cost) to improve their ability to meet their investigative objectives.

Program:

1:00 p.m. - 1:30 p.m.  Introduction
Alan E. Brill, MBA

1:30 p.m. - 2:00 p.m.  Introduction to the Toolset, Setup, and General Principles of Use
Alan E. Brill, MBA; Eric Zimmerman, BS

2:00 p.m. - 2:30 p.m.  Demonstrations of the Toolset Elements: Part 1
Alan E. Brill, MBA; Eric Zimmerman, BS

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

(continued)
Pre-Registration Required — $150 w/registration; $175 workshop only

#12 Eric Zimmerman’s Open Source Forensic Tools Library

Program cont.:

3:00 p.m. - 3:30 p.m. Demonstrations of the Toolset Elements: Part 2
               Alan E. Brill, MBA; Eric Zimmerman, BS

3:30 p.m. - 4:00 p.m. Using the Tools on Participant-Provided Data and Discussion
               Alan E. Brill, MBA; Eric Zimmerman, BS

Targeted Audience: Digital & Multimedia Sciences, General, Jurisprudence

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

Expected Handout Length: 20 Pages

Participants are encouraged to bring sample drives to discuss and in some cases (depending on time) evaluate using the tools.
Pre-Registration Required — $100 w/registration; $125 workshop only

#13 Moving From the Combined Probability of Inclusion (CPI) to Probabilistic Genotyping for DNA Mixture Interpretation

Monday, February 19, 2018  1:00 p.m. – 6:00 p.m.  4.5 CE Hours

Educational Objective(s): After attending this presentation, attendees will understand the current limitations of interpreting DNA mixtures using “binary” approaches in which alleles are either “included” or “excluded” from analysis. Attendees will develop an understanding and overview of probabilistic approaches that consider missing data (allele drop-out) or spurious alleles (allele drop-in) to interpret DNA profiles.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing an overview of the limitations of current statistical approaches and promises for the future of DNA mixture interpretation for forensic DNA analysts, DNA technical leaders, laboratory directors, prosecutors, defense attorneys, and judges.

Chair: Michael D. Coble, PhD
Co-Chair: Daniele S. Podini, PhD
National Institute of Standards and Technology  Department of Forensic Science
Gaithersburg, MD  Washington, DC

Program Description: This session will provide information about the limitations of the current methods of DNA mixture interpretation and introduce probabilistic approaches to mixture interpretation. The targeted audience for this session is the laboratory that has not yet committed to a mixture software program, but would like to have an introduction to improve their knowledge base.

Program:

1:00 p.m. - 1:10 p.m.  Introduction and Welcome
Michael D. Coble, PhD; Daniele S. Podini, PhD

1:10 p.m. - 2:00 p.m.  Probability Review and Bayes’ Theorem
Michael D. Coble, PhD

2:00 p.m. - 3:00 p.m.  The Likelihood Ratio (LR) and Setting Proposition
Michael D. Coble, PhD

3:00 p.m. - 3:20 p.m.  Break

3:20 p.m. - 4:30 p.m.  Hands-On Exercise With LR Calculations
Michael D. Coble, PhD; Daniele S. Podini, PhD

4:30 p.m. - 5:00 p.m.  Limitations of Current DNA Mixture Statistics
Michael D. Coble, PhD

5:00 p.m. - 5:45 p.m.  Probabilistic Geototyping
Michael D. Coble, PhD

5:45 p.m. - 6:00 p.m.  Questions and Discussions
Michael D. Coble, PhD; Daniele S. Podini, PhD

Targeted Audience: Criminalistics, Jurisprudence
Knowledge Level Required: Intermediate (some knowledge of subject presented)
Expected Handout Length: 125 Pages
#14 Pharmacogenomics — Uses in Forensic and Clinical Toxicology

Monday, February 19, 2018 1:00 p.m. – 6:05 p.m.  4.75 CE Hours

Educational Objective(s): After attending this presentation, attendees will be able to develop effective approaches for the development and validation of genetic assays for drug monitoring applications, identify the benefits associated with pharmacogenetic testing and understand their relevance to the practice of medicine, and utilize toxicology and pharmacogenetic test results in conjunction with other case histories for decisions regarding cause- and manner-of-death determinations.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by illustrating the benefits and utility of pharmacogenetic testing. Case studies will be provided to assist attendees with the interpretation of toxicology and pharmacogenetic test results and explain how these findings can impact death investigation outcomes.

Chair:
Laura M. Labay, PhD
NMS Labs
Willow Grove, PA

Co-Chair
William H. Anderson, PhD
NMS Labs
Willow Grove, PA

Faculty:
Wendy R. Adams, PhD
NMS Labs
Willow Grove, PA

Gwendolyn McMillin, PhD
ARUP Laboratories, Inc
Salt Lake City, UT

Jeffrey M. Jentzen, MD
University of Michigan
Ann Arbor, MI

Alan H. Wu, PhD
San Francisco General Hospital
San Francisco, CA

Jorge McCormack, MD
Pediatric Cardiology Associates
Mednax Medical Group
St. Petersburg, FL

Program Description: The purpose of this session is to familiarize participants with the study of pharmacogenomics and to cultivate knowledge regarding how genes affect an individual’s response to drugs. It is challenging to predict who will benefit from a medication, who will not respond at all, and who will experience adverse drug reactions. Speakers will detail the development and utility of predictive tests, address how genetic makeup influences drug metabolism, disease states and their progression, and describe how test results can have implications for cause- and manner-of-death determinations.

Program:

1:00 p.m. - 1:40 p.m.  Introduction to Genetics, Pharmacogenetics, and Pharmacogenomics  
Laura M. Labay, PhD

1:40 p.m. - 2:30 p.m.  Pharmacogenetic Testing and Development of Predictive Tests for Drug Testing  
Gwendolyn McMillin, PhD

2:30 p.m. - 2:45 p.m.  Break
Pre-Registration Required — $125 w/registration; $150 workshop only

#14 Pharmacogenomics — Uses in Forensic and Clinical Toxicology

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:45 p.m. - 3:35 p.m.</td>
<td>Wendy R. Adams, PhD</td>
<td>Genetics of Drug Metabolism and Drug-Drug Interactions</td>
</tr>
<tr>
<td>3:35 p.m. - 4:25 p.m.</td>
<td>Jorge McCormack, MD</td>
<td>Genetics of Medical Complications and Disease</td>
</tr>
<tr>
<td>4:25 p.m. - 5:15 p.m.</td>
<td>Alan H. Wu, PhD</td>
<td>Personalized and Predictive Medicine</td>
</tr>
<tr>
<td>5:15 p.m. - 6:05 p.m.</td>
<td>Jeffrey M. Jentzen, MD</td>
<td>Implications for Cause- and Manner-of-Death Determinations</td>
</tr>
</tbody>
</table>

Targeted Audience: Pathology/Biology, Toxicology

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

Expected Handout Length: 120
#15 Postmortem Monocular Indirect Ophthalmoscopy (PMIO)

**Tuesday, February 20, 2018**  
8:30 a.m. – 12:30 p.m.  
3.75 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will be able to: (1) differentiate between direct and indirect ophthalmoscopy, noting advantages and limitations of each technique for the postmortem detection of retinal hemorrhages; (2) discuss the fundal location of retinal hemorrhages relative to their projected aerial image during monocular indirect ophthalmoscopy; and, (3) accurately draw retinal abnormalities observed during monocular indirect ophthalmoscopy on a fundal diagram and capture the projected aerial image with a smartphone.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing an overview of PMIO, promoting skill acquisition, evaluating practical training, and facilitating imaging techniques with fundal diagrams and a smartphone.

**Chair:**  
Patrick E. Lantz, MD  
Wake Forest University School of Medicine

**Co-Chair:**  
Candace H. Schoppe, MD  
Southwestern Institute of Forensic Sciences

**Program Description:** PMIO permits examination of the decedent’s posterior fundus and portions of the peripheral retina without relying on ocular enucleation. The required equipment necessary for PMIO is relatively inexpensive. PMIO readily detects retinal hemorrhages and folds using a focal light source and an aspheric, convex condensing lens.

Learning how to perform and become proficient at PMIO can be perplexing and intimidating. Most pathology residents and forensic pathology fellows have limited exposure to indirect ophthalmoscopy. This hands-on session will facilitate the learning of PMIO: positioning the light source, correctly holding the indirect lens, and recording fundal abnormalities by drawing on fundal diagrams or image capture with a smartphone.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Description</th>
</tr>
</thead>
</table>
| 8:30 a.m. - 8:35 a.m. | Welcome  
*Patrick E. Lantz, MD* |
| 8:35 a.m. - 9:05 a.m. | PMIO Introduction  
*Patrick E. Lantz, MD* |
| 9:05 a.m. - 9:25 a.m. | A Demonstration of PMIO Using a Headlamp and Smartphone  
*Candace H. Schoppe, MD* |
| 9:25 a.m. - 10:25 a.m. | PMIO Hands-On Training  
*Patrick E. Lantz, MD; Candace H. Schoppe, MD* |
| 10:25 a.m. - 10:40 a.m. | Break |
| 10:40 a.m. - 12:10 p.m. | PMIO Hands-On Training  
*Patrick E. Lantz, MD; Candace H. Schoppe, MD* |
Pre-Registration Required — $100 w/registration; $125 workshop only

#15  Postmortem Monocular Indirect Ophthalmoscopy (PMIO)

12:10 p.m. - 12:25 p.m.  Optical PMIO Self-Assessment  
Patrick E. Lantz, MD; Candace H. Schoppe, MD

12:25 p.m. - 12:30 p.m.  PMIO Summary and Attendee Feedback  
Patrick E. Lantz, MD; Candace H. Schoppe, MD

Targeted Audience:  Pathology/Biology

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

Expected Handout Length:  25 pages
#16  Forensic Image Processing

Tuesday, February 20, 2018  8:30 a.m. – 12:45 p.m.  4.0 CE Hours

Educational Objective(s): The goal of this presentation is to provide a working knowledge of forensic image processing to enable an analyst to apply the optimum image processing algorithms to surveillance video and digital photography.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing basic forensic image processing skills for the analyst. Surveillance video is nearly ubiquitous and a successful analyst is one who is familiar with forensic image processing and how to use it.

Chair: Richard Vorder Bruegge, PhD
Federal Bureau of Investigation
Operational Technology Division
Quantico, VA

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

Faculty:
Marcus Borengasser, PhD
United States Department of Defense
Melbourne, FL

Kathleen L. Rettich, MS
Melbourne, FL

Program Description: This half-day workshop will cover the theory and implementation of forensic image processing by providing an introduction to forensic image processing concepts and application through a series of presentations and exercises. A series of lectures will present processing and enhancement algorithms that can be applied to surveillance video and digital photography. Concepts will be explored via “hands-on” exercises after each lecture. Students can bring laptop computers with open source image processing software already installed or they can contact the instructor for open source software recommendations. Prior knowledge of image processing is not required.

Program:

8:30 a.m. - 9:05 a.m.  Forensic Image Processing Concepts
   Marcus Borengasser, PhD

9:05 a.m. - 9:25 a.m.  Hands-On Exercise
   Marcus Borengasser, PhD

9:25 a.m. - 10:00 a.m. An Introduction to Digital Filters
   Marcus Borengasser, PhD

10:00 a.m. - 10:20 a.m. Hands-On Exercise
   Marcus Borengasser, PhD

10:20 a.m. - 10:35 a.m. Break
#16 Forensic Image Processing

**Pre-Registration Required — $150 w/registration; $175 workshop only**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:35 a.m. - 11:10 a.m.</td>
<td>Histogram Analysis</td>
<td>Marcus Borengasser, PhD</td>
</tr>
<tr>
<td>11:10 a.m. - 11:30 a.m.</td>
<td>Hands-On Exercise</td>
<td>Marcus Borengasser, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 12:05 p.m.</td>
<td>Feature Extraction</td>
<td>Marcus Borengasser, PhD</td>
</tr>
<tr>
<td>12:05 p.m. - 12:25 p.m.</td>
<td>Hands-On Exercise</td>
<td>Marcus Borengasser, PhD</td>
</tr>
<tr>
<td>12:25 p.m. - 12:45 p.m.</td>
<td>Questions and Answers</td>
<td>Marcus Borengasser, PhD</td>
</tr>
</tbody>
</table>

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

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

**Expected Handout Length:** 16 Pages

*Participants can bring laptop computers with open source image processing software already installed or they can contact the instructor for open source software recommendations. Prior knowledge of image processing is not required.*
#17  An Introduction to Lean Fundamentals and Six Sigma Operational Improvement

Tuesday, February 20, 2018  
8:30 a.m. – 4:30 p.m.  
6.0 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will better understand the common tools and techniques used in a Lean Six Sigma (LSS) project to increase productivity and efficiency of the laboratory without increasing employees or purchasing new equipment or software.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by introducing participants to a logical, step-wise procedure to greatly improve the understanding (through actual data collection) of the current laboratory system and to provide a structured method to eliminate waste and make improvements for a more efficient and effective laboratory process.

**Chair:**  
Joanie Brocato, PhD  
Baton Rouge, LA

**Co-Chair:**  
Linda Razzano, MS  
Department of Forensic Biology  
New York, NY

**Faculty:**  
Timothy D. Kupferschmid, MFS, MBA  
Office of the Chief Medical Examiner  
New York, NY

**Program Description:** Attendance at this full-day workshop will introduce the participants to the LSS philosophy of continuous improvement and its methodology to achieve rapid and lasting process improvements while producing a positive culture change.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m. - 10:00 a.m.</td>
<td>Introduction to LSS</td>
<td>Timothy D. Kupferschmid, MFS, MBA</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>Lean Fundamentals</td>
<td>Linda Razzano, MS</td>
</tr>
<tr>
<td>11:00 a.m. - 12:00 p.m.</td>
<td>Push vs. Pull Exercise</td>
<td>Timothy D. Kupferschmid, MFS, MBA; Joanie Brocato, PhD; Linda Razzano, 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. - 2:30 p.m.</td>
<td>Push vs. Pull Exercise</td>
<td>Timothy D. Kupferschmid, MFS, MBA; Joanie Brocato, PhD; Linda Razzano, MS</td>
</tr>
<tr>
<td>2:30 p.m. - 2:45 p.m.</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>
**WORKSHOPS**

*Pre-Registration Required — $200 w/registration; $250 workshop only*

**#17 An Introduction to Lean Fundamentals and Six Sigma Operational Improvement**

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2:45 p.m. - 3:30 p.m. | Louisiana State Police Crime Laboratory’s Experience With LSS  
  *Joanie Brocato, PhD* |
| 3:30 p.m. - 4:15 p.m. | NYC Office of Chief Medical Examiner Forensic Biology Laboratory’s Experience With LSS  
  *Linda Razzano, MS* |
| 4:15 p.m. - 4:30 p.m. | Wrap-Up  
  *Timothy D. Kupferschmid, MFS, MBA* |

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

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

**Expected Handout Length:** 100 Pages
#18 Domestic Violence and Child Abuse Deaths

Tuesday, February 20, 2018  
8:30 a.m. – 5:00 p.m.  
6.0 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will understand the biomechanics of accelerative/blunt force injury in infants and children; the dynamics of Munchausen Syndrome by Proxy; multiple descriptions of child interview techniques; psychological analysis, which can be conducted in child death investigations; and the Fatality Review Board (FRB) process within the United States Department of Defense. This session will also include homicide presentations by special agents and crime scene investigators who process domestic violence and child abuse death crime scenes.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing insight into the many disciplines utilized in domestic violence deaths. The presentations will leave a lasting impact on attendees through the intricate details of each topic, discussing the criminal, physiological, and psychological aspects of domestic violence.

**Chair:**  
Brian L. Janysek, MFS  
Oakton, VA

**Co-Chair:**  
David J. Zeliff, MFS  
Stafford, VA

**Faculty:**

Donald Hayden, MFS  
Richmond Hill, GA

Edward Mazuchowski II, MD, PhD  
Dover AFB, DE

Rick Malone, MD  
FPO, AP  
JAPAN

Michelle Miller, PsyD  
United States Army CID  
Springfield, VA

Sarah Mannix  
United States AFOSI  
Springfield, VA

Jessica Ann Veltri, MS  
United States Army Criminal Investigation Command  
22nd Military Police Battalion  
Joint Base Lewis-McChord, WA

**Program Description:** Medical examiners, psychologists, special agents, and crime scene investigators will present an array of topics from domestic violence to child deaths. Experts in their field will detail topics such as the biomechanics of accelerative/blunt force injury in infants and children, Munchausen Syndrome by Proxy, child interview techniques, 911 call and psychological analysis, FRB processes within the United States Department of Defense, as well as homicide presentations that illustrate various approaches to processing domestic violence and child abuse death crime scenes.

**Program:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>Introductions</td>
</tr>
<tr>
<td></td>
<td><em>Brian L. Janysek, MFS</em></td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>Munchausen Syndrome by Proxy</td>
</tr>
<tr>
<td></td>
<td><em>Rick Malone, MD</em></td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>Break</td>
</tr>
</tbody>
</table>

Pre-Registration Required — $200 w/registration; $250 workshop only
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#18 Domestic Violence and Child Abuse Deaths

10:00 a.m. - 10:30 a.m. The Murder of a 14-Month-Old Boy
Donald Hayden, MFS

10:30 a.m. - 11:00 a.m. Fatality Review Board
David J. Zeliff, MFS

11:00 a.m. - 12:00 p.m. Child Interview Techniques
Donald Hayden, MFS

12:00 p.m. - 1:30 p.m. Lunch

1:30 p.m. - 2:30 p.m. Accelerative/Blunt Force Trauma and Sudden Unexplained Infant Death
Edward Mazuchowski II, MD, PhD

2:30 p.m. - 2:45 p.m. Break

2:45 p.m. - 3:45 p.m. Double Murder and Suicide
Sarah Mannix

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

4:00 p.m. - 5:00 p.m. The Death of a 28-Day-Old Infant: Describing the Mother’s Pre-Incident Behaviors, Analysis of the 911 Call, and Reenactments
Michelle Miller, PsyD; Jessica Ann Veltri, MS

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

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

Expected Handout Length: 40 Pages
Pre-Registration Required — $200 w/registration; $250 workshop only

#19  The Evolution of Fire Investigation From the Perspective of Science: Why Science Matters in the Search for Justice

Tuesday, February 20, 2018     8:30 a.m. – 5:00 p.m.     6.25 CE Hours

Educational Objective(s): After attending this presentation, attendees will have an understanding of how: (1) past anecdotally based methods resulted in potentially erroneous convictions; (2) scientific research discredited those methods; (3) applicable standards have evolved as a result; and, (4) science-based research in many disciplines continues to improve our understanding of fire science and its proper application in fire investigation.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by explaining the importance of empirical scientific research as well as how and why the results of such research must be applied when investigating fire scenes, analyzing fire debris and other evidence, and crafting valid conclusions in any investigative discipline.

Chair: Paul Messner, JD
Dry Ridge, KY

Co-Chair: John J. Lentini, BA
Scientific Fire Analysis, LLC
Islamorada, FL

Faculty:
George A. Codding, JD
International Association of Arson Investigators
Boulder, CO

Daniel Madrzykowski, MS
Underwriters Laboratory Firefighter Safety Research Institute
Columbia, MD

Terry-Dawn Hewitt, LLM
McKenna Hewitt
Denver, CO

Program Description: This workshop will look at the methods, processes, and reasoning used in past problematic fire investigations and compare them to modern countervailing science-based analyses developed since those investigations and that were relied upon in post-conviction appeals. Included are discussions of interpretation of burn patterns and evidence, investigator and witness biases, methodology and reasoning issues, and analytical complexities occasioned by the wide variety of potential fire causes.

Program:

8:30 a.m. - 9:00 a.m.  Opening Remarks
Paul Messner, JD; John J. Lentini, BA; George A. Codding, JD

9:00 a.m. - 9:30 a.m.  Setting the Stage — The Adam Gray Case: The Fire Scene, Investigation, and Evidence Discovered (or Not)
George A. Codding, JD

9:30 a.m. - 10:15 a.m.  Analysis and Interpretation of the Adam Gray Case: The Selection and Identification of Evidence
John J. Lentini, BA; George A. Codding, JD

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

*Pre-Registration Required — $200 w/registration; $250 workshop only*

#19  **The Evolution of Fire Investigation From the Perspective of Science: Why Science Matters in the Search for Justice**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
</table>
| 10:30 a.m. - 11:15 a.m. | The Courtroom — The Weight of the Evidence: Gray; Willis; Garcia; Bunch; Han Tak Lee; et. al  
*Paul Messner, JD* |
| 11:15 a.m. - 12:00 p.m. | The Evolution of the Profession Since 1992: Changes to Practices, Knowledge, and Reasoning Through Research  
*John J. Lentini, BA* |
| 12:00 p.m. - 1:15 p.m. | Lunch                                                                                      |
| 1:15 p.m. - 2:00 p.m. | Changing the Process Through Standards Development  
*Terry-Dawn Hewitt, LLM* |
| 2:00 p.m. - 2:45 p.m. | Current Research to Support the Science of Fire Patterns and Their Interpretation  
*Daniel Madrzykowski, MS* |
| 2:45 p.m. - 3:00 p.m. | Break                                                                                      |
| 3:00 p.m. - 3:45 p.m. | Origin and Cause Determination — How Hard Can It Be? Real-World Experiences  
*Daniel Madrzykowski, MS* |
| 3:45 p.m. - 4:15 p.m. | Human Bias: Effects on First Responders, Witnesses, Investigators, and the Scientific Community  
*George A. Codding, JD* |
| 4:15 p.m. - 5:00 p.m. | Are We Still Getting Things Wrong? One State’s Response and Other Solutions  
*Paul Messner, JD; John J. Lentini, BA* |

**Targeted Audience:** Criminalistics, Engineering Sciences, General, Jurisprudence, Psychiatry & Behavioral Science

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

**Expected Handout Length:** 25 Pages
#20 Fentalogs: The Chemistry, Pharmacology, and Toxicology of Illicit Fentanyl and Emerging Opioids

Tuesday, February 20, 2018 8:30 a.m. – 5:00 p.m. 6.75 CE Hours

Educational Objective(s): After attending this presentation, attendees will be able to describe the origination of fentanyl and fentanyl analogs and describe their pharmacology as well as identify and implement methods for the safe handling of these compounds. In addition, attendees will be able to describe methods used to profile and disseminate information on emerging opioids, assess the findings of fentanyl and fentanyl analogs in casework, and implement appropriate analytical techniques used in their identification.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing current information on the opioid epidemic with a specific focus on fentanyl and fentanyl analogs and their chemistry, pharmacology, and toxicology seen in forensic casework.

Chair: Amanda L.A. Mohr, MSFS
The Center for Forensic Science Research & Education
Willow Grove, PA

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

Faculty:
Erin Artigiani, MA
University of Maryland
Center for Substance Abuse Research (CESAR)
College Park, MD

Timothy Wiegand, MD
University of Rochester Medical Center
Rochester, NY

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

Audrey M. Williams, PhD
Livermore, CA

Robert A. Middleberg, PhD
NMS Labs
Willow Grove, PA

Erin M. Worrell, BSc
Cuyahoga County Medical Examiner’s Office
Cleveland, OH

Lionel Raymon, PhD
Homestead, FL

Nicole A. Yarid
King County Medical Examiner’s Office
Seattle, WA

Paul Wax, MD
University of Texas Southwestern
Dallas, TX

Program Description: This workshop will focus on the opioid epidemic related to fentanyl and fentanyl analogs, providing information associated with the origination of these illicit substances, pharmacology and potency, safe handling of suspected fentanyl analogs, monitoring and early detection systems, analytical approaches in forensic investigation casework, and case reports.
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#20 Fentalogs: The Chemistry, Pharmacology, and Toxicology of Illicit Fentanyl and Emerging Opioids

Program:

8:30 a.m. - 8:35 a.m.  Welcome and Introduction
   Amanda L.A. Mohr, MSFS

8:35 a.m. - 9:15 a.m.  History and Chemistry of Illicit Opioids
   Barry K. Logan, PhD

9:15 a.m. - 10:00 a.m.  The Pharmacology of Illicit Opioids (Remote Presentation)
   Lionel Raymon, PhD

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

10:15 a.m. - 10:40 a.m.  Safe Handling of Seized Material Containing Heroin, Fentanyl, and Illicit Opioids
   Robert A. Middleberg, PhD

10:40 a.m. - 11:20 a.m.  Illicit Fentanyl Synthesis and the Use of Chemical Signatures to Identify the Source and Route of Manufacture of Fentanyl and Its Analogs
   Audrey M. Williams, PhD

11:20 a.m. - 12:00 p.m.  National Drug Early Warning System (NDEWS) — Early Warning Systems for Identifying Emerging Novel Opioids
   Erin Artigiani, MA

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

1:15 p.m. - 2:00 p.m.  Medical Toxicology of Fentanyl and Opioid Intoxication: Experience in the Emergency Room
   Timothy Wiegand, MD

2:00 p.m. - 2:40 p.m.  Carfentanil Use at the Moscow Theater Siege
   Paul Wax, MD

2:40 p.m. - 2:55 p.m.  Break

2:55 p.m. - 3:25 p.m.  Scene and Circumstances: Investigation of Scenes of Death Involving Novel Opioids
   Erin M. Worrell, BSc

3:25 p.m. - 3:50 p.m.  Autopsy Findings in Opioid- and Fentanyl-Related Deaths
   Nicole A. Yarid

3:50 p.m. - 4:30 p.m.  Analytical Approaches for Identifying and Confirming Novel Opioids
   Alex J. Krotulski, MS

4:30 p.m. - 5:00 p.m.  Toxicology Data Related to Fentalogs
   Amanda L.A. Mohr, MSFS

Targeted Audience: Criminalistics, General, Pathology/Biology, Toxicology
Knowledge Level Required: Basic (little to no knowledge of subject presented)
Expected Handout Length: 300 Pages
Supported By: Center for Forensic Science Research and Education at the Fredric Rieders Foundation
Pre-Registration Required — $200 w/registration; $250 workshop only

#21 Macromorphoscopic (MMS) Traits: Data Collection and Analysis

Tuesday, February 20, 2018  8:30 a.m. – 5:00 p.m.  7.25 CE Hours

Educational Objective(s): After attending this presentation, attendees will: (1) understand the history and theoretical concepts of ancestry estimation via cranial morphology, particularly in reference to MMS traits; (2) have gained experience scoring macromorphoscopic traits in human crania using recently developed software; (3) have learned the basic strategies of various statistical procedures to estimate ancestry with MMS trait scores; and, (4) have acquired working knowledge of the application of MMS trait data in casework.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing up-to-date methodologies and theoretical considerations in ancestry estimation using MMS trait data. Additionally, attendees will learn how to record, analyze, and report MMS trait data using the appropriate statistical framework. Attendees will be introduced to a worldwide reference dataset that permits ancestry estimations beyond the historical three-group classifications used in ancestry estimation from cranial morphology.

Chair:       Co-Chair:
Joseph T. Hefner, PhD     Kelly R. Kamnikar, MA
Michigan State University     Michigan State University
Department of Anthropology    East Lansing, MI

Faculty:
Amber M. Plemons, MA
Michigan State University
Department of Anthropology
East Lansing, MI

Program Description: Estimating ancestry from the skull need not be difficult. In much the same way students first learn metric analysis (e.g., “GOL is measured between these two landmarks and entered into a computer program to obtain an estimate”), macromorphoscopic trait analysis requires visual learning and a hands-on approach. The goal of this session is to increase the utilization of an empirical method to ancestry estimation via cranial morphological traits in the forensic sciences by training a subset of the community to correctly perform the method. In turn, this information can then be disseminated to colleagues and students.

Program:

8:30 a.m. - 8:45 a.m.  Welcome
Joseph T. Hefner, PhD

8:45 a.m. - 9:45 a.m.  An Introduction to Macromorphoscopic Traits
Joseph T. Hefner, PhD

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

10:00 a.m. - 10:45 a.m.  Observer Error in MMS Trait Analysis
Kelly R. Kamnikar, MA

10:45 a.m. - 11:15 a.m.  The Macromorphoscopic Databank
Amber M. Plemons, MA
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#21 Macromorphoscopic (MMS) Traits: Data Collection and Analysis

11:15 a.m. - 11:30 a.m.  Break

11:30 a.m. - 12:15 p.m.  Analytical Methods for MMS Data  
Joseph T. Hefner, PhD; Amber M. Plemons, MA

12:15 p.m. - 1:30 p.m.  Lunch

1:30 p.m. - 2:00 p.m.  Analytical Methods for MMS Data (cont.)  
Joseph T. Hefner, PhD; Kelly R. Kamnikar, MA

2:00 p.m. - 3:30 p.m.  Hands-On Exercises  
Joseph T. Hefner, PhD; Kelly R. Kamnikar, MA; Amber M. Plemons, MA

3:30 p.m. - 3:45 p.m.  Break

3:45 p.m. - 4:45 p.m.  Hands-On Exercises  
Joseph T. Hefner, PhD; Kelly R. Kamnikar, MA; Amber M. Plemons, MA

4:45 p.m. - 5:00 p.m.  Adjournment  
Joseph T. Hefner, PhD

Targeted Audience: Anthropology, General, Pathology/Biology

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

Expected Handout Length: 60 Pages
#22 Science Matters to Everyone: Victims, Offenders, and the Public

Tuesday, February 20, 2018
8:30 a.m. – 5:00 p.m.
6.5 CE Hours

Educational Objective(s): The goal of this presentation is to educate attendees regarding systemic issues in forensic science and the strides being taken to address them.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by exploring how the criminal justice system can or should respond in the face of backlogs, lab scandal, error, and publicity involving forensic science.

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

Co-Chair: Pamela A.W. King, JD
Rochester, MN

Faculty:

Rebecca Campbell, PhD
Michigan State University
Department of Psychology
East Lansing, MI

Joanna L. Collins, MFS
LINUS Investigations & Consulting
San Antonio, TX

James Downs, MD
forensX, LLC
Savannah, GA

John P. Kenney, DDS, MS
Park Ridge, IL

Linda Kenney Baden, JD
New York, NY

Gerald M. LaPorte, MSFS
National Institute of Justice
Office of Investigation & Forensic Science
Washington, DC

John J. Lentini, BA
Scientific Fire Analysis, LLC
Islamorada, FL

Gary McDonald, JD
Dallas County Criminal District Attorney’s Office
Dallas, TX

Judy Melinek, MD
PathologyExpert, Inc
San Francisco, CA

Program Description: This workshop will cover multiple areas in forensic science where more inquiry is needed, including the testing of sexual assault kits, conviction integrity units, and what happens when an expert changes his testimony after the fact.

Program:

8:30 a.m. - 8:45 a.m.
Introduction and Opening Remarks
Anjali A. Ranadive, JD; Joanna L. Collins, MFS

8:45 a.m. - 9:45 a.m.
Tapestry of Trials — Aaron Hernandez Case
Linda Kenney Baden, JD

9:45 a.m. - 10:30 a.m.
Tapestry of Trials — When the Science Doesn’t Match the Testimony
Judy Melinek, MD

Pre-Registration Required — $200 w/registration; $250 workshop only

This program is presented by the Forensic Sciences Foundation, Inc.
WORKSHOPS

Pre-Registration Required — $200 w/registration; $250 workshop only

#22 Science Matters to Everyone: Victims, Offenders, and the Public

10:30 a.m. - 10:45 a.m.  Break
10:45 a.m. - 11:45 a.m.  Tapestry of Trials — Odontology
                        John P. Kenney, DDS, MS
11:45 a.m. - 12:45 p.m. Lunch
12:45 p.m. - 1:30 p.m.  Discipline-Specific Errors: Arson
                        John J. Lentini, BA
1:30 p.m. - 2:30 p.m.  Sexual Assault Kit Testing Research
                        Rebecca Campbell, PhD
2:30 p.m. - 3:15 p.m.  Sexual Assault Kit Testing
                        Gerald M. LaPorte, MSFS
3:15 p.m. - 3:45 p.m.  Break
3:45 p.m. - 4:45 p.m.  Conviction Integrity Units
                        Gary McDonald, JD
4:45 p.m. - 5:00 p.m.  Questions and Answers
                        James Downs, MD; Pamela A.W. King, JD

Targeted Audience: Criminalistics, General, Jurisprudence, Odontology, Pathology/Biology

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

Expected Handout Length: 100 Pages

Proceeds from this workshop will benefit the Forensic Sciences Foundation, Inc.
#23  Cardiovascular Pathology for Medical Examiners and Coroners:  Basic and Advanced Techniques for the Investigation of Sudden Cardiac Death

Tuesday, February 20, 2018
1:00 p.m. – 5:00 p.m.
3.5 CE Hours

**Educational Objective(s):** After attending this presentation, attendees will: (1) understand basic cardiac anatomy relevant to the investigation of sudden cardiac death; (2) be able to apply basic and select advanced cardiac dissection techniques useful for the investigation of sudden cardiac death; (3) identify situations in which postmortem genetic testing may be useful; (4) appreciate the challenges of interpretation of genetic testing results with respect to determining mechanism of death, underlying cause of death, and contributory cause of death; and, (5) recognize situations in which consultation with a cardiovascular pathologist is warranted.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing up-to-date knowledge and practical techniques in cardiovascular pathology and molecular genetics that will assist medical examiners, coroners, death scene investigators, and others involved in the investigation of sudden death.

**Chair:** Peter T. Lin, MD
Rochester, MN

**Co-Chair:** Ross Reichard, MD
Mayo Clinic
Division of Anatomic Pathology
Rochester, MN

**Faculty:**
Marie Christine Aubry, MD
Mayo Clinic
Rochester, MN

Joseph J. Maleszewski, MD
Mayo Clinic
Rochester, MN

**Program Description:** This workshop is intended to be a practical introduction to the investigation of sudden cardiac death. The presenters include practicing cardiovascular and forensic pathologists with extensive experience in autopsy pathology, death investigation, surgical cardiovascular pathology, and molecular genetics. The basic foundations of cardiovascular pathology, including normal cardiac anatomy and histology, normal anatomic variants and standard cardiac dissection methods, will be reviewed. Advanced dissection techniques will also be taught, including long-axis cuts (four-chamber and left ventricular outflow cuts), base of heart dissection for demonstrating valvular heart disease, gross dissection and histologic examination of the cardiac conduction system, and histologic examination of valves, myocardium, and aorta. Both common and rare entities in the differential diagnosis for sudden cardiac death will be discussed, including atherosclerotic coronary artery disease, hypertensive heart disease, hypertrophic cardiomyopathy, dilated cardiomyopathy, arrhythmogenic cardiomyopathy, inherited arrhythmia syndromes, and inherited aortopathy syndromes.

The role of genetic testing in the diagnosis of inherited cardiomyopathy, arrhythmia, and aortopathy syndromes will also be discussed, including the challenges associated with the interpretation of genetic test results that are equivocal for pathogenicity, or when pathogenic variants are discovered in the setting of alternative and equally compelling causes of deaths. A framework for communication of results to families will also be provided. Guidelines for specimen retention and cardiovascular pathology subspecialist consultation will also be discussed. This session will incorporate didactic lectures, informal question-and-answer sessions with questions solicited from the audience, and hands-on tutorials utilizing 3D scanned and printed models.
WORKSHOPS

Pre-Registration Required — $100 w/registration; $125 workshop only

#23  Cardiovascular Pathology for Medical Examiners and Coroners:  Basic and Advanced Techniques for the Investigation of Sudden Cardiac Death

Program:

1:00 p.m. - 1:15 p.m.  Introduction
   Peter T. Lin, MD

1:15 p.m. - 2:00 p.m.  Normal Cardiac Anatomy and Variants, Conduction System, Coronary Artery Disease, and Hypertension
   Marie Christine Aubry, MD

2:00 p.m. - 2:15 p.m.  Discussion

2:15 p.m. - 3:00 p.m.  Cardiomyopathies, Inherited Arrhythmia Syndromes, and Genetic Testing
   Joseph J. Maleszewski, MD

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

3:15 p.m. - 4:00 p.m.  Myocarditis, Endocarditis, and Aortopathies:  Cardiovascular Pathology Pitfalls for Forensic Pathologists
   Peter T. Lin, MD

4:00 p.m. - 4:15 p.m.  Discussion

4:15 p.m. - 5:00 p.m.  Questions and Answers:  Tutorial Sessions With 3D Printed Models
   Joseph J. Maleszewski, MD; Marie Christine Aubry, MD; Peter T. Lin, MD

Targeted Audience:  General, Pathology/Biology

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

Expected Handout Length:  20 Pages
WORKSHOPS

Pre-Registration Required — $100 w/registration; $125 workshop only

#24 Think Tank on the Leading Edge of Forensic Science: Drones, Autonomous Vehicles, Big Data/Big Problems, National Security Globalization Into Protrusionism Privacy, Dirty Bombs, and Microbial Forensics

Tuesday, February 20, 2018 1:00 p.m. – 5:30 p.m. 4.0 CE Hours

Educational Objective(s): After attending this presentation, attendees will understand how the rapid rate of change in society may impact several fields in forensic science.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating how the rate of change in society provides new challenges for forensic science. The development of designer drugs as well as the rapid development of methods to extract information from large amounts of data should be considered and perhaps prompt needed changes in laws. The issues with investigation of Chemical, Biological, Radiological, and Nuclear (CBRN) as well as driverless cars, drones, and the insights of cybercrimes and globalization with privacy issues will be discussed.

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

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

Faculty:
David O. Carter, PhD
Chaminade University of Honolulu
Forensic Sciences Unit
Division of Natural Sciences and Mathematics
Honolulu, HI

Jeffery K. Tomberlin, PhD
Texas A&M University
Department of Entomology
College Station, TX

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

Erwin Van Eijk, MS
Netherlands Forensic Institute
Den Haag, NETHERLANDS

Carlos Fraga, PhD
Pacific Northwest National Laboratory
Richland, WA

Eduard Van Zalen, MSc
Netherlands Forensic Institute
The Hague, NETHERLANDS

Joshua M. Toman, LLM
Phoenix Legal Innovations, LLC
Charlotte, NC

Program Description: This workshop will provide insight on forensic science leading-edge topics and the impacts that the rapid rate of change have on the field.
#24 Think Tank on the Leading Edge of Forensic Science: Drones, Autonomous Vehicles, Big Data/Big Problems, National Security Globalization Into Protrusionism Privacy, Dirty Bombs, and Microbial Forensics

Program:

1:00 p.m. - 1:10 p.m. Opening Remarks
Laura L. Liptai, PhD; Zeno J. Geradts, PhD

1:10 p.m. - 1:40 p.m. Autonomous Vehicles: Our Vehicular Engineering and Human Factors Future
Laura L. Liptai, PhD

1:40 p.m. - 2:20 p.m. Judicial Implications of Autonomous Vehicles
Stephanie Domitrovich, JD, PhD

2:20 p.m. - 2:50 p.m. Big Data Forensics and Multimedia Deep Learning
Erwin Van Eijk, MS

2:50 p.m. - 3:05 p.m. Break

3:05 p.m. - 3:35 p.m. Criminalistics and Science in Authorship Identification of Text Messages
Joshua M. Toman, LLM

3:35 p.m. - 4:05 p.m. Nuclear Forensics and CBRN
Eduard Van Zalen, MSc; Carlos Fraga, PhD

4:05 p.m. - 4:35 p.m. Chemical Forensics International Technical Working Group: Striving to Prevent and Deter Chemical Attacks
Carlos Fraga, PhD

4:35 p.m. - 5:15 p.m. Microbial Forensics
David O. Carter, PhD; Jeffery K. Tomberlin, PhD

5:15 p.m. - 5:30 p.m. Closing
Laura L. Liptai, PhD; Zeno J. Geradts, PhD

Targeted Audience: All Disciplines

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

Expected Handout Length: 80 Pages
A separate registration fee, payable to the National Association of Medical Examiners (NAME), is required to attend this scientific program. To join or to attend, contact Denise McNally, NAME Executive Director, at (660) 734-1891 or at name@thename.org.

**Emerging Infectious Diseases (EID) and the Medical Examiner**

**Tuesday, February 20, 2018**

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m.</td>
<td>Welcome</td>
</tr>
<tr>
<td></td>
<td><em>Erin G. Brooks, MD</em></td>
</tr>
<tr>
<td>1:05 p.m.</td>
<td>Zika Virus, Coronavirus, and Other EID: Pathology From the Pandemics</td>
</tr>
<tr>
<td></td>
<td><em>Sherif R. Zaki, MD</em></td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Questions and Answers</td>
</tr>
<tr>
<td>2:05 p.m.</td>
<td>Newer Infectious Disease Diagnostic Modalities, Including Bacterial Gene Sequencing: A Toolkit for Medical Examiners</td>
</tr>
<tr>
<td></td>
<td><em>Andrew Bryan, MD, PhD</em></td>
</tr>
<tr>
<td>2:40 p.m.</td>
<td>Questions and Answers</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td>Break</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Wisconsin 2016 <em>Elizabethkingia Anophelis</em> Outbreak: Lessons Learned</td>
</tr>
<tr>
<td></td>
<td><em>Erin G. Brooks, MD</em></td>
</tr>
<tr>
<td>3:35 p.m.</td>
<td>Questions and Answers</td>
</tr>
<tr>
<td>3:40 p.m.</td>
<td>EID and the Role of Medical Examiner Surveillance Systems</td>
</tr>
<tr>
<td></td>
<td><em>Sarah Lathrop, DVM, PhD</em></td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>Questions and Answers</td>
</tr>
<tr>
<td>4:20 p.m.</td>
<td>Infectious Disease Death Clusters Among Injection Drug Users: The King County Medical Examiner Office Experience</td>
</tr>
<tr>
<td></td>
<td><em>Richard C. Harruff, MD, PhD</em></td>
</tr>
<tr>
<td>4:55 p.m.</td>
<td>Questions and Answers</td>
</tr>
</tbody>
</table>
Emerging Infectious Diseases (EID) and the Medical Examiner

CME STATEMENTS FOR JOINTLY SPONSORED ACTIVITIES

This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of MedChi, The Maryland State Medical Society, and the National Association of Medical Examiners. MedChi is accredited by the ACCME to provide continuing medical education for physicians.

MedChi designates this live activity for a maximum of 3.5 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Continuing Education Administration Fee
There is an administrative charge ($75 pre-registration, $100 on-site registration) for persons wishing to receive this credit. It will be necessary for you to complete a program evaluation as well as pay the administrative fee to receive CME credit for this meeting.

Self-Assessment Module
The American Board of Pathology has deemed the National Association of Medical Examiners to be an approved provider of Self-Assessment Modules (SAMs) for the Life-Long Learning and Self-Assessment Requirement (Part II) for Maintenance of Certification in Forensic Pathology. This activity has been planned and implemented in accordance with those guidelines and qualifies for a maximum of 3.5 hours of SAMs. There is an administrative charge of $35 for Members and $105 for Non-Members.

Registration Fee
The pre-registration fee for members is $150 and $200 for on-site registration. The pre-registration fee for non-members is $200 and $250 for on-site registration. Registration for this event is separate from the AAFS registration process. Contact Denise McNally at (660) 734-1891 or email name@thename.org to receive a registration form.
Forensic Science Research and Development Symposium
American Academy of Forensic Sciences 70th Annual Scientific Meeting

The National Institute of Justice (NIJ) Forensic Science Research and Development Symposium is a free and 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.

Registration information will be available at www.forensicCOE.org.

Tuesday, February 20, 2018
8:30 a.m. – 5:10 p.m.

Program:

8:30 a.m. - 8:40 a.m.  Welcome and Opening Remarks
Gerald M. LaPorte, MSFS

Morning Session I — Forensic Anthropology
Moderated by Danielle L. McLeod-Henning, MFS

8:40 a.m. - 9:05 a.m.  The Macromorphoscopic Databank: A New Tool for Forensic Anthropologists
Joseph T. Hefner, PhD – 2015-DN-BX-K012

9:05 a.m. - 9:30 a.m.  Modeling Surface Morphology of the Pubic Symphysis: Quantitative Methods and Computational Tools for the Objective Estimation of Age at Death for Modern Populations
Jieun Kim, PhD; Detelina Stoyanova, PhD – 2015-DN-BX-K010

9:30 a.m. - 9:55 a.m.  Building a Science of Adult Cranial Fracture
Todd W. Fenton, PhD; Mariyam I. Isa, MA – 2015-DN-BX-K013

9:55 a.m. - 10:20 a.m.  Standardizing Data for a Large-Scale, Whole Body Computerized Tomography (CT) Image Database
Heather J.H. Edgar, PhD – 2016-DN-BX-0144

10:20 a.m. - 10:35 a.m.  Break

Morning Session II — Controlled Substances and Toxicology
Moderated by Frances Scott, PhD

10:35 a.m. - 11:00 a.m.  Liver “Doesn’t DIE,” or at Least Its Enzymes, and Other Useful Information Discovered While Evaluating the Effect of Sample Preparation Techniques on Matrix Effects and Absolute Recovery of Opiates in Liver Tissue Using Ultra-Performance Liquid Chromatography-Tandem Mass Spectrometry (UPLC-MS/MS)
Carl E. Wolf II, PhD – 2016-DN-BX-0148

11:00 a.m. - 11:25 a.m.  Evaluating Trends in Novel Psychoactive Substances Using a Sentinel Population of Electronic Dance Music Festival Attendees
Amanda L.A. Mohr, MSFS – 2015-IJ-CX-K012
**Forensic Science Research and Development Symposium**

**Program cont.:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Speaker</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:25 a.m.</td>
<td>Assessing the Impact of Implementing Portable Mass Spectrometers for On-Site Drug Evidence Processing</td>
<td>Jamie R. Wieland, PhD – 2015-IJ-CX-K011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:15 p.m.</td>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:35 p.m.</td>
<td>Lunch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:35 p.m.</td>
<td>Afternoon Session I — Trace Microbiome</td>
<td>Moderated by Gregory Dutton, PhD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Developing Reliable Methods for Microbial Fingerprinting of Soil Evidence: Collection, Contamination, Storage, and Analysis</td>
<td>David R. Foran, PhD – 2015-DN-BX-K031</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>Evaluating the Skin Microbiome as Trace Evidence on Common Surface Types</td>
<td>David O. Carter, PhD – 2014-R2-CX-K411</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:25 p.m.</td>
<td>The Forensic Geosourcing Potential of the Human Microbiome</td>
<td>Lauren Brinkac Leone – 2015-R2-CX-K036</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:50 p.m.</td>
<td>Candidates of Skin Microbiomes for Human Identification</td>
<td>Bruce Budowle, PhD – 2015-NE-BX-K006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>Afternoon Session II — Forensic Biology/DNA</td>
<td>Moderated by Gregory Dutton, PhD</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multi-Locus Match Probability Dependencies</td>
<td>Bruce S. Weir, PhD – 2014-DN-BX-K028</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:20 p.m.</td>
<td>Microhaplotypes Analyzed by Massively Parallel Sequencing Are Valuable Forensic Tools</td>
<td>Kenneth Kidd, PhD – 2015-DN-BX-K023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:45 p.m.</td>
<td>The Production of High-Fidelity Electropherograms Results in Improved and Consistent Match-Statistics: Standardizing Forensic Validation by Coupling Laboratory-Specific Experimental Data With an In Silico DNA Pipeline</td>
<td>Catherine M. Grrgicak, PhD – 2014-DN-BX-K026</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Organization of Scientific Area Committees (OSAC) for Forensic Science works to strengthen the nation’s use of forensic science by facilitating the development of scientifically sound forensic science standards and by promoting the adoption of those standards by the forensic science community. OSAC has more than 550 members and 250 affiliates who work together to develop and evaluate forensic science standards via a transparent, consensus-based process that allows for participation and comment by all stakeholders.

This event will feature presentations from the Chairs of the five Scientific Area Committees (SAC), three Resource Committees, Statistics Task Group, and Forensic Science Standards Board (FSSB). Each presenter will describe their OSAC unit’s activities, including the latest standards under development, research gaps identified, challenges being addressed, and priorities for 2018. The public will be offered an opportunity to ask questions and provide feedback after each presentation. All presentations and questions from the audience will be webcast live and archived for future on-demand viewing.

Program:

8:00 a.m. - 8:15 a.m. Forensic Science Standards Board Update
Steven Johnson, BS, Chair

8:15 a.m. - 8:30 a.m. How Should Standards Minimize the “B-Word” (Bias) in Forensic Science?
William Thompson, PhD, Chair, Human Factors Committee

8:30 a.m. - 8:45 a.m. The Attorneys, Love ‘em or Hate ‘em, You Can’t (Should Not) Do Standards Without ‘em
Christopher Plourde, JD, Chair, Legal Resource Committee

8:45 a.m. - 9:00 a.m. The Yellow Brick Road to Standards Development
Karen Reczek, BS, Chair, Quality Infrastructure Committee

9:00 a.m. - 9:15 a.m. Statistics Is Never Having to Say You’re Certain
Karen Kafadar, PhD, Chair, Statistics Task Group

9:15 a.m. - 9:30 a.m. Break

9:30 a.m. - 10:30 a.m. How Good Standards Can Prevent DNA From Becoming a 4-Letter Word
George Herrin, PhD, Chair, Biology/DNA SAC
(including activities from the Biological Methods, Biological Data Interpretation and Reporting, and Wildlife Forensics Subcommittees)

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

10:45 a.m. - 12:15 p.m. Death, Crime Scenes, and OSAC
Gregory Davis, MD, Chair, Crime Scene/Death Investigation SAC
(including activities from the Anthropology, Crime Scene Investigation, Disaster Victim Identification, Dogs and Sensors, Fire and Explosion Investigation, Medicolegal Death Investigation, and Odontology Subcommittees)

12:15 p.m - 1:15 p.m Break
What Is OSAC Up To? A Behind-the-Scenes Look

Program cont.:

1:15 p.m - 2:30 p.m  Individualizations, Identifications, Associations, OH MY!!!
Melissa Gische, MFS, Chair, Physics/Pattern Interpretation SAC
(including activities from the Bloodstain Pattern Analysis, Firearms and Toolmarks, Footwear and Tire, Forensic Document Examination, and Friction Ridge Subcommittees)

2:30 p.m - 2:45 p.m  Break

2:45 p.m - 3:45 p.m  Is Digital & Multimedia Science Really “Forensic Science”?
Richard Vorder Bruegge, PhD, Chair, Digital/Multimedia SAC
(including activities from Digital Evidence, Facial Identification, Speaker Recognition, and Video/Imaging Technology and Analysis Subcommittees)

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

4:00 p.m - 5:15 p.m  Finding Meaning Through Forensic Chemistry — A Focus on the Progress Within the Chemistry/Instrumental Analysis SAC
Jose Almirall, PhD, Chair
(including activities from the Fire Debris & Explosives, Geological Materials, Gunshot Residue, Materials (Trace), Seized Drugs, and Toxicology Subcommittees)
Discover solutions to help advance your forensic laboratory’s success

Join us at booth #140
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

For Research, Forensic or Paternity Use Only. Not for use in diagnostic procedures.
© 2017 Thermo Fisher Scientific Inc. All rights reserved. All trademarks are the property of Thermo Fisher Scientific and its subsidiaries unless otherwise specified. COL05414 1217
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 Investigating the Accuracy of Additive Manufacturing Skeletal Samples for Evidence Reconstruction
Rachael M. Carew, MSc*; Ruth M. Morgan, PhD; Carolyn Rando, PhD

11:30 a.m. - 1:00 p.m. A2 Radiographic Image Analysis and the Estimation of Age at Death in Adult Males
Andrew C. Seidel, MA*; Laura C. Fulginiti, PhD; Joel K. Simcoe
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. A3 Landmark and Measurement-Based Data Assistant (LAMbDA): A Pedagogical Tool for Cranial Landmark Data Collection
Kelly R. Kamnikar, MA*; Amber M. Plemons, MA; Alexis C. Goots, MA
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. A4 A Test of Quantitative Age-at-Death Estimation of the Pubic Symphysis Using the forAge Program
Audrey D. Schaefer, BA*; Jessica Galea, BA

11:30 a.m. - 1:00 p.m. A5 The Glenoid Cavity in Sex Estimation Among Contemporary Filipinos: Preservation and Accuracy Rates
Matthew C. Go, MA*; Jana Andrea D.S. Santos, BA*; Anne Marie R. Valera, BA*;
Giswinne van de Wijdeven, MS*; Nicole Marie C. Vesagas, BA*

11:30 a.m. - 1:00 p.m. A6 Reliability and Validity of the Walker and Klales, et al. Methods
Mackenzie Walls*, Alexandra R. Klales, PhD; Kate M. Lesciotto, JD, MS;
Timothy P. Gocha, PhD; Heather M. Garvin, PhD

11:30 a.m. - 1:00 p.m. A7 Dirt Matters: Case Studies in Forensic Archaeological Stratigraphy
Sabrina C. Ta’ala, MA*, Laurel E. Freas, PhD; Dane Terence Magoon, MA;
Kelley S. Esh, MA; Owen L. O’Leary, PhD; Gregory E. Berg, PhD;
Alexander F. Christensen, PhD

11:30 a.m. - 1:00 p.m. A8 Analysis of Interobserver and Intraobserver Error Associated With the Use of 3D Laser Scan Data of the Pubic Symphysis
Jieun Kim, PhD*; Bridget F.B. Algee-Hewitt, PhD; Detelina Stoyanova, PhD;
Cristina Figueroa-Soto, MA; Dennis E. Slice, PhD

11:30 a.m. - 1:00 p.m. A9 Analysis of Osteon Pull-Out and Collagen Degradation to Establish Fracture Timing
James Luong, MSc*; Sadaf Fakhra, MSc; Natalie R. Langley, PhD; Beatrix Dudzik, PhD;
Maria Teresa A. Tersigni-Tarrant, PhD

11:30 a.m. - 1:00 p.m. A10 Quantitative Population Differences in Anterior Zygomatic Projection (ZP)
Chelsea C. Cataldo-Ramirez, BA*; Heather M. Garvin, PhD; Luis L. Cabo, MS

11:30 a.m. - 1:00 p.m. A11 The Use of the Mastoid Triangle for Sex Estimation
Natalie L. Andras*

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
</tr>
</thead>
</table>
| 11:30 a.m. - 1:00 p.m. | **A12** The Impact of Asymmetrical Leg Lengths on Adult Stature Estimation  
Megan E. Ingoldstad, PhD* |
| 11:30 a.m. - 1:00 p.m. | **A13** The Utility of Postcranial Non-Metric Traits in Ancestry Analysis  
Micayla C. Spiros, MSc*; Carolyn Rando, PhD |
| 11:30 a.m. - 1:00 p.m. | **A14** Testing the Reliability of Ancestry-Specific Juvenile Age Estimation Methods  
Using the Diaphyseal Length of the Humerus  
Hugo Cardoso, PhD*; Laure Spake, MA*; Luis Rios, MA; John Albanese* |
| 11:30 a.m. - 1:00 p.m. | **A15** A Revision of the Histological Age Estimation Formula From Stout for Sternal Rib Ends  
Nicole M. Weiss, BS* |
| 11:30 a.m. - 1:00 p.m. | **A16** An Examination of Pelvic Scarring as a Determinant of Parturition Status  
Helen M. Brandt, BA*; Stephen P. Nawrocki, PhD; Krista E. Latham, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation) |
| 11:30 a.m. - 1:00 p.m. | **A17** Stature Estimation Using Measurements of the Cranium for Populations  
in the United States  
Kelsey Kyllonen, MA*; Terrie L. Simmons-Ehrhardt, MA; Keith L. Monson, PhD |
| 11:30 a.m. - 1:00 p.m. | **A18** Histological Variables at Multiple Locations and the Effect on Age Estimation  
Victoria M. Dominguez, MA; Nicole M. Crowe, BS*; Angela L. Harden, MA;  
Amanda M. Agnew, PhD |
| 11:30 a.m. - 1:00 p.m. | **A19** Using Structure From Motion Photogrammetry to Quantify Volume Gain and Loss During the Human Decomposition Process  
Kathleen Flor-Stagnato, BA*; Susan Sincerbox, BS*; Nicholas P. Herrmann, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation) |
| 11:30 a.m. - 1:00 p.m. | **A20** The Use of the Mandibular Symphysis for Estimating Ancestry  
Ginesse A. Listi, PhD* |
| 11:30 a.m. - 1:00 p.m. | **A21** Scavenging Patterns in Hawaii: An Archaeological and Skeletal Case Study  
Robert Kalani Carreira, BA*; Jennifer F. Byrnes, PhD; William R. Belcher, PhD |
| 11:30 a.m. - 1:00 p.m. | **A22** Anatomy and Biological Anthropology: Time for a Family Reunion?  
Natalie R. Langley, PhD*; Lauren Butaric, PhD |
| 11:30 a.m. - 1:00 p.m. | **A23** The Forensic Application of Skeletal Stress Indicators: A Correlation Study of Linear Enamel Hypoplasia (LEH), Harris Lines, Cortical Bone Loss (CBL), and Stature  
Justin Goldstein, MA*  
(FSF Emerging Forensic Scientist Award Poster Presentation) |
| 11:30 a.m. - 1:00 p.m. | **A24** The Use of High-Resolution Micro-Computed Tomography (micro-CT) for Quantifying Vascular Pore Networks Across Whole Cross Sections of Human Cortical Bone  
Mary E. Cole, MA*; Sam D. Stout, PhD |
| 11:30 a.m. - 1:00 p.m. | **A25** The Effect of Cranium Orientation on Positive Identification Using Frontal Sinus Radiographs  
Alyssa R. Harrison, BS* |
ANTHROPOLOGY

11:30 a.m.  -  1:00 p.m.  A26  A Study on the Asymmetry Between the Left and Right Human Pubic Symphysis for Age-at-Death Estimation Based on 3D Laser Scans and Computational Methods
Detelina Stoyanova, PhD*; Bridget F.B. Algee-Hewitt, PhD; Jieun Kim, PhD; Dennis E. Slice, PhD

11:30 a.m.  -  1:00 p.m.  A27  Preauricular Sulcus (PAS) and Parity Status: A Possible Correlation?  
A Test on a Documented British Collection
Sarah E. Canty, BSc*; Matteo Borrini, PhD*; Constantine Eliopoulos, PhD; Silvia Gonzalez, PhD

Thursday — Session I

Antemortem and Peri-Mortem Skeletal Trauma

Moderator: Todd W. Fenton, PhD
Michigan State University
Department of Anthropology
East Lansing, MI

Co-Moderator: Katie M. Rubin, MS
University of Florida, CA Pound Human Identification Laboratory
Gainesville, FL

8:30 a.m.  -  8:45 a.m.  A28  Forensic Fractography of Bone: A New Approach to Skeletal Trauma Analysis
Angi M. Christensen, PhD*; Joseph T. Hefner, PhD; Michael A. Smith, PhD; Jodi Blakely Webb, MS; Maureen Bottrell, MS; Todd W. Fenton, PhD

8:45 a.m.  -  9:00 a.m.  A29  A Retrospective Study of Intentional Body Dismemberment in New York City: 1996-2016
Bradley J. Adams, PhD*; Christopher W. Rainwater, MS; An-Di Yim, MA; Helen S. Alesbury, BS

9:00 a.m.  -  9:15 a.m.  A30  Determining Common Skeletal Injury Locations Based on Manner of Death (MOD)
Courtney N. Hulse, MA*; Kyra E. Stull, PhD; Laura D. Knight, MD
(FSF Emerging Forensic Scientist Award Paper Presentation)

9:15 a.m.  -  9:30 a.m.  A31  Butterfly Fractures in Medicolegal Investigations
Steven A. Symes, PhD*; Ericka N. L’Abbe, PhD; Mark M. LeVaughn, MD

9:30 a.m.  -  9:45 a.m.  A32  Early Signs of Direct Fracture Repair and Indirect Intramembranous Fracture Repair Without Indications of Endochondral Ossification in the Ribcage
Katie M. Rubin, MS*; Michala K. Stock, MA

9:45 a.m.  -  10:00 a.m.  A33  Initiation and Propagation of Fractures in Blunt Impacts to Unconstrained Human Cadaver Heads
Mariyam I. Isa, MA*; Todd W. Fenton, PhD; Alexis C. Goots, MA; Elena O. Watson, BA; Patrick E. Vaughan, BS; Feng Wei, PhD; Roger C. Haut, PhD

10:00 a.m.  -  10:15 a.m.  A34  The Influence of Implement Shape on Fracture Pattern and Defect Size in Experimental Blunt Cranial Impacts
Elena O. Watson, BA*; Todd W. Fenton, PhD; Mariyam I. Isa, MA; Alexis C. Goots, MA; Patrick E. Vaughan, BS; Feng Wei, PhD; Roger C. Haut, PhD

*Presenting Author
**Anthropology**

10:15 a.m. - 10:30 a.m.  **A35**  
**Estimating Points of Impact in Multiple Blunt Force Cranial Trauma: Lessons From Experimental Impacts**  
Alexis C. Goots, MA*; Mariyam I. Isa, MA; Todd W. Fenton, PhD; Elena O. Watson, BA; Patrick E. Vaughan, BS; Feng Wei, PhD; Roger C. Haut, PhD

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

### Biological Profile: Sex Determination

**Moderator:** Sean D. Tallman, PhD  
Boston University  
Departments of Anatomy and Neurobiology  
and Anthropology  
Boston, MA

**Co-Moderator:** Janet E. Finlayson, MA  
University of Florida  
Gainesville, FL

10:45 a.m. - 11:00 a.m.  **A36**  
**Introducing MorphoPASSE: The Morphological Pelvis and Skull Sex Estimation Database**  
Alexandra R. Klales, PhD*; Stephanie J. Cole, MS

11:00 a.m. - 11:15 a.m.  **A37**  
**Computational Anatomy: What Prospects for Forensic Anthropology?**  
Rémi Agier; Remy Prost, PhD; Razmig Kechichan; Sébastien Valette; Laurent Fanton, MD, PhD; Angelique Franchi, MD*

11:15 a.m. - 11:30 a.m.  **A38**  
**Risen From the Ashes: An Exploratory Study for Developing New Methods of Analyzing Cremated Human Remains**  
Anthony W. Hudson*  
(FSF Emerging Forensic Scientist Award Paper Presentation)

11:30 a.m. - 11:45 a.m.  **A39**  
**Estimating Sex With Outline Shape Analysis of the Trochlear Constriction and the Olecranon Fossa**  
Saskia Ammer, MSc*; João Pedro Valente de Oliveira Coelho, MSc  
(FSF Emerging Forensic Scientist Award Paper Presentation)

11:45 a.m. - 12:00 p.m.  **A40**  
**The Utility of Clavicular and Humeral Non-Metric Sex Assessment Methods in Japanese and Thai Individuals**  
Sean D. Tallman, PhD*

12:00 p.m. - 1:45 p.m.  
**Lunch**

### Poster Session

11:30 a.m. - 1:00 p.m.  **A41**  
**Resolving Commingling and Past Accounting at Cabanatuan Prison Camp Cemetery**  
Mary S. Megyesi, PhD

11:30 a.m. - 1:00 p.m.  **A42**  
**Procedures for Sorting Small-Scale Cases of Commingled Remains: An Integrative Approach Using Morphological, Metric, and Chemical Methods**  
Colleen F. Milligan, PhD*; Eric J. Bartelink, PhD; Alexandra Perrone, MA

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Abstract Title</th>
<th>Presenting Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>A43</td>
<td>How Large Is Too Large? The Effect of Assemblage Size in Reassociating Commingled Remains</td>
<td>Kyle A. McCormick, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A44</td>
<td>Commingling Among Unidentified Remains Stored at Mortuary Facilities in Bosnia and Herzegovina (BiH)</td>
<td>D. Sarzinski, MSc*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A45</td>
<td>The Accuracy of Visual Pair Matching of the Humerus of a Large-Scale Commingled Assemblage</td>
<td>Carrie B. LeGarde, MA*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A46</td>
<td>Osteometric Sorting of Commingled Upper Limb Bones</td>
<td>Ioanna Anastopoulou, BSc; Fotios A. Karakostis, MSc; Konstantinos Moraitis, PhD*; Matteo Borrini, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A47</td>
<td>The Use of Portable X-Ray Fluorescence (pXRF) Spectrometry for a Large Commingled Assemblage</td>
<td>Larkin F. Kennedy, PhD*; Stephanie Fuehr, MA</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A48</td>
<td>Estimating the Number of Individuals in a Large Commingled Assemblage of Known Size</td>
<td>Andrea Palmiotto, PhD*; Carrie A. Brown, PhD*; Carrie B. LeGarde, MA</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A49</td>
<td>Using Biological Data to Inform a DNA Sequencing Strategy</td>
<td>Carrie A. Brown, PhD*; Jeffrey James Lynch, MSc</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A50</td>
<td>A Multidisciplinary Approach to Identifying Unaccounted Service Members From the Battle of Tarawa in 1943</td>
<td>Rebecca J. Wilson-Taylor, PhD*; Anthony J. Koehl, PhD; Audrey L. Scott, PhD; Willa R. Trask; Heli Maijanen, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A51</td>
<td>A Comparison of Bullet Type on Cranial Gunshot Exit Wounds</td>
<td>Elizabeth A. DiGangi, PhD*; Elizabeth A. Evangelou, MA*; Tessa Somogyi, MA*; Jessica E. Sanger, BA; Daniel Castellanos, MA*; Donald Poon, BA*; Kevin E. Sheridan, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A52</td>
<td>Ancestral Variation and Postcranial Metrics for Three United States Populations: Implications for Stature Estimation</td>
<td>Bridget F.B. Algee-Hewitt, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A53</td>
<td>A Comparison of Historical and Present-Day Skeletal Analyses of Unidentified Remains Recovered From Europe During World War II</td>
<td>Katherine Skorpinski, PhD*; Ian Spurgeon, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A54</td>
<td>An Assessment of Ancestry and Sex Estimation Using FORDISC® 3.1</td>
<td>John Albanese*, Abegail Dagdag; Carmen Skalic, BA; Hugo Cardoso, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>A55</td>
<td>A Multidisciplinary Approach to Identification and Repatriation at Mount Austen, Guadalcanal</td>
<td>Megan E. Ingvoldstad, PhD*; Kimberly A. Maeyama, PhD</td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Poster Number</td>
<td>Title</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>---------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A56</td>
<td>A Test of the (hu)MANid Classification Software on a Sample of United States White and Black Mandibles</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A57</td>
<td>Comparing Socio-Economic and Population-Level Differences and Quantifying Their Impact on Subadult Age Estimations</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A58</td>
<td>Age Estimation of Hispanic Children Using the London Atlas</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A59</td>
<td>A Geometric Morphometric Analysis of Contemporary Hispanic Populations From Mexico and Colombia</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A60</td>
<td>The Frequency of Asymmetry in Non-Metric Craniofacial Trait Expression and Its Effect on Ancestry Assessment</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A61</td>
<td>Non-Metric Traits of the Mandible in Ancestry Estimation</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A62</td>
<td>Using Basicranial Landmarks to Estimate Ancestry in an American Sample</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A63</td>
<td>Craniometric Variation of Modern Asian and Hispanic Individuals Using Multivariate Analysis</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A64</td>
<td>WITHDRAWN</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A65</td>
<td>Sensitivity Analysis of Craniometric Measurements and Modeling Techniques to Assess Impact of Measurement Error on FORDISC® Results</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>A66</td>
<td>The Importance of Sitewide Taphonomic Assessments for Highly Fragmented, Comingled, and Heat-Altered Remains From Mass Graves</td>
</tr>
</tbody>
</table>

*Presenting Author
Histology and Quality Assurance

Moderator: Maria Teresa A. Tersigni-Tarrant, PhD  
Saint Louis University School of Medicine  
Center for Anatomical Science  
St. Louis, MO  
Co-Moderator: Vincent J. Sava, MA  
Defense POW/MIA Accounting  
Agency Laboratory  
Joint Base Pearl Harbor-Hickam, HI

1:45 p.m. - 2:00 p.m. A67 The Occurrence of Osteon Banding in Adult Human Cortical Bone  
Janna M. Andronowski, PhD*; Isaac V. Pratt, MSc; David M.L. Cooper, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:00 p.m. - 2:15 p.m. A68 Estimation of the Postmortem Interval (PMI) of Skeletonized Human Remains Using Nile Blue and Indophenol Colorimetrics on Femoral Cortical Thin Sections  
Léa M. Lerchundi, MSc; Anne Coulombeix, MSc; Pierre M.M. Guyomarc’h, PhD*

2:15 p.m. - 2:30 p.m. A69 Volumetric Histological Age Estimation Utilizing a Geographic Information Systems (GIS) -Based Analytical Approach  
Szuzanna Michener, MSc*; Lynne S. Bell, PhD; Nadine Schuurman, PhD; David Swanson, BA  
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:30 p.m. - 2:45 p.m. A70 Validation, Verification, and Performance Checks of Anthropological Equipment and Software: The Importance of Quality Assurance in Forensic Anthropology Laboratories  
Julie M. Fleischman, PhD*; Christian Crowder, PhD; Michal L. Pierce, MS; Kate Spradley, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:45 p.m. - 3:00 p.m. A71 Accreditation of Forensic Anthropology and Practice in the United Kingdom  
Catriona M. Davies, PhD*; Lucina Hackman, PhD

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

Biological Profile: Age Estimation and Ancestry Determination

Moderator: Joseph T. Hefner, PhD  
Michigan State University  
Department of Anthropology  
East Lansing, MI  
Co-Moderator: Diana L. Messer, MS  
Erie, PA

3:15 p.m. - 3:30 p.m. A72 Validation of the Acetabulum as a Skeletal Indicator of Age at Death  
Allysha P. Winburn, PhD*

3:30 p.m. - 3:45 p.m. A73 Exploring the Performance of a Global Subadult Age Estimation Model Using Unsupervised Machine Learning Techniques  
Kyra E. Stull, PhD*; Michael H. Price, PhD

*Presenting Author
3:45 p.m. - 4:00 p.m. A74 A Multidisciplinary Protocol to Assess Chronological Age of Unidentified Migrants
Francesco Lupariello, MD*; Serena Maria Curti, MD; Davide Santovito, MD; Moreno Bertoni, MD; Giancarlo Di Vella, MD, PhD

4:00 p.m. - 4:15 p.m. A75 Dental Morphological Ancestry Estimation in a Self-Identified Biracial Sample
Chaunsey Clemmons, BA*; Daniel J. Wescott, PhD

4:15 p.m. - 4:30 p.m. A76 Improvement to the Estimation of Hispanic Ancestry Through the Combination of Cranial and Dental Traits
Christopher A. Maier, PhD*

4:30 p.m. - 4:45 p.m. A77 SkullProfiler: A Simple New Capability for the Quantitative Estimation of Ancestry and Sex From Lateral Skull Photographs
Jodi M. Caple, BS*; John E. Byrd, PhD; Carl N. Stephan, PhD

4:45 p.m. - 5:00 p.m. A78 Analyzing Morphometric Methods of Race Differentiation in the Human Pelvic Girdle
Laura Yurka, MA*

Thursday — Session II

Forensic Anthropology: Facilities, Databases, Ethics, and Professionalism

Moderator: Maranda A. Kles, PhD
University of Louisiana at Lafayette
Lafayette, LA

Co-Moderator: Katelyn L. Bolhofner, PhD
Arizona State University
Tempe, AZ

8:30 a.m. - 8:45 a.m. A79 Masters of Our Own House: The Planning and Construction of the New Defense POW/MIA Accounting Agency (DPAA) Laboratory in Hawaii
Vincent J. Sava, MA*; John E. Byrd, PhD

8:45 a.m. - 9:00 a.m. A80 Learning From Our Casework: The Society of Forensic Anthropologists (SOFA) Case Database
Cris E. Hughes, PhD*; Chelsey A. Juarez, PhD; Katharine Chapman Pope, MA

9:00 a.m. - 9:15 a.m. A81 Forensic Research Outdoor Station (FROST): The Implementation of a Cold-Climate Forensic Anthropology Research Facility
Jane Wankmiller, PhD*; Scott Demel, PhD

9:15 a.m. - 9:30 a.m. A82 The New Revolution of Bone Collection and the Necessity for the International Digital Bone Collection Center (IDBCC)
Yu Ryang Jang, PhD*

9:30 a.m. - 9:45 a.m. A83 The Ethics of Conducting Research on Human Subjects in Forensic Anthropology
Marin A. Pilloud, PhD*; Nicholas V. Passalacqua, PhD
ANTHROPOLOGY

9:45 a.m. - 10:00 a.m.  A84  Imaging Human Skeletal Remains: Ethical Considerations  
                          David Errickson*

10:00 a.m. - 10:15 a.m.  A85  The Current State of Forensic Anthropology as a Profession  
                          Nicholas V. Passalacqua, PhD*; Marin A. Pilloud, PhD

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

Taphonomy and Postmortem Interval (PMI)

Moderator: Mary S. Megyesi, PhD  
Defense POW/MIA Accounting  
Agency Laboratory  
Joint Base Pearl Harbor-Hickam, HI  
Co-Moderator: Kelly R. Kamnikar, MA  
Michigan State University  
East Lansing, MI

10:30 a.m. - 10:45 a.m.  A86  The Suitability of Digital Photographs to Evaluate Decomposition of Pig Carcasses in a Tropical Climate: A Preliminary Investigation  
                          Agathe J.G. Ribereau-Gayon, MSc*; Carolyn Rando, PhD; Ruth M. Morgan, PhD;  
                          David O. Carter, PhD  
                          (FSF Emerging Forensic Scientist Award Paper Presentation)

10:45 a.m. - 11:00 a.m.  A87  Predicting the Postmortem Submersion Interval (PMSI) From the Microbiome of Bone in a Fresh Water Lake  
                          Claire M. Cartozzo, MSFS*; Baneshwar Singh, PhD; Tal Simmons, PhD  
                          (FSF Emerging Forensic Scientist Award Paper Presentation)

11:00 a.m. - 11:15 a.m.  A88  The Faunal Succession of Forensically Important Arthropods and Large Vertebrate Scavengers in Rural Northwest Florida  
                          Kristen M. Grow, BA*

11:15 a.m. - 11:30 a.m.  A89  Analysis of the Interactions Between Taphonomic and Pathological Processes  
                          Maria L. Cox, BA*  
                          (FSF Emerging Forensic Scientist Award Paper Presentation)

11:30 a.m. - 11:45 a.m.  A90  A Comparison of Two Methods for Estimating the Postmortem Interval (PMI) From Decomposed Human Remains  
                          Mary Studebaker-Reed, BA*; Deborra C. Pinto, PhD; Michelle R. Sanford, PhD

11:45 a.m. - 12:00 p.m.  A91  The Differential Effects of Environmental Factors on Immature and Mature Bone Degradation: A Controlled Experiment Using Pig Skeletal Remains  
                          Shera Fisk, BSc*; Francesco Berna, PhD; Deborah C. Merrett, PhD; Hugo Cardoso, PhD

12:00 p.m. - 1:45 p.m.  Lunch

*Presenting Author
Humanitarian Forensic Science

Moderator: Davette N. Gadison, MA  
New Orleans, LA  
Co-Moderator: Kate Spradley, PhD  
Texas State University  
Department of Anthropology  
San Marcos, TX

1:45 p.m. - 2:00 p.m.  A92  
Science as a Human Right: Using DNA to Identify Missing Migrants  
Robin C. Reineke, PhD*; Mirza M. Monterroso, MA

2:00 p.m. - 2:15 p.m.  A93  
The Approach Toward Identification of Deceased Migrants in the United States and European Union: A Comparative Study Between LABANOF (Italy), OpID (Texas), and PCOME (Arizona) Experiences  
Annalisa Cappella, PhD; Timothy P. Gocha, PhD*; Jennifer M. Vollner, PhD; Deborah Mazzarelli, BS; Lara Olivieri, MSc; Bruce E. Anderson, PhD; Kate Spradley, PhD; Cristina Cattaneo, PhD

2:15 p.m. - 2:30 p.m.  A94  
Humanitarian Science in the Texas Borderlands: Incorporating a Sociopolitical Perspective to the Forensic Investigation of Migrant Identification  
Krista E. Latham, PhD*; Alyson O’Daniel, PhD; Kate Spradley, PhD

2:30 p.m. - 2:45 p.m.  A95  
Assessing the Spatial Patterns of Undocumented Border Crosser (UBC) Deaths in the Southern Arizona Desert  
Caitlin C.M. Vogelsberg, MS*  
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:45 p.m. - 3:00 p.m.  A96  
The Application of Stable Isotopes and Geostatistics to Infer Region of Geographic Residence for Undocumented Migrants  
Robyn Theresa Kramer, BA*; Nicholas P. Herrmann, PhD; Eric J. Bartelink, PhD; Kate Spradley, PhD

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

Forensic Archaeology

Moderator: Christopher W. Rainwater, MS  
Office of the Chief Medical Examiner  
New York, NY  
Co-Moderator: Lauren R. Pharr, PhD  
Memphis, TN

3:15 p.m. - 3:30 p.m.  A97  
Digital Technologies and Forensic Archaeology: Reflections on the Experiences of the Committee of Missing Persons in Cyprus  
Caroline L. Sturdy Cols, PhD*; Dante Abate, PhD; Noly Moyssi, PhD*; Demet Karsili, MA*; Marina Faka, MSc; Ahmet Anilir, MSc; Stylianos Manoli; Sorin Hermon, PhD

3:30 p.m. - 3:45 p.m.  A98  
Broken Link: The Role of Forensic Anthropology in Cultural Resources Management  
Rebekah Loveless, MA*; Brandon C. Linton*
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:45 p.m.</td>
<td>A99</td>
<td>Identifying Vulture Scavenging Locations Through Global Positioning Systems (GPS), Geographic Information Systems (GIS), and Remote Sensing</td>
<td>Lauren R. Pharr, PhD*; Michael Leitner, PhD</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>A100</td>
<td>Staged and Altered Homicide Scenes: An Analysis of Secondary Sites</td>
<td>Erin H. Kimmerle, PhD*</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>A101</td>
<td>The Application of Photogrammetry for Documenting Scenes With Skeletal Remains: Capabilities and Shortcomings for Use in Central Florida</td>
<td>Kevin Gidusko, BA; John J. Schultz, PhD; Mason H. Branscome, BA*</td>
</tr>
<tr>
<td>4:30 p.m.</td>
<td>A102</td>
<td>An Examination of the Relationship Between Intrinsic Properties of Bone and Skeletal Element Recovery</td>
<td>Valerie Sgheiza, BS*</td>
</tr>
<tr>
<td>4:45 p.m.</td>
<td>A103</td>
<td>The Use of Geographic Information Systems (GIS) to Identify Relationships Between Victim Dispersal Patterns and Skeletal Trauma After a Blast Event</td>
<td>Alice Fazlollah Gooding, PhD*; Caroline Johnston, BS; Kendra Thomas, BS; Michael McClung, BS</td>
</tr>
</tbody>
</table>

**Friday**

**A Miscellany of Anthropology**

*Moderator: Krista E. Latham, PhD
University of Indianapolis
Biology Department
Indianapolis, IN*

*Co-Moderator: Victoria Swenson, MA
Knoxville, TN*

<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>A104</td>
<td>Variety and Distribution of Orthopedic Devices in the Cyprus Research Reference Collection and Their Relationship to Skeletal Trauma: Preliminary Results</td>
<td>Xenia Paula Kyriakou*; Amy I. Perez; Anna Williams, PhD</td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>A105</td>
<td>The Application of Consolidation Materials to Burned Bone: A Comparative Approach</td>
<td>Courtney C. Siegert, BA*; Michelle D. Hamilton, PhD; Elizabeth Erhart; Joanne Devlin, PhD</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>A106</td>
<td>The Effect of Scanner Performance on Capture Ability and Identification Success on Postmortem Biometric Data</td>
<td>Kelly Sauerwein, MA*; Samantha Upton, BA*; Elizabeth Albee, BA; Anielle Duncan, BA; Dawnie W. Steadman, PhD; David Bolme, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author*
ANTHROPOLOGY

9:15 a.m. - 9:30 a.m.  A107  In Search of Jane Doe: An Analysis of Solvability Factors in Unidentified Remains
Melissa Ann Pope, MA*; Kelsee Hentschel-Fey, MA; Erin H. Kimmerle, PhD

9:30 a.m. - 9:45 a.m.  A108  Changes in DNA Quantity and Quality in the Human Tibia After Short-Term Surface or Subsurface Burial
Zachariah A. Landhuis, BA*; McKenzie R. Siewert, BS; David R. Foran, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

9:45 a.m. - 10:00 a.m.  A109  Long-Term Cocaine Use and Its Potential Effect on Bone Morphology
Nicollette S. Appel, MS*; Donald F. Siwek, PhD; Tara L. Moore, PhD

10:00 a.m. - 10:15 a.m.  A110  Mismeasurement of the Tibia and Femur Reconsidered: How Were Measurements Taken at the Central Identification Unit in Kokura, Japan?
Alexander F. Christensen, PhD*

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

Statistics and the Biological Profile

Moderator: Nicholas P. Herrmann, PhD
Texas State University
Department of Anthropology
San Marcos, TX

Co-Moderator: Jennifer F. Byrnes, PhD
University of Hawaii - West O‘ahu
Kapolei, HI

10:30 a.m. - 10:45 a.m.  A111  A Validation Study of the Langley Decision Tree Model for Sex Estimation
Heather M. Garvin, PhD*; Alexandra R. Klales, PhD

10:45 a.m. - 11:00 a.m.  A112  Age-Cohort Categorization and Multi-Factorial Age Estimation in Machine Learning Environments
Joseph T. Hefner, PhD*; Nicholas V. Passalacqua, PhD

11:00 a.m. - 11:15 a.m.  A113  On the Central Importance of Analysis of Covariance (ANCOVA) in Human Skeletal Research
Stephen P. Nawrocki, PhD*; Krista E. Latham, PhD; Madeline Parker, BS

11:15 a.m. - 11:30 a.m.  A114  Fuzzy Inference System (FIS) as a Novel Statistical Method for Forensic Ancestry Estimation
Donovan M. Adams, MS*; Rebecca L. George, MA
(FSF Emerging Forensic Scientist Award Paper Presentation)

11:30 a.m. - 11:45 a.m.  A115  Body Mass Estimation: Preliminary Equations for the Undocumented South Texas Migrants Using Bayesian Inference
Elaine Y. Chu, BSc*; Kate Spradley, PhD

11:45 a.m. - 1:30 p.m.  Lunch

*Presenting Author
<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>A116</td>
<td>Decomposition Rates: Autopsied vs. Non-Autopsied Human Remains</td>
<td>Cortnee J. Agan*, Christiane Baigent, MSc*; Melissa A. Connor, PhD; Eriek S. Hansen, PhD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(FSF Emerging Forensic Scientist Award Poster Presentation)</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A117</td>
<td>Testing the Accuracy of the Correlation Between the Condyles of the Distal Femur and Proximal Tibia: A Validation Study</td>
<td>Erin B. Waxenbaum, PhD; Lauren Diaz-Albertini, BA*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A118</td>
<td>Using Microbial Clocks in Human Cadaver Ribs as a Postmortem Tool</td>
<td>Jessica L. Metcalf, PhD; Aaron M. Lynne, PhD; Jennifer R. Kiely, BS*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A119</td>
<td>Toward a Skeletal Atlas of Elder Abuse: A Pilot Study of Fracture Patterns in Documented Cases</td>
<td>Katelyn L. Bolhoffier, PhD*; Laura C. Fulginiti, PhD; Jane E. Buikstra, PhD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(FSF Emerging Forensic Scientist Award Poster Presentation)</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A120</td>
<td>Results of Testing Interobserver/Intraobserver Error for “Planar” Proxy for Upper Facial Breadth and Novel Measurement of Interorbital Distance</td>
<td>Angeline Smith*; Jacob L. Cheramie; Maranda A. Kles, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A121</td>
<td>Challenges in Identifying United States Casualties From Past Conflicts: An Assessment of Lines of Evidence</td>
<td>Heli Maijanen, PhD*; Andrea Palmiotto, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A122</td>
<td>The Application of the Megyesi Method and Improved Total Body Scores (TBS) and Accumulated Degree Days (ADD) Equations to Pennsylvania, Ohio, and New York Cases</td>
<td>Dorianis Perez, BS; Paige A. Lynch, BA*; Rhian Dunn, BA; Audrey E. Constantino, BS*; Luis L. Cabo, MS</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A123</td>
<td>The Human Cadaver Decomposition Island (CDI) and the Vegetation Regrowth Interval</td>
<td>Tonya Parnell, BS; Katie Tanner, BS; Stacie G. Gray, BS; Haeli Kennedy*; Joan A. Bytheway, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A124</td>
<td>Modern Variation in Vertebral Column Segmentation and Transitions</td>
<td>Janet E. Finlayson, MA*; Amanda N. Friend, MA</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A125</td>
<td>Spatial Analysis and Animal Activity: A Taphonomic Study Using Geographic Information Systems (GIS) to Document Animal Modification to Human Bone at Outdoor Crime Scenes</td>
<td>Jessica Yopak, BA*; Dennis C. Dirkmaat, PhD; Luis L. Cabo, MS</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>A126</td>
<td>The Relative Compositional Changes of Buried Juvenile Porcine Ribs and Ulnae in the Early Postmortem Interval</td>
<td>Luisa Marinho, MSc*; Shera Fisk, BSc*; Hugo Cardoso, PhD*</td>
</tr>
</tbody>
</table>

*Presenting Author
<table>
<thead>
<tr>
<th>Session Time</th>
<th>Session Code</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>A127</td>
<td>Seasonal and Spatial Variation in Local Weather Station Data From Knoxville, Tennessee</td>
<td>Kathleen Hauther*, Derek A. Boyd, MA; William D. Cawley, BA; Kelly Sauerwein, MA; Yangseung Jeong, PhD</td>
</tr>
<tr>
<td></td>
<td>A128</td>
<td>The Influence of Three-Layered Cranial Architecture Development on Non-Accidental Pediatric Cranial Blunt Force Trauma (BFT) Outcomes</td>
<td>Donna C. Boyd, PhD*; Kimber G. Cheek; Cliff Boyd, PhD</td>
</tr>
<tr>
<td></td>
<td>A129</td>
<td>Reexamining Differences in the Rate of Decomposition Between Previously Frozen and Never Frozen Human Remains Using the Accumulated Decomposition Score (ADS)</td>
<td>Shelby Garza, BSc*; Daniel J. Wescott, PhD</td>
</tr>
<tr>
<td></td>
<td>A130</td>
<td>Assessing the Utility of Total Body Score (TBS) and Accumulated Degree Days (ADD) for Estimating Postmortem Interval (PMI) in Clothed Vulture-Scavenged Human Remains</td>
<td>Krystle Lewis, BS*; Daniel J. Wescott, PhD</td>
</tr>
<tr>
<td></td>
<td>A131</td>
<td>A Quantitative Approach to Estimating the Postmortem Interval (PMI) Using Histotaphonomy</td>
<td>Ann H. Ross, PhD*; Amanda R. Hale, MA*</td>
</tr>
<tr>
<td></td>
<td>A132</td>
<td>Microbiome of Forensically Important Flies (Diptera) Associated With Human Cadavers</td>
<td>Sibyl R. Bucheli, PhD*; Aaron M. Lynne, PhD</td>
</tr>
<tr>
<td></td>
<td>A133</td>
<td>The Effects of Hydrochloric Acid on Fleshed Porcine Ribs</td>
<td>Amarettta J. Azevedo, MA*</td>
</tr>
<tr>
<td></td>
<td>A134</td>
<td>Sex Estimation Based on Analysis of the Enamel Proteome</td>
<td>Julia Yip, BS*; Michelle Salemi, MS; Brett Phinney, PhD; Jelmer Eerkens, PhD; Glendon Parker, PhD</td>
</tr>
<tr>
<td></td>
<td>A135</td>
<td>Visualizing Commingling in the Korean War Project Assemblage</td>
<td>Caitlyn Estanique; Sarah M. Richer, PhD*</td>
</tr>
<tr>
<td></td>
<td>A136</td>
<td>Microbial Ecology and Soil Geochemistry in a Multi-Individual Grave</td>
<td>Alexandra L. Emmons, MA*; Sarah W. Keenan, PhD; Lois S. Taylor, MS; Jon Davoren; Jennifer M. DeBruyn, PhD; Gary Phillips, MS; Ernest C. Bernard, PhD; Amy Z. Mundorff, PhD</td>
</tr>
<tr>
<td></td>
<td>A137</td>
<td>The Effects of Household Corrosive Acids on Restored and Non-Restored Teeth</td>
<td>Brittany M Trapp, BA*; Sean D. Tallman, PhD</td>
</tr>
<tr>
<td></td>
<td>A138</td>
<td>Differential Recovery Rates of Skeletonized Human Remains</td>
<td>Rhian Dunn, BA*; Dorianis Perez, BS*; Alexandra R. Klales, PhD; Dennis C. Dirkmaat, PhD</td>
</tr>
</tbody>
</table>
11:30 a.m. - 1:00 p.m.  A139  Fracture Pattern Comparison Between Pig and Human Crania Cremated on an Open-Air Pyre  
Lisa Monetti*; Carolyn Rando, PhD

11:30 a.m. - 1:00 p.m.  A140  Postmortem Interval (PMI) Estimation Using Bone Lipidomics  
Beatrix Dudzik, PhD*; Natalie R. Langley, PhD; Lee Meadows Jantz, PhD; Johnny E. Cebak, PhD; Paul Wood, PhD

Harnessing More Advanced Technologies

Moderator: Nicholas V. Passalacqua, PhD  
Western Carolina University  
Cullowhee, NC

Co-Moderator: Amanda N. Friend, MA  
University of Florida, CA Pound  
Human Identification Laboratory  
Gainesville, FL

1:30 p.m. - 1:45 p.m.  A141  A Method for the 3D Restoration of Fragmented Human Crania for Trauma Analysis  
Teresa V. Wilson, PhD*

1:45 p.m. - 2:00 p.m.  A142  Influence of a 1.5 Tesla (1.5T) Magnetic Resonance Imaging (MRI) on Ferromagnetic Microtraces  
Rianne Groot*; Paul Hofman, PhD; Reza R.R. Gerretsen, MD; Mayonne Van Wijk, MSc; Jeroen Kroll; Erwin Vermeij; Steven B.C.G. Chang, MSc

2:00 p.m. - 2:15 p.m.  A143  The Incorporation of 3D Photogrammetry and Geophysics in the Recovery of a Mass Grave: Six Years of Experiential Learning  
Stephen J. Yerka, MA*; Joanne Devlin, PhD

2:15 p.m. - 2:30 p.m.  A144  An Analysis of Computerized Tomography (CT) -Derived Bone Density Values and Volumetrics for Age and Sex Estimation From the Proximal Femur  
Jonathan M. Ford, PhD*; Todd R. Kumm, MD; Summer J. Decker, PhD*

2:30 p.m. - 2:45 p.m.  A145  Using Fourier Transform Infrared-Attenuated Total Reflection (FTIR-ATR) to Measure Bone Degradation and Crystallinity for Forensic Reconstruction  
Kelsa West, BS*; Eric J. Bartelink, PhD; Christyann M. Darwent, PhD; Nicolas Zwyns, PhD

2:45 p.m. - 3:00 p.m.  A146  The Biomechanics and Composition of Juvenile Pig Ribs in Relation to the Postmortem Interval in a Subaerial Environment  
Luisa Marinho, MSc*; Alison Galloway, PhD; Stephen N. Robinovitch, PhD; Carolyn J. Sparrey, PhD; Hugo Cardoso, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

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

Moderator: Eric J. Bartelink, PhD
California State University, Chico
Department of Anthropology
Chico, CA

Co-Moderator: Allysha P. Winburn, PhD
University of West Florida
Department of Anthropology
Pensacola, FL

3:15 p.m. - 3:30 p.m. A147 Mitochondrial DNA and Stable Isotope Analyses as Molecular and Chemical Signatures of Identity of Victims: A Combined Approach for Provenancing Unknown Skeletal Remains From India
Jagmahender Singh Sehrawat, PhD*; Raj Kamal, PhD

3:30 p.m. - 3:45 p.m. A148 Evidence Recorded in Fingernails: Carbon, Oxygen, and Strontium Isotopes Reveal Diet and Travel Histories
Christy J. Mancuso, MS*; James Ehleringer
(FSF Emerging Forensic Scientist Award Paper Presentation)

3:45 p.m. - 4:00 p.m. A149 Taphonomic Effects on Isotope Ratios of Human Hair
Tiffany B. Saul, PhD*; Gwyneth W. Gordon, PhD; Brett J. Tipple, PhD;
Lesley A. Chesson, MS; Dawnie W. Steadman, PhD; Daniel J. Wescott, PhD

4:00 p.m. - 4:15 p.m. A150 Trace Isotope Analysis of Dental Enamel for Micro Regional Geographic Attribution of Human Remains in Virginia
Nicole J. Palmer, BS*; Robert H. Stein, MS; Scott Gronert, PhD; Qin Wang, PhD;
Tal Simmons, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

4:15 p.m. - 4:30 p.m. A151 The Application of Isotope Analysis to Aid in the Investigation of Unidentified Remains From a Suspected World War II Mass Grave
Katharine E. Kolpan, PhD*; Ian Hanson, MSc; George D. Kamenov, PhD;
John Krigbaum, PhD

4:30 p.m. - 4:45 p.m. A152 Spatial Distributions of Carbon and Nitrogen Isotope Ratios in Human Hair From Central and Southern Mexico — Another Indication of Geographical Origin
Chelsey A. Juarez, PhD*

4:45 p.m. - 5:00 p.m. A153 The Application of Multi-Isotope Analysis to Assist With Georeferencing Unidentified Decedents
Liotta N. Dowdy, MA*; Kirsten A. Verostick, MA; Erin H. Kimmerle, PhD;
George D. Kamenov, PhD

5:00 p.m. - 5:15 p.m. A154 Multi-Isotope Approaches for Region of Origin Predictions of Unidentified Border Crossers (UBCs) From South Texas
Eric J. Bartelink, PhD*; Sarah A. Hall, MA; Lesley A. Chesson, MS;
Melanie M. Beasley, PhD

*Presenting Author
## Wednesday

**Poster Session**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
<th>Presentation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>B1</td>
<td>A Comparative Analysis of Globally Used Forensic Semen Detection Methods and Their Differing Applications</td>
<td>Megan Peters*, Claire Glynn, PhD</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B2</td>
<td>A Powder-Free Approach to Extracting DNA From Environmentally Challenged Bone Samples</td>
<td>LeAnn M. Harrel, BS*; Carrie Mayes, BS; David A. Gangitano, PhD; Sheree R. Hughes-Staum, PhD</td>
<td>FSF Emerging Forensic Scientist Award Poster Presentation</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B3</td>
<td>Qualitative and Quantitative Analysis of Minute Levels of Saliva in Expirated Blood</td>
<td>Mackenzie E. Whiting*; Claire Glynn, PhD</td>
<td>FSF Emerging Forensic Scientist Award Poster Presentation</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B4</td>
<td>An Assessment of the PreCR® Repair Mix as a Viable Repair Method for Soil-Degraded DNA</td>
<td>Olivia Negrón, BS*; David San Pietro, PhD</td>
<td>FSF Emerging Forensic Scientist Award Poster Presentation</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B5</td>
<td>An Evaluation of a Novel Massively Parallel Sequencing (MPS) 74-Microhaplotype Panel for Biogeographic Ancestry Prediction</td>
<td>Fabio Oldoni, PhD; Rebecca Hart, BS*; Nyra Rashad, BS; Keylie Gibson; 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</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B6</td>
<td>Assessing Alternative Polymerases for Amplifying Mitochondrial DNA From Shed Hairs</td>
<td>Natalie Damaso, PhD*; Emily Ashe, BS; Kelly A. Meiklejohn, PhD; Mark F. Kavlick, MPhil; James M. Robertson, PhD</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B7</td>
<td>Direct Amplification of Sperm Using Laser Microdissection (LMD) and Promega’s® PowerPlex® Fusion 6C Amplification Kit</td>
<td>Kelli B. Raley, MSFS*; Michelle M. Baker, BS*</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B8</td>
<td>The Evaluation and Implementation of the Promega® Casework Direct Kit for Y-Screening on Sexual Assault Samples</td>
<td>Carmen Young*; Amy McGuckian, MSFS; Julie Conover Sikorsky, MS; Kelly Beatty, MSFS</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B9</td>
<td>The Development of a Multianalyte Paper-Based Device for Serological Measurements</td>
<td>Rosa L. Cromartie, BS*; George T. Duncan, PhD; Bruce R. McCord, PhD</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B10</td>
<td>Botanical Evidence in a Case of Environmental Crime: The Application of Short Tandem Repeat (STR) DNA Markers and Tree Ring Analysis of Eucalyptus Globulus Disks</td>
<td>Jaime H. Solano, PhD; Leonardo Anabalon; Alejandra Figueroa, BSc*</td>
<td></td>
</tr>
</tbody>
</table>

*Presenting Author*
<table>
<thead>
<tr>
<th>Session Time</th>
<th>Duration</th>
<th>Session Code</th>
<th>Title</th>
<th>Authors/Contributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B11</td>
<td>An Evaluation of the Illumina® ForenSeq™DNA Signature Prep Kit and Promega® PowerPlex® Fusion System in the Evaluation of Degraded Identical Twin Samples</td>
<td>Aminna M. McGee, MS*; Abigail S. Bathrick, MFS; Sarah Cavanaugh, MSFS (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B12</td>
<td>Oxidative Mitochondrial DNA (mtDNA) Damage and Repair: A Modeling Approach Compared to DNA Recovered From Bullet Cartridge Cases</td>
<td>Rachel M. Bonds, BS*; Charity A. Holland, MPH; Mitchell M. Holland, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B13</td>
<td>The Development and Optimization of a Direct Polymerase Chain Reaction (PCR) System of Mixtures of Sperm and Epithelial Lysates From Cotton Swabs</td>
<td>Meghan Roig, BS*; Vanessa Martinez; Deepthi V. Nori, PhD; Bruce R. McCord, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B14</td>
<td>WITHDRAWN</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B15</td>
<td>Protein-Based Human Identification Using Hair Shafts From Different Body Sites</td>
<td>Jennifer A. Milan, BS*; Pei Wen Wu, MS; Michelle Salemi, MS; Brett Phinney, PhD; Robert Rice, PhD; Glendon Parker, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B16</td>
<td>Argon Direct Analysis in Real-Time Mass Spectrometry (Ar DART®-MS) for Forensic Analysis of Illicit Drugs</td>
<td>Liguo Song, PhD; Wei Chean Chuah*; Xinyi Lu, PhD; John E. Bartmess, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B17</td>
<td>Forensic Analysis of Illicit Drugs by Nitrogen Direct Analysis in Real-Time Mass Spectrometry (N2 DART®-MS)</td>
<td>Liguo Song, PhD*; Wei Chean Chuah; Jeffrey D. Quick; Sheher Mohsin, PhD; Benjamin Owen, PhD; Edward Remsen, PhD; John E. Bartmess, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B18</td>
<td>Structural Elucidation of Synthetic Opioids</td>
<td>Julie R. Pallister, MSc*; Cathy Copeland, MSc</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B19</td>
<td>The Detection of Gamma-Hydroxybutyric Acid (GHB) in Water and Mixed Drinks Without Sample Preparation Using Total Vaporization-Solid Phase Microextraction (TV-SPME) With On-Fiber Derivatization</td>
<td>Logan D. Hickey, BSc*; Jordan Ash, MS; Vicky Pai; John V. Goodpaster, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B20</td>
<td>The Detection of Phytocannabinoids From Buccal Swabs Using One Vial Headspace Vaporization Derivatization Coupled With Solid-Phase Microextraction-Gas Chromatography/Mass Spectrometry (SPME-GC/MS)</td>
<td>Lauren M. Perry, BS; Sun Yi Li, BSc*; Jorn Chi-Chung Yu, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B21</td>
<td>The Determination of the Source of Origin for Methomyl in a Fatal Poisoning Case by Gas Chromatography/Isotope Ratio Mass Spectrometry (GC/IRMS)</td>
<td>Nam Yee Kim; Hye-Jin Choi*; Byeong-Yeol Song, PhD; Seongshin Gwak, PhD; Geummun Nam, PhD; Young-Shik Choi, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>1:00 p.m.</td>
<td>B22</td>
<td>A Comparison of Portable Infrared (IR) Spectrometers and the Narcotic Identification Kit (NIK) Field Test for the On-Scene Analysis of Cocaine Hydrochloride (HCl)</td>
<td>Dory K. Lieblein*; Meghann McMahon, MS; Pauline E. Leary, BA, MS, PhD; Peter Massey, MS; Brooke W. Kammrath, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
</tbody>
</table>

*Presenting Author
<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>B23</td>
<td>An Assessment of Drugs in Syringes From New York City Syringe Exchange Programs</td>
<td>Taís R. Fiorentin, PhD*; Jaclyn Blachman-Forshay; Alexandra Harocopos; Denise Paone, EdD; Zeland Schwartz, PhD; Barry K. Logan, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B24</td>
<td>Narcotic Age and Working Dog Performance: Instrumental Perspectives on Training Aid Lifespan</td>
<td>Lauren Alejandro, BSc*; Paola A. Prada, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B25</td>
<td>The Classification of Synthetic Phenethylamines According to Structural Subclass Using Multivariate Statistical Procedures</td>
<td>Amanda L. Setser, BS*; Ruth Waddell Smith, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B26</td>
<td>The Development of a Multichannel Paper Microfluidic Device for the Detection of Drugs of Abuse Using Gold Nanoparticle/Aptamer Complexes</td>
<td>Ling Wang, MS*; Bruce R. McCord, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B27</td>
<td>The Prevention of Occupational Exposure to Fentanyl and Fentanyl-Like Compounds: Elbow Grease and OxiClean™</td>
<td>Travis J. Worst, PhD*; Noah M. Froelich; Jon E. Sprague, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B28</td>
<td>Touch DNA in Forensic Science</td>
<td>Ashley Hall, PhD*</td>
</tr>
</tbody>
</table>

**Thursday — Session I**

**Mathematics, Mixtures, and Modeling Matters I**

*Presenting Author*
CRIMINALISTICS

9:35 a.m. - 9:50 a.m.  
**B33** An Evaluation of DNA·VIEW® Mixture Solutions Beta Software With Two-, Three-, and Four-Person Mixtures for Forensic Applications  
Timothy J. Graham, BA*; Drew Badder, BS; Fabio Oldoni, PhD; Selena Cisana, PhD; Charles H. Brenner, PhD; Daniele S. Podini, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

9:50 a.m. - 10:10 a.m.  
**B34** An Evaluation of DNA Results With Propositions at the Activity Level: How to Identify the Features That Influence the Bayes Factor — An Example With a Stabbing Scenario  
Lydie Samie*; Franco Taroni, PhD; Christophe Champod, PhD

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

Ancestry, Identification, and Kinship Matters

**Moderator:** Pamela M. Hofsass, MS  
Contra Costa County Sheriff's Crime Laboratory  
Martinez, CA

**Co-Moderator:** Tracey Dawson Cruz, PhD  
Virginia Commonwealth University  
Richmond, VA

10:25 a.m. - 10:40 a.m.  
**B35** A Cost-Benefit Analysis of Kinship Testing Involving Siblings and Half Siblings  
Brandi L. Iorio*; Timothy J. Graham, BA; Riya Thekdi, BA; Rachael Holderle, BS; Brieanne T. Knight, MSc; Amanda C. Sozer, PhD; Daniele S. Podini, PhD; Moses S. Schanfield, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

10:40 a.m. - 10:55 a.m.  
**B36** Science Matters: Using DNA to Solve Missing Persons Cases in New York City  
Andrew J. Schweighardt, PhD*

10:55 a.m. - 11:10 a.m.  
**B37** The Evaluation of the Effects of Linked Markers on Kinship Testing  
Timothy J. Graham, BA*; Riya Thekdi, BA; Brandi L. Iorio; Rachael Holderle, BS; Brieanne T. Knight, MSc; Amanda C. Sozer, PhD; Daniele S. Podini, PhD; Moses S. Schanfield, PhD

11:10 a.m. - 11:25 a.m.  
**B38** Short Tandem Repeat (STR) Profiles and Ethnic Affiliation — Chemometric Evaluation  
Patryk Wlasiuk, MSc; Eugenio Alladio, PhD*; Monica Omedei, PhD; Giuseppina D’amico; Denise Caneparo, MS; Marco Vincenti, MS; Roberto Testi, MD, PhD; Paolo Garofano, MD, PhD; Grzegorz Zadora

11:25 a.m. - 11:40 a.m.  
**B39** A Statistical and Allele Frequency Evaluation on the Methods of Kinship Calculations  
Riya Thekdi, BA*; Timothy J. Graham, BA; Brandi L. Iorio; Rachael Holderle, BS; Brieanne T. Knight, MSc; Amanda C. Sozer, PhD; Daniele S. Podini, PhD; Moses S. Schanfield, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

11:40 a.m. - 11:55 a.m.  
Ozlem Bullbul, PhD*; Gonul Filoglu; Faruk Asicioglu, MD, PhD

*Presenting Author
### CRIMINALISTICs

**11:55 a.m. - 12:10 p.m. B41**  
**The Utility of the Precision ID Ancestry Panel for Predicting Ancestry From High-Quality and Forensic-Type Samples**  
*Ashley M. Cooley, MS*; *Kelly A. Meiklejohn, PhD*; *Tracey Dawson Cruz, PhD*; *James M. Robertson, PhD*  

**12:10 p.m. - 1:15 p.m.**  
**Lunch**  

---

### Poster Session

**11:30 a.m. - 1:00 p.m. B42**  
**Enhance the Power of Discrimination of Semen Identification by a Combination of Microfluidic Chips and Erase Kits**  
*Fang-Chun Chung, MS*; *Chu-Chun Hsu, MS*; *Hua-Sheng Tsai, MS*; *Kuan-Miao Yen, MS*; *Yu-En Chen, MS*; *Chun-Yen Lin*  

**11:30 a.m. - 1:00 p.m. B43**  
**Investigating the Impact of Protein and Peroxidase Blood Enhancement Reagents on DNA Recovery From Laundered Clothing**  
*Gabrielle A. Hartley*; *Claire Glynn, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*  

**11:30 a.m. - 1:00 p.m. B44**  
**Investigating Novel Methods for Estimating Time Since Deposition (TSD) of Bloodstains in Forensic Samples**  
*Amanda L.J. Adams*; *Claire Glynn, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*  

**11:30 a.m. - 1:00 p.m. B45**  
**Isoalleles Revealed by Massively Parallel Sequencing (MPS) Provide Increased Resolution and Discrimination in Forensic Casework**  
*Adam M. Garver, MFS*; *Jocelyn M. Bush, MS*; *Max M. Larijani, MSFS*; *Steven M. Wiechman, BS*; *Esley M. Heizer, Jr., PhD*  

**11:30 a.m. - 1:00 p.m. B46**  
**The Development of a Mitochondrial DNA (mtDNA) Assay for Forensic Human Inclusion/Exclusion Screening Using Real-Time Polymerase Chain Reaction High-Resolution Melt (PCR HRM) Analysis**  
*Ashley F. Cowan*; *Kelly M. Elkins, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*  

**11:30 a.m. - 1:00 p.m. B47**  
**Differentiation of Henna-Based Hair Dyes Using Attenuated Total Reflectance/Fourier Transform Infrared (ATR/FTIR) Spectroscopy**  
*Morgan Vesco*; *Kelly M. Elkins, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*  

**11:30 a.m. - 1:00 p.m. B48**  
**A Dietary Supplement of Choline and Seminal Choline Crystals: A Consideration for Seminal Fluid Identification by Florence Iodine Reagent**  
*Khudooma Saeed Alnuaimi, MSc*  

**11:30 a.m. - 1:00 p.m. B49**  
**The Effect of Body Mass and Cadaveric Bloat on DNA Quantity and Downstream Short Tandem Repeat (STR) Success**  
*Madeline G. Roman, BS*; *Amy E. Sorensen, MS*; *David A. Gangitano, PhD*; *Sheree R. Hughes-Stamm, PhD*  

*Presenting Author*
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presentation Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m.</td>
<td>B50</td>
<td>The Collection of DNA From Fingerprints on Weathered Trash Bags</td>
<td>Ellen M. Cassidy, BS*; Shanan S. Tobe, PhD; Jillian C. Fesolovich; Allen F. Stewart, MS</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B51</td>
<td>Blast Suppression Foam Does Not Inhibit DNA Recovery and Analysis</td>
<td>Calvin R. Justus, PhD*; Kelsey Kyllonen, MA; Keith L. Monson, PhD; Mark F. Kavlick, MPhil</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B52</td>
<td>Preliminary Experiments on Human Bloodstain Age Estimation by $^{1}H,^{13}C$ Nuclear Magnetic Resonance (NMR) Spectroscopy</td>
<td>Roberto Rosa, PhD*; Erika Ferrari, PhD; Consuelo Mugoni, PhD; Paolo Veronesi; Cristina Leonelli, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B53</td>
<td>The Influence of Ceramic Tiles’ Surface Characteristics on the Analysis of Bloodstain Patterns</td>
<td>Roberto Rosa, PhD*; Alessio Ferrara, MSc; Consuelo Mugoni, PhD; Paolo Veronesi; Cristina Leonelli, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B54</td>
<td>Method Validation for DNA Recovery From Cartridge Casings</td>
<td>Mackenzie Matney*, Mark Powell; Eleanor J. Salmon, MSFS; Kelly Beatty, MSFS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(FSF Emerging Forensic Scientist Award Poster Presentation)</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B55</td>
<td>New Strategies and Recommendations for Front-End Separation of Compromised Biological Mixtures Using Cellular Fluorescence Profiling and Flow Cytometry</td>
<td>Emily Brocato*; Briana Ratchford, BS; Kate Philpott, JD; Christopher J. Ehrhardt, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B56</td>
<td>Probing Potential Interferences in DNA Extraction of Semen Collected on Surface-Enhanced Raman Spectroscopy (SERS)-Active Forensic Evidence Swabs</td>
<td>Katarina G. Ruehl*; Brittania J. Bintz, MSc*; Geraldine Monjardez, PhD; David D. Evanoff, Jr., PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B57</td>
<td>The Optimization of Human Hair Proteomic Processing for Single Hair and Ancestral Analysis</td>
<td>Zachary Carl Goecker, MPS*; Michelle Saleni, MS; Brett Phinney, PhD; Glendon Parker, PhD; Robert Rice, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B58</td>
<td>Quantifiler® Trio or PowerQuant® System? Is One Kit Better at Predicting the Success of Short Tandem Repeat (STR) Typing of the Male Component of Sexual Assault Evidence?</td>
<td>Danielle K. Gibbes, BS*; Susan Greenspoon, PhD; Sarah J. Seashols Williams, PhD; Bonnie Brown, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B59</td>
<td>Ion Mobility Mass Spectrometer (IMMS) — A Useful Confirmatory Tool for Analyzing Drugs and Explosives</td>
<td>A. Bakarr Kanu, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B60</td>
<td>A Preliminary Characterization of Sexual Assault Lubricants: A Comparison Between Direct Analysis in Real-Time Time-Of-Flight/Mass Spectrometry (DART*-TOF/MS), Gas Chromatography/Mass Spectrometry (GC/MS), and Fourier Transform Infrared (FTIR) Spectrometry</td>
<td>Caterina Vadell-Orsini; Mark Maric, PhD; Candice Bridge, PhD; Brooke Baumgarten, BS* (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
</tbody>
</table>
11:30 a.m. - 1:00 p.m. B61 An Analysis of Standard Glass Reference Materials Via Advanced Chemical Techniques for Forensic Applications
Kelsey E. Seyfang, BSc*; Paul Kirkbride, PhD; Rachel S. Popelka-Filcoff, PhD; Hilton Kobus, PhD

11:30 a.m. - 1:00 p.m. B62 Quantifying the Uncertainty of Measurement for Gas Chromatography/Mass Spectrometry (GC/MS) Acceptance Criteria
J. Tyler Davidson, MS*; Glen P. Jackson, PhD

11:30 a.m. - 1:00 p.m. B63 The Characterization of Nylon Fiber Color by Ultra High-Performance Liquid Chromatography-Mass Spectrometry (UHPLC-MS)
Vanessa M. Cardona, BS*; Ioan Marginean, PhD

11:30 a.m. - 1:00 p.m. B64 A Sticky Situation: How Adhesive Collection of Fibers Affects Analysis
Lauren Todd*; Eric J. Hazelrigg, MS
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. B65 The Identification of Fine Plastic Materials by Thermal Desorption and Pyrolysis Combined With Direct Analysis in Real-Time Mass Spectrometry (TDP/DART®-MS)
Chikako Takei*; Kenichi Yoshizawa, MPharm

11:30 a.m. - 1:00 p.m. B66 The Evidentiary Significance of Automotive Paints From the Northeast: A Study of Red Paint
Kaitlin Kruglak*; John A. Reffner, PhD; Virginia M. Maxwell, DPhil; Brooke W. Kamrath, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. B67 Assessing the Capability of Combining Elemental and Phase Mapping in Automotive Paint Systems Analysis Using Scanning Electron Microscope/Energy Dispersive Spectroscopy (SEM/EDS)
Sun Yi Li, BSc*; William M. Davis, PhD; Roger Kahn, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. B68 The Enhancement of Human Scent Profiles as Forensic Evidence
Alice B. Boone, BS*; Howard Holness, MBA; Kenneth G. Furton, PhD

11:30 a.m. - 1:00 p.m. B69 Phase Equilibria of Complex Fluid Mixtures: Modeling and Measurements With the Advanced Distillation Curve With Reflux (ADC-R)
Megan Harries*; Marcia Huber, PhD; Thomas J. Bruno, PhD
(FSF Emerging Forensic Scientist Award Poster Presentation)

Sequencing: The Next Generation Matters I

Moderator: Nasir A. Butt, PhD
Cuyahoga County Medical Examiner’s Office
Cleveland, OH

Co-Moderator: Linda Razzano, MS
Office of the Chief Medical Examiner
Department of Forensic Biology
New York, NY

1:15 p.m. - 1:40 p.m. B70 The Development of the Precision ID GlobalFiler™ Next Generation Sequencing (NGS) Short Tandem Repeat (STR) Panel
Joseph P. Chang, BS*; Chien-Wei Chang, PhD; Ryo Hasegawa, BS; Sharon C. Wootton, PhD; Robert Lagacé, BS

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:40 p.m. - 2:00 p.m.</td>
<td>B71</td>
<td>A Novel Workflow for Identifying Phenotypic Polymorphisms in Detoxification Enzymes Associated With Drug Metabolism</td>
<td>Kari A. Graham, BA; Ryan Gutierrez, BS; Kyleen Elizabeth Elwick, BA; Sheree R. Hughes-Stamm, PhD; Bobby Larue, Jr., PhD</td>
</tr>
<tr>
<td>2:00 p.m. - 2:15 p.m.</td>
<td>B72</td>
<td>From the Ashes: Genetic Identification of Burned or Cremated Human Skeletal Remains</td>
<td>Kelly Grisedale, PhD; Brittan J. Bintz, MSc; Maureen Hickman, MS</td>
</tr>
<tr>
<td>2:15 p.m. - 2:30 p.m.</td>
<td>B73</td>
<td>An Analysis of Challenging Forensic Samples Using Probe Capture Next Generation Sequencing (NGS)</td>
<td>Symone Watson; Maria G. Almada, MS; Cassandra Calloway, PhD; Shelly Y. Shih, MS*</td>
</tr>
<tr>
<td>2:30 p.m. - 2:45 p.m.</td>
<td>B74</td>
<td>An Innovative Massively Parallel Sequencing (MPS) 74-Microhaplotypeplex Forensic Assay for Improved Deconvolution of Mixed DNA Samples</td>
<td>Fabio Oldoni, PhD; Sharon C. Wootton, PhD; Robert Lague, BS; Ryo Hasegawa, BS; Joseph P. Chang, BS; Kenneth Kidd, PhD; Daniele S. Podini, PhD (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>2:45 p.m. - 3:00 p.m.</td>
<td>B75</td>
<td>Massively Parallel DNA Sequencing Applications for Forensic Mixture Analysis</td>
<td>Christine H. Baker, MS; Jocelyn M. Bush, MS; Lindsay Catlin, MS; Esley M. Heizer, Jr, PhD; Adriana N. Swatzell; Richard A. Guerrieri, MS; Mark Wilson, PhD; Michael L. Dickens, PhD</td>
</tr>
<tr>
<td>3:00 p.m. - 3:15 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:15 p.m. - 3:35 p.m.</td>
<td>B76</td>
<td>Enzymatic Cascades for Biochemical Identification From Sweat</td>
<td>Mindy Hair*, Adrianna Mathis, Erica K. Brunelle, BSc*, Lenka Halamkova, PhD; Jan Halamek, PhD*</td>
</tr>
<tr>
<td>3:35 p.m. - 3:50 p.m.</td>
<td>B77</td>
<td>A Comparison Study of a Mass Spectrometry (MS) -Based Serological Assay With Existing Casework Models</td>
<td>Catherine O. Brown, MSFS*; Phillip Danielson, PhD*; Kevin M. Legg, PhD* (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>3:50 p.m. - 4:10 p.m.</td>
<td>B78</td>
<td>Confirmatory Identification and Genotyping of Human Seminal Fluid Collected on Surface-Enhanced Raman Scattering (SERS) -Active Forensic Evidence Swabs</td>
<td>Brittan J. Bintz, MSc*; Katarina G. Ruehl; Geraldine Monjardez, PhD; David D. Evanoff, Jr., PhD*</td>
</tr>
<tr>
<td>4:10 p.m. - 4:25 p.m.</td>
<td>B79</td>
<td>Identification of Body Fluid Using Multiplex Polymerase Chain Reaction (PCR)</td>
<td>Quentin T. Gauthier, MSFS*; Joana Antunes, MS; Bruce R. McCord, PhD</td>
</tr>
</tbody>
</table>

*BPresenting Author

Bodily Fluid Matters I

**Moderator:** Cyndi Hall, MS
Idaho State Police
Forensic Services
Meridian, ID

**Co-Moderator:** Stacie R. Brenner, MFS
Palm Beach County Sheriff’s Office
West Palm Beach, FL

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:15 p.m. - 3:35 p.m.</td>
<td>B76</td>
<td>Enzymatic Cascades for Biochemical Identification From Sweat</td>
<td>Mindy Hair*, Adrianna Mathis, Erica K. Brunelle, BSc*, Lenka Halamkova, PhD; Jan Halamek, PhD*</td>
</tr>
<tr>
<td>3:35 p.m. - 3:50 p.m.</td>
<td>B77</td>
<td>A Comparison Study of a Mass Spectrometry (MS) -Based Serological Assay With Existing Casework Models</td>
<td>Catherine O. Brown, MSFS*; Phillip Danielson, PhD*; Kevin M. Legg, PhD* (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>3:50 p.m. - 4:10 p.m.</td>
<td>B78</td>
<td>Confirmatory Identification and Genotyping of Human Seminal Fluid Collected on Surface-Enhanced Raman Scattering (SERS) -Active Forensic Evidence Swabs</td>
<td>Brittan J. Bintz, MSc*; Katarina G. Ruehl; Geraldine Monjardez, PhD; David D. Evanoff, Jr., PhD*</td>
</tr>
<tr>
<td>4:10 p.m. - 4:25 p.m.</td>
<td>B79</td>
<td>Identification of Body Fluid Using Multiplex Polymerase Chain Reaction (PCR)</td>
<td>Quentin T. Gauthier, MSFS*; Joana Antunes, MS; Bruce R. McCord, PhD</td>
</tr>
</tbody>
</table>
The Effect of Organic Acid Influenced by Sample pH on False Positive Test Results Using Immunochromatographic Assays
Megan M. Foley, MSFS*; Catherine O. Brown, MSFS; Christian G. Westring, PhD; Phillip Danielson, PhD; Heather E. McKiernan, MSFS

Thursday — Session II
Multidisciplinary Session: Criminalistics II/General II/Pathology/Biology I/Toxicology — The Synthetic Opioids Epidemic and Forensic Science

Moderator: Vincent J. Desiderio, MS
United States Postal Inspection Service
Dulles, VA
Co-Moderator: Michael F. Rieders, PhD
NMS Labs
Willow Grove, PA

8:30 a.m. - 10:45 a.m. B81 The Growing Phenomenon of the Epidemic of Synthetic Opioids and Forensic Science: Impact and Response
Vincent J. Desiderio, Jr., MS; Michael F. Rieders, PhD; Brandon Callahan, BA*; Agnes D. Winokur, MS*; Erin M. Worrell, BSc*; John F. Casale, BS*; Karl E. Williams, MD*; Sherri L. Kacinko, PhD*; Patrick Buzzini, PhD

10:45 a.m. - 11:00 a.m. Break

Improving the Practice of Criminalistics Matters

Moderator: Dennis C. Hilliard, MS
Rhode Island State Crime Laboratory
Kingston, RI
Co-Moderator: Matthew J. Gamette, MS
Idaho State Police Forensic Services
Meridian, ID

11:00 a.m. - 11:15 a.m. B82 The Data Needed to Realize the Value of Forensic Science
Sheila Willis, PhD*

11:15 a.m. - 11:30 a.m. B83 Criminalists’ Ethics in the Era of Social Media
Jennifer S. Mihalovich, MPH; Gregory B. Matheson, BS*

Edward G. Bartick, PhD*

11:45 a.m. - 12:00 p.m. B85 FORESIGHT 2020 Project: Connecting Labs, Laboratory Information Management Systems (LIMS), and FORESIGHT for Benchmarking Performance
Max M. Houck, PhD*

12:00 p.m. - 1:00 p.m. Lunch
**Trace Evidence Matters I**

**Moderator:** Jack Hietpas, PhD  
*Penn State University*  
University Park, PA

**Co-Moderator:** Tranellie Collins, BS  
*Illinois State Police*  
Springfield, IL

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
</table>
| 1:00 p.m. - 1:15 p.m. | **B86** Rates of Loss and Replacement of Very Small Particles (VSP) on the Contact Surfaces of Footwear During Successive Exposures | **Presenting Author**  
David A. Stoney, PhD; Andrew M. Bowen, MS; Madeline Ausdemore, MS; Paul L. Stoney, MBA; Cedric Neumann, PhD |
| 1:15 p.m. - 1:30 p.m. | **B87** The Determination of Key Factors in Particle Combination Analysis to Enable Systematic Improvement, Optimization, and Transition to Practice | **Presenting Author**  
David A. Stoney, PhD; Paul L. Stoney, MBA |
| 1:30 p.m. - 1:45 p.m. | **B88** A Forensic Comparison of Sandy Soils Using Raman Spectroscopy, X-Ray Diffraction, and Synchrotron Powder Diffraction (PD) | **Presenting Author**  
Kari M. Pitts, PhD; Richard M. Clarke, BSc; Mehrooz Aspandiar, PhD; John Coumaros, PhD |
| 1:45 p.m. - 2:00 p.m. | **B89** The Use of Scanning Electron Microscopy With Energy-Dispersive X-Ray Spectroscopy (SEM/EDS) for Quantitative Forensic Comparisons of Blue Glass | **Presenting Author**  
Thomas Kubic, JD, PhD; Tiffany J. Millett, MS; Mircea Comanescu, MPhil |
| 2:00 p.m. - 2:15 p.m. | **B90** Chemical Pattern Recognition in Glasses: What Can Be Extracted From Spectroscopic Data Sets? | **Presenting Author**  
Sergey Mamedov, PhD* |
| 2:15 p.m. - 2:30 p.m. | **B91** A Forensic Analysis of Automotive Paint Evidence Using Direct Analysis in Real-Time Mass Spectrometry (DART®-MS) | **Presenting Author**  
Mark Maric, PhD*; Robert B. Cody, PhD; Candice Bridge, PhD |
| 2:30 p.m. - 2:45 p.m. | **B92** Comparing X-Ray Diffractometry (XRD) and Fourier Transform Infrared (FTIR) Spectroscopy for the Analysis of Forensic Evidence | **Presenting Author**  
Ke’La Kimble*; Walter F. Rowe, PhD |
| 2:45 p.m. - 3:00 p.m. | **B93** The Persistence and Environmental Degradation Patterns of Sexual Lubricants and Personal Hygiene Products (PHPs) Using Direct Analysis in Real-Time Time-Of-Flight/Mass Spectrometry (DART®-TOF/MS) and Gas Chromatography/Mass Spectrometry (GC/MS) | **Presenting Author**  
Yasmine Moustafa, MS*; Candice Bridge, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation) |
| 3:00 p.m. - 3:15 p.m. | **Break** | |
Fingerprints and Firearms Matter

Moderator: Eric S. Sahota, BA
Las Vegas, NV

Co-Moderator: Philip R. Antoci, MS
New York Police Department Crime Laboratory
Jamaica, NY

3:15 p.m. - 3:45 p.m. B94 Using Eye Tracking to Understand Decisions Made by Forensic Latent Print Examiners
Bradford Ulery, MS; R. Austin Hicklin, MS*; Tom Busey, PhD; Maria A. Roberts; JoAnn Buscaglia, PhD*

3:45 p.m. - 4:05 p.m. B95 A Case Impact and Operational Cost Analysis of Blind Verifications in Latent Print Examinations
Thomas Wortman, BS*

4:05 p.m. - 4:25 p.m. B96 Statistical Interpretation and Reporting of Fingerprint Evidence at the United States Army Criminal Investigation Laboratory (USACIL)
Henry J. Swofford, MSFS*

4:25 p.m. - 4:40 p.m. B97 An Update on the Academy Standards Board (ASB) Firearms and Tool Marks Consensus Body
Gregory E. Laskowski, MPA*

4:40 p.m. - 5:00 p.m. B98 An Objective Comparison of Striated Tool Marks Produced From Ten Consecutively Manufactured Cold Chisels Measured by Contact and Optical Surface Profilometry and Comparison Microscopy
Robert M. Thompson, BS*; Junfeng J. Song, MS; Wei Chu

5:00 p.m. - 5:15 p.m. B99 The Critical Angle of Bullet Impacts in Common Materials Seen in Forensic Casework
Richard T. Wyant, MS*

Friday — Session I

Sequencing: The Next Generation Matters II

Moderator: Jennifer Johnson, MS
Federal Bureau of Investigation
Federal DNA Database Unit
Quantico, VA

Co-Moderator: Daniel E. Katz, MFS
Maryland State Police
Forensic Sciences Division
Pikesville, MD

8:30 a.m. - 8:50 a.m. B100 Battelle’s Final Report on the National Institute of Justice (NIJ) -Sponsored Initiative: A Feasibility and Guidance Study of Massively Parallel Sequencing (MPS) for Forensic DNA Applications
Richard A. Guerrieri, MS*; Mark Wilson, PhD; Jocelyn M. Bush, MS; Angela Minard-Smith, MS; Michael L. Dickens, PhD

*Presenting Author
CRIMINALISTICS

8:50 a.m. - 9:15 a.m.  B101  Massively Parallel Sequencing (MPS) of Short Tandem Repeats (STRs) and Microhaplotypes for Mixtures
Sharon C. Wootton, PhD; Joseph P. Chang, BS*; Ryo Hasegawa, BS; Chien-Wei Chang, PhD; Sheri J. Olson, MS; Daniele S. Podini, PhD; Kenneth Kidd, PhD; Robert Lagacé, BS

9:15 a.m. - 9:40 a.m.  B102  Investigating Rates of Mitochondrial DNA (mtDNA) Heteroplasmy in Different Haplogroups Using Massively Parallel Sequencing (MPS)
Emmy L. Demchak*; Jennifer A. McElhoe, DPhil; Mitchell M. Holland, PhD

9:40 a.m. - 9:55 a.m.  Break

DNA Interpretation and Instrumental Matters

Moderator:  Jeannie Funkhauser, BS
Denver Police Department
Crime Laboratory
Denver, CO

Co-Moderator:  Kelly M. Elkins, PhD
Towson University
Chemistry Department & Forensic Science Program
Towson, MD

9:55 a.m. - 10:10 a.m.  B103  Is That Peak Real or Is It a Mis-Type? Only the Profile Donor Knows for Sure
Keith Inman, MCrim; Norah Rudin, PhD*

10:10 a.m. - 10:25 a.m.  B104  Genotyping Challenging DNA by the Isolation of Polymerase Chain Reaction Products (IPCRp)
Pero Dimsoski, PhD*; Dragan Primorac, MD, PhD; Gordan Lauc, PhD

10:25 a.m. - 10:45 a.m.  B105  Forensic Biology Under the Microscope
James Anstead, PhD; Kelsy Lowther, MS; Erica Reynaga, MS; Elizabeth O’Bannon, MS; Sherri Deaton, MS; Brandt G. Cassidy, PhD*

10:45 a.m. - 11:05 a.m.  B106  High Resolution Melt (HRM) Curve Analysis for Preliminary Screening of Short Tandem Repeat (STR) Loci at Quantification — Obtaining More Information Earlier in the DNA Workflow
Darianne Cloudy, BS; Hannah Wines, BS*; Kristiana M. Kuehnert, MS; Sarah J. Seashols Williams, PhD; Jordan Cox, MS; Edward Boone, PhD; Tracey Dawson Cruz, PhD

11:05 a.m. - 11:25 a.m.  B107  Maximizing the Amount of DNA Recovered: A Study of Mawi DNA Technologies’ iSWAB™-ID Collection Device for Forensic Science Application
Michelle K. Gordon, MS*; Robin W. Cotton, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

11:25 a.m. - 11:45 a.m.  B108  An Evaluation of QIAGEN® Investigator® 24plex GO! Using Crime Scene Substrates and Direct Amplification
Marcel Burton, BS*; Reena Roy, PhD

11:45 a.m. - 12:00 p.m.  Discussion

12:00 p.m. - 1:00 p.m.  Lunch
<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>B109</td>
<td>An Evaluation of the Quality of Short Tandem Repeat (STR) Profiles Generated by Rapid DNA Instruments</td>
<td>Tetsushi Kitayama, PhD*; Takashi Fukagawa, PhD; Haruhiko Watahiki, MS; Yasuke Mita, PhD; Koji Fujii, PhD; Natsuko Mizuno, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B110</td>
<td>The Recovery of the Mitochondrial Genome From Cremated Human Remains</td>
<td>Maureen Hickman, MS*; Mark Wilson, PhD; Kelly Grisedale, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B111</td>
<td>The Development of an X-Chromosome Insertion-Deletion (InDel) Multiplex for Forensic Applications</td>
<td>Gonul Filoglu*; Selen Ozyer, BSc; Zulal Uslu, MSc; Tugba Ünsal, PhD; Ozlem Bullbul, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B112</td>
<td>The Impact of Antioxidant Beverages on the Chemiluminescent Detection of Bloodstains at Crime Scenes</td>
<td>Kelsey D. Bettes*, Claire Glynn, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B113</td>
<td>WITHDRAWN</td>
<td></td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B114</td>
<td>Identification of Kratom (Mitragyna Speciosa) DNA Using a Real-Time Polymerase Chain Reaction High-Resolution Melt (PCR HRM) Assay</td>
<td>Ashley F. Cowan*, Kelly M. Elkins, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B115</td>
<td>Internal Validation of a Quantifier® Trio Setup Method on the Hamilton® Microlab® Sequential Transfer and Aliquotting Robot (STAR)</td>
<td>Kelsey J. Peloso*; David R. Fisher, MS; Kyra McKay, MA; Kelly Beatty, MSFS</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B116</td>
<td>The Identification of Forensically Relevant Body Fluids Using Methylation-Specific Polymerase Chain Reaction (PCR) and High-Resolution Melt (HRM) Analysis</td>
<td>Rebecca Levine*; Cynthia B. Zeller, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B117</td>
<td>A Comparison of Extraction Methods for Amplification of Nuclear DNA From Hair Shafts Using the InnoTyper 21® DNA Typing Kit</td>
<td>Anna L. Kelleher, BS*; Robin W. Cotton, PhD; Sudhir K. Sinha, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B118</td>
<td>The Limits of Detection (LODs) of Surface-Enhanced Raman Spectroscopy (SERS) -Active Swabs Used to Screen for Human Bodily Fluids (HBFs)</td>
<td>Geraldine Monjardez, PhD*; Brittainia J. Bintz, MSc*; Katarina G. Ruehl*; David D. Evanoff, Jr., PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B119</td>
<td>The Extraction of Touch DNA From Chemically Developed, Aged Fingerprints</td>
<td>Amber J. Smith, BA*; Shanan S. Tobe, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B120</td>
<td>The Impact of Length of Time of Personal Contact on Secondary DNA Transfer</td>
<td>Cynthia Cale, BS*; Krista E. Latham, PhD; Gay L. Bush, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
<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>B121</td>
<td>Statistical Modeling of the Case Information From Ohio’s Sexual Assault Kit (SAK) Testing Initiative</td>
<td>Jaimie E. Kerka*, D.J. Heckman, BS; James Albert, PhD; Jon E. Sprague, PhD*; Lewis O. Maddox, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B122</td>
<td>The Development of Epigenetic DNA Methylation Markers to Predict Tobacco Smoking of Unknown Suspects</td>
<td>Hussain J.H. Alghanim, MS*; Bruce R. McCord, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B123</td>
<td>The Development of a Paper Microfluidic Device for the Detection of Organic Smokeless Powder Residue</td>
<td>Kathryn R. Chabaud, BS*; Bruce R. McCord, PhD; Ilaria Pirazzini, MS</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B124</td>
<td>Determining the Threshold of Identification Via Gas Chromatography/Mass Spectrometry (GC/MS) of Weathered Gasoline Extracted From Nylon Carpet</td>
<td>Charlotte Allison Newton*; Ellen Hondrogiannis</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B125</td>
<td>The Characterization of Propellants in Shotgun Cartridges by Isotope Ratio Mass Spectrometry (IRMS) and X-Ray Fluorescence (XRF) Spectroscopy</td>
<td>Nam Yee Kim; Hye-Jin Choi*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B126</td>
<td>An Explosives Analysis With Portable Ion-Trap Gas Chromatography/Mass Spectrometry (GC/MS) for Battlefield Forensics</td>
<td>Kayla M. Moquin*; Pauline E. Leary, PhD; Brooke W. Kammrath, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B127</td>
<td>An Examination of Striations on Bullets Discharged From 3D-Printed Metallic Gun Barrels</td>
<td>Jennifer Turner, MS; Robert Baldwin, JD; Scott Golightly, BS; Pamela Zelbst, PhD; Jorn Chi-Chung Yu, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B128</td>
<td>Bridging the Gap Between Categorical and Probabilistic Statements in Fire Debris Analysis</td>
<td>Mary R. Williams, MS*; Michael E. Sigman, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B129</td>
<td>Useful Characteristics to Assist With Identifying Hornady® Bullets and Their Potential Caliber</td>
<td>Renee Hudson, BSc*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B130</td>
<td>The Effects of Varying Decomposition Settings on Powder Stippling Patterns on Skin</td>
<td>Meaghan C. Dougher, BA*; Ralph R. Ristenbatt III, MS; Jason W. Brooks, VMD, PhD; Peter J. Diauczuk</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B131</td>
<td>“Free Range” Gunshot Primer Residue: A Study on Multiple Transfers of Gunshot Primer Residue</td>
<td>Thomas R. White, BS; Stephanie A. Freiwald, BS; Christopher P. Chany, MS*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B132</td>
<td>The Sub-Particle Composition and Morphology of Gunshot Residues (GSR)</td>
<td>Nick J. Lucas, MSc*; Kelsey E. Seyfang, BSc; Paul Kirkbridge, PhD; Hilton Kobus, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B133</td>
<td>The Refinement of a Mathematical Model to Predict Evaporation of Gasoline</td>
<td>Natasha K. Eklund, BA*; Victoria L. McGuffin, PhD; Ruth Waddell Smith, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
</tbody>
</table>

*Presenting Author
CRIMINALISTICS

11:30 a.m. - 1:00 p.m. B134  Assessing Microheterogeneity of Surrogate Post-Detonation Urban Debris (SPUD) Standard Reference Material (SRM) 4600 Using Microbeam X-Ray Fluorescence (µ-XRF)
Barbara L. Fallon, MS; Kevin Pfeuffer, PhD; John L. Malloy, PhD; Mark A. Tyra, PhD; Jacqueline L. Mann, PhD; JoAnn Buscaglia, PhD*
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. B135  Statistical Characterization of Aluminum (Al) Powders in Explosives Using Automated Particle Micromorphometry
JenaMarie Baldaino, MS*; Danica Ommen, MS; Cami Fuglsby; Christopher P. Saunders, PhD; Jack Hietpas, PhD; JoAnn Buscaglia, PhD*
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. B136  A Case Study: Rubber Buckshot Tissue Penetration Capability
Dijana Coric*

Mathematics, Mixtures, and Modeling Matters II

Moderator: Lisa M. Burdett, MS
Kansas Bureau of Investigation
Great Bend, KS

Co-Moderator: David A. Gangitano, PhD
Sam Houston State University
Houston, TX

1:00 p.m. - 1:20 p.m. B137  Multiple Factors Influencing Probabilistic DNA Mixture Interpretation of Highly Challenging Samples: The Relevance of Deep Validation Studies to Ensure Quality Assurance Requirements in Actual Casework
Paolo Garfano, MD, PhD*; Monica Omedei, PhD; Giuseppina D’amico; Denise Caneparo, MS; Marco Vincenti, MS; Roberto Testi, MD, PhD; Eugenio Alladio, PhD

1:20 p.m. - 1:40 p.m. B138  Probabilistic Prediction of the Number of Contributors in DNA Mixtures Using a Machine Learning-Based Approach
Michael Marciano, MS*; Jonathan Adelman, MS*

1:40 p.m. - 1:55 p.m. B139  Validating TrueAllele® Interpretation of DNA Mixtures Containing up to Ten Unknown Contributors
Nasir A. Butt, PhD*; David W. Bauer, PhD*; Mark W. Perlman, PhD, MD

The Wild (DNA) Kingdom Matters

Moderator: David A. Gangitano, PhD
Sam Houston State University
Houston, TX

Co-Moderator: Lisa M. Burdett, MS
Kansas Bureau of Investigation
Great Bend, KS

1:55 p.m. - 2:10 p.m. B140  Autosomal, Chloroplast, and Mitochondrial Data of a United States Cannabis DNA Database
Rachel M. Houston, BS*; Sheree R. Hughes-Stamm, PhD; David A. Gangitano, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:10 p.m. - 2:25 p.m. B141  The RoarPlex – A Novel Tetrancleotide Microsatellite and Sex Identification Panel
Colton L. Ames*; Jan E. Janecka, PhD; Nickolas P. Walker; Lisa R. Ludvico, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)
CRIMINALISTICS

2:25 p.m. - 2:45 p.m.  B142  The Development of the Field Isolation and Amplification of DNA Assay (FIA-DNA) Kit: A Revolutionary Method for Species Identification of Unknown Samples
Nickolas P. Walker*; Matthew J. Jevit, MSc; Colton L. Ames; Jan E. Janecka, PhD; Lisa R. Ludvico, PhD; Mary Janecka, MSc
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:45 p.m. - 3:00 p.m.  B143  The Development and Validation of a Dual-Genus, Multiplex Polymerase Chain Reaction (PCR) Assay for African and Asian Elephants for Forensic Purposes
Jillian C. Fesolovich*; Margret J. Potoczniak, MSFS; Lawrence Quarino, PhD; Shanan S. Tobe, PhD

3:00 p.m. - 3:15 p.m.  B144  Public Sequence Databases: An Assessment of Their Reliability for Identifying Non-Human Biological Material
Kelly A. Meiklejohn, PhD; Natalie Damaso, PhD*; James M. Robertson, PhD

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

DNA Recovery Methods Matter

Moderator: Daniele S. Podini, PhD
Department of Forensic Science
Washington, DC

Co-Moderator: Sheree R. Hughes-Stamm, PhD
Sam Houston State University
Department of Forensic Science
Huntsville, TX

3:30 p.m. - 3:45 p.m.  B145  Optimized Recovery of DNA and Protein Components From Contact Traces on Fired and Unfired Cartridge Casings
Mechthild K. Prinz, PhD*; Steven Kranes; Stacey-Ann Sterling, BS; Glendon Parker, PhD; Katelyn Mason, PhD; Deon Anex, PhD; Bradley Hart, PhD

3:45 p.m. - 4:00 p.m.  B146  Alternate Proteases and Direct Cell Lysis Methods for the Recovery of Exogenous DNA From Fingernails
Caitlin Izzo*; Robin W. Cotton, PhD

4:00 p.m. - 4:15 p.m.  B147  Increasing DNA Typing Success With Improved Front-End Processing and Alternate Workflow Strategies
Allison J. Sherier, TX; Angie Ambers, PhD; Rachel E. Wiley, MFS; Nicole M. Novroski, MS; Bruce Budowle, PhD*

4:15 p.m. - 4:30 p.m.  B148  The Evaluation and Optimization of DNA Recovery and Amplification From Bullet Cartridge Cases
Heather V. Milnthorp, MSFS*; Heather E. McKiernan, MSFS; Phillip Danielson, PhD

4:30 p.m. - 4:45 p.m.  B149  Crime Scene Culture: How Inadvertent Collection of Bacteria Affects DNA Profiling Success
Robert A. Bever, PhD*; Sayed Mohammad R. Mosavi, MSc; Allie Flores, BS; Jangbir Sangha, MA; Daniel Watsula, MS

4:45 p.m. - 5:15 p.m.  Discussion

*Presenting Author
Criminalistics Believe It or Not!

Moderator: Mechthild K. Prinz, PhD  
John Jay College of Criminal Justice  
Department of Sciences  
New York, NY

Co-Moderator: Kelli B. Raley, MSFS  
Arizona Department of Public Safety  
Phoenix, AZ

7:00 p.m. - 9:00 p.m.  

Believe It or Not! is back this year! 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 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 attendees in suspense; however, we want to offer some clues about this session and share a couple of previews.

Join us to hear about the case of the man who killed the “Devil” to get out of prison! Judge Christopher Plourd will recount how crime scene reconstruction and ballistics proved critical to the reopening of a solved murder cold case, ultimately freeing two wrongfully convicted persons. Or, learn how an unbroken bottle of wine became a murder weapon in a real homicide case. Weird! Anyone who has watched a Western movie has probably seen a whiskey bottle used to hit someone over the head, breaking the bottle into a thousand pieces. Not so in real life! Perhaps someone will present a real-life murder case straight from a Hollywood movie. Past years’ speakers have featured odd specimens ranging from chocolate bars to stuffed animals.

Hear about cases with crazy circumstances or bizarre pieces of evidence. Some of your friends and colleagues will be sharing stories that will be even more entertaining than your favorite forensic-themed television shows.

Toward the end of this session, there will be a moment to remember Dr. Richard Saferstein, Retired Fellow of the Criminalistics Section, and a fixture of the annual meetings. Dr. Saferstein’s textbooks are found on many criminalists’ bookshelves today and will be for years to come.

If you’ve ever found yourself with nothing to do on the Friday evening before the end of the annual meeting, if you’ve ever exclaimed, Believe It or Not! (or wish you had), this session is for you!

Friday — Session II

Trace Evidence Matters II

Moderator: Lori J. Wilson, PhD  
Eastern Kentucky University  
Department of Chemistry  
Richmond, KY

Co-Moderator: Robert W. Parsons, MS  
Indian River Crime Laboratory  
Fort Pierce, FL

8:30 a.m. - 8:45 a.m.  
B150  An Improved Method for the Analysis of Fiber Evidence Using Polarized Light Microscopy (PLM)  
John A. Reffner, PhD*; Samuel Kaplan, BS
8:45 a.m. - 9:00 a.m.  B151  Microscopical Discrimination of Human Head Hairs Sharing a Mitochondrial Haplogroup
Sandra Koch, MS*; Corey Liebowitz, BS; Nina G. Jablonski, PhD; Mark D. Shriver, PhD

9:00 a.m. - 9:15 a.m.  B152  Determining the Effects of Storage Conditions on the Preservation of Ignitable Liquid Residues
Clare Fried, MSFS*; Edward Sisco, MS; Marcela Najarro, MFS; Thomas A. Brettell, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

9:15 a.m. - 9:30 a.m.  B153  The Identification of Representative Compounds in Ignitable Liquids and Substrates: Classification of Fire Debris Using a Naïve Bayes Approach
Anuradha Akmeemana, MS*; Mary R. Williams, MS; Michael E. Sigman, PhD

9:30 a.m. - 9:45 a.m.  B154  The Calculation of Likelihood Ratios in Fire Debris Analysis: Model Effects
Michael E. Sigman, PhD*; Mary R. Williams, MS

9:45 a.m. - 10:00 a.m.  B155  The Utilization of Receiver Operator Curves (ROCs) for the Evaluation of Fire Debris: The Influence of Population Distributions on Classifier Performance
Alysaa Allen*; Michael E. Sigman, PhD; Mary R. Williams, MS
(FSF Emerging Forensic Scientist Award Paper Presentation)

10:00 a.m. - 10:15 a.m.  B156  A Combined Approach of Gas Chromatography/Mass Spectrometry (GC/MS) and Chemometric Strategies for Fire Debris Investigation Purposes
Eugenio Alladio, PhD*; Marco Pazzi, PhD; Laura Pacifici, MSc; Fabrizio Malaspina, MSc; Paolo Garofano, MD, PhD; Marco Vincenti, MS

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

Analysis of Seized Drugs Matters I

Moderator:  Thomas M. Blackwell, BS
Drug Enforcement Agency
New York, NY

Co-Moderator:  Theresa B. Browning, MFS
Springfield, VA

10:30 a.m. - 10:45 a.m.  B157  The Detection of Toxic Adulterants in Seized Drug Exhibits in Kentucky and Vermont
Tais R. Fiorentin, PhD*; David M. Martin, PhD; Thom Browne, Jr.; Jeremy S. Triplett, MS; Trisha L. Conti, PhD; Barry K. Logan, PhD

10:45 a.m. - 11:00 a.m.  B158  An Investigation Into Darknet Markets: Their Use in Predicting Emerging Drug Trends and the Correlation With Discussion on Surface Web Drug Forums
Robert Paul Hessler, Jr., BS*; Kathy Macropol, PhD; David Klein, BA; Karen S. Scott, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

11:00 a.m. - 11:15 a.m.  B159  Predicting the Origin of Heroin by Analysis of Inorganic Elements and Isotope Ratios of Strontium (Sr)
Joshua S. DeBord, MSc*; Ali Pourmand, PhD; Sarah C. Jantzi, PhD; Sini Panicker; Jose R. Almirall, PhD
CRIMINALISTICS

11:15 a.m. - 11:30 a.m.  B160  The Material Effects of Commercial Swabs on the Extraction of Multiple Drugs Using Microfluidics and Mass Spectrometry
Emily Lynn Lichtenberger, BS*; Michael Roberts, BS; Nelson R. Vinueza, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

11:30 a.m. - 11:45 a.m.  B161  Low-Field Nuclear Magnetic Resonance (NMR) Applications in Forensic Drug Analysis
Jonathan J. Duffy, BS*; Aaron Urbas, PhD; Katrice Lippa, PhD; Luke Short, PhD; Ioan Marginean, PhD

11:45 a.m. - 12:00 p.m.  B162  Separation and Identification of Drugs of Abuse by Nano-Liquid Chromatography/Electron Ionization/Mass Spectrometry (nLC/EI/MS)
Jocelyn V. Abonamah, BS*; Mehdi Moini, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

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

Multidisciplinary Session: Criminalistics II/General II — Forensic Education Matters

Moderator:  Ann B. Geisendorfer, JD, MS
Hudson Valley Community College
Troy, NY

Co-Moderator: A. Bakarr Kanu, PhD
Winston-Salem University
Department of Chemistry
Winston-Salem, NC

1:00 p.m. - 1:15 p.m.  B163  A Collaboration for Forensic Student Success: Bridging the High School-to-College Transition
Jillian C. Fesolovich*; Ashley Hudgins, MS*; Vicki A. Stanavitch, PhD

1:15 p.m. - 1:30 p.m.  E107  Forensic Science Capstone Experience: The Thesis, the Review, and the Practicum
Kimberly Nugent, MSc*

1:30 p.m. - 1:45 p.m.  B164  Using Forensic Cases to Improve Ethical Reasoning Skills
Lyndsie N. Ferrara, MS*; James B. Schreiber, PhD

1:45 p.m. - 2:00 p.m.  B165  Teaching Ethics in Forensic Science: A Laboratory Approach
Douglas A. Ridolfi, MS*

2:00 p.m. - 2:15 p.m.  E108  Minimum Education Requirements for Crime Scene Investigators (CSIs): The Missing Link in Forensic Science
Mary Juno, MSc*

2:15 p.m. - 2:30 p.m.  E109  Group Experiential Learning in the Forensic Science Classroom
John A. Williams, PhD*

2:30 p.m. - 2:45 p.m.  B166  Supplementing Forensic Science Services With Research, Training, and Mentoring: Employing Quality Management Personnel to Meet an Organization’s Continuous Education Program Goals
Jasmine M. Jefferson, MS*; Michal L. Pierce, MS; Luis A. Sanchez, MD

*Presenting Author
CRIMINALISTICS

2:45 p.m. - 3:00 p.m.  E110  A Study of the Forensic Science Education Programs Accreditation Commission (FEPAC) - Accredited Graduate Forensic Science Programs' Curricula
Catherine G. Rushton, EdD*

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

Advances in Chemical and Instrumental Analyses Matter

Moderator:  Kimberly S. Kobojek, MS
Arizona State University New College
Phoenix, AZ

Co-Moderator:  Elizabeth A. Gardner, PhD
University of Alabama Department of Justice
Birmingham, AL

3:15 p.m. - 3:30 p.m.  B167  Validation of a Portable Direct Analysis in Real-Time Mass Spectrometry (DART*-MS) System for Trace Explosives Detection in the Laboratory or in the Field
Marcela Najarro, MFS*; Edward Sisco, MS; Elizabeth Robinson, MS

3:30 p.m. - 3:45 p.m.  B168  Chemical Imaging of Cyanoacrylate-Fumed Fingerprints Using Mass Spectrometry Imaging
Kelly C. O'Neill*; Paige L. Hinners, MS; Young-Jin Lee

3:45 p.m. - 4:00 p.m.  B169  Lifestyle Determination From Chemical Identification in Fingerprints
Paige L. Hinners, MS*; Kelly C. O'Neill; Young-Jin Lee

4:00 p.m. - 4:15 p.m.  B170  The Identification of Prohibited Treatments on Racing Tires by Solid Phase Microextraction (SPME)
Zackery Roberson*; John V. Goodpaster, PhD

4:15 p.m. - 4:30 p.m.  B171  Decreasing the Uncertainty of Peak Assignments Using Multidimensional Ultra-High Performance Liquid Chromatography (UHPLC)
Cecilia Marisol Ochoa, BA*; Peter J. Schoenmakers; Claude Mallet, PhD; Ira S. Lurie, PhD

4:30 p.m. - 4:45 p.m.  B172  Assessing the Forensic Utility of a Silicone Rubber Passive Sampler for the Detection of Pollutants in Aqueous Environments
Jonathan W. Bareford, BS*; Jon Beihoffer, MS; Eric J. Hazelrigg, MS; Christopher J. Ehrhardt, PhD

4:45 p.m. - 5:00 p.m.  B173  An Investigation of the Correlation Between Human Age and Aspartic Acid and Asparagine Racemization and Isomerization of the Eye Lens Crystallins Proteins
Kaitlin Long*; Mehdi Moini, PhD

*Presenting Author
**CRIMINALISTICS**

**Saturday — Session I**

**Bodily Fluid Matters II**

*Presenting Author*

**Moderator:** Andrew J. Schweighardt, PhD  
Northport, NY

**Co-Moderator:** Lisa Mertz, MS  
Office of the Chief Medical Examiner  
Department of Forensic Biology  
New York, NY

8:30 a.m. - 8:45 a.m. **B174**  
Experimental Approaches to Study the Degradation of Messenger RNA (mRNA) in Dried Bloodstains Subjected to Storage in the Laboratory  
Jun Fu, PhD; Robert W. Allen, PhD*

8:45 a.m. - 9:00 a.m. **B175**  
The Characterization and Persistence of Vaginal Bacteria Under Fingernails  
An Truong, BS*; George Sensabaugh, D.Crim; Cassandra Calloway, PhD  
(FSF Emerging Forensic Scientist Award Paper Presentation)

9:00 a.m. - 9:15 a.m. **B176**  
A Molecular Assessment of DNA Methylation Profiling for Body Fluid Identification in a Forensic Application  
Dina A. Shokry, MD*

9:15 a.m. - 9:30 a.m. **B177**  
Can Detection of Testosterone With Anti-Testosterone Antibody Be Used to Identify Male Cells?  
Jennifer Miller, BS*; Christopher J. Ehrhardt, PhD; Vamsi Yadavalli, PhD; Susan Greenspoon, PhD

9:30 a.m. - 9:50 a.m. **B178**  
Toward Implementation of Improved Body Fluid Identification Methods  
Toni M. Diegoli, PhD; Karen Olson, PhD; Philip Nase, MS; Rachel Creager*; Chinye Obata, BS; Joel D. Sutton, MSFS; Henry P. Maynard, MS

9:50 a.m. - 10:05 a.m. **B179**  
Victim Sexual Assault Evidence Kits (SAEKs) — Teamwork Between a Crime Lab, Special Victim’s Unit, and District Attorney’s Office  
Jennifer S. Mihalovich, MPH*; Jill Encinias, BS; Erin Kingsbury, JD

10:05 a.m. - 10:20 a.m. **B180**  
The Mapping of Drug Users in Philadelphia, Pennsylvania, by Creating DNA Profiles From Trace DNA Evidence Collected From Drug Paraphernalia  
Benetta A. George, BA*; Shanan S. Tobe, PhD; Jillian C. Fesolovich; Heather L. Harris, MFS, JD

*Presenting Author*
## Analysis of Seized Drugs Matters II

**Moderator:** Agnes D. Winokur, MS  
Drug Enforcement Agency Southeast Laboratory  
Miami, FL  

**Co-Moderator:** Alison P. Kidder-Mostrom, MSFS  
Chicago, IL

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:15 a.m.</td>
<td>B184</td>
<td>2018 Update From the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG)</td>
<td>Sandra E. Rodriguez-Cruz, PhD*</td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>B185</td>
<td>What’s in the Bag? Screening Trace Drug Contamination in Baggies by Thermal Desorption Combined With Direct Analysis in Real Time-Mass Spectrometry (TD/DART*-MS)</td>
<td>Edward Sisco, MS*; Marcela Najarro, MFS; Jennifer R. Verkouteren, MS</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>B186</td>
<td>Cannabinoid Vapor Pressure Measurements and Predictions by Porous Layer Open Tubular-Cryoadsorption (PLOT-Cryo)</td>
<td>Tara Lovestead, PhD*; Thomas J. Bruno, PhD</td>
</tr>
<tr>
<td>9:15 a.m.</td>
<td>B187</td>
<td>The Identification of Various Controlled Substances by Headspace Chemical Analysis Using Headspace Solid-Phase Microextraction (HS/SPME) and Gas Chromatography/Mass Spectrometry (GC/MS)</td>
<td>Justin Day, MS*; Harry R. Ehmann, MS; Jorn Chi-Chung Yu, PhD</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>B188</td>
<td>Recent Seizures at the Canadian Border: New Fentanyl Analogue and Other Novel Psychoactive Substances (NPS)</td>
<td>Michael McFarlane, MSc*</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>B189</td>
<td>The Analytical Profile of Fluorobutyryl Fentanyl Isomers</td>
<td>Kelly Song, BS; Adriana M. de Armas, BS*</td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------------</td>
<td>---------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>B190</td>
<td>Separation of Fentanyl Analogues, Homologues, and Positional Isomers by Ultra High-Performance Liquid Chromatography (UHPLC)</td>
<td>Carolyn Angi*; Ira S. Lurie, PhD; Ioan Marginean, PhD</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>B191</td>
<td>Using Quadrupole Time-Of-Flight (qTOF) Liquid Chromatography/Mass Spectrometry (LC/MS) to Distinguish 2- and 3-Furanyl Fentanyl and Other Fentanyl-Related Compounds</td>
<td>Sally F. Ho, PhD*</td>
</tr>
<tr>
<td>10:30 a.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>B192</td>
<td>A 12-Year Study of Brake Dust From 123 Vehicles for Particles Similar to Gunshot Residue</td>
<td>Mary Keehan, MS; Douglas DeGaetano, MS*</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>B193</td>
<td>A Framework for the Assessment of Gunshot Residue (GSR) Evidence: Transfer, Contamination, and Preservation</td>
<td>Nick J. Lucas, MSc*; Michael Cook, BSc; Paul Kirkbridge, PhD; Hilton Kobus, PhD</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(FSF Emerging Forensic Scientist Award Paper Presentation)</td>
<td></td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>B194</td>
<td>A Review of Gunshot Residue (GSR) Evidence in Suicide Cases</td>
<td>Jason L. Schroeder, MS, MBA*; William M. Davis, PhD; Roger Kahn, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>B195</td>
<td>Novel Capabilities for Forensic Gunshot Residue (GSR) Analysis Through Exploitation of Glass Found in Primer Mixes</td>
<td>Kelsey E. Seyfang, BSc*; Nick J. Lucas, MSc; Paul Kirkbridge, PhD; Rachel S. Popelka-Filcoff, PhD; Hilton Kobus, PhD; Kahlee E. Redman, BSc</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(FSF Emerging Forensic Scientist Award Paper Presentation)</td>
<td></td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>B196</td>
<td>The Determination of Gunshot Residue (GSR) Settling Velocity</td>
<td>Cassidy M. Schultheis*; Stephanie J. Wetzel, PhD; Stephanie Horner, MS; Allison Laneve, MS</td>
</tr>
</tbody>
</table>
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m.  C1  The Walls Are Listening: A Forensic Study of Home Personal Assistants
Jessica Wright*; Ian Levstein, MS; Dale Mosley; Terry Fenger, PhD

11:30 a.m. - 1:00 p.m.  C2  Observer Agreement in the Identification and Quantification of Dorsal Hand Traits From Digital Images
Derek A. Boyd, MA*; Aislynn MacKenzie; Briana M. Turner-Gilmore; Richard Vorder Bruegge, PhD; Walter Bruehs, MS; Jenna M. Walker, BS

Thursday

Digital and Multimedia Sciences Lab Procedures and Quality Assurance

Moderator: Jason Lewis, PhD
University of the Virgin Islands
Department of Computer & Computational Sciences
St. Thomas, VI

Co-Moderator: Patrick A. Eller, MS
United States Army Criminal Investigation Division Command
Quantico, VA

8:30 a.m. - 9:00 a.m.  C3  United States Army Criminal Investigation Command (USACIDC)
Digital Forensics: A Program Overview
Patrick A. Eller, MS*; Joseph Levi White, MS*

9:00 a.m. - 9:20 a.m.  C4  Scientific Working Group on Digital Evidence (SWGDE) and Its Current Efforts in Digital Forensics and Forensic Audio — Part 1
Mary F. Horvath, MFS*; Steven B. Watson, BA*; Jeff M. Smith, MS*; Marla E. Carroll, BS*

9:20 a.m. - 9:45 a.m.  C5  Current Efforts in Video Forensics, Image Analysis, and Photography as It Relates to Digital Evidence From the Scientific Working Group on Digital Evidence (SWGDE) — Part 2
Mary F. Horvath, MFS*; Jesus R. Valenzuela, BA*; Marla E. Carroll, BS*; Kimberly Meline, BS*

9:45 a.m. - 10:05 a.m.  C6  Testing Digital Forensic String Search Tools
James R. Lyle, PhD*; Barbara Guttman, BA

10:05 a.m. - 10:30 a.m.  C7  Validating Mobile Forensics Tools in Your Lab With the National Institute of Standards and Technology's (NIST) Federated Testing
Barbara Guttman, BA; James R. Lyle, PhD; Benjamin R. Livelsberger, MS; Richard Ayers, MS; Jenise Reyes-Rodriguez, BS*

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

*Presenting Author
Audio and Video Forensics

Moderator: Alex J. Nelson, PhD  
National Institute of Standards and Technology  
Gaithersburg, MD  
Co-Moderator: Walter T. Hart, MBA  
San Francisco, CA

10:45 a.m. - 11:05 a.m.  
C8 An Audio Enhancement Framework for Forensic Purposes  
Catalin Grigoras, PhD; Jeff M. Smith, MS; James Zjalic, BSc*

11:05 a.m. - 11:30 a.m.  
C9 Time Domain Analysis of Lossy Compression Decoding Artifacts  
Catalin Grigoras, PhD*; Jeff M. Smith, MS

11:30 a.m. - 11:55 a.m.  
C10 Analyzing Video Evidence in Officer-Involved Shooting Cases  
Parris Ward, JD*

11:55 a.m. - 12:15 p.m.  
C11 Video Datasets for Developing Image Forensic Techniques  
Manato Hirabayashi, MS*; Kenji Kurosawa, PhD; Norimitsu Akiba, PhD;  
Daitsu Imoto, MS; Hidetoshi Kakuda, PhD; Ken‘ichi Tsuchiya, PhD; Kenro Kuroki, PhD

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

Image Analysis and Camera Identification

Moderator: Christina A. Malone, MSFS  
Defense Forensic Science Center  
Forest Park, GA  
Co-Moderator: Joseph Levi White, MS  
United States Army  
Criminal Investigation Laboratory  
Forest Park, GA

1:15 p.m. - 1:40 p.m.  
C12 Another Forensic Image Data Set (AFIDS)  
Mark D. Guido, MS*; Michael McCarrin, PhD*

1:40 p.m. - 2:00 p.m.  
C13 Digital Image Recompression Analysis: Twitter*  
Gretchel Lomboy*; Catalin Grigoras, PhD; Jeff M. Smith, MS

2:00 p.m. - 2:25 p.m.  
C14 Deep Learning With Camera Identification  
Eleni Athanasiadou, BSc; Zeno J. Geradts, PhD*; Erwin Van Eijk, MS

2:25 p.m. - 2:50 p.m.  
C15 Curating Forensic Image Collection Using Machine Learning  
Wangcheng Yan, BS; Audris Mockus, PhD*; Tiffany B. Saul, PhD;  
Dawnie W. Steadman, PhD

2:50 p.m. - 3:10 p.m.  
C16 Source Camera Comparison Using Photo Response Non-Uniformity (PRNU) on WhatsApp  
Christiaan Meij, BSc; Zeno J. Geradts, PhD*

3:10 p.m. - 3:30 p.m.  
Break

*Presenting Author
Cell Phone Analysis and Procedures

Moderator: Mary F. Horvath, MFS
Ft. Myers, FL

3:30 p.m. - 3:55 p.m. C17 Forensic Identification of the Source Smart Phone Camera From a Digital Image
Rajesh Kumar, PhD*; Arvind Mudaliyar, MSc; ShantiKumar Gupta, PhD

3:55 p.m. - 4:20 p.m. C18 A Case Study: Ransomware Containing Child Pornography Observed on an Android™ Mobile Device
Joseph Levi White, MS*

4:20 p.m. - 4:45 p.m. C19 Android™ Thumbnails: Is There More? An In-Depth Analysis of the Android™ Photo Gallery and Camera Processes Looking for Metadata
Mary F. Horvath, MFS*; Steven B. Watson, BA*

4:45 p.m. - 5:10 p.m. C20 An Analysis of Apple® Mobile Devices to Support or Refute Claims of Spoliation of Data
Andrew N. Crouse, BA*; Samuel I. Brothers, BBA*

Friday

Chat, Skimmers, and the Darknet

Moderator: Aisha Ali-Gombe, PhD
Towson University
Towson, MD

Co-Moderator: Jason M. Paroff, JD
Epiq Ediscovery Solutions, Inc
New York, NY

8:30 a.m. - 8:55 a.m. C21 Snapchat® Data Recovery Capabilities
Joseph Levi White, MS*; Christina A. Malone, MSFS

8:55 a.m. - 9:20 a.m. C22 Skimmer Forensics: The Identification, Seizure, and Analysis of These Problematic Little Devices
James Darnell, BS*; John Simonello, MSc

9:20 a.m. - 9:45 a.m. C23 Darknet Investigation and Forensic Techniques
Sarah Cortes, PhD*

9:45 a.m. - 10:10 a.m. C24 A Freedom Hosting Darknet Case Study: Anatomy of a Takedown
Sarah Cortes, PhD*; Gareth Owenson, PhD*

10:10 a.m. - 10:35 a.m. C25 A Digital Forensics Tool for the Language-Based Analysis of Child Sex Offender Chats
Kathryn C. Seigfried-Spellar, PhD*; Marcus Rogers, PhD*

10:35 a.m. - 10:45 a.m. Break

*Presenting Author
Presenting Author: 141

DIGITAL & MULTIMEDIA SCIENCES

Smart Home, Vehicles, Drones, and Advanced Analyses

Moderator: James R. Lyle, PhD
National Institute of Standards and Technology
Gaithersburg, MD

Co-Moderator: Carl R. Kriigel, MA
United States Army
Criminal Investigation Laboratory
Forest Park, GA

10:45 a.m. - 11:05 a.m.  C26 Defining a Taxonomy of Digital Evidence Artifacts Available From Small Unmanned Aircraft Systems
Steven B. Watson, BA*; David Rathbone

11:05 a.m. - 11:25 a.m.  C27 Vehicle Forensics: A Method of Validation for Infotainment System Tracklog Maps Using Java™ OpenStreetMap Editor®
Christopher D. Jenkins*; John E. Sammons, MS; Ian Levstein, MS;
Terry Fenger, PhD

11:25 a.m. - 11:50 a.m.  C28 Is Your Home Secretly a Confidential Informant for the Police? The Potential of Smart Home Devices to Serve as Evidence in Criminal Cases
Jason Lewis, PhD*; Arl Polydore; Lawrence White; Jair Smith; K'Mari McClean;
Roberto Tirado

11:50 a.m. - 12:15 p.m.  C29 Smart Home (Home Automation) Forensics: An Analysis of an Amazon® Echo™
Carl R. Kriigel, MA*; Joseph Levi White, MS; Christina A. Malone, MSFS

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

Poster Session

11:30 a.m. - 1:00 p.m.  C30 The Virtual Crime Scene: The Role of 3D Motion Capture and 3D Model Buildings for the Reconstruction of Dynamics and Reproduction of Settings in a Case of Murder
Isabella Aquila, MD*; Alfredo Manca; Giuseppe Ivan Aquila; Roberto Raffaele*;
Giuseppe Capoccia; Manolo Vozza; Antonio Rocca; Salvatore Gagliano;
Matteo Antonio Sacco, MD; Santo Gratteri, MD*; Pietrantonio Ricci

11:30 a.m. - 1:00 p.m.  C31 Overcoming the Hurdles of Imaging, Storing, and Archiving Digital Evidence
Kristy Tredway*

*Presenting Author
Multidisciplinary Session: Digital & Multimedia Sciences/Engineering Sciences — Electrical Interferences With Forensic Data and Analyses

Moderator: Mary F. Horvath, MFS  
Ft. Myers, FL

Co-Moderator: David Pienkowski, PhD  
University of Kentucky  
Albert B. Chandler Hospital  
Lexington, KY

1:15 p.m. - 1:30 p.m.  D32  Data Center Failures and Outages  
Helmut G. Brosz, BASc, PEng*

1:30 p.m. - 1:45 p.m.  D33  Forensic Image Processing  
Marcus Borengasser, PhD*

1:45 p.m. - 2:05 p.m.  C32  Measuring the Hygroscopic Capacity of Integrated Circuit Packages and Circuit Boards  
Steven B. Watson, BA*; David Rathbone

2:05 p.m. - 2:25 p.m.  C33  Electromagnetic “Soundscapes” and Their Relevance in Media Forensics  
Eddy B. Brixen, BA*
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m. D1 Quantifying 3D Gait Reconstruction With a Single Camera
Jungbin Lee, BS; Cong-Bo Phan; Seungbum Koo, PhD*
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m. D2 The Advancement of the Evaluation Method of Fracture Risk by a Blow Using
Computer Simulation-Calibration by an Actual Fracture Experiment
Tatsuya Fukuoka*; Yasumi Ito, PhD; Momoko Watanabe; Yoshiyuki Kagiyama, PhD;
Tetsuya Nemoto, PhD

Thursday

Forensic Applications of Fire Science

Moderator: David Pienkowski, PhD
University of Kentucky
Albert B. Chandler Hospital
Lexington, KY

Co-Moderator: Kurt D. Weiss, MS
Automotive Safety Research
Santa Barbara, CA

8:30 a.m. - 8:50 a.m. D3 Fulgurites in Litigation
Christopher S. Palenik, PhD*

8:50 a.m. - 9:05 a.m. D4 The Role of Engineering Sciences in Forensic Fire Investigation
S.B. Addison Larson, MS*

9:05 a.m. - 9:20 a.m. D5 The Impact of Ventilation on Fire Damage Patterns From Room Fires
in Full-Scale Structures
Daniel Madrzynkowski, MS*; Craig G. Weinschenk, PhD

9:20 a.m. - 9:30 a.m. Break

Etiology of Vehicle Mishaps Clarified Via Forensic Engineering Analyses

Moderator: David Pienkowski, PhD
University of Kentucky
Albert B. Chandler Hospital
Lexington, KY

Co-Moderator: S.B. Addison Larson, MS
Sherman, CT

9:30 a.m. - 9:45 a.m. D6 Steering Failure in a Triple Fatality Crash
David Hallman, MS*

*Presenting Author
### Injury Potential of Edged Instruments: Are You Sharp Enough to Get the Point?

**Moderator:** David Pienkowski, PhD  
**University of Kentucky**  
**Albert B. Chandler Hospital**  
**Lexington, KY**

**Co-Moderator:** John Nixon, CEng, MBA  
**Athena Research & Consulting, LLC**  
**Bippus, IN**

<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>D11</td>
<td>The Injury Potential of Fidget Spinners</td>
<td>Sarah V. Hainsworth, PhD*; Michael E. Fitzpatrick, PhD</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>D12</td>
<td>A Critical Assessment of Cutting — Slicing, Stabbing, Sawing, and Chopping: The Mechanisms of Separating and Penetrating Biomaterials and the Relevance of Sharpness</td>
<td>Sarah V. Hainsworth, PhD*; Guy N. Rutty, MD</td>
</tr>
</tbody>
</table>

### Who’s Driving: Forensic Methods of Vehicle Operator Identification

**Moderator:** Michelle R. Hoffman, MS  
**Forensic Injury Analysis, LLC**  
**Tempe, AZ**

**Co-Moderator:** Darren Franck, MSME  
**Advanced Engineering Associates, Inc**  
**Charleston, WV**

<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>D13</td>
<td>Who’s Driving?</td>
<td>David Pienkowski, PhD*</td>
</tr>
<tr>
<td>1:15 p.m.</td>
<td>D14</td>
<td>An Overview of Physical Evidence to Assist With Driver Identification in Vehicle Collisions</td>
<td>Kurt D. Weiss, MS*</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>D15</td>
<td>Determination of Driver Identity: Effective Scientific Investigation, Comparison and Contrast of Forensic Evidence, and Its Spoliation in Various Cases</td>
<td>Mark C. Pozzi, MS*</td>
</tr>
</tbody>
</table>
2:30 p.m. - 3:00 p.m.  D16  Vehicle System Forensics and Determining Who Was Driving at the Time of a Crash
   Wesley Vandiver*

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

3:15 p.m. - 3:35 p.m.  D17  If the Shoe Fits, Wear It — Using Injury Patterns, Forensic Science, and Impact
   Biomechanics to Identify the Driver in a Fatal Vehicle Crash
   Billy S. Cox, Jr.*

3:35 p.m. - 3:55 p.m.  D18  Follow the Broken Bones — Using Injury Patterns, Forensic Science, and Impact
   Biomechanics to Identify the Driver in a Multi-Occupant, Double-Fatality Vehicle Crash
   Billy S. Cox, Jr.*

3:55 p.m. - 4:40 p.m.  D19  A Rollover Off a Cliff With No Witnesses, No Vehicle, and Nothing But
   Unreliable Information: The Use of Forensic Evidence, Vehicle Crashworthiness, and Human Factors Testing to Prove Driver Identity
   Mark C. Pozzi, MS*

4:40 p.m. - 5:00 p.m.  Discussion

---

**Friday**

**Forensic Analyses of Helmets and Head Injuries**

**Moderator:**  
David Pienkowski, PhD  
University of Kentucky  
Albert B. Chandler Hospital  
Lexington, KY

**Co-Moderator:**  
Michelle R. Hoffman, MS  
Forensic Injury Analysis, LLC  
Tempe, AZ

---

8:30 a.m. - 8:45 a.m.  D20  Forensic Analysis and Testing to Evaluate Football Helmet Environmental Degradation and the Effects of Repeat Impacts
   Mark C. Pozzi, MS*; Kenneth J. Saczalski, PhD*; Mark N. West, BS; Luis Frausto, MS; Todd Saczalski, BSMET

8:45 a.m. - 9:00 a.m.  D21  Differential Protective Effects of Motorcycle Helmets Against Head Injury
   Michael Singleton, PhD*

9:00 a.m. - 9:15 a.m.  D22  Real-World Football Helmet Performance Versus Certification Testing, Refurbishment, and Inspection
   Mark C. Pozzi, MS*; Kenneth J. Saczalski, PhD*

9:15 a.m. - 9:30 a.m.  Break

*Presenting Author
Misconduct and Ethics Violations in Forensic Investigations

Moderator: David Pienkowski, PhD
University of Kentucky
Albert B. Chandler Hospital
Lexington, KY

Co-Moderator: Darren Franck, MSME
Advanced Engineering Associates, Inc
Charleston, WV

9:30 a.m. - 9:50 a.m. D23 Does Size Really Matter — Or Is How You Manipulate It More Important?
A Review of Data Analysis and Presentation Tips and Tricks
John Nixon, CEng, MBA*

9:50 a.m. - 10:15 a.m. D24 It’s a Fair System, Isn’t It? Facts, Alternative Facts, and Other Litigation Influencers
John Nixon, CEng, MBA*

Mark C. Pozzi, MS*; Kenneth J. Saczalski, PhD*

10:40 a.m. - 10:45 a.m. Break

Forensic Analysis of Engineered Structures, Devices, and Methods

Moderator: David Pienkowski, PhD
University of Kentucky
Albert B. Chandler Hospital
Lexington, KY

Co-Moderator: S.B. Addison Larson, MS
Sherman, CT

10:45 a.m. - 11:00 a.m. D26 Forensic Microscopy in Determining Historical 1960s and 1970s Asbestos Exposures to Cutting Asbestos/Cement (A/C) Pipe
James Millette, PhD*

11:00 a.m. - 11:15 a.m. D27 A Forensic Performance Analysis of Load-Limiting Devices in Automotive Seat Belt Retractors
Louis Daulerio, BA; Gary Whitman, BS*; Alan Cantor, BS; Larry Sicher, BS; Mike Markushewski, BS

11:15 a.m. - 11:30 a.m. D28 Autonomous Vehicle Control Systems and Human Factors
Stephanie Domitrovich, JD, PhD*; Laura L. Liptai, PhD*

11:30 a.m. - 11:45 a.m. D29 What Confidence Do We Have in Confidence Intervals?
Willem A. Schreuder, PhD*

11:45 a.m. - 12:00 p.m. D30 The Effect of Microscopic Surface Coatings and Residues on the Size and Shape of Bloodstains
Samira Shiri*; Kenneth F. Martin, MS; James Bird, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

*Presenting Author
12:00 p.m. - 12:15 p.m.  

**D31**  
Joshua M. Toman, LLM*; Laura L. Liptai, PhD*

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

Lunch

**Multidisciplinary Session: Digital & Multimedia Sciences/Engineering Sciences — Electrical Interferences With Forensic Data and Analyses**

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

*Co-Moderator: David Pienkowski, PhD  
University of Kentucky  
Albert B. Chandler Hospital  
Lexington, KY*

1:15 p.m. - 1:30 p.m.  

**D32**  
Data Center Failures and Outages  
Helmut G. Brosz, BASc, PEng*

1:30 p.m. - 1:45 p.m.  

**D33**  
Forensic Image Processing  
Marcus Borengasser, PhD*

1:45 p.m. - 2:05 p.m.  

**C32**  
Measuring the Hygroscopic Capacity of Integrated Circuit Packages and Circuit Boards  
Steven B. Watson, BA*; David Rathbone

2:05 p.m. - 2:25 p.m.  

**C33**  
Electromagnetic “Soundscapes” and Their Relevance in Media Forensics  
Eddy B. Brixen, BA*

*Presenting Author
**Wednesday**

**Poster Session**

11:30 a.m. - 1:00 p.m. **E1** The Challenge of Diagnosing Sexual Abuse in Children: A Matter for Experts  
Francesco Lupariello, MD*; Serena Maria Curti, MD; Caterina Petetta, MD; Elena Coppo, MD; Giancarlo Di Vella, MD, PhD*

11:30 a.m. - 1:00 p.m. **E2** Cupping Therapy Practiced on Children: Maltreatment or Alternative Therapeutic Procedure?  
Serena Maria Curti, MD*; Francesco Lupariello, MD; Caterina Petetta, MD; Sara Simona Racialbuto, PsyD; Elena Coppo, MD; Giancarlo Di Vella, MD, PhD*

11:30 a.m. - 1:00 p.m. **E3** Two Cases of Acute Drug Poisoning in Children: A Form of Life-Threatening Neglect  
Caterina Petetta, MD; Serena Maria Curti, MD; Francesco Lupariello, MD; Sara Simona Racialbuto, PsyD; Elena Coppo, MD*; Janet B. Duval, MSN; Giancarlo Di Vella, MD, PhD

11:30 a.m. - 1:00 p.m. **E4** Child Sexual Abuse: The Importance of the Forensic Medical Examination in the Judicial Decisions  
Patricia Jardim; Ricardo Jorge Dinis-Oliveira, PhD; Teresa Magalhães, PhD*

11:30 a.m. - 1:00 p.m. **E5** An Experimental Evaluation of Participant Recall as One Indicator of the Reliability of Infant Death Doll Reenactments  
Jason M. Wiersema, PhD*; Larissa Ybanez; Allison Woody; Si Gao, MS; Stephanie Miller, BA; Christian Crowder, PhD

11:30 a.m. - 1:00 p.m. **E6** A Growth Chart Review in Sudden Unexpected Infant Death (SUID)  
Bailey D. Lyttle, BA*; Marco Ross, MD

11:30 a.m. - 1:00 p.m. **E7** The Sensitivity of Pediatric Organ Donation: Ways to Decrease the Decline Rate From Coroners/Medical Examiners  
Tyrish Y. Page, MA*; Nicholas I. Batalis, MD*

11:30 a.m. - 1:00 p.m. **E8** The Expanded Application of Forensic Science and Law Enforcement Methodologies in Army Counterintelligence  
Braden Stockham, MFS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*

11:30 a.m. - 1:00 p.m. **E9** Crime Fear Comparison Based on Residence Selection: Gated Communities vs. Apartments  
Sevil Atasoy, PhD; Kadri Daligic*: Betul Kilinc; Oktay Cavus*

11:30 a.m. - 1:00 p.m. **E10** The Spanish Police Intervention Unit Inside the Chaos: Crime Scene Protection Cases  
Carlos J. Lopez-Gobernado, PhD*
GENERAL

11:30 a.m. - 1:00 p.m.  E11 A Usual Cause of Hospitalization and an Unusual Cause of Death
Giuseppe Bertozzi, MD*; Francesca Maglietta, MD; Giuseppe Davide Albano; Mauro A. Ciavarella; Gabriela Perilli, MD; Dania De Carlo, MD; Irene Riezzo, MD, PhD

11:30 a.m. - 1:00 p.m.  E12 Examining the Heritability Effects of Latino Youth Violence
Elvis Sevilla; Ashraf Mozayani, PharmD, PhD*

11:30 a.m. - 1:00 p.m.  E13 Dog Bite-Related Accidents: A New Forensic Approach
Francesco Sessa, MS*; Vera Filetti, MSc; Fabrizio Iarussi, DVM; Valerio Iarussi, MD; Marcello Rendine; Mauro A. Ciavarella; Giuseppe Davide Albano; Irene Riezzo, MD, PhD

11:30 a.m. - 1:00 p.m.  E14 Science Matters: Putting Light on Facial Approximations
Sandra R. Enslow, BA*

11:30 a.m. - 1:00 p.m.  E15 Accuracy Assessment of Korean Craniofacial Reconstructions Applying the Face Pool Comparison Method
Su-Min Kim*; Won-Joon Lee, MD

11:30 a.m. - 1:00 p.m.  E16 Forensic Awareness of Emergency Service Nurses in Turkey
Merve Eyüp, BSc*; Incı Yagmur Tezbasan, BSc; Hatice Yılmaz, BSc; Sevil Atasoy, PhD

Thursday — Session I

Moderator: Precious JeanBatiste, MS
United States Army Criminal Investigation Division Command
Fort Hood, TX

Co-Moderator: Karen A. Wiggins, MA
Washington, DC

8:30 a.m. - 8:45 a.m.  E17 Forensic Science in Austria: Insights on Working Processes and Result Communication Concerning DNA, Fingermarks, and Handwriting
Aline Girod-Frais*; Christian Graff
(FSF Emerging Forensic Scientist Award Paper Presentation)

8:45 a.m. - 9:00 a.m.  E18 Raman Microspectroscopy and Advanced Statistics for Detection and Characterization of Gunshot Residue (GSR)
Igor K. Lednev, PhD*; Shelby R. Khandasammy, BS; Justin Bueno, MS

9:00 a.m. - 9:15 a.m.  E19 Analysis of Blood Traces by Attenuated Total Reflection (ATR)
Fourier Transform Infrared (FTIR) Spectroscopy for Species Identification
Ewelina M. Mistek*; Igor K. Lednev, PhD

9:15 a.m. - 9:30 a.m.  E20 Universal Detection of Body Fluid Traces In Situ With Raman Hyperspectroscopy for Forensic Purposes
Gregory McLaughlin, PhD; Marisia A. Fikiet, MS*; Masahiro Ando, PhD; Hiro-o Hamaguchi, PhD; Igor K. Lednev, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

*Presenting Author
### GENERAL

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 a.m.</td>
<td>E21</td>
<td>Bioaffinity-Based Concepts in Forensic Serology</td>
<td>Jan Halámk, PhD*; Juliana Agudelo, BSc; Erica K. Brunelle, BSc*; Crystal Huynh, BS*; Lenka Halamkova, PhD; Leif McGoldrick, BS*</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>E22</td>
<td>DNA in the Air: The Recovery of DNA Samples From Residential HVAC</td>
<td>Maher Noureddine, PhD*; James A. Bailey, PhD</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>E23</td>
<td>A Universal Method for Biological Stain Characterization Using Raman Spectroscopy: From Body Fluid Identification to Phenotype Profiling</td>
<td>Igor K. Lednev, PhD*</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>E24</td>
<td>The Rapid Online Wildlife Identification Network (ROWIN):</td>
<td>James P. Creecy, PhD*</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>E25</td>
<td>A Different Kind of DNA Casework: When It Barks or Purrs</td>
<td>Teri Kun, BS*; Christina D. Lindquist, MS</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>E26</td>
<td>A Different Kind of DNA Casework: When It Has Fangs or Antlers</td>
<td>Kimberly Frazier, MS*</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>E27</td>
<td>A Different Kind of DNA Casework: When It Has Antlers</td>
<td>Brandt G. Cassidy, PhD*; James Anstead, PhD; Kelsy Lowther, MS; Erica Reynaga, MS; Elizabeth O’Bannon, MS; Sherri Deaton, MS; Christina D. Lindquist, MS</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>E28</td>
<td>A Different Kind of DNA Casework: When It Has Fins</td>
<td>Piper Schwenke, MS*; Kathy Moore, MS; Trey Knott, MS; Linda Park, PhD; Christina D. Lindquist, MS</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>E29</td>
<td>A Different Kind of DNA Casework: When It Has Horns or Tusks</td>
<td>Mary K. Burnham-Curtis, PhD*; Barry Baker, MA; Gabriela Chavarria, PhD; Edgard O. Espinoza, PhD; Christina D. Lindquist, MS</td>
</tr>
</tbody>
</table>

### Break

<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>E30</td>
<td>The Risk for Immersion Pulmonary Edema (IPE) From Scuba Diving</td>
<td>Benjamin Mokdad*; Isabelle Le Blanc, MD; Gilles Tournel, PhD; Sophie Thureau, MD; Anne-Claire Lhoumeau, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E31</td>
<td>A Study of Death by Firearm Injury</td>
<td>Mobin Ul Islam, MD, MPH*</td>
</tr>
</tbody>
</table>

### 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>E30</td>
<td>The Risk for Immersion Pulmonary Edema (IPE) From Scuba Diving</td>
<td>Benjamin Mokdad*; Isabelle Le Blanc, MD; Gilles Tournel, PhD; Sophie Thureau, MD; Anne-Claire Lhoumeau, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E31</td>
<td>A Study of Death by Firearm Injury</td>
<td>Mobin Ul Islam, MD, MPH*</td>
</tr>
</tbody>
</table>
11:30 a.m. - 1:00 p.m.  **E32**  Revisiting the Question of Yellow Discoloration of the Skull Bones and Diabetes Mellitus in an Autopsy Population  
*Angeline Eliasson, MD*; *Carl Johan Wingren, PhD*

11:30 a.m. - 1:00 p.m.  **E33**  Standardizing a Large-Scale, Whole Body Computed Tomography (CT) Image Database  
*Heather J.H. Edgar, PhD*; *Shamsi Berry, PhD*

11:30 a.m. - 1:00 p.m.  **E34**  Stabbing Exploration: An Essential Duality  
*Anne-Claire Lhoumeau, MD*; *Sophie Thuereau, MD*; *Cyril Gricourt*; *Benjamin Mokdad*; *Isabelle Le Blanc, MD*; *Florence Vincent*; *Jean-Nicolas Dacher*; *Gilles Tournel, PhD*

11:30 a.m. - 1:00 p.m.  **E35**  A Case Report of a Peculiar Bullet Track: Trajectory Making the Defense Unfeasible  
*Ivan D. Miziara, MD, PhD*; *Nelson Bruni, MD*; *Carmen Silvia M. Miziara, MD, PhD*

11:30 a.m. - 1:00 p.m.  **E36**  When a Man Kills a Woman — Femicide in Clark County, Nevada: An Overview of Intimate Partner Homicide (IPH) and Intimate Partner Homicide Followed by Suicide (IPHFS)  
*Cristina Tica, MA*; *Caryn E. Tegtmeyer, MA*

11:30 a.m. - 1:00 p.m.  **E37**  A Homicide by Shotgun: The Other Side of a Widespread Weapon  
*Mauro A. Ciavarella*; *Giuseppe Davide Albano*; *Giuseppe Bertozzi, MD*; *Francesca Maglietta, MD*; *Benedetta Di Battista, MD*; *Furio Martino Patete*; *Monica Salerno, MD, PhD*

11:30 a.m. - 1:00 p.m.  **E38**  The Characterization of Volatile Organic Compounds (VOCs) Present in the Headspace of Decomposing Animal and Human Remains  
*Hyun Jee Kim*; *Seh Yeon Park*; *Jisook Min, PhD*

11:30 a.m. - 1:00 p.m.  **E39**  Collaboration of Forensic Disciplines Used to Solve a 13-Year-Old Homicide  
*Sandra E. Jones*; *Deborah Radisch, MD*; *Clyde B. Gibbs*

11:30 a.m. - 1:00 p.m.  **E40**  Suture Embolism to the Left Superior Lobar Pulmonary Artery: A Case Report and Review of the Literature  
*Janice S. Ahn, MD*; *Joy Grise, MS*; *Joseph A. DelTondo, DO*

11:30 a.m. - 1:00 p.m.  **E41**  The Risk of Selfie-Related Deaths: A Case Report on the Dangerous “Daredevil Selfie” Phenomenon  
*Isabella Aquila, MD*; *Matteo Antonio Sacco, MD*; *Valerio Riccardo Aquila*; *Roberto Raffaele*; *Santo Gratteri, MD*; *Paola Frati, PhD*; *Vittorio Fineschi, MD, PhD*; *Pietrantonio Ricci*

11:30 a.m. - 1:00 p.m.  **E42**  A Nunchaku Strangled Woman: A Case Report  
*Giuseppe Davide Albano*; *Mauro A. Ciavarella*; *Francesca Maglietta, MD*; *Giuseppe Bertozzi, MD*; *Natascha Pascale, MD*; *Benedetta Di Battista, MD*; *Dania De Carlo, MD*

11:30 a.m. - 1:00 p.m.  **E43**  The American Board of Forensic Taphonomy (ABFTaph): A Multidisciplinary Approach to Decomposition  
*Amanda L. Roe, PhD*; *Leon G. Higley, PhD*; *Tal Simmons, PhD*; *Neal H. Haskell, PhD*
<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>E44</td>
<td>The Application of Eukaryotic Community Succession on Porcine Remains for Postmortem Interval (PMI) Estimation</td>
<td>Luisa Forger*; Michael Shane Woolf, MS; Tal Simmons, PhD; Jenise Swall, PhD; Catherine Cupples Conn, PhD; Baneshwar Singh, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E45</td>
<td>The Taphonomic Effects of Differential Burial Practices and Environment in Recently Discovered World War II Cemeteries</td>
<td>Hillary R. Parsons, PhD*; Heather Backo, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E46</td>
<td>Veteran Suicides in Harris County, Texas</td>
<td>Bethany L. Bless, MS*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E47</td>
<td>A Multidisciplinary Search for Missing People: Psychology, Canine Units, and Forensic Archaeology</td>
<td>Simone Montaldo*; Luca Daveri; Matteo Borrini, PhD*</td>
</tr>
</tbody>
</table>

**Moderator:** Mark Vecellio, MFS  
**Co-Moderator:** Mitchell D. Sigal, MFS  
**Sanford, NC**  
**Orange County Sheriff-Coroner**  
**Santa Ana, CA**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:15 p.m.</td>
<td>E48</td>
<td>The Current State of Illicit Drugs, Counterfeit Pharmaceuticals, and New Psychoactive Substances in West Asia — Particularly Turkey</td>
<td>Sevil Atasoy, PhD*</td>
</tr>
<tr>
<td>1:30 p.m.</td>
<td>E49</td>
<td>Medicolegal Death Investigation in the Changing Face of Drug Overdoses</td>
<td>Erin M. Worrell, BSc*; Thomas P. Gilson, MD</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>E50</td>
<td>Attacking the Epidemic: Methods and Considerations for Detection of Fentanyl and Novel Psychoactive Substances (NPS) by Thermal Desorption Direct Analysis in Real-Time Mass Spectrometry (DART®-MS)</td>
<td>Edward Sisco, MS*</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>E51</td>
<td>Side Effects of Anabolic Androgenic Steroids Abuse: What About Necrotizing Fasciitis?</td>
<td>Giuseppe Bertozzi, MD*; Mauro A. Ciavarella; Francesca Maglietta, MD; Giuseppe Davide Albano; Santina Cantatore; Francesco Sessa, MS; Monica Salerno, MD, PhD</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>E52</td>
<td>High Order Trace Transfers: Considerations for the Analysis of Sub-Visible and Nanoparticles</td>
<td>Christopher S. Palenik, PhD*</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>E53</td>
<td>Teaching Forensic Image Processing</td>
<td>Marcus Borengasser, PhD*</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td>E54</td>
<td>The Opportunity of a Lifetime: The Educational Outreach Program at the Defense Forensic Science Center (DFSC)</td>
<td>Rachel Creager*; Henry P. Maynard III, MSFS</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>E54</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL

Moderator: Kimberlee Sue Moran, MSc
Rutgers University – Camden
Camden, NJ

Co-Moderator: Carraugh R. Nowak, MFS
Hilbert College
Hamburg, NY

3:15 p.m. - 3:30 p.m.  E55  Fingerprint Analysis: Determination of Biological Sex Via Enzymatic Assay
Crystal Huynh, BS*; Erica K. Brunelle, BSc*; Mindy Hair*; Lenka Halamkova, PhD; Jan Halámek, PhD*

3:30 p.m. - 3:45 p.m.  E56  Data-Driven Decisions in Latent Print Examination to Improve Quality
Anthony Koertner, MS*

3:45 p.m. - 4:00 p.m.  E57  3D Imaging Technology to Uncover Changes in Latent Fingerprint Topography in Four Dimensions
Josep De Alcaraz-Fossoul, PhD; Michelle Mancenido Mancenido, PhD; Jennifer Broatch, PhD; Emmanuel Soignard, PhD; Lindsey J. Porter*; Brandon Shelton; Nathaniel Silverman; Sara R. Anderson*

4:00 p.m. - 4:15 p.m.  E58  Score-Based Likelihood Ratio
Elham Tabassi, MS*; Larry Tang, PhD

4:15 p.m. - 4:30 p.m.  E59  The Impact of DNA Swabbing Collection Methods on Latent Print Evidence
Monica J. Kupsco, MS*

4:30 p.m. - 4:45 p.m.  E60  Size Variations Associated With the Different Methods of Recording Outsole Impressions of Reference Footwear for Comparisons
Anthony Koertner, MS*; Jeremy J. John, MS

4:45 p.m. - 5:00 p.m.  E61  Bradford Reagent and Ninhydrin: Chemical Approaches for Biological Sex Identification From Fingerprints
Erica K. Brunelle, BSc*; Anh M. Le, BSc; Crystal Huynh, BS*; Kelly Wingfield; Lenka Halamkova, PhD; Mindy Hair*; Jan Halámek, PhD*

Thursday — Session II

Multidisciplinary Session: Criminalistics II/General II/Pathology/Biology I/Toxicology — The Synthetic Opioids Epidemic and Forensic Science

Moderator: Vincent J. Desiderio, MS
United States Postal Inspection Service
Dulles, VA

Co-Moderator: Michael F. Rieders, PhD
NMS Labs
Willow Grove, PA

8:30 a.m. - 10:45 a.m.  B81  The Growing Phenomenon of the Epidemic of Synthetic Opioids and Forensic Science: Impact and Response
Vincent J. Desiderio, Jr., MS; Michael F. Rieders, PhD; Brandon Callahan, BA*; Agnes D. Winokur, MS*; Erin M. Worrell, BSc*; John F. Casale, BS*; Karl E. Williams, MD*; Sherri L. Kacinko, PhD*; Patrick Buzzini, PhD

*Presenting Author
Friday — Session I

Moderator: Amanda Fitch, MS
American Society for the Prevention of Cruelty to Animals
Gainesville, FL

Co-Moderator: Kimberly Nugent, MSc
University of Ontario Institute of Technology
Faculty of Science
Oshawa, ON, CANADA

8:30 a.m. - 8:45 a.m. E62 The “CSI Effect”: Is It Relevant to You?
Brittany Borzych*

8:45 a.m. - 9:00 a.m. E63 Comparing the Degree of Force in Infants With Suspected Abusive Head Trauma to Traffic Accidents or High-Altitude Falls Is Not Viable
Jacob Johannes Andersson, MS*; Ingemar Thiblin, PhD

9:00 a.m. - 9:15 a.m. E64 Expert Decision Making and Visual Analysis: An Empirical Approach to Understand and Advance Examination in the Human Identification Sciences
Sherry Nakhaeizadeh*; Nadine Smit*; Helen Earwaker, PhD; Ruth M. Morgan, PhD; Tim Thompson, PhD

9:15 a.m. - 9:30 a.m. E65 Testing Unsubmitted Sexual Assault Kits: The National Institute of Justice-Federal Bureau of Investigation (NIJ-FBI) Sexual Assault Kit Partnership Successes and Lessons Learned
Heather E. Waltke, MS*; Heather LaSalle, MS*

9:30 a.m. - 9:45 a.m. E66 A Case Study: From Maternal Instinct to Staged Domestic Homicide
Eric R. Ruiz Hernandez, MD*

9:45 a.m. - 10:00 a.m. E67 Utah Quick Kit (UQuIK): A Collaborative Program on the Sexual Assault Kit Analysis Process
Julie L. Valentine, PhD*; Suzanne Miles, BS*

10:00 a.m. - 10:15 a.m. E68 Big Business, Big Brother, and Genetic Genealogy
Colleen M. Fitzpatrick, PhD*

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

Moderator: Heather V. Milnthorp, MSFS
The Center for Forensic Science
Research & Education
Willow Grove, PA

Co-Moderator: Carlos J. Lopez-Gobernado, PhD
Policía Nacional
Madrid, SPAIN

10:30 a.m. - 10:45 a.m. E69 Child Abuse in Northwest Italy: A Five-Year Retrospective Analysis
Serena Maria Curti, MD*; Francesco Lupariello, MD; Caterina Petetta, MD; Elena Coppo, MD; Sara Simona Racalbuto, PsyD; Silvia Murdocca, DSW; Giancarlo Di Vélia, MD, PhD*

10:45 a.m. - 11:00 a.m. E70 Keeping Safe: Understanding Violence Against Law Enforcement by Youth Street Gangs
Cliff Akiyama, MPH, MA*

*Presenting Author
### GENERAL

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 a.m.</td>
<td>E71</td>
<td>Trauma, Cognition, and the Investigators</td>
<td>Amanda L. Farrell, PhD*; Timothy J. Ainger, PhD*</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>E72</td>
<td>A Case Study: A Comparative Analysis of Common Behavioral Evidence in Three Columbian Cases of Domestic Homicides</td>
<td>Eric R. Ruiz Hernandez, MD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E73</td>
<td>3D Reconstruction of Shooting Incidents Using Laser Scanning and Computer Modeling</td>
<td>Parris Ward, JD*; Frank P. Sheridan</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>E74</td>
<td>Bulletproof: Two Incidents of Non-Penetrative Bullet Strikes Inflicted on Soldiers Without Armor During Operation Iraqi Freedom</td>
<td>Ryan P. Brokaw, MFS*; Keith M. McCullen, MFS*</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td></td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>

#### 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>E75</td>
<td>A Unique Capstone Experience to Assess Student Learning in a Bachelor of Science (BS) Forensic Science Program</td>
<td>Lori J. Wilson, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E76</td>
<td>Developing an Information Literacy-Intensive Forensic Science Course</td>
<td>Laura Sare*; Sarah Bankston, MS*; Jeffery K. Tomberlin, PhD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E77</td>
<td>Graduate and Undergraduate Education in Forensic Sciences in Turkey</td>
<td>Inanç Pastirmaci, BSc; Kaan Yilancioglu, PhD; Tugba Ünsal, PhD*; Sevil Atasoy, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E78</td>
<td>Language Use Among Forensic Professionals</td>
<td>Emily F. Wiegers, MA*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E79</td>
<td>Evaluation of the Booz Allen Hamilton Tactical Forensic Device: The VAMPIRE™</td>
<td>Jennifer A. Busk*; Peter Massey, MS; Timothy M. Palmbach, MS, JD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E80</td>
<td>Enhanced Postmortem Fingerprinting Techniques</td>
<td>Selma Delic, MS*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E81</td>
<td>Is Latent Print Viability Affected by Heat (Accumulated Degree Hours) From 60-Watt Incandescent Light Bulbs?</td>
<td>Olivia K. Colella, BA*; Marilyn T. Miller, EdD; Sylvia Buffington-Lester; Francis J. Curran, BS; Tal Simmons, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E82</td>
<td>An Efficient Workflow to Recover Examination-Quality Postmortem Fingerprints From Human Remains</td>
<td>Marzena H. Mulawka, MFS*; Bryan Johnson, MSFS*; Aaron Uhle, MS; Gary W. Reinecke, MA*; David Martinez, BS; Leah Hogue</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>E83</td>
<td>Fire Debris Analysis</td>
<td>Abdurhman M. Dhabbah, PhD*</td>
</tr>
</tbody>
</table>

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E84</strong> Race Differentiation by Raman Spectroscopy of a Bloodstain for Forensic Purposes</td>
<td>Ewelina M. Mistek*; Lenka Halamkova, PhD; Kyle C. Doty, BS; Claire Muro, PhD; Igor K. Lednev, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E85</strong> Nuclear Magnetic Resonance (NMR) Spectroscopy as a Screening Agent for Designer Opioids</td>
<td>Nicole Homburger*; Megan Chambers; Ling Huang, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E86</strong> An 11-Year Review Conducted by the West Tennessee Regional Forensic Center (WTRFC) on Deaths While in an Inpatient Rehabilitation or Counseling Center</td>
<td>Braden E. Taylor*; Erica Curry, MD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E87</strong> The Development of a Protein Extraction Protocol in Burnt Bone</td>
<td>Ruben Dario Diaz-Martin, PhD*; Lorena Valencia Caballero, PhD*; Javier Rolando Ambrosio, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E88</strong> The Effects of Surface Composition and Time Intervals on the Stability of Explosive Residues</td>
<td>Jessica Shiffert*; Stephanie J. Wetzel, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E89</strong> Cytochrome P450 and Chemical Oxidation of Synthetic Cannabinoids JWH-015 and Bay 59-3074</td>
<td>Oluseyi A. Vanderpuye, PhD*; Alexis K. Bailey; Christina Dunn</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E90</strong> Optimal Headspace Extraction for the Detection of Volatile Organic Compounds (VOCs) Released From Triacetone Triperoxide (TATP) Using Solid-Phase Microextraction (SPME)</td>
<td>Kelvin J. Frank, Jr., BS*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E91</strong> The Investigation of Ancestral Origins Using Human Cranial Hair</td>
<td>Sirena Lam*; Robert H. Powers, PhD; Alyssa L. Marsico, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td><strong>E92</strong> The Classification of Forensic Soil Evidences by Application of Thermally Assisted Hydrolysis and Methylation With Pyrolysis-Gas Chromatography/Mass Spectrometry (THM-Py-GC/MS) and Multivariate Analysis</td>
<td>Choong Sik Lee, MS*</td>
</tr>
</tbody>
</table>

**Moderator:** Cheryl F. Nelson, DVM
Versailles, KY

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:15 p.m. - 1:30 p.m.</td>
<td><strong>E93</strong> A Comparison of Bioelectrical Impedance Analysis Techniques for Estimating Postmortem Interval (PMI)</td>
<td>Eriek S. Hansen, PhD*; Christiane Baigent, MSc; Melissa A. Connor, PhD</td>
</tr>
<tr>
<td>1:30 p.m. - 1:45 p.m.</td>
<td><strong>E94</strong> Determination of Intent: Accident, Suicide, or Homicide? The Utilization of Social Behavioral Science Within the Medicolegal Death Investigation Process</td>
<td>Barbara C. Wolf, MD; Kyle Shaw, MBBS; Brett E. Harding, MBA*</td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Title</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>E95</td>
<td>Forensic Archaeology Matters: Methods, Differentiation From and Contributions to, Other Forensic Strategies in Crime Scene Investigation</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>E96</td>
<td>Geographic Information Systems (GIS) and Predictive Modeling of Body Disposal Sites</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>E97</td>
<td>Deconstructing Desiccation and Decomposition</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>E98</td>
<td>A Comparison of Insect Activity on Different Carrion Types at the Anthropological Research Facility (ARF) in Knoxville, Tennessee</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td>E99</td>
<td>Taking the Bite Out of Requesting Antemortem Dental Records</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td></td>
<td>Break</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>E100</td>
<td>A Retrospective Study of Homeless Deaths in the County of Santa Clara, California</td>
</tr>
<tr>
<td>3:30 p.m.</td>
<td>E101</td>
<td>Chemical Characterization of Tattoo Inks to Aid in the Identification of Highly Decomposed Remains</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>E102</td>
<td>A Five-Year Retrospective Study on Suicide and the Use of Antidepressants in Washington, DC</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>E103</td>
<td>Efforts at the Centers for Disease Control and Prevention (CDC) to Improve Fatality Management and Mortality Reporting Practices During Mass Fatality Incidents at the State and Local Levels</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>E104</td>
<td>Disaster-Related Deaths and Data: A New Toolkit and Training to Enhance Death Scene Investigations After Disasters</td>
</tr>
</tbody>
</table>

*Presenting Author
Friday — Session II

Multidisciplinary Session: Criminalistics II/General II — Forensic Education Matters

Moderator: Ann B. Geisendorfer, JD, MS
Hudson Valley Community College
Troy, NY

Co-Moderator: A. Bakarr Kanu, PhD
Winston-Salem University
Department of Chemistry
Winston-Salem, NC

1:00 p.m. - 1:15 p.m. B163 A Collaboration for Forensic Student Success: Bridging the High School-to-College Transition
Jillian C. Fesolovich*; Ashley Hudgins, MS*; Vicki A. Stanavitch, PhD

1:15 p.m. - 1:30 p.m. E107 Forensic Science Capstone Experience: The Thesis, the Review, and the Practicum
Kimberly Nugent, MSc*

1:30 p.m. - 1:45 p.m. B164 Using Forensic Cases to Improve Ethical Reasoning Skills
Lyndsie N. Ferrara, MS*; James B. Schreiber, PhD

1:45 p.m. - 2:00 p.m. B165 Teaching Ethics in Forensic Science: A Laboratory Approach
Douglas A. Ridolfi, MS*

2:00 p.m. - 2:15 p.m. E108 Minimum Education Requirements for Crime Scene Investigators (CSI)s:
The Missing Link in Forensic Science
Mary Juno, MSc*

2:15 p.m. - 2:30 p.m. E109 Group Experiential Learning in the Forensic Science Classroom
John A. Williams, PhD*

2:30 p.m. - 2:45 p.m. B166 Supplementing Forensic Science Services With Research, Training, and Mentoring:
Employing Quality Management Personnel to Meet an Organization’s Continuous Education Program Goals
Jasmine M. Jefferson, MS*; Michal L. Pierce, MS; Luis A. Sanchez, MD

2:45 p.m. - 3:00 p.m. E110 A Study of the Forensic Science Education Programs Accreditation Commission (FEPAC) -Accredited Graduate Forensic Science Programs’ Curricula
Catherine G. Rushton, EdD*
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m.  **F1**  Cross Examination and Direct Examination in Criminal Procedure Discussions in Turkey  
Hatice Yilmaz, BSc*; Sevil Atasoy, PhD

11:30 a.m. - 1:00 p.m.  **F2**  Assessment of the Allegations and Evidence in Criminal Proceedings and the Innocence Project in Turkey  
Hatice Yilmaz, BSc*; Sevil Atasoy, PhD

Thursday

Autopsy, Case Studies, and Fingerprints

**Moderator:** Michele Vaira, JD  
Foggia, ITALY

**Co-Moderator:** Mary F. Dayton, JD  
Dekalb County Public Defender/ Georgia State University  
Atlanta, GA

8:30 a.m. - 8:50 a.m.  **F3**  Evidentiary Neglect: The Failure to Perform an Autopsy  
Stephanie Domitrovich, JD, PhD*; Jeffrey M. Jentzen, MD*

8:50 a.m. - 9:20 a.m.  **F4**  The Aaron Hernandez Verdict: Hard Work and Critical Analysis Secure Acquittal  
Linda Kenney Baden, JD*; James Downs, MD*

9:20 a.m. - 9:40 a.m.  **F5**  Care Decisions in Desperate Cases in Infancy: Parens Patriae or Birth Parents’ Responsibility — Lessons From the Case of Charlie Gard  
Alexander Robert W. Forrest, LLM*

9:40 a.m. - 10:10 a.m.  **F6**  Bringing Science Back: Strengthening the Foundation of Fingerprint Examination  
Henry J. Swofford, MSFS*

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

*Presenting Author
JURISPRUDENCE

Review of Science

Moderator: Michele Vaira, JD
Foggia, ITALY

Co-Moderator: Mary F. Dayton, JD
Dekalb County Public Defender/
Georgia State University
Atlanta, GA

10:30 a.m. - 11:00 a.m.  F7  Mad (Forensic) Scientist and Murder: A Case of Suspected Innocence After 22 Years
Scott Bresler, PhD*; Donald R. Caster, JD*

11:00 a.m. - 11:20 a.m.  F8  An Interpretation of the 2016 President’s Council of Advisors on Science and Technology (PCAST) Document in Terms of Forensic Metrology
Veronica Scotti, LLM*; Alessandro M. Ferrero, MSc

11:20 a.m. - 11:40 a.m.  F9  The National Institute of Standards and Technology (NIST) Plans and Approaches to Conducting Scientific Foundation Reviews of Forensic Science Disciplines
John M. Butler, PhD*

11:40 a.m. - 12:00 p.m.  F10  The President’s Council of Advisors on Science and Technology (PCAST) Report on Forensic Science: Why It Fails Foundational Validity
Kenneth E. Melson, JD*

12:00 p.m. - 1:30 p.m.  Lunch

Poster Session

11:30 a.m. - 1:00 p.m.  F11  Female Murder Victims in Turkey
Güzide Sara Berber, BS*; Sevil Atasoy, PhD

11:30 a.m. - 1:00 p.m.  F12  Mandatory Vaccination: The Italian Case Between Clinical and Legal Profiles
Alberto Marchese*; Cristina Mondello, MD; Elvira Ventura Spagnolo, MD*; Aurora Vesto, PhD

DNA

Moderator: Robert M. Sanger, JD
Sanger, Swysen & Dunkle
Santa Barbara, CA

1:30 p.m. - 1:50 p.m.  F13  Distorting DNA Evidence: Methods of Math Distraction
Mark W. Perlin, PhD, MD*

1:50 p.m. - 2:10 p.m.  F14  Is Epigenetics Ready for Prime Time? The Potential of Using DNA Methylation Pattern Evidence to Differentiate Between Monozygotic Twins and to Estimate Age in DNA Donors
Robert F. Hedges, JD*
2:10 p.m. - 2:30 p.m.  F15  “Not Suitable for Comparison” Almost Sends the Wrong Man to Prison
Brian J. Walsh, JD*

2:30 p.m. - 2:50 p.m.  Break

Admissibility and Issues With Scientific Evidence

Moderator:  Robert M. Sanger, JD
Sanger, Swysen & Dunkle
Santa Barbara, CA

2:50 p.m. - 3:50 p.m.  F16  You Be the Judge: An Interactive Session Regarding Admissibility of Scientific Evidence
W. Milton Nazum III, JD*; Stephanie Domitrovich, JD, PhD*

3:50 p.m. - 4:20 p.m.  F17  Post-Conviction Relief: The Many Errors Leading to a Miscarriage of Justice
Charlotte J. Word, PhD*; Robin W. Cotton, PhD*; Emily C Paavola, JD*

4:20 p.m. - 5:00 p.m.  F18  The Need for Scientifically Educated Persons at the Sharp End of Scene Investigations
Peter R. De Forest, DCrim*; John J. Lentini, BA

4:40 p.m. - 5:00 p.m.  F19  How Judges and Juries May Perceive Liability Issues Arising From the Operation of Highly Automated Vehicles
Stephanie Domitrovich, JD, PhD*; Laura L. Liptai, PhD*

Friday

Drugs, Drivers, and Impairment

Moderator:  Paula H. Wulff, JD
Federal Bureau of Investigation
Alexandria, VA

8:30 a.m. - 8:50 a.m.  F20  Quantification of Scientific Opinions and the American Jury System
Robert M. Sanger, JD*

8:50 a.m. - 9:10 a.m.  F21  What Does “Under the Influence” Mean in Driving Under the Influence (DUI) Drug Cases?
Ronald L. Moore, Esq., JD*

9:10 a.m. - 9:30 a.m.  F22  Due Process: Unscrambling SCRAM*
Gil Sapir, JD; Donald J. Ramsell, JD*

*Presenting Author
JURISPRUDENCE

9:30 a.m. - 9:50 a.m.  F23  The Use of Field Sobriety Tests (FST) as Proof of Driving Impairment  
Jeremy C. Brehmer, JD*; Ronald L. Moore, Esq., JD*

9:50 a.m. - 10:10 a.m.  F24  WITHDRAWN

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

Miscellaneous Science

Moderator:  Paula H. Wulff, JD  
Federal Bureau of Investigation  
Alexandria, VA

10:25 a.m. - 11:10 a.m.  F25  The Intersection of Science, Standards, and the Law in Fire Litigation  
Terry-Dawn Hewitt, LLM*; Wayne J. McKenna, LLB

11:10 a.m. - 11:30 a.m.  F26  The Case of the Missing Millionaire: How Sante and Kenneth Kimes Did Not Get Away With Murder  
Kerry J. O’Connell, JD*

11:30 a.m. - 12:00 p.m.  F27  Expert Witnesses: A View From the Bench  
Daniel G. Martin*

12:00 p.m. - 1:30 p.m.  Lunch

Poster Session

11:30 a.m. - 1:00 p.m.  F28  Infrared and Ultraviolet Photography for Individual Identification Using Minor Skin Imperfections  
Kendra Rollins, MFS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*

11:30 a.m. - 1:00 p.m.  F29  Forensic Archaeology: The Legal Aspect for a Practical Application in the Italian Context  
Sara Raponi, JD*; Matteo Borrini, PhD*

Science Related to the Mind

Moderator:  Samuel C. Bauer, JD  
Hilton Head, SC  
Co-Moderator: Patrizia Trapella, JD, MA  
Este, ITALY

1:30 p.m. - 2:00 p.m.  F30  The Science and Law of Solitary Confinement  
Donald E. Shelton, JD, PhD*
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00 p.m.</td>
<td>F31</td>
<td>The Albertani Case: Neuroscience and Criminal Trial in Italy</td>
<td>Michele Vaira, JD*; Laura Muscatello, MD*</td>
</tr>
<tr>
<td>2:20 p.m.</td>
<td>F32</td>
<td>Improving Forensic Competency Evaluations Through Better Participation by Defense Counsel</td>
<td>Paul R. Spyhalski, JD*</td>
</tr>
<tr>
<td>2:40 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dogs, Death, and Reports**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:00 p.m.</td>
<td>F33</td>
<td>Death in the Line of Duty: A New York Police Department (NYPD) Officer Gunned Down During a Botched Robbery</td>
<td>Kerry J. O’Connell, JD*</td>
</tr>
<tr>
<td>3:20 p.m.</td>
<td>F34</td>
<td>The Dog Alerts But There’s No Body: The Science of Human Remains Detection — K-9 Evidence for the Courtroom</td>
<td>Mary E. Cablk, PhD*</td>
</tr>
<tr>
<td>3:40 p.m.</td>
<td>F35</td>
<td>The Need for Transparency in Forensic Report Writing</td>
<td>Sheila Willis, PhD*</td>
</tr>
</tbody>
</table>

**Where We Go From Here**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00 p.m.</td>
<td>F36</td>
<td>A Tale of Two Futures</td>
<td>Peter R. De Forest, DCrim*; Rebecca E. Bucht, PhD; Michelle D. Miranda, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author*
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m.  G1  Migratory Flows and Unaccompanied Minors: The Age Assessment Protocol of the University of Turin (Italy)
Giancarlo Di Vella, MD, PhD*; Emilio Nuzzolese, PhD*; Davide Santovito, MD; Serena Maria Curti, MD; Francesco Lupariello, MD*

11:30 a.m. - 1:00 p.m.  G2  Measuring Root Transparency for Age-at-Death Estimation: What About the Light?
Joe Adserias Garriga, DDS, PhD*; Laia Nogue Navarro; Sara C. Zapico, PhD; Douglas H. Ubelaker, PhD

11:30 a.m. - 1:00 p.m.  G3  Implications of Canine Width, Inter-Canine Distance, and Facial Dimensions in Forensic Identification
Kewal Krishan, PhD*; Vaibhavi Sharma, MSc; Tanuj Kanchan, MD

Thursday

Dental Identification 1

Moderator:  Marnie L. Sperling, DMD  Whippany, NJ
Co-Moderator:  Leigh-Ann Schuerman, DMD  Cave Creek, AZ
Co-Moderator:  Kyle C. Tanaka, DDS  Lynwood, WA

8:30 a.m. - 8:55 a.m.  G4  Dental Exclusion: What’s Next? The Role of the Odontologist as Part of the Identification Team
Taylor L. Gardner, BFSc*; Yolanda Nerkowski, BA*; Robert E. Wood, DDS, PhD*

8:55 a.m. - 9:20 a.m.  G5  Multimodality Multidisciplinary Dental Identification in a High Stakes Case of Prior Misidentification
Taylor L. Gardner, BFSc*; Yolanda Nerkowski, BA*; Robert E. Wood, DDS, PhD*

9:20 a.m. - 9:50 a.m.  G6  The Dental Identification After an Air Disaster 45 Years Ago: The Dubai Accident in 1972 With 112 Victims
Tore T. Solheim*

9:50 a.m. - 10:15 a.m.  G7  OdontoSearch: Modifications, Updates, and Proper Usage
Kenneth W. Aschheim, DDS*; Bradley J. Adams, PhD

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

*Presenting Author
Presenting Author

**ODONTOLOGY**

10:30 a.m. - 10:55 a.m.  
**G8** Atypical Dental Identifications: What to Do When Antemortem Radiographs Are Missing  
*Kenneth W. Aschheim, DDS*; *Lawrence A. Dobrin, DMD*

10:55 a.m. - 11:20 a.m.  
**G9** The Head in Cement and the Medical Examiner  
*David S. Lynn, DDS*

11:20 a.m. - 11:45 a.m.  
**G10** Evaluating a Selfie Identification App in the Forensic Dental Identification Process  
*Emilio Nuzzolese, PhD*; *Francesco Lupariello, MD*; *Giancarlo Di Vella, MD, PhD*

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

**Poster Session**

11:30 a.m. - 1:00 p.m.  
**G11** Silver-Stain Modification as a Method to Enhance Visualization of Histological Features for Tooth Cementum Analysis (TCA)  
*Katrin Koel-Abt, PhD*; *Derek E. Peters, MS*

11:30 a.m. - 1:00 p.m.  
**G12** Macroscopic and Microscopic Changes of Dental Tissues Exposed to Thermal Radiations: Forensic Interest in Fire Disaster Modeling  
*Aïda Bencheikh, DDS*; *Steve Toupennay, DDS*

11:30 a.m. - 1:00 p.m.  
**G13** Mass Loss Reaction of Root Canal Materials Exposed to Thermal Radiations: Forensic Interest in Fire Disaster Modeling  
*Steve Toupennay, DDS*; *Aïda Bencheikh, DDS*

11:30 a.m. - 1:00 p.m.  
**G14** Establishing the Necessity for Ethnic Markers in Forensic Odontology: A Literature Review  
*Eric T. Washington, DDS*

**Thomas Krauss Memorial Bitemark Session**

**Moderator:** Judy Y. Marshall, DMD  
**Co-Moderator:** Iris L. Shields, DDS  
*Marshall Family Dentistry*  
*Bel Air, MD*

1:00 p.m. - 1:25 p.m.  
**G15** Bitemarks in Wrongful Convictions in the United States  
*Robert B.J. Dorion, DDS*

1:25 p.m. - 1:45 p.m.  
**G16** The Defense Expert Witness’ Obligation to Silence and Its Consequence of Wrongful Conviction  
*Robert B.J. Dorion, DDS*

1:45 p.m. - 2:15 p.m.  
**G17** Validation of an Algorithm to Mathematically Describe Bitemarks  
*James McGivney, DMD*

2:15 p.m. - 2:45 p.m.  
**G18** Lessons From 30-Year-Old Louisiana Bitemark Cases: Jackson, Keko, and Others  
*Robert E. Barsley, DDS, JD*

*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>G19</td>
<td>Case Studies of Failure to Diagnose Oral Malignancies: What Is the Standard of Care for Diagnosing an Oral Malignancy?</td>
<td>John D. McDowell, DDS*</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>G20</td>
<td>The Good, the Bad, and the Ugly</td>
<td>Peter F. Hamp!, DDS*, David C. Houpt, DMD</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>G21</td>
<td>Project LifeMeters: A Digital Solution Optimizing Forensic Measurement Tools in Bitemark Analysis</td>
<td>Armin A. Farid, DMD*, Hidir Sayli, Nadji Hedjazi</td>
</tr>
<tr>
<td>4:25 p.m.</td>
<td>G22</td>
<td>An Examination of Bitemark Analysis in the Turkish Judiciary and the High Court</td>
<td>Huseyin Afsin, PhD*, Yalcin Buyuk, MD; Abdi Ozaslan, MD; Gulnaz T. Javan, PhD</td>
</tr>
<tr>
<td>4:45 p.m.</td>
<td>G23</td>
<td>Recognizing Bitemarks: A Basic Problem</td>
<td>Alexander S. Forrest, MDS*</td>
</tr>
</tbody>
</table>

**Friday**

### Dental Age Assessment

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>G24</td>
<td>Dental Age Quicksheets (DAQS): The Use of Rapid Calculation Procedures to Determine “Uncertainty” in Dental Age Estimation (DAE)</td>
<td>Derek M. Draft, DDS*; Graham J. Roberts, MDS; Victoria S. Lucas, PhD; Fraser McDonald, PhD; Manoharan Andiappan, MSc</td>
</tr>
<tr>
<td>8:50 a.m.</td>
<td>G25</td>
<td>Statistical Tools in Assessing Validity and Reliability of Tools Used in Forensic Odontology</td>
<td>Mithun Rajshekar, MFSc*</td>
</tr>
<tr>
<td>9:10 a.m.</td>
<td>G26</td>
<td>Dental Age Estimation Using the Demirjian Method: A Flawed and Obsolescent System</td>
<td>Graham J. Roberts, MDS*; Fraser McDonald, PhD; Manoharan Andiappan, MSc; Victoria S. Lucas, PhD</td>
</tr>
<tr>
<td>9:35 a.m.</td>
<td>G27</td>
<td>Root Pulp Visibility (RPV): Validation of Applicability of RPV in Determining Adult Status</td>
<td>Victoria S. Lucas, PhD*; Manoharan Andiappan, MSc; Fraser McDonald, PhD; Graham J. Roberts, MDS</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>------------</td>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td>G28</td>
<td>Dental Age Assessment From Analysis of Canine Pulp/Tooth Volume Ratios Using Cone Beam Computed Tomography (CBCT)</td>
<td>Mohammed A. Barayan*; David R. Senn, DDS; Husniye Demirturk Kocasarac, DDS, PhD</td>
</tr>
<tr>
<td>10:40 a.m.</td>
<td>G29</td>
<td>The Accuracy of Two Dental Age Estimation Methods on Saudi Children: Cameriere’s Measurement of Open Apices and The London Atlas of Tooth Development</td>
<td>Dara M. Alsudairi*; Sakher J. AlQahtani, PhD*</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>G30</td>
<td>Magnetic Resonance Imaging (MRI) of Third Molars in Forensic Age Estimation Validation of the Gent and Graz Protocols</td>
<td>Jannick De Tobel, MD*; Griet I.L. Parmentier, MD; Ines Phlypo, DDS; Beneditie Descamps, PhD; Sara Neyt, PhD; Wim Van De Velde, MD; Patrick W. Thevissen, PhD; Koenraad L. Verstraete, PhD</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>G31</td>
<td>The Use of Magnetic Resonance Imaging (MRI) in Forensic Age Estimation of Living Children, Adolescents, and Subadults: Protocol for a Systematic Review and Preliminary Results</td>
<td>Jannick De Tobel, MD*; Griet I.L. Parmentier, MD; Nele S. Pauwels, PhD; Koenraad L. Verstraete, PhD; Patrick W. Thevissen, PhD</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>G32</td>
<td>A Senegalese Case Study Illustrating a Determination of Age of the Pupils Without Civil Status or With False Declaration of Age by Means of Their Dental Assessment</td>
<td>Khalifa Dieng, DDS*</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>G33</td>
<td>Cephalometric Analysis of Historic Native American Arikara</td>
<td>Beverly Hedgepeth, DDS*; Murray K. Marks, PhD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>G34</td>
<td>Correctional Dentistry and Forensic Odontologists: Bridging the Gap</td>
<td>Lisa M. Hofstad, DMD*</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>G35</td>
<td>An Evaluation of a Multimedia Training Module and Lab for Teaching Radiographic Technique and Safety When Using Hand-Held Portable Dental X-Ray Equipment in Forensic Odontology</td>
<td>Tara L. Newcomb, MS*; Ann M. Bruhn, MS</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>G36</td>
<td>The Integration of a Forensic Dentistry/Catastrophe Preparedness Course Into a Dental Hygiene Bachelor of Science Program Using the American Board of Forensic Odontology (ABFO) Curriculum Guidelines: A 12-Year Study</td>
<td>Winnie Furnari, MS*</td>
</tr>
</tbody>
</table>

*Presenting Author
## Dental Identification 2

**Moderator:** John B. Nase, DDS  
**Co-Moderator:** Lisa M. Hofstad, DMD  
**Dental Forensic Services of Indian Valley**  
**Harleysville, PA**  
**Quincy, FL**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00 p.m. - 1:25 p.m.</td>
<td>G37</td>
<td><strong>Differential Identification of Three Young House Fire Victims: Methods When Statistics Fail</strong></td>
<td>John B. Nase, DDS*</td>
</tr>
<tr>
<td>1:25 p.m. - 1:50 p.m.</td>
<td>G38</td>
<td><strong>Dental Forensic Identification Information: How to “Get” What We Require</strong></td>
<td>Walter F. Zoller, DMD*; Jan Westberry, DMD*</td>
</tr>
<tr>
<td>1:50 p.m. - 2:15 p.m.</td>
<td>G39</td>
<td><strong>Postmortem Human Identification Challenges Regarding Domestic Disappearance and the Health Insurance Portability and Accountability Act (HIPAA)</strong></td>
<td>Iris L. Shields, DDS*</td>
</tr>
<tr>
<td>2:15 p.m. - 2:35 p.m.</td>
<td>G40</td>
<td><strong>Use of the Radiographic Positioning Device Holder in the Postmortem Dental Examination</strong></td>
<td>Judy Y. Marshall, DMD*; Luke Stanton Marshall, BS</td>
</tr>
<tr>
<td>2:35 p.m. - 3:00 p.m.</td>
<td>G41</td>
<td><strong>Identification of a Child Using Comparative Overlays of Primary and Permanent Dentition</strong></td>
<td>Grace Chung, DDS*</td>
</tr>
<tr>
<td>3:00 p.m. - 3:15 p.m.</td>
<td>Break</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3:15 p.m. - 3:35 p.m.</td>
<td>G42</td>
<td><strong>Back to Nice — July 2016: The Dental Identification Team’s Role in the Disaster Victim Identification (DVI) Mission of the Terrorist Truck Attack in France</strong></td>
<td>Steve Toupenay, DDS*; Aïda Bencheikh, DDS*; Lise Malfroy Camine, DDS*</td>
</tr>
<tr>
<td>3:35 p.m. - 3:55 p.m.</td>
<td>G43</td>
<td><strong>The Accuracy of Dental Identification of Adults With Unrestored Teeth by Visual Comparison With Radiographs of Mixed Dentition</strong></td>
<td>Ludovica Gorza*; Scheila Manica</td>
</tr>
<tr>
<td>3:55 p.m. - 4:15 p.m.</td>
<td>G44</td>
<td><strong>Active Participation of the United Arab Emirates’ Disaster Victim Identification Team Using Dental Identification</strong></td>
<td>Salem Alalie; Sakher J. AlQahtani, PhD*; Patrick W. Thevissen, PhD</td>
</tr>
<tr>
<td>4:15 p.m. - 4:30 p.m.</td>
<td>G45</td>
<td><strong>A Study of Morphological Patterns of Lip Prints in Relation to Gender and Blood Groups Among the Egyptian Population</strong></td>
<td>Dina A. Shokry, MD*</td>
</tr>
<tr>
<td>4:30 p.m. - 4:45 p.m.</td>
<td>G46</td>
<td><strong>Collecting Antemortem Dental Data</strong></td>
<td>Gwenola Drogou, DDS*; Aime Conigliaro, MSc; Charles E. Georget, PhD</td>
</tr>
</tbody>
</table>
**Wednesday**

**Poster Session**

11:30 a.m. - 1:00 p.m. **H1**  
**A Rare Presentation of Alexander Disease**  
Edana D. Stroberg, DO*; Kenneth D. Hutchins, MD; E.O. Lew, MD

11:30 a.m. - 1:00 p.m. **H2**  
**Adrenal Gland Changes in Relation to the Cause of Death**  
Cristina Mondello, MD*; Elvira Venturra Spagnolo, MD*; Letteria Minutoli, MD;  
Domenico Puzzolo, MD; Vincenzo Macaione, MD; Consuelo Malta, BS;  
Mariagrazia Rinaldi, BS; Antonio Micali, MD

11:30 a.m. - 1:00 p.m. **H3**  
WITHDRAWN

11:30 a.m. - 1:00 p.m. **H4**  
**When the Walls Close In: Chronic Allograft Vasculopathy on Autopsy of an Orthotopic Heart Transplant Patient**  
Farshaad Bilimoria, MD*; Stacey L. Reed, DO; Mark L. Bunker, MD;  
Jan F. Silverman, MD

11:30 a.m. - 1:00 p.m. **H5**  
**Fatality Following Percutaneous Endoscopic Gastrostomy Tube Insertion**  
Hannah C. Jarvis, MRCS*

11:30 a.m. - 1:00 p.m. **H6**  
**Examining the Distribution of Manner and Cause of Deaths at Hotels and Motels**  
Heather I. Chen, BA*; Joyce L. deJong, DO

11:30 a.m. - 1:00 p.m. **H7**  
**An Unusual Case of Repeat Exertional Rhabdomyolysis With Associated Lymphocytic Thyroiditis and Sickle Cell Trait**  
Heather I. Chen, BA*; Joyce L. deJong, DO

11:30 a.m. - 1:00 p.m. **H8**  
**Pediatric Death by Macrophage-Activation Syndrome (MAS) Related to Epstein Barr Virus: The Role of Microbiological and Histological Postmortem Investigations**  
Isabella Aquila, MD*; Francesca Pepe, MD; Pietrantonio Ricci; Silvia Boca;  
Santo Gratteri, MD*

11:30 a.m. - 1:00 p.m. **H9**  
**A Doubtful Case of Suicide by Firearm: The Comparison Between the Forensic Analysis of the Crime Scene and the Computed Tomography (CT) -3D Postmortem Investigation in Reconstructing the Manner of Death**  
Isabella Aquila, MD*; Roberto Raffaele*; Santo Gratteri, MD;  
Matteo Antonio Sacco, MD; Vittorio Fineschi, MD, PhD; Paola Frati, PhD;  
Pietrantonio Ricci

11:30 a.m. - 1:00 p.m. **H10**  
**The Analysis of Pattern Injuries From Blunt Trauma and Sharp Force in a Forensic Case of Homicide: An Experimental Study Using a Pig Head Model**  
Isabella Aquila, MD*; Roberto Raffaele*; Matteo Antonio Sacco, MD;  
Alfredo Manca; Giuseppe Capoccia; Manolo Vozza; Santo Gratteri, MD*;  
Pietrantonio Ricci  
(FSF Emerging Forensic Scientist Award Poster Presentation)

*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>H11</td>
<td>The Role of Crime Scene Investigation and Judicial Inspection in Bath-Related Deaths: A Case Report With Forensic Implications</td>
<td>Isabella Aquila, MD*; Pietrantonio Ricci; Matteo Antonio Sacco, MD; Vittorio Fineschi, MD, PhD; Roberto Raffaele*; Santo Gratteri, MD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H12</td>
<td>Sudden Death: The Role of Histopathological Investigations in a Case of Eosinophilic Myocarditis (EM)</td>
<td>Isabella Aquila, MD*; Silvia Boca; Pietrantonio Ricci; Ciro Di Nunzio, MFS, PhD*; Santo Gratteri, MD*</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H13</td>
<td>The Role of Proteomics for the Forensic Estimation of Postmortem Interval (PMI): A Preliminary Experimental Study</td>
<td>Isabella Aquila, MD*; Matteo Antonio Sacco, MD; Santo Gratteri, MD*; Roberto Raffaele*; Pietrantonio Ricci</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H14</td>
<td>A Case of Sudden Death From Takayas Arteritis (TA): The Role of the “Histopathological Autopsy” in the Diagnosis of a Rare Disease</td>
<td>Isabella Aquila, MD*; Andrea Galassi, MD; Santo Gratteri, MD*; Roberto Raffaele*; Pietrantonio Ricci</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H15</td>
<td>Methods for Optimizing Postmortem Fingerprint Recovery From Mummified Fingers</td>
<td>Lee Morgan*; Marty Johnson, PhD; Jered B. Cornelison, PhD; Carolyn V. Isaac, PhD; Joyce L. deJong, DO; Joseph A. Prahlow, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H16</td>
<td>Forensic Radiology in Medicolegal Autopsy Practice</td>
<td>Thomas B. Duong, BS*; Ray-Young Tsao, BS; Sheila Spotswood, MD; Carolyn V. Isaac, PhD; Jered B. Cornelison, PhD; Joseph A. Prahlow, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H17</td>
<td>Age Determination of Traumatic Subcutaneous Hematomas Using 3.0T Magnetic Resonance Imaging (MRI): A Feasible Approach</td>
<td>Kathrin Ogris, MD*; Thomas Widek, MSc; Martin Söllradl, MSc; Patrick P. Torreiter, MD; Peter Grabuschnigg, MD; Thorsten Schwark, PhD; Eva Scheurer, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H18</td>
<td>A Comparison of Peak Sound Levels of Non-Contact and Contact Gunshots Into a Gelatin Block</td>
<td>Katrina Van Pelt, DO*; Paul V. Benson, MD; Kevin Jenkins, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H19</td>
<td>The Accuracy of 3D-Printed Models Using Measurements Obtained From Volume-Rendered Computed Tomography (CT) Images</td>
<td>Kelly Weintraub, MD*; Zabiullah Ali, MD; David R. Fowler, MD</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H20</td>
<td>Detection of Human Male DNA From Whole Lucilia sericata (Meigen) (Diptera: Calliphoridae) Larvae Using the Quantifiler® Trio DNA Quantification Kit</td>
<td>Laura Ann Nutton*; Brendan Chapman, BSc; Paola A. Magni, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H21</td>
<td>Infant Death Following Home Birth: A Case Report of Fatal Hypoglycemia in a Neonate</td>
<td>Leah M. Schuppener, DO*; Robert F. Corliss, MD</td>
</tr>
</tbody>
</table>
11:30 a.m. - 1:00 p.m.  **H22** Patterns and Trends of Teenage Homicides in the State of Maryland: A Forensic Autopsy Study (2006-2015)
*Ling Li, MD*; *Xiang Zhang, MD*; *Juan Ning, MD*; *Daming Sun, MD*; *Donghua Zou, MD*; *Mary G. Ripple, MD*; *David R. Fowler, MD*

11:30 a.m. - 1:00 p.m.  **H23** An Evaluation of Elderly Deaths: A Retrospective Forensic Autopsy Study in Maryland (2005-2015)
*Kendra Oghomwen Iregbe*; *Allison Hausen*; *Feng Shi, MS*; *Juan Ning, MD*; *Donghua Zou, MD*; *Xiang Zhang, MD*; *Ling Li, MD*; *David R. Fowler, MD*

11:30 a.m. - 1:00 p.m.  **H24** WITHDRAWN

**Thursday — Session I**

Multidisciplinary Session: Criminalistics II/General II/Pathology/Biology I/Toxicology — The Synthetic Opioids Epidemic and Forensic Science

**Moderator:** Vincent J. Desiderio, MS
United States Postal Inspection Service
Dulles, VA

**Co-Moderator:** Michael F. Rieders, PhD
NMS Labs
Willow Grove, PA

8:30 a.m. - 10:45 a.m.  **B81** The Growing Phenomenon of the Epidemic of Synthetic Opioids and Forensic Science: Impact and Response
*Vincent J. Desiderio, Jr., MS; Michael F. Rieders, PhD; Brandon Callahan, BA*; *Agnes D. Winokur, MS*; *Erin M. Worrell, BSc*; *John F. Casale, BS*; *Karl E. Williams, MD*; *Sherri L. Kacinko, PhD*; *Patrick Buzzini, PhD*

**Poster Session**

11:30 a.m. - 1:00 p.m.  **H25** The Microbiome of Human Cadavers Can Provide an Estimate of the Postmortem Interval (PMI)
*Aaron M. Lynne, PhD*; *Sibyl R. Bucheli, PhD*

11:30 a.m. - 1:00 p.m.  **H26** A Quantitative Assay for Accurate 16S DNA Quantification for High-Throughput Sequencing (HTS) Library Preparation of Microbial Samples
*Raquel Green*; *Elena Martinez Planes*; *Denise Wohlfahrt, BS*; *Baneshwar Singh, PhD*; *J. Brooks, PhD*; *Sarah J. Seashols Williams, PhD*

11:30 a.m. - 1:00 p.m.  **H27** Insects Attached to Vehicles Traveling on Roads in Mexico
*Carolina Núñez-Vázquez, PhD*

11:30 a.m. - 1:00 p.m.  **H28** A Checklist of Forensically Important Blow Flies (Diptera: Calliphoridae) Collected From Human Remains in Central Indiana
*Lauren Weidner, PhD*; *Caroline Garvin Hanau, BS*
11:30 a.m. - 1:00 p.m.  H29  The Characterization of Louisiana Winter Carrion Decomposition and Its Effects on Accumulated Degree Day (ADD) Estimations
DeAnn L. Lemus, BA*; Erin J. Watson-Horzelki, PhD

11:30 a.m. - 1:00 p.m.  H30  The Necessity of Glycolic Acid Testing in Suspected Antifreeze Ingestion Deaths
Abigail J. Grande, MPH*; Joseph A. Prakhlow, MD; Paul Moorman; Prentiss Jones, Jr., PhD

11:30 a.m. - 1:00 p.m.  H31  When Thromboembolism Is Inevitable: A Case Report of a Lung Cancer Patient's Unexpected Death
Alberto Alongi*; Emilliano G. Maresi; Antonina Argo
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  H32  Fatal Intrahepatic Hemorrhage After Nadroparin Use for Total Hip Arthroplasty
Alessandro Bonsignore, MD, PhD*; Cristian Palmieri, MD; Francesca Buffelli, MD; Francesco De Stefano, MD; Francesco Ventura, MD

11:30 a.m. - 1:00 p.m.  H33  A Case Series: A Massive Hepatic Subcapsular Hematoma as an Unexpected Hypoxic Complication — A Preventable Neonatal Death, Not a Latrogenic Rupture of the Liver!
Francesca Buffelli, MD*; Alessandro Bonsignore, MD, PhD; Luca A. Ramenghi, MD; Ezio Fulcheri, MD

11:30 a.m. - 1:00 p.m.  H34  Video Game-Associated Deaths in the Tidewater District of Virginia (2015-2017)
Alison Bybee, BS*; Wendy M. Gunther, MD

11:30 a.m. - 1:00 p.m.  H35  Sudden Cardiac Death and Epilepsy-Related Gene Mutations in Sudden Unexpected Death in Epilepsy (SUDEP)
Andrew S. Williams, MD*; Anne E. Keller, MPH; Robyn Whitney, MD; Kris Cunningham, MD; Michael S. Pollanen, MD, PhD; Elizabeth J. Donner, MD, MSc

11:30 a.m. - 1:00 p.m.  H36  A Novel Approach to Radiographic Identification of Skeletal Remains by the Z-Projection of Cranial Computerized Tomography (CT) Scans
Carlos J. Zambrano, PhD; Angela Berg, MA, RN*; Marc Allen Harrison, MD; Eric Duvall, DO

11:30 a.m. - 1:00 p.m.  H37  A Case of Congenital Laryngeal Stenosis Diagnosed at Autopsy
Angelina I. Phillips, MD*

11:30 a.m. - 1:00 p.m.  H38  Congenital Hypertrophic Cardiomyopathy in a Neonate: A Rare Etiology for Unexpected Death
Nathan Shaller, MD*; Anna G. McDonald, MD; Patrick E. Lantz, MD

11:30 a.m. - 1:00 p.m.  H39  Acute Neonatal Appendicitis — An Autopsy Diagnosis
Asha Sigei*

11:30 a.m. - 1:00 p.m.  H40  The Sixth Biggest Earthquake in the World: The Working Strategy of a Forensic Identification Team Among Chaos
Carlos A. Gutierrez, MS*
(FSF Emerging Forensic Scientist Award Poster Presentation)
Thursday — Session II

Biology

**Moderator:** Sherah L. Van Laerhoven, PhD  
University of Windsor  
Department of Biology  
Windsor, ON, CANADA

**Co-Moderator:** Gail S. Anderson, PhD  
Simon Fraser University  
School of Criminology  
Burnaby, BC, CANADA

11:30 a.m. - 1:00 p.m.  
**H41** Differentiating Impact and Heat-Related Skeletal Fractures From a Small Plane Crash  
Cassie E. Skipper, MA*; Marin A. Pilloud, PhD; Laura D. Knight, MD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

11:30 a.m. - 1:00 p.m.  
**H42** Central Italy Earthquake: A Disaster Victim Identification (DVI) Experience  
Chantal Milan, DMD, MS*; Andrea Berti, PhD; Filippo Barni, PhD; Luca Gasparollo, BS; Cesare Rapone, BS; Carlo Belardo, Lyceum; Veronica De Pisapia, JD; Fabio Crescenzi; Enrico A. Risso, MD, MFM, MFFLM; Luigi Ripani, PhD

11:30 a.m. - 1:00 p.m.  
**H43** A Fatal Sex and Drug Party: Understanding the Real Cause of Death  
Ciro Di Nunzio, MFS, PhD*; Isabella Aquila, MD*; Aldo Di Nunzio*; Luca Lepore; Michele Di Nunzio, BS; Matteo Antonio Sacco, MD; Antonio Perna, MD; Pietrantonio Ricci

11:30 a.m. - 1:00 p.m.  
**H44** Considerations on Death Caused by Heroin Inhalation: A Literature Review  
Ciro Di Nunzio, MFS, PhD*; Aldo Di Nunzio*; Isabella Aquila, MD; Michele Di Nunzio, BS; Emilio D’Oro, MD; Pietrantonio Ricci

11:30 a.m. - 1:00 p.m.  
**H45** The Lethal Attack of Cane Corso Dogs: A Multidisciplinary Approach to Solve the Puzzle  
Ciro Di Nunzio, MFS, PhD*; Isabella Aquila, MD*; Michele Di Nunzio, BS*; Antonio Della Valle; Aldo Di Nunzio; Angela Serino; Pietrantonio Ricci

11:30 a.m. - 1:00 p.m.  
**H46** Patterns of Bruising in Cases With and Without Alcohol Abuse  
Daniel Krona, MD*; Carl Johan Wingren, PhD

11:30 a.m. - 1:00 p.m.  
**H47** Fatalities Due to the Failure of Continuous Subcutaneous Insulin Infusion Devices: A Report of Six Cases  
Timothy L. Williams, MD; Andrew Ziegler, BS; Nicole A. Yarid*; Daniel L. Schultz, MD; Elizabeth A. Bundock, MD, PhD

11:30 a.m. - 1:00 p.m.  
**H48** Bathtub-Related Deaths  
Anders Rietz*; Anders Eriksson, MD, PhD; Jeffrey M. Jentzen, MD  
(FSF Emerging Forensic Scientist Award Poster Presentation)

8:30 a.m. - 8:45 a.m.  
**H49** Suitcase Concealment: An Interdisciplinary Analysis of the Taphonomic Processes and Their Effect on Postmortem Interval (PMI) Estimation  
A. Skylar Joseph, MS*; Gary W. Reinecke, MA; Ian Dadour, PhD

8:45 a.m. - 9:00 a.m.  
**H50** Insects and Bacteria as Forensic Decomposition Markers of Buried Rat Carcasses  
Lavinia Iancu, PhD*; Georgiana Necula-Petrareanu, PhD; Emily Junkins, MS; Cristina Purcarea, PhD

*Presenting Author
9:00 a.m. - 9:15 a.m.  H51  The Influence of Depth and Mixtures on the Bacterial Profiling of Soil Using Next Generation Sequencing  
Emily R. Heinz, BS; David R. Foran, PhD*

9:15 a.m. - 9:30 a.m.  H52  A Survey of Bacterial Diversity Associated With Various Life Stages of Lucilia sericata and Phormia regina Collected From Central Virginia  
Denise Wohlfahrt, BS*; Michael Shane Woolf, MS; Rina Lidder, BS; Baneshwar Singh, PhD

9:30 a.m. - 9:45 a.m.  H53  The Utility of Barnacles in Forensic Investigations  
Ian Dadour, PhD*; Danea Pirtle, BA; Gary W. Reinecke, MA; Paola A. Magni, PhD

9:45 a.m. - 10:00 a.m.  H54  The Beaver Dam, Flies, and the Axe: You Can’t Hide From Mother Nature  
Steven A. Symes, PhD*; Mark M. LeVaughn, MD; John A. Lewis, Jr., DDS; L.R. Funte, MD; Brent Davis, MD; Anastasia Holobinko, PhD; Heidie Newby, BS; Anna C. Follett, BA

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

**Biology**

Moderator: Jeffery K. Tomberlin, PhD  
Texas A&M University  
Department of Entomology  
College Station, TX  
Co-Moderator: Sherah L. Van Laerhoven, PhD  
University of Windsor  
Department of Biology  
Windsor, ON, CANADA

10:30 a.m. - 10:45 a.m.  H55  Exogenous Factors Affecting Bacterial Profiling of Soil on Clothing Via Next Generation Sequencing  
Emily R. Heinz, BS; David R. Foran, PhD*  
(FSF Emerging Forensic Scientist Award Paper Presentation)

10:45 a.m. - 11:00 a.m.  H56  A Comparison of the Geographical Variability of the Thanatomiobiome of Finnish and American Corpses  
Gulnaz T. Javan, PhD*; Sheree J. Finley, MS; Sari Tuomisto, PhD; Pekka J. Karhunen, PhD

11:00 a.m. - 11:15 a.m.  H57  The Ecology of the Human Postmortem Microbiome: Insights From a Large-Scale Study  
Jennifer L. Pechal, PhD*; Carl J. Schmidt, MD; Heather R. Jordan, PhD; M. Eric Benbow, PhD

11:15 a.m. - 11:30 a.m.  H58  A Global Partnership to Study Geographic Variation in the Human Postmortem Microbiome (HPMM)  
M. Eric Benbow, PhD*; Jennifer L. Pechal, PhD; Heather R. Jordan, PhD; Vadim Mesli, MD; Erwan Le Garff, MD; Valéry C Hedouin, MD, PhD; Carlo P. Campobasso, MD, PhD; Valentina Bugelli, MD; Stefan Pittner, PhD; Fabio Monticelli; Carl J. Schmidt, MD

11:30 a.m. - 11:45 a.m.  H59  Fluorescent Bacteria in the Gut of Mice Carcasses Provides Insight on Postmortem Microbial Translocation  
Zachary M. Burcham, BS*; Jennifer L. Pechal, PhD; Jeffrey L. Bose, PhD; M. Eric Benbow, PhD; Carl J. Schmidt, MD; Heather R. Jordan, PhD

11:45 a.m. - 12:00 p.m.  H60  Autopsy Sampling to Uncover Human Resistome Diversity  
Heather R. Jordan, PhD*; Zachary M. Burcham, BS; Jennifer L. Pechal, PhD; Hannah Campbell, BS; Jason Rosch, PhD; Carl J. Schmidt, MD; M. Eric Benbow, PhD

12:00 p.m. - 1:30 p.m.  Lunch
### Imaging

**Moderator:** Mario Rascon, MD  
**Co-Moderator:** James Louis Caruso, MD  
**Office of the Medical Examiner**  
El Paso, TX  
Denver, CO

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m. - 1:45 p.m.</td>
<td>An Affordable Immersion Pump for Postmortem Computerized Tomography Angiography (PMCTA) in Forensic Pathology: The First Ten Cases</td>
<td>Wolf Schweitzer*; Patricia M. Flach, MD; Dominic Gascho*; Lars Ebert, PhD*; Jakob Heimer, MD*; Michael Thali, MD*</td>
</tr>
<tr>
<td>1:45 p.m. - 2:00 p.m.</td>
<td>Exsanguination on Postmortem Computed Tomography (CT) — What Remains When Blood Leaves the Body</td>
<td>Jakob Heimer, MD*; Vasiliki Chatzaraki, MD</td>
</tr>
<tr>
<td>2:00 p.m. - 2:15 p.m.</td>
<td>Global Illumination in Postmortem Computed Tomography (CT): A Presentation of Its Use in Forensic Medicine</td>
<td>Martin Kolopp*; Alain Blum, PhD; Laurent Martrille, MD (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>2:15 p.m. - 2:30 p.m.</td>
<td>Detection of Pulmonary Thrombembolism and Postmortem Clotting on Postmortem Magnetic Resonance Imaging (MRI)</td>
<td>Lars Ebert, PhD; Dominic Gascho; Michael Thali, MD; Patricia M. Flach, MD; Barbara Fliss, MD, MSc*</td>
</tr>
<tr>
<td>2:30 p.m. - 2:45 p.m.</td>
<td>A Comparison of Postmortem and Antemortem Computed Tomography (CT) for the Identification of Adults With Unique Anatomical Variations</td>
<td>Casey P. Bitting, DO*; Zabiullah Ali, MD; Nikki Mourtzinos, DO; David R. Fowler, MD</td>
</tr>
<tr>
<td>2:45 p.m. - 3:00 p.m.</td>
<td>Photogrammetry Applied to Forensic Pathology: Low-Cost Support to “Freeze the Body in Time”</td>
<td>Laura Donato; Alessandro Di Luca, MD*; Rossana Cecchi, PhD</td>
</tr>
</tbody>
</table>

### Systemic Issues

**Moderator:** Gregory A. Schmunk, MD  
**Co-Moderator:** Dianne Little, MBBS  
**Polk County Medical Examiner’s Office**  
Des Moines, IA  
Queensland Health Forensic and Scientific Services  
Southport, AUSTRALIA

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30 p.m. - 3:45 p.m.</td>
<td>Forensic Photography: Focus on Small Findings Using Digital Consumer Cameras</td>
<td>Valeria Hofer*; Rosa M. Martinez, MD*; Michael Thali, MD*; Wolf Schweitzer*</td>
</tr>
<tr>
<td>3:45 p.m. - 4:00 p.m.</td>
<td>The Redevelopment of the Mississippi State Medical Examiner’s Office</td>
<td>Mark M. LeVaughn, MD*; L. R. Funte, MD; Brent Davis, MD; Anastasia Holobinko, PhD; Steven A. Symes, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author*
PATHOLOGY/BIOLOGY

4:15 p.m. - 4:30 p.m.  H70  Autopsy By Videoconferencing
Benjamin Mokdad*; Anne-Claire Lhoumeau, MD; Sophie Thureau, MD; Cyril Gricourt; Isabelle leblanc, MD; Gilles Tournal, PhD

4:30 p.m. - 4:45 p.m.  H71  A Review of In-Custody Deaths in Mississippi
Mark M. LeVaughn, MD*; Brent Davis, MD; L.R. Funte, MD; Anastasia Holobinko, PhD; Steven A. Symes, PhD

4:45 p.m. - 5:00 p.m.  H72  The National Institute of Justice’s (NIJ’s) National Missing and Unidentified Persons System NamUs and the Federal Bureau of Investigation (FBI) Laboratory Collaboration: Using Next Generation Identification (NGI) to Solve Unidentified Persons Cases
Gerald M. LaPorte, MSFS*; Bryan Johnson*; Luther S. Schaeffer, MSFS, MS

Thursday — Session III

Jay Dix Memorial Bonus Day

Moderator: Michael A. Graham, MD
Saint Louis University School of Medicine
Division of Forensic Pathology
St. Louis, MO

9:00 a.m. - 9:10 a.m.  H73  Jay Dix Memorial Bonus Day Introduction
Michael A. Graham, MD*

9:10 a.m. - 10:00 a.m.  H73  Blunt Force Injury
Joseph A. Prahlow, MD*

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

10:10 a.m. - 11:00 a.m.  H73  Firearm Injuries
Andrew M. Baker, MD*

11:00 a.m. - 11:50 a.m.  H73  Head Injury
Rudolph Castellani, MD*

11:50 a.m. - 2:00 p.m.  Lunch

2:00 p.m. - 2:50 p.m.  H73  Cause and Manner of Death
James R. Gill, MD*

2:50 p.m. - 3:00 p.m.  Break

3:00 p.m. - 3:50 p.m.  H73  Investigation of Deaths in Custody
Michael A. Graham, MD*

3:50 p.m. - 4:00 p.m.  Questions & Answers

*Presenting Author
**Friday — Session I**

**Brain and Heart**

**Moderator:** L.J. Dragovic, MD  
Oakland County Medical Examiner’s Office  
Pontiac, MI  

**Co-Moderator:** Ellen Moffatt, MD  
City & County of San Francisco  
Office of the Medical Examiner  
San Francisco, CA

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>H74</td>
<td>Mind Over Matter: A Death Potentially Related to Non-Epileptic Seizures</td>
<td>William T. Harrison, MD*; Tiffany O’Neill, DO</td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>H75</td>
<td>Subdural Hematoma, Retinal Hemorrhages, and Cerebral Venous Sinus Thrombosis (CVST): Homicidal or Natural Death</td>
<td>Joshua Vandeburgh*; Joyce L. deJong, DO; Rudy J. Castellani, MD</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>H76</td>
<td>Postmortem Evaluation of Mild Traumatic Brain Injury (Concussion): Importance and Relevance</td>
<td>Melissa M. Blessing, DO*; Ross Reichard, MD</td>
</tr>
<tr>
<td>9:15 a.m.</td>
<td>H77</td>
<td>Forensic Neuropathology of Cerebral Palsy (CP): The Implications for Cause-of-Death Determination</td>
<td>Zhanna Georgievskaya*; Yue Meng, BA*; Jacqueline Nunez, MD; Declan Mcguone, MBBS; Rebecca Folketh, MD, PhD</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>H78</td>
<td>Preliminary Results of Synaptic Neuroplasticity of Memory Areas: A Comparison Between Violent Deaths and Sudden Deaths</td>
<td>Antonietta Lanzarone*; Antonina Argo; Elvira Ventura Spagnolo, MD; Stefania Zerbo, MD, MD; Daniele Daricello, MD; Rosario Barone, MD; Maria Laura Uzzo, MD; Giovanni Francesco Spatola, MD</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>H79</td>
<td>Cardiac Manifestations of Churg-Strauss Syndrome: A Case Report and Literature Review</td>
<td>Melissa Wils-Owens, BS*; Wendy M. Gunther, MD</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td></td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

**Postmortem Changes**

**Moderator:** Laura D. Knight, MD  
Washoe County Regional Medical Examiner’s Office  
Reno, NV  

**Co-Moderator:** Katherine F. Maloney, MD  
Erie County Medical Examiner’s Office  
Buffalo, NY

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 a.m.</td>
<td>H80</td>
<td>Decomposition Odor Analysis Techniques and Prospective Applications in Postmortem Examinations</td>
<td>Katelynn A. Perrault, PhD*; Pierre-Hugues Stefanuto, PhD; Lena M. Dubois, MSc; Vincent Varlet, PhD; Silke Grabherr, PhD; Jean-François M. Focant, PhD</td>
</tr>
</tbody>
</table>

*Presenting Author
PATHOLOGY/BIOLOGY

10:45 a.m. - 11:00 a.m.  **H81**  Time and Temperature Effects on Volatile Organic Compound Generation During Early Decomposition  
*Brittany N. Reed, BSc*; Robert H. Powers, PhD; R. Christopher O’Brien, PhD

11:00 a.m. - 11:15 a.m.  **H82**  The Big Sleep: Elucidating the Early Sequence of Molecular Events in the First Hours of Death to Determine the Postmortem Interval  
*Sara C. Zapico, PhD*; Paula Núñez, PhD; Sofia T. Menéndez, PhD; M. Ángeles Villaronga, PhD; Douglas H. Ubelaker, PhD; Juana M. Garcia-Pedrero, PhD

11:15 a.m. - 11:30 a.m.  **H83**  Utilizing Radio Frequency Identification Technology (RFID) to Automate Data Acquisition Between the Baltimore Office of the Chief Medical Examiner (OCME) and the Living Legacy Foundation Organ Procurement Organization (OPO)  
*Pamela A. Ferreira, MD*; Rick Kolovich; Kendra Harris, MBA; Michael Eagle; William Spencer-Strong, MBA; David R. Fowler, MD

11:30 a.m. - 11:45 a.m.  **H84**  Nailfold Capillaroscopy Efficacy in Assessing Postmortem Interval (PMI) Compared to Vitreous Potassium Concentration: A Preliminary Study  
*Marianna Meroni*; Valerio Ferretti, MD; David Bauer, MD, PhD

11:45 a.m. - 12:00 p.m.  **H85**  Partially Skeletonized Remains Demonstrating Dragging Injuries, Internal Beveling of the Skull, and Tracheal Obstruction: A Team Approach  
*Brandy Shattuck, MD*; Carolyn V. Isaac, PhD; S. Adam Shahid, PhD; Jennifer L. Pechal, PhD

12:00 p.m. - 1:30 p.m.  Lunch

**Poster Session**

11:30 a.m. - 1:00 p.m.  **H86**  Does Black Tar Heroin “Protect” King County, Washington, From Fentanyl-Related Mortality?  
*Nicole A. Yarid*; Richard C. Harruff, MD, PhD; Andrea Orvik; Janinne Blank; Sini Panicker

11:30 a.m. - 1:00 p.m.  **H87**  Graze Laceration and Graze Fracture: Injuries Which Are Unnamed in Literature  
*Nilesh K. Tumram, MD*

11:30 a.m. - 1:00 p.m.  **H88**  Fatalities to Children Falling Into Abandoned Borewells: A 10-Year Study  
*Nilesh K. Tumram, MD*

11:30 a.m. - 1:00 p.m.  **H89**  A Fatality Caused by Molten Metal Splash During a Field Visit Near a Furnace: A Case Report  
*Nilesh K. Tumram, MD*

11:30 a.m. - 1:00 p.m.  **H90**  Animal Tusk Injuries: Are They Unique With Specific Animals?  
*Nilesh K. Tumram, MD*

11:30 a.m. - 1:00 p.m.  **H91**  The Recovery of Vertebrate DNA From the Gastrointestinal (GI) Tract of Flesh-Eating Insects: A Mass Disaster Simulation Study  
*Pardon T. Masarirambi, BSc*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*

*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>H92</td>
<td>Medicolegal Issues in a Death Due to Duchenne’s Muscular Dystrophy</td>
<td>Joseph A. Prahow, MD; Philip Vasin Bystrom, BA*</td>
</tr>
<tr>
<td></td>
<td>H93</td>
<td>Electrocution Due to Multiple Entry and Exit Wounds — A One-of-a-Kind Case Report</td>
<td>Puneet Setia, MD*; Navneet Ateriya, MD; Ashish Saraf, MD; Tamaj Kanchan, MD</td>
</tr>
<tr>
<td></td>
<td>H94</td>
<td>Is Methamphetamine Use Associated With an Increased Suicide Risk in Adolescents and Young Adults?</td>
<td>Ransom A. Ellis IV*; Diane C. Peterson, MD</td>
</tr>
<tr>
<td></td>
<td>H95</td>
<td>Acetyl Fentanyl: Trends and Concentrations in Metro Detroit</td>
<td>Sarah E. Avedschmidt, MD*; Carl J. Schmidt, MD; David Moons, MD, PhD; Daniel S. Isenschmid, PhD; Kilak Kesha, MD; Avneesh Gupta, MD</td>
</tr>
<tr>
<td></td>
<td>H96</td>
<td>A Lesson Learned From a Case of Unexpected Death of a 73-Year-Old Woman Due to a Congenital Diaphragmatic Hernia</td>
<td>Matteo Moretti, MD*; Silvia D. Visona, MD; Fiorella Lanzillotta, MD; Luisa Andrello, MD; Gualit Toh Javan, PhD; Antonio M.M. Osculati, MD*</td>
</tr>
<tr>
<td></td>
<td>H97</td>
<td>Sudden Death of a 3-Year-Old Girl Due to a Rare Thymic Neoplasm</td>
<td>Silvia D. Visona, MD*; Luca Tajana; Matteo Moretti, MD; Luisa Andrello, MD; Antonio M.M. Osculati, MD</td>
</tr>
<tr>
<td></td>
<td>H98</td>
<td>Sudden Death During Sexual Intercourse: A Fatal Aortic Dissection and Sildenafil Abuse</td>
<td>Diana Bonuccelli, MD; Massimo Martelloni, MD; Alberto Mandoli, MD; Margherita Neri, MD, PhD; Stefano D’Errico, MD*</td>
</tr>
<tr>
<td></td>
<td>H99</td>
<td>Aortic Dissection in Cocaine Abuse: A Fatal Case</td>
<td>Stefano D’Errico, MD*; Sara Niballi, MD; Benedetta Guidi, MD; Marco Conti, MD; Diana Bonuccelli, MD; Anna Talarico</td>
</tr>
<tr>
<td></td>
<td>H100</td>
<td>Bilateral Adrenal Hemorrhage Following Arthroplasty: A Case Study</td>
<td>Sina Kipry, BA; Drake Thrasher*, Predrag Bulic</td>
</tr>
<tr>
<td></td>
<td>H101</td>
<td>Trends of Cannabis- and Alcohol-Related Single Vehicle Accident Fatalities at the Jackson County Medical Examiner’s Office From 2012 to 2016</td>
<td>Tiffany A. Hollenbeck, DO*; Adrian Baron, MD; Diane C. Peterson, MD</td>
</tr>
<tr>
<td></td>
<td>H102</td>
<td>Cranial Abnormalities Seen at Autopsy</td>
<td>Timothy Wysozan, BS*; Carolyn V. Isaac, PhD; Jered B. Cornelison, PhD; Joseph A. Prahow, MD</td>
</tr>
<tr>
<td></td>
<td>H103</td>
<td>Tied to His Own Apron Strings: A Case of Accidental Strangulation by Power Tool</td>
<td>Christine James, DO*; Karl E. Williams, MD; Todd M. Luckasevic, DO</td>
</tr>
<tr>
<td></td>
<td>H104</td>
<td>Troubling Trocars: The Time-Consuming Recovery and Wound Documentation of Fragmenting Bullets</td>
<td>Christine James, DO*; Courtney E. Healy, BS; Todd M. Luckasevic, DO</td>
</tr>
</tbody>
</table>

*Presenting Author
**PATHOLOGY/BIOLOGY**

<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>H105</td>
<td>Mixed-Mode Assessment of Reference Lung Weights in a Medicolegal Autopsy Setting — A Bayesian Approach</td>
<td>Torfinn Gustafsson, MD*; Anders Erikkson, MD, PhD; Carl Johan Wingren, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>H106</td>
<td>Predicting Fatal Intoxications in a Medicolegal Autopsy Population Using the Weight of the Lungs</td>
<td>Carl Johan Wingren, PhD; Anders Erikkson, MD, PhD; Torfinn Gustafsson, MD*</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>H107</td>
<td>How Should Live Entomological Samples Be Stored?</td>
<td>Valentina Bugelli, MD*; Valeria Schmidt; Carlo P. Campobasso, MD, PhD*; Jens Amendt, PhD</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>H108</td>
<td>Death by Hanging: The High Prevalence of Intervertebral Disc Vacuum Phenomenon in Thoracic and Lumbar Spine in Postmortem Computed Tomography (PMCT)</td>
<td>Vasiliki Chatzaraki, MD*; Jakob Heimer, MD; Michael Thali, MD; Wolf Schweitzer</td>
</tr>
<tr>
<td>11:30 a.m. - 1:00 p.m.</td>
<td>H109</td>
<td>An Autopsy Case of Pulmonary Embolism and Underlying Multiple Myeloma</td>
<td>Raman Baldzizhar, MD*</td>
</tr>
</tbody>
</table>

**Pediatrics**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m. - 1:45 p.m.</td>
<td>H110</td>
<td>An Analysis of Skeletal Trauma in Suspected Child Abuse Fatalities: A Procedure Involving Radiology, Pathology, Histology, and Anthropology</td>
<td>Bradley J. Adams, PhD*; Sean C. Kelly, MD</td>
</tr>
<tr>
<td>1:45 p.m. - 2:00 p.m.</td>
<td>H111</td>
<td>Reducing Misdiagnosis in Child Abuse</td>
<td>Brooke H. Blake, MD*; Michael Laposata, PhD</td>
</tr>
<tr>
<td>2:00 p.m. - 2:15 p.m.</td>
<td>H112</td>
<td>Antemortem Versus Postmortem Bone Fractures: The Usefulness of Morphological Observation Using a Scanning Electron Microscope</td>
<td>Silvia D. Visona, MD*; Chiara Rossetti, MD; Yao Chen, MD; Matteo Moretti, MD; Luisa Andrello, MD; Guhnaz T. Javan, PhD; Andrea Verzeletti, MD; Antonio M.M. Osculati, MD (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>2:15 p.m. - 2:30 p.m.</td>
<td>H113</td>
<td>Posterior Rib Fractures in Non-Traumatic Pediatric Deaths</td>
<td>Jennifer C. Love, PhD*; Kristinza W. Giese, MD</td>
</tr>
<tr>
<td>2:30 p.m. - 2:45 p.m.</td>
<td>H114</td>
<td>A Frozen Newborn: A Multidisciplinary Approach in a Case of Infanticide</td>
<td>Enrica Calabrese, MD*; Raffaella Marino, MD; Elena Lucenti, MD; Omar Bonato, MD; Mauro Coppone, MD; Matteo Fabbri, MSc; Margherita Neri, MD, PhD; Rosa Maria Gaudio (FSF Emerging Forensic Scientist Award Paper Presentation)</td>
</tr>
<tr>
<td>2:45 p.m. - 3:00 p.m.</td>
<td>H115</td>
<td>A Review of Multiple Dog-Mauling Fatalities of Infants Less Than Six Months of Age and Neonates in Travis County, Texas, and Cook County, Chicago, Illinois</td>
<td>Kendall V. Crowns, MD*; Michelle S. Montonera, MS; Adrienne Segovia, MD</td>
</tr>
<tr>
<td>3:00 p.m. - 3:30 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PATHOLOGY/BIOLOGY

Environment

Moderator: Katherine F. Maloney, MD  
Erie County Medical Examiner’s Office  
Buffalo, NY

Co-Moderator: Ellen Moffatt, MD  
City & County of San Francisco  
Office of the Medical Examiner  
San Francisco, CA

3:30 p.m. - 3:45 p.m.  H116  
Distinguishing an Accidental Drowning From a Homicide: The Death of a 72-Year-Old Woman in Mississippi  
Charles E. Middleton IV, MD*; L.R. Funte, MD; Mark M. LeVaughn, MD

3:45 p.m. - 4:00 p.m.  H117  
Diatom Test: Still an Irreplaceable Analysis  
Paolo Frisoni, MD; Maurizio Coppone, MD; Stefano Tomasi; Chiara Marini, MD; Erica Bucchio, MD; Raffaella Inglese, MD; Rosa Maria Gaudio; Margherita Neri, MD, PhD; Letizia Alfieri, MD*

4:00 p.m. - 4:15 p.m.  H118  
Armanni-Ebstein Lesions and Hypothermia: A Five-Year Retrospective Study From the Cook County Medical Examiner’s Office  
Lorenzo Gitto, MD*; Serenella Serinelli, MD; Fonni Arunkumar, MD

4:15 p.m. - 4:30 p.m.  H119  
Hypothermia Deaths Due to Environmental Exposure in King County, Washington  
Tara Dixon, MD*; Brian Mazrim, MD; Richard C. Harruff, MD, PhD

4:30 p.m. - 4:45 p.m.  H120  
Common Cutaneous Injuries Found in Drowning Deaths  
Abigail J. Grande, MPH*; Timothy Wysozan, BS; Joyce L. deJong, DO

4:45 p.m. - 5:00 p.m.  H121  
A Probabilistic Analysis of the Cause of a Traffic Death Following Two Crashes Using National Crash Data  
Michael Freeman, MD, PhD; Ellen M. Freeman*

Friday — Session II

Multidisciplinary Session: Pathology/Biology Session II/Toxicology — Postmortem Forensic Toxicology

Moderator: James Louis Caruso, MD  
Office of the Medical Examiner  
Denver, CO

Co-Moderator: Karen S. Scott, PhD  
Arcadia University  
Glenside, PA

8:30 a.m. - 8:45 a.m.  K42  
Using Medical Examiner Case Narratives to Improve Opioid Overdose Surveillance  
Emily Hurstak, MD; Phillip O. Coffin, MD; Nikolas P. Lemos, PhD*

8:45 a.m. - 9:00 a.m.  K43  
Prescription Drug Degradation in a Simulated Postmortem Blood Model  
Jared Castle, BSc*; Danielle Marie Butzbach, PhD; Claire Leneman, PhD; Stewart Walker, PhD; Frank Reith, PhD; Sam P. Costello, PhD; Paul Kirkbride, PhD

9:00 a.m. - 9:15 a.m.  K44  
Strange Bedfellows: Fentanyl Mixed With the Antiquated Poison Strychnine  
Daniel Atherton, MD*; Rachel C. Beck, PhD; Brandi C. McCleskey, MD

*Presenting Author
### PATHOLOGY/BIOLOGY

<table>
<thead>
<tr>
<th>Time</th>
<th>Session No.</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:15 a.m.</td>
<td>K45</td>
<td>An Investigation Into the Analysis of Fentanyl in Postmortem Blood Using Biocompatible Solid-Phase Microextraction (BioSPME)</td>
<td>Chandler Marie Grant, MS*; Thomas A. Brettell, PhD; Samuel D. Land, MD; Marianne E. Starets, PhD</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>K46</td>
<td>Fatal Hydromorphone Overdose in a Child: A Case Report</td>
<td>Teri L. Martin, MSc*</td>
</tr>
<tr>
<td>9:45 a.m.</td>
<td>K47</td>
<td>An Accidental Death Due to Paraquat Poisoning: An Unusual Case Requiring Toxicologist, Pathologist, and Investigator Collaboration</td>
<td>Erin E. Walsh, MS*; Elisa N. Shoff, BS; Sean Hurst, MD; George W. Hime, MS; Diane Boland, PhD</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>K48</td>
<td>Postmortem Tissue Distribution of Synthetic Cathinones</td>
<td>Lindsay Glicksberg, BS*; Ruth E. Winecker, PhD; Caitlin E. Miller, MS; Sarah Kerrigan, PhD</td>
</tr>
<tr>
<td>10:15 a.m.</td>
<td></td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

**Moderator:** Madeleine J. Swortwood, PhD  
Sam Houston State University  
Huntsville, TX

**Co-Moderator:** Dianne Little, MBBS  
Queensland Health Forensic and Scientific Services  
Southport, AUSTRALIA

<table>
<thead>
<tr>
<th>Time</th>
<th>Session No.</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 a.m.</td>
<td>H122</td>
<td>Immune Responses in Opioid Use</td>
<td>Henry J. Carson, MD*</td>
</tr>
<tr>
<td>10:45 a.m.</td>
<td>H123</td>
<td>Preliminary Findings From the Drug Enforcement Administration’s (DEA’s) National Forensic Laboratory Information System (NFLIS) Medical Examiner/Coroner Office Survey</td>
<td>DeMia P. Pressley, MS; Artisha R. Polk, MPH; Ligun Wong, MS; Terrence Boos, PhD; Hope Smiley-McDonald, PhD; Katherine N. Moore, MS*; Edrina Burnette, MS; Jeffrey M. Ancheta, BS; Neelima Kunta, BS; David Heller, BS; Jeri D. Ropero-Miller, PhD</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>H124</td>
<td>Developing “Real-Time” Surveillance for Drug Overdose Deaths in King County, Washington</td>
<td>Nicole A. Yarid*; Julia Hood, PhD; Richard C. Harruff, MD, PhD</td>
</tr>
<tr>
<td>11:15 a.m.</td>
<td>H125</td>
<td>New Psychoactive Substances (NPS) -Related Deaths in Sweden — An Alarming Development</td>
<td>Gisela Pettersson, MD*; Gunilla Thelander, BSc</td>
</tr>
<tr>
<td>11:30 a.m.</td>
<td>H126</td>
<td>Deaths in Denver, Colorado, With the Detection of Cannabinoid Metabolites: 2010-2016</td>
<td>Derek Bumgarner, MD*; Meredith A. Frank, MD; Krista L. Timm, MD; James Louis Caruso, MD</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>H127</td>
<td>Levamisole: A High-Performance Cutting Agent</td>
<td>Nadia Solomon, MSc*; Jonathan Hayes, MD</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td></td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>
# Forensic Potpourri

<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>H128</td>
<td>Fire Marshal and Medical Examiner Collaboration in the Investigation of a Complex Homicide</td>
<td>Christine James, DO*; Donald Brucker, PhD; Karl E. Williams, MD</td>
</tr>
<tr>
<td>1:45 p.m.</td>
<td>H129</td>
<td>An Atypical Suicide by Submachine Gun: A Case Report</td>
<td>Martin Kolopp*; Alain Blum, PhD; Marc-Antoine Leupold, MD; Laurent Martrille, MD</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>H130</td>
<td>Ballistic Analysis of an Attempted Murder Using a Porcine Model</td>
<td>Michael Freeman, MD, PhD*; Karl E. Williams, MD; Anders Eriksson, MD, PhD</td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>H131</td>
<td>The Effect of Public Awareness and Legislation Against Strangulation on the Occurrence of Gender-Based Violence in King County, Washington</td>
<td>Micheline Lubin, MD*; Richard C. Harruff, MD, PhD; Jillian Jetter, MPH; David Martin, JD; Nicole Siver; Cloyd Steigerr</td>
</tr>
<tr>
<td>2:30 p.m.</td>
<td>H132</td>
<td>Two Dead Bodies in a Cemetery: An Unexpected Lightning Strike</td>
<td>Alexandra M. Hart, MD*; Katherine F. Maloney, MD; Nicole A. Yarid; Tara J. Mahar, MD</td>
</tr>
<tr>
<td>2:45 p.m.</td>
<td>H133</td>
<td>An Unusual Case of Suicide in a Young Skydiver</td>
<td>Pierre-Antoine Peyron, MD*; Eric Baccino, MD; Emmanuel Margueritte, MD</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Miscellaneous

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30 p.m.</td>
<td>H134</td>
<td>An Exceptional Case of Acute Respiratory Failure Caused by Intra-Thoracic Gastric Perforation Secondary to Overeating</td>
<td>Alessandro Di Luca, MD*; Vincenzo M. Grassi, MD; Gerardo Di Masi, MD; Eleonora Ricci, MD; Antonio Oliva, MD, PhD</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>H135</td>
<td>Determining the Difference Between Blunt and Sharp Force Traumas in Human Head Hair</td>
<td>Amy Evans, BS*; Carol J. Ritter, MS</td>
</tr>
</tbody>
</table>

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
</tr>
</thead>
</table>
| 4:00 p.m.  | **H136** Violence Against Vulnerable Persons: The Death of a Transgendered Individual in Mississippi  
L.R. Funte, MD*; Brent Davis, MD; Mark M. LeVaughn, MD; Anastasia Holobinko, PhD; Steven A. Symes, PhD |
| 4:15 p.m.  | **H137** Establishing Organ Weight Norms for Caucasian and Minority Populations Using Autopsy Data From Two Institutions and the Evaluation of Autopsy Reports Using a Novel Free-Text Analysis Tool  
Emily Wolak, DO*; Daniel W. Dye, MD; Sarah Lathrop, DVM, PhD; Garon Bodor, MS; Matthew D. Cain, MD |
| 4:30 p.m.  | **H138** The Thanatotranscriptome: An Assessment of Messenger RNA (mRNA) Abundances in Cadaver Prostate Tissues  
Sheree J. Finley, MS*; Mariah Tolbert, BSc; Silvia D. Visona, MD; Antonio M.M. Osculati, MD; Gulnaz T. Javan, PhD |
**PSYCHIATRY & BEHAVIORAL SCIENCE**

**Wednesday**

**Poster Session**

11:30 a.m. - 1:00 p.m.  **I1**  
**Elder Abuse: Perception and Knowledge of the Phenomenon by Healthcare Workers From Two Italian Hospitals**  
Ignazio Grattagliano, PsyD*; Graziamaria Corbi, PhD; Carlo P. Campobasso, MD, PhD; Lidia Scarabaggio, RN; Roberto Catanesi, MD; Nicola Ferrara, MD; Carlo Sabbà, MD; Giorgio Fiore, MD

11:30 a.m. - 1:00 p.m.  **I2**  
**Financial-Psychological Crime: The Madoff Case**  
Ignazio Grattagliano, PsyD; Alessio Ostuni, MD*; Mariela Marrone, MD; Anna Cassano, PsyD; Fulvia Carucci, PsyD; Michele Di Marcantonio, PsyD; Giancarlo Di Vella, MD, PhD; Lucia Tattoli, PhD; Carlo P. Campobasso, MD, PhD; Graziamaria Corbi, PhD; Roberto Catanesi, MD

**Thursday**

**Youth and Adolescents**

Moderator:  John L. Young, MD  
Yale University  
New Haven, CT

8:30 a.m. - 8:45 a.m.  **I3**  
**Sudden Death of a Child: What Could Have Happened in a Family With a Different Socioeconomic Status?**  
Erica Bacchio, MD*; Omar Bonato, MD; Elena Lucenti, MD; Letizia Alfieri, MD; Natascha Pascale, MD; Simone Oniti, MD; Stefano Malaguti, MD; Rosa Maria Gaudio; Margherita Neri, MD, PhD

8:45 a.m. - 9:00 a.m.  **I4**  
**Self-Cutting and Suicide Risk Among Adolescents: The Case of the “Blue Whales”**  
Francesco Lupariello, MD*; Serena Maria Curti, MD; Elena Coppo, MD; Sara Simona Racaibuto, PsyD; Ignazio Grattagliano, PsyD; Giancarlo Di Vella, MD, PhD

9:00 a.m. - 9:15 a.m.  **I5**  
**Acute Stress Disorder (ASD) Symptomatology and Crime in a Nationally Representative Sample of Youth**  
Joseph Chien, DO*; Bronte T. Pagan, BS; Kayla E. Wyant, BA; Kendell L. Coker, PhD

9:15 a.m. - 9:20 a.m.  **Questions & Answers**

*Presenting Author
Sexual Offenders

Moderator: Thanh Ly, BSc
Ottawa, ON, CANADA

9:20 a.m. - 9:35 a.m. 16 Female-Perpetrated Sexual Abuse on Children: A Five-Year Long Italian Experience
Serena Maria Curti, MD*; Francesco Lupariello, MD; Caterina Petetta, MD; Anna M. Baldelli, JD; Sara Simona Racalbuto, PsyD; Elena Coppo, MD; Ignazio Grattagliano, PsyD; Giancarlo Di Vella, MD, PhD*

9:35 a.m. - 9:50 a.m. 17 Sexual Offending and IQ: What Is the Relationship?
R. Gregg Dwyer, MD, EdD*; Emily D. Gottfried, PhD*

9:50 a.m. - 10:05 a.m. 18 Do Sex Offenders Secretly Reoffend During Treatment?
Thanh Ly, BSc*; J. Paul Fedoroff, MD*

10:05 a.m. - 10:20 a.m. Break

Criminal Analyses and Psychopathy

Moderator: Eleanor B. Vo, MD
OmaDesala Psychiatric Services
Ewing, NJ

10:20 a.m. - 10:40 a.m. 19 The Unfolding Development of Forensic Behavioral Science
John L. Young, MD*

10:40 a.m. - 11:00 a.m. 110 Application of the Equivocal Death Psychological Autopsy for Investigation: A Case Study
Cinzia Gimelli, PsyD, PhD*

11:00 a.m. - 11:30 a.m. 111 A Review of More Than 20 Parricides and Crime Scene Behaviors: Does It Differentiate Mental Illness, Psychopathy, or Abuse as the Reason for Killing Parents?
Eleanor B. Vo, MD*; Kaveh Cyrus Ghaedi, DO*; Wade C. Myers, MD*

11:30 a.m. - 1:00 p.m. Lunch
Poster Session

11:30 a.m. - 1:00 p.m.  I12  Narcissism and Violence: Criminological Understanding in a Homicide Case of Complete Decapitation
Ignazio Grattagliano, PsyD*; Gabriele Rocca; Alessandro Bonsignore, MD, PhD; Alfredo Verde, PhD

11:30 a.m. - 1:00 p.m.  I13  Holy Crime: Sexual Abuse of Minors by Priests
Ignazio Grattagliano, PsyD; Alessio Ostuni, MD*; Mariclara Marrone, MD; Anna Cassano, PsyD; Annalisa Pasquale, PsyD; Giancarlo Di Vella, MD, PhD; Lucia Tattoli, PhD; Carlo P. Campobasso, MD, PhD; Graziamaria Corbi, PhD; Roberto Catanese, MD

11:30 a.m. - 1:00 p.m.  I14  Are There Similarities Between Forensic Technician and Sworn Peace Officer Stress?
Selena M. McKay-Davis, MFS*; Ismail M. Sebetan, MD, PhD*; Paul Stein, PhD*

Criminal Analyses and Psychopathy

Moderator:  Eleanor B. Vo, MD
OmaDesala Psychiatric Services
Ewing, NJ

1:00 p.m. - 1:15 p.m.  I15  Variation in Genes Affecting Dopamine Turnover, Oxytocin, and Serotonin in Inmate and Student Populations
Elizabeth Chesna, BS*; Ana I. Blanco, MS; Charity M. Beherec, MS; Gabriella Cansino-Jones, MS; Peyton Gandy, MSFS; Jessica Wells, PhD; Danielle Boisvert, PhD; Todd Armstrong, PhD; Sheree R. Hughes-Stamm, PhD; David A. Gangitano, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

1:15 p.m. - 1:35 p.m.  I16  Phenotypic Characteristics in Different Groups of Psychopathic Individuals
Donatella La Tegola, PhD*; Alan R. Felthous, MD; Roberto Catanese, MD; Domenico Montalbò, MD*; Felice F. Carabellesse, MD

1:35 p.m. - 1:50 p.m.  I17  The Psychopathic Semantics of Serial Killer Theodore Robert Bundy
Kaveh Cyrus Ghaedi, DO*; Ross Crosby, PhD

1:50 p.m. - 2:05 p.m.  I18  The Psychopathological Profile of the Female Serial Killer: From Homicide to Cannibalism — The True Story of the “Soapmaker of Correggio”
Isabella Aquila, MD*; Pietrantonio Ricci; Matteo Antonio Sacco, MD; Paola Frai, PhD; Valerio Riccardo Aquila; Santo Gratteri, MD*

2:05 p.m. - 2:25 p.m.  I19  Empathy for the Psychopathic Patient
Paulina Riess, MD*; Ahmed Albassam, MD*

2:25 p.m. - 2:40 p.m.  Break
Brief Communications (Q&A)

Moderator: R. Gregg Dwyer, MD, EdD
Medical University of South Carolina
Community & Public Safety Psychiatry Division
Charleston, SC

2:40 p.m. - 2:50 p.m. I20  How Just Is Manifest Injustice (MI)? Evaluating the Use of Manifest Justice in the Washington State Juvenile Rehabilitation Administration
Nicole Sussman, MD*; Terry Lee, MD; Kevin Hallgren, PhD

2:50 p.m. - 3:00 p.m. I21  Potential Effects of Legalized Recreational Cannabis on Youth
Jeramy R. Peters, DO*; Joseph Chien, DO

3:00 p.m. - 3:10 p.m. I22  Females Who Sexually Offend: Characteristics and Behaviors
Emily D. Gottfried, PhD*; R. Gregg Dwyer, MD, EdD*

3:10 p.m. - 3:20 p.m. I23  High-Functioning Autism and Violence Risk
Lindsay Howard, DO; Will Frizzell, MD*; Joseph Chien, DO

3:20 p.m. - 3:30 p.m. I24  Factitious Disorder Imposed on Another: A Life-Threatening Italian Case
Sara Simona Racalbuto, PsyD; Serena Maria Curti, MD*; Francesco Lupariello, MD*; Elena Coppo, MD; Giancarlo Di Vella, MD, PhD

Friday

Thoughts for the Forensic Psychiatrist

Moderator: Tony Godet
Geneva University Hospital
Geneva, SWITZERLAND

8:30 a.m. - 10:30 a.m. I25  Clinical Psychiatry and Neuropsychiatry in the Forensic Context
Vernon M. Neppe, MD, PhD*

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

10:45 a.m. - 10:55 a.m. I26  Contribution of the Psychiatrist in the Evaluation of Fitness for Detention While in Custody in France
Arsene Gambier, MD*; Camille Rerolle, MD; Pauline Saint-Martin, MD, PhD

10:55 a.m. - 11:10 a.m. I27  Impartiality and Forensic Psychiatry: How Forensic Psychiatry Specialists Consider the Concept of Impartiality
Tony Godet*; Gérard Niveau, MD

*Presenting Author
Racial Trauma: Its Mental Health Manifestations in Racial Minorities Involved in the Legal System and Incorporating Findings in Forensic Psychiatric Assessments

Donald R. Brown II, MD*

11:10 a.m. - 11:25 a.m.

Lunch

Poster Session

Mental Wellness and Suicide Prevention Programming Among United States Police Agencies

Leslie Ethan Dodson, BA*; Megan Thoen, PhD; Brandy Pina-Watson, PhD; Elizabeth Trejos-Castillo, PhD

11:30 a.m. - 1:00 p.m.

Determining Implicit and Explicit Attitudes of Hiring Non-Violent Ex-Offenders

Cristine S. Kilburn, MA*; Nora Gayzur, PhD*

11:30 a.m. - 1:00 p.m.

Thoughts for the Forensic Psychiatrist

A Complex Case of Psychosis and Factitious Disorder

J. Brandon Birath, PhD; Stacie Collins, MD*; Davin Agustines, DO*

1:00 p.m. - 1:20 p.m.

Criminological Analysis of Human Smuggling and Migrant Trafficking Into Italy

Laura Volpini, PhD*; Federica Mondani

1:20 p.m. - 1:35 p.m.

Break

Legal Considerations and Those Involved

Live-Streaming Suicide and Murder on Facebook*: Can Someone Be Held Liable?

Chris Chen, MD*

2:25 p.m. - 2:40 p.m.

Do Evidence Submission Forms Expose Latent Print Analysts to Task-Irrelevant Information?

Brett Gardner, PhD*; Sharon Kelley, PhD; Daniel C. Murrie, PhD; Kellyn Blaisdell, BA

2:40 p.m. - 2:55 p.m.

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:55 p.m.</td>
<td>I35</td>
<td>Jury Instructions on Insanity Acquittal Disposition</td>
<td>Jennifer Piel, MD*</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td>I36</td>
<td>Compassionate Care for the Criminal Courts</td>
<td>Karen B. Rosenbaum, MD*</td>
</tr>
<tr>
<td>3:45 p.m.</td>
<td>Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>I37</td>
<td>The Patient Can Leave: Involuntary Hospitalization of Non-Psychiatric Patients Who Lack the Capacity to Refuse Medical Treatment</td>
<td>Thomas Rodriguez, MD*</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>I38</td>
<td>Capacity to Consent to Psychiatric Treatment in Ontario, Canada: Perspectives From a Forensic Psychiatry Program</td>
<td>Sebastien S. Prat, MD*; Joseph Ferencz, MD</td>
</tr>
</tbody>
</table>
Wednesday

Poster Session

11:30 a.m. - 1:00 p.m. **J1** An Examination of Highly Deceptive Counterfeit Currency
Khurram W. Mahmood, MPhil*; Sehrish Mohsin, MS*; Muhammad Irfan Ashiq, PhD*; Bushra Iftikhar, MPhil*; Nadeem-Ul-Hassan Khan, MPhil*; Mohammad A. Tahir, PhD*

11:30 a.m. - 1:00 p.m. **J2** Questioned Document Examination of Two-Source Traced Forgery in Signatures: A Case Study
Zumrad Usman Bhutta, MS*; Iqbal Mehmood, BSc*; Saqib Sultan Al Mehmood*

11:30 a.m. - 1:00 p.m. **J3** The Significance of Electrostatic Detection Apparatus (ESDA) in the Determination of Tampering
Nadeem-Ul-Hassan Khan, MPhil*; Saqib Iqbal, MPhil; Kamran Ghafoor, PharmD; Sadaf Iqbal, MPhil; Muhammad Irfan Ashiq, PhD; Mohammad A. Tahir, PhD*

Thursday

Questioned Documents 1

*Presenting Author*
<table>
<thead>
<tr>
<th>Time</th>
<th>J8</th>
<th>Security Document Artwork That Resists Reverse Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30 a.m.</td>
<td><em>Presenting Author</em></td>
<td>Joel A. Zlotnick, MSFS*; Jordan C. Brough, MFS; Troy J. Eberhardt, BS</td>
</tr>
<tr>
<td>12:00 p.m.</td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>

**Questioned Documents 2**

Moderator: Jeanne M. Dietrich, BS
Internal Revenue Service
National Forensic Laboratory
Chicago, IL

<table>
<thead>
<tr>
<th>Time</th>
<th>J9</th>
<th>Distinguishing Characteristics of Robotic Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 p.m.</td>
<td>J10</td>
<td>An Analysis of Forensic Document Examiner (FDE) Aptitude in Determining and Comparing Velocity Rates of Handwritten Strokes</td>
</tr>
<tr>
<td>1:35 p.m.</td>
<td></td>
<td>Michael Caligiuri, PhD; Linton Mohammed, PhD*; Carl R. McClary, BA*</td>
</tr>
<tr>
<td>1:35 p.m.</td>
<td></td>
<td>Introduction</td>
</tr>
<tr>
<td>1:35 p.m.</td>
<td>J11</td>
<td>The Influence of Terminal Illness and Prescription Medications on Patient Signatures</td>
</tr>
<tr>
<td>1:35 p.m.</td>
<td></td>
<td>Jan Seaman Kelly, BA*</td>
</tr>
<tr>
<td>1:55 p.m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:15 p.m.</td>
<td>J12</td>
<td>Measuring the Frequency Occurrence of Handwritten Numerals</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td></td>
<td>Thomas W. Vastrick, BS*; Ellen M. Schuetzner, BA; Kelsey Osborn</td>
</tr>
<tr>
<td>3:15 p.m.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:35 p.m.</td>
<td>J13</td>
<td>Initials: Value for Identification</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td></td>
<td>Jane A. Lewis, MFS*</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td>J14</td>
<td>Competency for Chinese Handwriting Examination</td>
</tr>
<tr>
<td>4:15 p.m.</td>
<td></td>
<td>Chi Keung Li, PhD*</td>
</tr>
</tbody>
</table>

*Presenting Author
Friday

Questioned Documents 3

Moderator: Timothy Campbell, BSc
Canada Border Services Agency
Ottawa, ON, CANADA

8:50 a.m. - 9:00 a.m. Introduction

9:00 a.m. - 9:20 a.m. J15 Research on the Mechanism of Paper Burning by Thermal-Gravimetry and the Handling Methods for Charred Documents
Da Qin, PhD*

9:20 a.m. - 9:40 a.m. J16 The Evaluation of Method Parameters Affecting Magnetic Flux Measurement of Toners as a Screening Tool for Casework Application
Carrie Polston, BA*, Williams Mazzella, PhD; Martin Furbach, MS; Patrick Buzzini, PhD (FSF Emerging Forensic Scientist Award Paper Presentation)

9:40 a.m. - 10:00 a.m. J17 The Application of t-Stochastic Node Embedding and Random Forest Statistical Methods to Classify Raman Spectra of Inkjet Printer Inks for Purposes of Identification and Production of Investigative Leads
Patrick Buzzini, PhD; James M. Curran, PhD*; Carrie Polston, BA

10:00 a.m. - 10:10 a.m. Questions & Answers

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

10:30 a.m. - 10:50 a.m. J18 Inks Examination Using a Combination of Video Spectral Comparator (VSC) Spectra and Color Deconvolution
Yi Hui Ngor*; Nellie Cheng, BS

10:50 a.m. - 11:20 a.m. J19 The Evolution of Documents and Their Security Submitted for Examination Using a Video Spectral Comparator (VSC*80)
E.L. Jim Lee, Jr., MS*; Darren Corbett, BS

11:20 a.m. - 11:50 a.m. J20 A Physical-Chemical Study of Crossed Line Intersection
Daniela Djidrovskas*

11:50 a.m. - 12:00 p.m. Questions & Answers

*Presenting Author
Wednesday

Toxicology Section Awardees Recognition *(by invitation only)*

6:30 p.m. - 7:30 p.m.  
**Supported by:** Cayman Chemical Company  
Center for Forensic Science Research and Education at the  
Fredric Rieders Foundation

**Poster Session**

**Moderator:** Jeff Walterscheid, PhD  
Armed Forces Medical Examiner System  
Division of Forensic Toxicology  
Dover AFB, DE

**Co-Moderator:** Laureen J. Marinetti, PhD  
Alere Forensics USA  
Redwood Toxicology Laboratory, Inc  
Santa Rosa, CA

7:30 p.m. - 9:00 p.m.  
**K1** Drivers Under the Influence of Alcohol and Drugs: An Eight-Year Retrospective Analysis in a Southern Italian Region  
Anna Carfora*; Carlo P. Campobasso, MD, PhD; Raffaella Petrella; Paola Cassandro; Renata Borriello

7:30 p.m. - 9:00 p.m.  
**K2** Surface-Enhanced Raman Spectroscopy (SERS) -Based Screening Test for Synthetic Cannabinoids in Oral Fluid  
Irene Conticello, BS; Chiara Deriu, MS*; Thaddeus Mostowtt, MFS; Bruce R. McCord, PhD

7:30 p.m. - 9:00 p.m.  
**K3** Will the Real “Molly” Please Stand Up? N-Ethyl Pentylone-Related Deaths in Alabama  
Rachel C. Beck, PhD; Susan Kloda; Jennifer Whiddon, BS; Daniel W. Dye, MD; Daniel Atherton, MD; C. Andrew Robinson, Jr., PhD*

7:30 p.m. - 9:00 p.m.  
**K4** Carfentanil-Induced Fatalities: A Case Series  
Nicholas J. Corsi, BSc*; Prashanti Boinapally, PhD; James C. Anthony, PhD; L.J. Dragovic, MD

7:30 p.m. - 9:00 p.m.  
**K5** An Assessment of the Incorporation of Amphetamine and Diazepam Into Human Head Hair for the Preparation of Hair Reference Material  
Jennett M. Chenevert, BS*; Ashley N. Kimble, BS; Anthony P. DeCaprio, PhD

7:30 p.m. - 9:00 p.m.  
**K6** A Mass Spectrometric Approach to the Analysis of Covalent Modifications of Blood Proteins by Drugs of Abuse  
Richard A. Gilliland, MSFS*; Anthony P. DeCaprio, PhD

7:30 p.m. - 9:00 p.m.  
**K7** Hydrogen Sulfide (H₂S) Poisoning in the Workplace: Toxicological Investigations in a Fatal and Non-Fatal Accident  
Elvira Ventura Spagnolo, MD*; Antonina Argo; Cristina Mondello, MD*; Stefania Zerbo, MD; Luigi Cardia*; Alberto Marchese; Aurora Vesto, PhD; Nunziata Barbera, MD

*Presenting Author
<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 p.m. - 9:00 p.m. K8</td>
<td>The Development of a Rapid Multi-Target Screening Method for Emergency Toxicology by Gas Chromatography/Mass Spectrometry (GC/MS) and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)</td>
<td>Hee-Sun Chung, PhD*</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K9</td>
<td>A Concentration of Biomarkers in Vitreous Humor for the Estimation of Postmortem Interval (PMI) in South Korea</td>
<td>Hee-Sun Chung, PhD*</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K10</td>
<td>Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) Extraction of Novel Psychoactive Substances (NPS) From Biological Matrices</td>
<td>Ashley N. Kimble, BS*; Anthony P. DeCaprio, PhD</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K11</td>
<td>A Validated Method for the Quantitative Determination of Zolpidem, Zopiclone, and Zaleplon (ZZZ Drugs) in Blood, Stomach Contents, and Liver by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)</td>
<td>Madison R. Schaackmuth, BS*; Rachel Marvin, PhD; Erica Bakota, PhD</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K12</td>
<td>Performing Retrograde Extrapolation of Blood Alcohol in Driving Under the Influence (DUI) Trials</td>
<td>Jennifer O. Rattanaprasit, MS; Michael P. Stypa, MS*; Marlissa Collins, MSFS; Denise K. Heineman, BS; Darby A. Lanz, MSFS; Christine Maloney; Natasha Ortiz, BS; Dana C. Russell, BS; Theresa A. Suffecool, BS; Nicole L. Van Aken, BS; Stacy A. Wilkinson</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K13</td>
<td>The Identification of Five Kratom Alkaloids Using High Resolution Mass Spectrometry</td>
<td>Stephanie Basiliere, BS*; Kelsie Bryand, MS; Sarah Kerrigan, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K14</td>
<td>Conformational Considerations of Ethylenediamine Opioids AH-7921 and U-47700</td>
<td>John L. Krstensky, PhD*; Alexander Zambon, PhD; Thomas Hsu, PhD; Jayapal Mallareddy, PhD; Lauren L. Richards-Waugh, PhD</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K15</td>
<td>The Transformation of Drug/Metabolite Ratios: An Objective Assessment of Toxicity</td>
<td>Oneka T. Cummings, PhD; Frank Wallace, BA; Erin C. Strickland, PhD; Ronald C. Backer, PhD; Gregory L. McIntire, PhD*</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K16</td>
<td>The Electroanalytical Identification of 25I-NBOH and 2C-I Via Differential Pulse Voltammetry: A Rapid and Sensitive Screening Method to Avoid Misidentification</td>
<td>Jose Gonzalez-Rodriguez, PhD; Ana B. Andrade, PhD*</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K17</td>
<td>Death From Poppy Tea Consumption</td>
<td>Lauren N. Fox, MSFS*; Ruth E. Winecker, PhD; Sandra C. Bishop-Freeman, PhD</td>
</tr>
<tr>
<td>7:30 p.m. - 9:00 p.m. K18</td>
<td>The Impact of Storage Temperature, Glucose, and Microorganisms on Blood Alcohol Concentration in Non-Decomposed Whole Blood</td>
<td>S. Sharee Lambert*; Melissa M. Bailey, PhD; Carrie Hodges, MLS (FSF Emerging Forensic Scientist Award Poster Presentation)</td>
</tr>
</tbody>
</table>

*Presenting Author
TOXICOLOGY

7:30 p.m. - 9:00 p.m.  K19  An Analysis of Drugs and Their Metabolites in Saliva and Urine Using Various Swabs in Conjunction With Direct Analysis in Real-Time Mass Spectrometry (DART®-MS)
        Nicholas L. Drury, BSc*; Nicholas T. Lappas, PhD; Mehdi Moini, PhD

7:30 p.m. - 9:00 p.m.  K20  The Concentration and Distribution of Methamphetamine (MA) and Amphetamine (AM) in MA-Related Postmortems
        Seung Kyung Baek, PhD*; Heejin Yang; Yujin Park, PhD; Heesang Lee; Jiyoung Jo

7:30 p.m. - 9:00 p.m.  K21  The Effects of Kambo: The First Case of Sudden Death in Forensic Literature
        Isabella Aquila, MD*; Santo Gratteri, MD*; Matteo Antonio Sacco, MD; Vittorio Fineschi, MD, PhD; Simona Magi, PhD; Pasqualina Castaldo, PhD; Graziella Viscomi; Salvatore Amoroso; Pietrantonio Ricci

7:30 p.m. - 9:00 p.m.  K22  An Evaluation of Alcohol Concentrations in Samples Referred to the Forensic Laboratory in Baghdad
        Atheer Jawad Al-Saffar; Haider K. Al-Rubai, MSc; Enas Muataz Al-Qazzaz, BPharm; Muataz Abdulmajeed Al-Qazzaz, PhD*

7:30 p.m. - 9:00 p.m.  K23  The Evaluation of Direct and Indirect Biomarkers of Ethanol Consumption: A Likelihood Ratio (LR) Approach to Identify Chronic Alcohol Misusers for Forensic Purposes
        Eugenio Alladio, PhD*; Marco Vincenti, MS; Agnieszka Martyna, PhD; Alberto Salomone, PhD; Valentina Firro, PhD; Grzegorz Zadora; Paolo Garofano, MD, PhD

Thursday

Multidisciplinary Session: Criminalistics II/General II/Pathology/Biology I/Toxicology — The Synthetic Opioids Epidemic and Forensic Science

Moderator: Vincent J. Desiderio, MS
           United States Postal Inspection Service
           Dulles, VA

Co-Moderator: Michael F. Rieders, PhD
              NMS Labs
              Willow Grove, PA

8:30 a.m. - 10:45 a.m.  B81  The Growing Phenomenon of the Epidemic of Synthetic Opioids and Forensic Science: Impact and Response
        Vincent J. Desiderio, Jr., MS; Michael F. Rieders, PhD; Brandon Callahan, BA*; Agnes D. Winokur, MS*; Erin M. Worrell, BSc*; John F. Casale, BS*; Karl E. Williams, MD*; Sherri L. Kacinko, PhD*; Patrick Buzzini, PhD

10:45 a.m. - 11:00 a.m.  Break
Opioids

Moderator: Kayla N. Ellefsen, PhD
Travis County Medical Examiner’s Office
Austin, TX

Co-Moderator: Michael P. Stypa, MS
Las Vegas Metropolitan Police Department
Las Vegas, NV

11:00 a.m. - 11:15 a.m. K24 2017 Novel Illicit Opioids: Trends and Toxicological Insights
Donna M. Papsun, MS*; Melissa Friscia, MSFS; Jennifer L. Turri, MS; Sherri L. Kacinak, PhD; Barry K. Logan, PhD

11:15 a.m. - 11:30 a.m. K25 The Morphine in Your Pantry — Understanding the Overdose Risk of Home-Brewed Poppy Seed Tea
Deborah L. Powers, BA*; Stephen A. Erickson, MD; Madeleine J. Swortwood, PhD

11:30 a.m. - 11:45 a.m. K26 Carfentanil-Related Deaths in Wayne County, Michigan: Epidemiology and Toxicology
Denice M. Teem, BS*; Daniel S. Isenschmid, PhD; Carl J. Schmidt, MD; Barry K. Logan, PhD

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

Drugs and Driving

Moderator: Amy Miles, BS
Madison, WI

Co-Moderator: Dayong Lee, PhD
Houston Forensic Science Center
Houston, TX

1:00 p.m. - 1:15 p.m. K27 A Field Performance of the DrugTest 5000® and DDS® Onsite Oral Fluid (OF) Devices by Oregon and Vermont Drug Recognition Experts (DREs)
Marilyn A. Huestis, PhD*; Amanda L.A. Mohr, MSFS; Alex J. Krotulski, MS; Barry K. Logan, PhD

1:15 p.m. - 1:30 p.m. K28 An Analysis of Ethanol in Blood and Oral Fluid Samples From Dosed Individuals by Headspace Gas Chromatography
Emily R. Parchuke, BS*; Matthew R. Wood, PhD; Marianne E. Staretz, PhD; Thomas A. Brettell, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

1:30 p.m. - 1:45 p.m. K29 Alcohol Extrapolations: Scientific, Legal, and Ethical Considerations
Ashraf Mozayani, PharmD, PhD*

1:45 p.m. - 2:00 p.m. K30 Quantification of Minor Blood Cannabinoids and Their Utility as Recent Cannabis Use Markers in Driving Under the Influence of Drugs (DUID) Investigation Cases
Ayako Chan-Hosokawa, MS*; Marykathryn Tynon Moody, MSFS; Loan Nguyen, BS; Bingfang Yue, PhD; Barry K. Logan, PhD; Marilyn A. Huestis, PhD
TOXICOLOGY

2:00 p.m. - 2:15 p.m.  K31  A Study of an Active-State CB1 Receptor Model and JWH Synthetic Cannabinoids
Caroline Spencer, BS*; Pankaj Pandey, PhD; Robert J. Doerksen, PhD;
Murrell Godfrey, PhD

2:15 p.m. - 2:30 p.m.  K32  The Evaluation and Preservation of Urine Specimens in Forensic Toxicology
Meaghan Ringel, BS*; Shanan S. Tobe, PhD; Gail Audrey Ann Cooper, PhD;
Karen S. Scott, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

2:30 p.m. - 2:45 p.m.  K33  Novel Stimulants N-Ethyl Pentylone and Dibutylene: Case Reports, Quantitative
Confirmation, and Metabolic Profile Determination
Alex J. Krotulski, MS*; Donna M. Papsun, MS; Bruno De Martinis, PhD;
Amanda L.A. Mohr, MSFS; Barry K. Logan, PhD

2:45 p.m. - 3:00 p.m.  Break
Supported by: Immunalysis Corporation
Utak Laboratories, Inc.

Analytical Methods in Toxicology

Moderator: Erin A. Spargo, PhD
Dallas, TX

Co-Moderator: Alex J. Krotulski, MS
Center for Forensic Science
Research & Education
Willow Grove, PA

3:00 p.m. - 3:15 p.m.  K34  Pharmacokinetic and Pharmacodynamic Differences Between
Paramethoxymethamphetamine (PMMA), Paramethoxyamphetamine (PMA),
3,4-Methylenedioxymethamphetamine (MDMA), and Amphetamine in a
Mouse Model
Robert Kronstrand, PhD*; Mikael Andersson, PhLic; Hanna Göske, MSc

3:15 p.m. - 3:30 p.m.  K35  The Development of a High Resolution Mass Spectrometry (HRMS) Library
and Method Validation for Screening and Confirmation of 800+ Novel
Psychoactive Substances (NPS) by Liquid Chromatography/Quadrupole
Time-Of-Flight/Mass Spectrometry (LC/qTOF/MS)
Melanie Eckberg, MSFS*; Anthony P. DeCaprio, PhD

3:30 p.m. - 3:45 p.m.  K36  6-Monoacetylmorphine (6-MAM) Positivity: A Comparison of Two Methods
Jolene Bierly, MSFS*; Laura M. Labay, PhD; Barry K. Logan, PhD

3:45 p.m. - 4:00 p.m.  K37  The Development and Validation of a Method for the Analysis of Novel
Emerging Opioids
Marykathryn Tynon Moody, MSFS*; Stephanie Kumor, MA; Parul Shah, BS;
Donna M. Papsun, MS; Barry K. Logan, PhD

4:00 p.m. - 4:15 p.m.  K38  A Semi-Quantitative Retrospective Method Validation for Three Synthetic
Cannabinoids With Analytical Confirmation in Toxicology Casework
Stephanie Kumor, MA*; Kristopher W. Graf, BS; Sherri L. Kacinko, PhD

*Presenting Author
4:15 p.m. - 4:30 p.m.  K39  Fully Automated Detection and Quantification of Insulin Analogs by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) in Postmortem Vitreous Humor
Kevin M. Legg, PhD*; Laura M. Labay, PhD; Barry K. Logan, PhD

4:30 p.m. - 4:45 p.m.  K40  The Effect of Sample Preparation Techniques on Matrix Effects and Absolute Recovery of Opiates in Liver Tissue Using Ultra Performance Liquid Chromatography-Tandem Mass Spectrometry (UPLC-MS/MS): Part 1
Casey Spencer, BS*; Jean A. Heneks, BA; Justin L. Poklis, BS; Carl E. Wolf II, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

4:45 p.m. - 5:00 p.m.  K41  The Identification of Adulterants in Preliminary Drug Analysis
Bianca Olivieri*; Mark Maric, PhD; Candice Bridge, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

Toxicology Open Forum (Not Eligible for CE Credit)

Moderator:  H. Chip Walls, BS
Forensic, Analytical & Clinical Toxicology Lab
Miami, FL

Co-Moderator:  Nikolas P. Lemos, PhD
University of California - San Francisco
Palm Springs, CA

7:00 p.m. - 9:00 p.m.  Toxicology Open Forum
Supported by:  Agilent Technologies, Inc.
NMS Labs

Friday

Multidisciplinary Session:  Pathology/Biology Session II/Toxicology — Postmortem Forensic Toxicology

Moderator:  James Louis Caruso, MD
Office of the Medical Examiner
Denver, CO

Co-Moderator:  Karen S. Scott, PhD
Arcadia University
Glenside, PA

8:30 a.m. - 8:45 a.m.  K42  Using Medical Examiner Case Narratives to Improve Opioid Overdose Surveillance
Emily Hurstak, MD; Phillip O. Coffin, MD; Nikolas P. Lemos, PhD*

8:45 a.m. - 9:00 a.m.  K43  Prescription Drug Degradation in a Simulated Postmortem Blood Model
Jared Castle, BSc*; Danielle Marie Butzbach, PhD; Claire Lenehan, PhD;
Stewart Walker, PhD; Frank Reith, PhD; Sam P. Costello, PhD; Paul Kirkbridge, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

9:00 a.m. - 9:15 a.m.  K44  Strange Bedfellows:  Fentanyl Mixed With the Antiquated Poison Strychnine
Daniel Atherton, MD*; Rachel C. Beck, PhD; Brandi C. McCleskey, MD

9:15 a.m. - 9:30 a.m.  K45  An Investigation Into the Analysis of Fentanyl in Postmortem Blood Using Biocompatible Solid-Phase Microextraction (BioSPME)
Chandler Marie Grant, MS*; Thomas A. Brettell, PhD; Samuel D. Land, MD;
Marianne E. Staretz, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)
9:30 a.m. - 9:45 a.m. K46 Fatal Hydromorphone Overdose in a Child: A Case Report
Teri L. Martin, MSc*

9:45 a.m. - 10:00 a.m. K47 An Accidental Death Due to Paraquat Poisoning: An Unusual Case Requiring Toxicologist, Pathologist, and Investigator Collaboration
Erin E. Walsh, MS*; Elisa N. Shoff, BS; Sean Hurst, MD; George W. Hime, MS; Diane Boland, PhD

10:00 a.m. - 10:15 a.m. K48 Postmortem Tissue Distribution of Synthetic Cathinones
Lindsay Glicksberg, BS*; Ruth E. Winecker, PhD; Caitlin E. Miller, MS; Sarah Kerrigan, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

10:15 a.m. - 10:30 a.m. Break
Supported by: Waters Corporation

10:30 a.m. - 10:45 a.m. H122 Immune Responses in Opioid Use
Henry J. Carson, MD*

10:45 a.m. - 11:00 a.m. H123 Preliminary Findings From the Drug Enforcement Administration’s (DEA’s) National Forensic Laboratory Information System (NFLIS) Medical Examiner/Coroner Office Survey
DeMia P. Pressley, MS; Artisha R. Polk, MPH; Liqun Wong, MS; Terrence Boos, PhD; Hope Smiley-McDonald, PhD; Katherine N. Moore, MS*; Edrina Burnette, MS; Jeffrey M. Ancheta, BS; Neelima Kunta, BS; David Heller, BS; Jeri D. Ropero-Miller, PhD

11:00 a.m. - 11:15 a.m. H124 Developing “Real-Time” Surveillance for Drug Overdose Deaths in King County, Washington
Nicole A. Yarid*; Julia Hood, PhD; Richard C. Harruff, MD, PhD

11:15 a.m. - 11:30 a.m. H125 New Psychoactive Substances (NPS)-Related Deaths in Sweden — An Alarming Development
Gisela Pettersson, MD*; Gunilla Thelander, BSc

11:30 a.m. - 11:45 a.m. H126 Deaths in Denver, Colorado, With the Detection of Cannabinoid Metabolites: 2010-2016
Derek Bumgarner, MD*; Meredith A. Frank, MD; Krista L. Timm, MD; James Louis Caruso, MD

11:45 a.m. - 12:00 p.m. H127 Levamisole: A High-Performance Cutting Agent
Nadia Solomon, MSc*; Jonathan Hayes, MD

12:00 p.m. - 1:00 p.m. Lunch
General Forensic Toxicology

Moderator: Robert D. Johnson, PhD
Tarrant County Medical Examiner’s Office
Fort Worth, TX
Co-Moderator: Amanda L.A. Mohr, MSFS
Center for Forensic Science
Research & Education
Willow Grove, PA

1:00 p.m. - 1:15 p.m.  K49  Acute Intoxications With Phenibut (β-Phenyl-γ-Aminobutyric Acid), an Emergent Psychoactive γ-Aminobutyric Acid (GABA) Agonist
Erin L. Karschner, PhD*; John J. Kristofic, BS; Jeffrey D. Chmiel, MS; Neal C. Goebel, PhD; Jeff Walterscheid, PhD

1:15 p.m. - 1:30 p.m.  K50  A Forensic Characterization of Bacterial and Fungal Organisms in Traditional Chinese Herbs
Julia Grzymkowski*; Justin L. Poklis, BS; Christopher J. Ehrhardt, PhD; Michelle R. Peace, PhD
(FSF Emerging Forensic Scientist Award Paper Presentation)

1:30 p.m. - 1:45 p.m.  K51  The Role of Toxicology in Child Custody Disputes
Sherri L. Kacinko, PhD*

1:45 p.m. - 2:00 p.m.  K52  A Segmental Analysis of Endogenous Gamma-Hydroxybutyric (GHB) Acid in Human Hair
Jennifer Thomas, PhD*; Erin Waddell Lloyd, PhD; Christopher C. Donnelly, BA; Mark L. Miller, PhD; Madeline A. Montgomery, BS; Roman Karas, BS; Marc A. LeBeau, PhD

2:00 p.m. - 2:15 p.m.  K53  A Wastewater Analysis for Tobacco and Drug Detection in New York City
Alethea Jacox, MS; Nicole Centazzo, BS*; Bonnie-Marie Frederick, MS; Jasmine Gayle, MS; Marta Concheiro-Guisan, PhD

2:15 p.m. - 2:30 p.m.  Break
Supported by: Lipomed, Inc.
PinPoint Testing, Inc.

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

2:30 p.m. - 5:00 p.m.  K54  Postmortem Pediatric Toxicology
Robert A. Middleberg, PhD*; Nikolas P. Lemos, PhD; Richard C. Harruff, MD, PhD*; Carl J. Schmidt, MD*; Thomas G. Rosano, PhD*

*Presenting Author
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. - 8:17 p.m.  LW1  The Dead Horse Investigation — Forensic Photo Analysis Meets Genealogy  
Colleen M. Fitzpatrick, PhD*

8:17 p.m. - 8:34 p.m.  LW2  Three Complementary Analyses of Ansel Adams’ Moonrise, Hernandez, New Mexico  
Roderick T. Kennedy, JD*

8:34 p.m. - 8:51 p.m.  LW3  A Review of Changing Crime Patterns and the Development of Forensic Science in Ireland  
Sheila Willis, PhD*

8:51 p.m. - 9:08 p.m.  LW4  The 2014 Killing of Five Babies in Oulu, Finland, and the Neonatal Line (NNL) Investigation as the Definitive Bottom Line  
Vivian Visnapuu*

9:08 p.m. - 9:25 p.m.  LW5  A Forensic Examination of 19th-Century Archaeological Remains  
Thomas J. David, DDS*

9:25 p.m. - 9:42 p.m.  LW6  The Dark Side of the Show: Investigating Mysterious Aspects of Traditional American Sideshows  
Matteo Borrini, PhD*

9:42 p.m. - 10:00 p.m.  LW7  The Phoenix Canal Murders + Forensic Genealogy = Solved!  
Colleen M. Fitzpatrick, PhD*
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 2017-18 Program Committees, it is required that relevant AAFS staff members, program committee members, and reviewers complete a Financial Disclosure 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 Disclosure Forms are on file in the AAFS Office.

A

Wendy R. Adams, PhD – Reviewer
  NMS Labs (Salary).
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 – Committee Member
  Discloses no financial relationships with commercial entities.

B

Jonathan D. Bethard, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Jolene Bierly, MSFS – Reviewer
  NMS Labs, NYSP Forensic Investigation Center (Salary).
Erik T. Bieschke, MS – Reviewer
  Discloses no financial relationships with commercial entities.
Eileen M. Briley, MS – Reviewer
  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.
Patrick Buzzini, PhD – Committee Member
  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, Reviewer
  Broward State Attorney’s Office (Monetary Payment), Nova Southeastern University [Spouse] (Salary).
Daniel Cheswick, MS – Reviewer
  Discloses no financial relationships with commercial entities.

Michael R. Corbett, PhD, LLM – Reviewer
  Discloses no financial relationships with commercial entities.
Anthony G. Costantino, PhD – Reviewer
  Drugscan, Inc. (Salary).
Fiona J. Couper, PhD – Committee Member, Reviewer
  Discloses no financial relationships with commercial entities.

D

Neha J. Desai, MSFS – Reviewer
  Discloses no financial relationships with commercial entities.
Peter J. Diaczuk, BS – Reviewer
  Discloses no financial relationships with commercial entities.
Taylor M. Dickerson III, MSFS – Reviewer
  Discloses no financial relationships with commercial entities.
Stephanie Domitrovich, JD, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Sandra Doolittle, BS – AAFS Staff
  Discloses no financial relationships with commercial entities.
James Downs, MD – Committee Member
  forensX, LLC (Sole Proprietor), RTI (Video Editor/Speaker), Shaken Baby Alliance (Honorarium).

E

Tiffany Eckert, MS – Reviewer
  Discloses no financial relationships with commercial entities.
Kayla N. Ellefsen, PhD – Reviewer
  Discloses no financial relationships with commercial entities.
Patrick A. Eller, MS – Reviewer
  Discloses no financial relationships with commercial entities.
Paul D. Emanovsky, PhD – Committee Member
  Discloses no financial relationships with commercial entities.

F

J. Paul Fedoroff, MD – Committee Member
  Discloses no financial relationships with commercial entities.
Kenneth E. Ferslew, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Dwain C. Fuller, BS – Reviewer
Discloses no financial relationships with commercial entities.

Christine Funk, JD – Committee Member
Discloses no financial relationships with commercial entities.

G

Michael E. Gorn, MS – Reviewer
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

Sarah V. Hainsworth, PhD – Committee Member
Discloses no financial relationships with commercial entities.

Heather L. Harris, MFS, JD – Reviewer
NMS Labs (Consultant Fee).

Kristen Hartnett-McCann, PhD – Committee Member, Reviewer
Discloses no financial relationships with commercial entities.

Christine Haskell, JD – Committee Member
Saint Joseph’s College (Salary).

W. Lee Hearn, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Joseph T. Heffner, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Nicholas P. Hermann, PhD – Reviewer
Discloses no financial relationships with commercial entities.

Jack Hietpas, PhD – Reviewer
Oak Ridge Institute for Science and Education, Pennsylvania State University (Salary).

Michelle R. Hoffman, MS – Committee Member
Discloses no financial relationships with commercial entities.

Pamela M. Hofsass, MS – Reviewer
Discloses no financial relationships with commercial entities.

Mary F. Horvath, MFS – Committee Member
Discloses no financial relationships with commercial entities.

Kathy Howard – AAFS Staff
Discloses no financial relationships with commercial entities.

Mary A. Huestis, PhD – Reviewer
Cannabix Technologies, Inc., Intelligent Fingerprinting, NMS Labs, ThermoFisher (Consultant Fee).

L

Amrita Lal-Paterson, MSFS – 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.

Nikolas P. Lemos, PhD – Committee Member, Reviewer
Lemos Toxicology Services LLC (Salary).

Jason R. Lewis, PhD – Reviewer
Discloses no financial relationships with commercial entities.

George C. Li, MS – Reviewer
Discloses no financial relationships with commercial entities.

Jennifer F. Limoges, MS – Reviewer
Discloses no financial relationships with commercial entities.
### PROGRAM COMMITTEE
#### FINANCIAL DISCLOSURE

#### M
- **Christina A. Malone, MFS**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Laureen J. Marinetti, PhD**: Reviewer
  - Alere™ Forensics at Redwood Toxicology Laboratory (Salary).
- **Julie Maxwell, JD**: Committee Member
  - 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
  - Discloses no financial relationships with commercial entities.
- **Toni Merritt**: AAFS Staff
  - Discloses no financial relationships with commercial entities.
- **Roger D. Metcalf, DDS, JD**: Committee Member
  - Discloses no financial relationships with commercial entities.
- **Robert A. Middleberg, PhD**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Owen L. Middleton, MD**: Reviewer
  - Immunalysis™ (Honorarium).
- **Amy Miles, BS**: Reviewer
  - Immunalysis™ (Honorarium).
- **Chris Milroy, MD, LLB**: Committee Member
  - Discloses no financial relationships with commercial entities.
- **Linda L. Mitchell, MD**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Linton Mohammed, PhD**: Committee Member
  - Roche Pharmaceuticals [Spouse] (Salary).
- **Amanda L.A. Mohr**: Reviewer
  - Fredric Rieders Family Foundation (Salary).
- **Lisa M. Mokleby, MS**: Reviewer
  - Aurora Forensics (Consultant Fee).
- **Christine Moore, PhD, DSc**: Reviewer
  - Immunalysis™/Alere™ (Salary).
- **Ronald N. Morris, BS**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Ashraf Mozayani, PharmD, PhD**: Reviewer
  - BacTracker LLC (Founder/Partner).

#### P
- **Jacqueline L. Paraf, MD**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **David Pienkowski, PhD**: Committee Member
  - Discloses no financial relationships with commercial entities.
- **Deborrah C. Pinto, PhD**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Daniele S. Podini, PhD**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Sebastian S. Prat, MD**: Committee Member
  - Discloses no financial relationships with commercial entities.
- **Christopher W. Rainwater, MS**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Stewart Raley, MA**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Anjali A. Ranadive, JD**: Committee Member
  - Discloses no financial relationships with commercial entities.
- **Stephen B. Roche, BS**: Reviewer
  - Discloses no financial relationships with commercial entities.
- **Katie M. Rubin, MS**: Reviewer
  - University of Florida (Stipend).

#### N
- **Adam Negrusz, PhD**: Reviewer
  - United States Drug Testing Laboratories, Inc. (Salary).
- **Alex J. Nelson, PhD**: Reviewer
  - Discloses no financial relationships with commercial entities.

#### O
- **John J. O’Brien, MA**: Reviewer
  - Discloses no financial relationships with commercial entities.
Amanda C. Sozer, PhD – Reviewer  
SNA International, LLC (Salary).

Erin A. Spargo, PhD – Reviewer  
Discloses no financial relationships with commercial entities.

Jacqueline A. Speir, PhD – Reviewer  
Discloses no financial relationships with commercial entities.

Michele T. Stauffenberg, MD – Reviewer  
Discloses no financial relationships with commercial entities.

Denice M. Teem, BS – Reviewer  
NMS Labs (Salary).

MariaTeresa A. Tersigni-Tarrant, PhD – Reviewer  
Discloses no financial relationships with commercial entities.

Jayne E. Thatcher, PhD – Reviewer  
Discloses no financial relationships with commercial entities.

Tatiana Trejos, PhD – Reviewer  
Discloses no financial relationships with commercial entities.

Karolyn L. Tontarski, MS – Committee Member  

Noelle J. Umbach, PhD – Committee Member  
New York City OCME (Salary).

Sherah L. Van Laerhoven, PhD – Reviewer  
AirFlow Sciences Corp. [Spouse] (Salary/Disbursement/Part Owner).

Susan Welti, MFS – Reviewer  
Discloses no financial relationships with commercial entities.

Douglas R. White, MS – Committee Member  
NIST (Salary).

Joseph Levi White, MS – Reviewer  
Discloses no financial relationships with commercial entities.

Jom Chi-Chung Yu, PhD – Reviewer  
Discloses no financial relationships with commercial entities.
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

Jocelyn V. Abonamah, BS - B162
Discloses no financial relationships with commercial entities.
Amanda L.J. Adams, BS - B44
Discloses no financial relationships with commercial entities.
Bradley J. Adams, PhD - A29, H110
Discloses no financial relationships with commercial entities.
Donovan M. Adams, MS - A114
Discloses no financial relationships with commercial entities.
Wendy R. Adams, PhD - W14
Discloses no financial relationships with commercial entities.
Jonathan Adelman, MS - B138
Discloses no financial relationships with commercial entities.
Joe Adserias-Garriga, DDS, PhD - E106, G2, W11
Discloses no financial relationships with commercial entities.
Huseyin Afsin, PhD - G22
Discloses no financial relationships with commercial entities.
Cortnee J. Agan - A116
Discloses no financial relationships with commercial entities.
Davin Agustines, DO - I31
Discloses no financial relationships with commercial entities.
Janice S. Ahn, MD - E40
Discloses no financial relationships with commercial entities.
Timothy J. Ainger, PhD - E71
Discloses no financial relationships with commercial entities.
Cliff Akiyama, MPH, MA - E70
Discloses no financial relationships with commercial entities.
Anuradha Akmeemana, MS - B153
Discloses no financial relationships with commercial entities.
John Albanese - A14, A54
Discloses no financial relationships with commercial entities.
Giuseppe Davide Albano - E42
Discloses no financial relationships with commercial entities.
Ahmed Albassam, MD - I19
Discloses no financial relationships with commercial entities.
Lauren Alejandro, BSc - B24
Discloses no financial relationships with commercial entities.
Adam Aleksander, PhD - D7
Discloses no financial relationships with commercial entities.
Letizia Alfieri, MD - H117
Discloses no financial relationships with commercial entities.

David Alford, BS - W03
Discloses no financial relationships with commercial entities.
Bridget F.B. Algee-Hewitt, PhD - A52
Discloses no financial relationships with commercial entities.
Hussain J.H. Alghamian, MS - B122
Discloses no financial relationships with commercial entities.
Eugenio Alldario, PhD - B38, B156, K23
Discloses no financial relationships with commercial entities.
Alysaa Allen - B155
Discloses no financial relationships with commercial entities.
Robert W. Allen, PhD - B174
Discloses no financial relationships with commercial entities.
John Alligire, BS - W02
Discloses no financial relationships with commercial entities.
Saqib Sultan AL Mehmood - J2, J5
Discloses no financial relationships with commercial entities.
Khudooma Saeed Alnuaimi, MSc - B48
Discloses no financial relationships with commercial entities.
Alberto Alongi - H31
Discloses no financial relationships with commercial entities.
Sakher J. AlQuahtani, PhD - A58, E106, G29, G44
Discloses no financial relationships with commercial entities.
Muaz Abdulmajeed AlQazzaz, PhD - K22
Discloses no financial relationships with commercial entities.
Shada Alsalamah, PhD - E106
Discloses no financial relationships with commercial entities.
Dara M. Alsudairi - G29
Discloses no financial relationships with commercial entities.
Colton L. Ames - B141
Discloses no financial relationships with commercial entities.
Saskia Ammer, MSc - A39
Discloses no financial relationships with commercial entities.
Gail S. Anderson, PhD - S2
Discloses no financial relationships with commercial entities.
Robert L. Anderson, MS - D9
Discloses no financial relationships with commercial entities.
Sara R. Anderson - E57
Discloses no financial relationships with commercial entities.
Jacob Johannes Andersson, MS - E63
Discloses no financial relationships with commercial entities.
Ana B. Andrade, PhD - K16
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Natalie L. Andras - A11
Discloses no financial relationships with commercial entities.
Janna M. Andronowski, PhD - A67
Discloses no financial relationships with commercial entities.
Carolyn Angi - B190
Discloses no financial relationships with commercial entities.
Nicollette S. Appel, MS - A109
Discloses no financial relationships with commercial entities.
Isabella Aquila, MD - C30, E41, H8, H9, H10, H11, H12, H13, H14, H43, H45, I18, K21
Discloses no financial relationships with commercial entities.
Erin Artigiani, MA - W20
Discloses no financial relationships with commercial entities.
Kenneth W. Aschheim, DDS - E106, G7, G8
Discloses no financial relationships with commercial entities.
Muhammad Irfan Ashiq, PhD - J1
Discloses no financial relationships with commercial entities.
Sevil Atasoy, PhD - E48
Discloses no financial relationships with commercial entities.
Daniel Atherton, MD - K44
Discloses no financial relationships with commercial entities.
Marie Christine Aubry, MD - W23
Discloses no financial relationships with commercial entities.
Sarah E. Avedschmidt, MD - H95
Discloses no financial relationships with commercial entities.
Amaretta J. Azevedo, MA - A133
Discloses no financial relationships with commercial entities.

B

Erica Bacchio, MD - I3
Discloses no financial relationships with commercial entities.
Seung Kyung Baek, PhD - K20
Discloses no financial relationships with commercial entities.
Christiane Baigent, MSc - A116
Discloses no financial relationships with commercial entities.
Andrew M. Baker, MD - B55, H73
Discloses no financial relationships with commercial entities.
Christine H. Baker, MS - B75
Discloses no financial relationships with commercial entities.
Michelle M. Baker, BS - B7
Discloses no financial relationships with commercial entities.
JenaMarie Baldaino, MS - B135
Discloses no financial relationships with commercial entities.
Raman Baldzizhar, MD - H109
Discloses no financial relationships with commercial entities.
Sarah Bankston, MS - E76
Discloses no financial relationships with commercial entities.
Mohammed A. Barayen - G28
Discloses no financial relationships with commercial entities.
Jonathan W. Bareford, BS - B172
Discloses no financial relationships with commercial entities.
Robert E. Barsley, DDS, JD - G18
Discloses no financial relationships with commercial entities.
Eric J. Bartelink, PhD - A154
Discloses no financial relationships with commercial entities.
Edward G. Bartick, PhD - B84
Discloses no financial relationships with commercial entities.
Stephanie Basiliere, BS - K13
Discloses no financial relationships with commercial entities.
Nicholas I. Batalis, MD - E7
Discloses no financial relationships with commercial entities.
David W. Bauer, PhD - B139
Discloses no financial relationships with commercial entities.
Brooke Baumgarten, BS - B60
Discloses no financial relationships with commercial entities.
Sarah Baumgarten, MSc - A66
Discloses no financial relationships with commercial entities.
M. Eric Benbow, PhD - H58
Discloses no financial relationships with commercial entities.
Aida Bencheikh, DDS - G42
Discloses no financial relationships with commercial entities.
Zain Bhaloo, MSc - S2
Discloses no financial relationships with commercial entities.
Dyer Bennett, MS - W03
Discloses no financial relationships with commercial entities.
Güzide Sara Berber, BS - F11
Discloses no financial relationships with commercial entities.
Angela Berg, MA, RN - H36
Discloses no financial relationships with commercial entities.
John Berketa, PhD - W11
Discloses no financial relationships with commercial entities.
Broiana B. Bermudez, BS - S2
Discloses no financial relationships with commercial entities.
Giuseppe Bertozzi, MD - E11, E51
Discloses no financial relationships with commercial entities.
Kelsey D. Bettex - B112
Discloses no financial relationships with commercial entities.
Robert A. Bever, PhD - B149
Discloses no financial relationships with commercial entities.
Zain Bhaloo, MSc - S2
Discloses no financial relationships with commercial entities.
Zumrad Usman Bhutta, MS - J2, J5
Discloses no financial relationships with commercial entities.
Jolene Bierly, MSFS - K36
Discloses no financial relationships with commercial entities.
Farshad Bilimoria, MD - B4
Discloses no financial relationships with commercial entities.
Brittania J. Bintz, MSc
Discloses no financial relationships with commercial entities.
- B56, B118
(SERS) swabs (Discussion of Unlabeled/Investigational Use of
Product/Device). - B78
Casey P. Bitting, DO - H65
Discloses no financial relationships with commercial entities.
Brooke H. Blake, MD - H111
Discloses no financial relationships with commercial entities.
Bethany L. Bless, MS - E46
Discloses no financial relationships with commercial entities.
Melissa M. Blessing, DO - H76
Discloses no financial relationships with commercial entities.
Katelyn L. Bolhofner, PhD - A119
Discloses no financial relationships with commercial entities.
Rachel M. Bonds, BS - B12  
  Discloses no financial relationships with commercial entities.

Alessandro Bonsignore, MD, PhD - H132  
  Discloses no financial relationships with commercial entities.

Alice B. Boone, BS - B68  
  Discloses no financial relationships with commercial entities.

Marcus Borengasser, PhD - D33, E53, W16  
  Discloses no financial relationships with commercial entities.

Matteo Borrini, PhD - A27, A46, E47, F29, LW6  
  Discloses no financial relationships with commercial entities.

Brittany Borzych - E62  
  Discloses no financial relationships with commercial entities.

Sabra R. Botch-Jones, MS, MA - B55  
  Discloses no financial relationships with commercial entities.

Andrew M. Bowen, MS - W04  
  Discloses no financial relationships with commercial entities.

Derek A. Boyd, MA - C2  
  Discloses no financial relationships with commercial entities.

Donna C. Boyd, PhD - A48, A49  
  Discloses no financial relationships with commercial entities.

Helen M. Brandt, BA - A16  
  Discloses no financial relationships with commercial entities.

Mason H. Branscome, BA - A101  
  Discloses no financial relationships with commercial entities.

Jeremy C. Brehmer, JD - F23  
  Discloses no financial relationships with commercial entities.

Charles H. Brenner, PhD - B29  
  Discloses no financial relationships with commercial entities.

Scott Bresler, PhD - F7  
  Discloses no financial relationships with commercial entities.

Alan E. Brill, MBA - W12  
  Discloses no financial relationships with commercial entities.

Eddy B. Brixen, BA - C33  
  Discloses no financial relationships with commercial entities.

Emily Brocato - B55  
  Discloses no financial relationships with commercial entities.

Joanie Brocato, PhD - W17  
  Discloses no financial relationships with commercial entities.

Amy N. Brodeur, MFS - W08  
  Discloses no financial relationships with commercial entities.

Ryan P. Brokaw, MFS - E74  
  Discloses no financial relationships with commercial entities.

Tracy A. Brookshire, BS - E99  
  Discloses no financial relationships with commercial entities.

Helmut G. Brosz, BAsC, PEng - D32  
  Discloses no financial relationships with commercial entities.

Samuel I. Brothers, BBA - C20  
  Discloses no financial relationships with commercial entities.

Carrin E. Brown, PhD - A48, A49  
  Discloses no financial relationships with commercial entities.

Catherine O. Brown, MSFS - B77  
  Discloses no financial relationships with commercial entities.

Donald R. Brown II, MD - I28  
  Discloses no financial relationships with commercial entities.

Adrienne L. Brundage, PhD - W08  
  Discloses no financial relationships with commercial entities.

Erica K. Brunelle, BSc - B76, E21, E55, E61  
  Discloses no financial relationships with commercial entities.

Sibyl R. Bucheli, PhD - A132, H25  
  Discloses no financial relationships with commercial entities.

Bruce Budowle, PhD - B147  
  Discloses no financial relationships with commercial entities.

Francesca Buffelli, MD - H33  
  Discloses no financial relationships with commercial entities.

Kristi Bugajski, PhD - E98  
  Discloses no financial relationships with commercial entities.

Valentina Bugelli, MD - H107  
  Discloses no financial relationships with commercial entities.

Ozlem Bullbul, PhD - B40  
  Discloses no financial relationships with commercial entities.

Derek Bumgarner, MD - H126  
  Discloses no financial relationships with commercial entities.

Sara C. Zapico, PhD - H82, W11  
  Discloses no financial relationships with commercial entities.

Mary E. Cablk, PhD - E105, F34  
  Discloses no financial relationships with commercial entities.

Enrica Calabrese, MD - H114  
  Discloses no financial relationships with commercial entities.

Cynthia Cale, BS - B120  
  Discloses no financial relationships with commercial entities.

Brandon Callahan, BA - B81  
  Discloses no financial relationships with commercial entities.

Sergio Calle, BA - A59  
  Discloses no financial relationships with commercial entities.

Allison Campbell, PhD - S1  
  Discloses no financial relationships with commercial entities.
Rebecca Campbell, PhD - W22  
Discloses no financial relationships with commercial entities.

Timothy Campbell, BSc - J6  
Discloses no financial relationships with commercial entities.

Carlo P. Campobasso, MD, PhD - H107  
Discloses no financial relationships with commercial entities.

Sarah E. Canty, BSc - A27  
Discloses no financial relationships with commercial entities. 

Jodi M. Caple, BS - A77  
Discloses no financial relationships with commercial entities.

Luigi Cardia - K7  
Discloses no financial relationships with commercial entities.

Vanessa M. Cardona, BS - B63  
Discloses no financial relationships with commercial entities.

Hugo Cardoso, PhD - A14, A126  
Discloses no financial relationships with commercial entities.

Rachael M. Carew, MSc - A1  
Discloses no financial relationships with commercial entities.

Anna Carfora - K1  
Discloses no financial relationships with commercial entities.

Jocelyn R. Carlson, MS - W01  
Discloses no financial relationships with commercial entities.

Kelsey A. Carpenter, MS - A56  
Discloses no financial relationships with commercial entities.

Robert Kalani Carreira, BA - A21  
Discloses no financial relationships with commercial entities.

Marla E. Carroll, BS - C4, C5  
Discloses no financial relationships with commercial entities. 

Henry J. Carson, MD - H122  
Discloses no financial relationships with commercial entities.

David O. Carter, PhD - W24  
Discloses no financial relationships with commercial entities.

Claire M. Cartozzo, MSFS - A87  
Discloses no financial relationships with commercial entities. 

John F. Casale, BS - B81  
Discloses no financial relationships with commercial entities.

Brandt G. Cassidy, PhD - B105, E27  
Discloses no financial relationships with commercial entities.

Ellen M. Cassidy, BS - B50  
Discloses no financial relationships with commercial entities.

Rudy J. Castellani, MD - H173, W09  
Discloses no financial relationships with commercial entities.

Daniel Castellanos, MA - A51  
Discloses no financial relationships with commercial entities.

Donald R. Caster, JD - F7  
Discloses no financial relationships with commercial entities.

Jared Castle, BSc - K43  
Discloses no financial relationships with commercial entities.

Chelsea C. Cataldo-Ramirez, BA - A10  
Discloses no financial relationships with commercial entities. 

Oktay Cavus - E9  
Discloses no financial relationships with commercial entities.

Nicole Centazzo, BS - K53  
Discloses no financial relationships with commercial entities.

Kathryn R. Chabaud, BS - B123  
Discloses no financial relationships with commercial entities.

Joseph P. Chang, BS - B70, B101  
Discloses no financial relationships with commercial entities.

Ayako Chan-Hosokawa, MS - K30  
Discloses no financial relationships with commercial entities.

Christopher P. Chany, MS - B131  
Discloses no financial relationships with commercial entities.

Vasilek Chatzarakis, MD - H108  
Discloses no financial relationships with commercial entities.

Chris Chen, MD - I33  
Discloses no financial relationships with commercial entities.

Heather I. Chen, BA - H6, H7  
Discloses no financial relationships with commercial entities.

Jennett M. Cheneverett, BS - K5  
Discloses no financial relationships with commercial entities.

Elizabeth Chesna, BS - I15  
Discloses no financial relationships with commercial entities.

Joseph Chien, DO - I5  
Discloses no financial relationships with commercial entities.

Jennifer Chin, JD - W10  
Discloses no financial relationships with commercial entities.

Hye-Jin Choi - B21, B125  
Discloses no financial relationships with commercial entities.

Alexander F. Christensen, PhD - A110  
Discloses no financial relationships with commercial entities.

Ani M. Christensen, PhD - A28  
Discloses no financial relationships with commercial entities. 

Elaine Y. Chu, BSc - A115  
Discloses no financial relationships with commercial entities.

Wei Chien Chuah - B16  
Discloses no financial relationships with commercial entities.

Fang-Chun Chung, MS - B42  
Discloses no financial relationships with commercial entities.

Grace Chung, DDS - G41  
Discloses no financial relationships with commercial entities.

Hee-Sun Chung, PhD - K8, K9  
Discloses no financial relationships with commercial entities.

Mauro A. Ciavarella - E37  
Discloses no financial relationships with commercial entities.

Maria Susana Ciruzzi, PhD - S2  
Discloses no financial relationships with commercial entities.

Chaunese Clemmons, BA - A75  
Discloses no financial relationships with commercial entities.

Samantha W. Coberly - A60  
Discloses no financial relationships with commercial entities.

Michael D. Coble, PhD - W13  
Discloses no financial relationships with commercial entities.

George A. Codding, JD - W19  
Discloses no financial relationships with commercial entities.

Mary E. Cole, MA - A24  
Discloses no financial relationships with commercial entities.

Olivia K. Colella, BA - E81  
Discloses no financial relationships with commercial entities.

Stacie Collins, MD - I31  
Discloses no financial relationships with commercial entities.
Disclosures no financial relationships with commercial entities.

James Darnell, BS - C22
Discloses no financial relationships with commercial entities.

Angela M. Dautartas, MA - E98
Discloses no financial relationships with commercial entities.

Thomas J. David, DDS - LW5
Discloses no financial relationships with commercial entities.

J. Tyler Davidson, MS - B62
Discloses no financial relationships with commercial entities.

Catriona M. Davies, PhD - A71
Discloses no financial relationships with commercial entities.

Justin Day, MS - B187
Discloses no financial relationships with commercial entities.

Josep De Alcaraz-Fossoul, PhD - S2
Discloses no financial relationships with commercial entities.

Adriana M. de Armas, BS - B189
Discloses no financial relationships with commercial entities.

Joshua S. DeBord, MSc - B159
Discloses no financial relationships with commercial entities.

Summer J. Decker, PhD - A144
Discloses no financial relationships with commercial entities.

Peter R. De Forest, DPharm - F18, F36
Discloses no financial relationships with commercial entities.

Douglas DeGaetano, MS - B192
Discloses no financial relationships with commercial entities.

Joyce L. de Jong, DO - W09
Discloses no financial relationships with commercial entities.

Selma Delic, MS - E80
Discloses no financial relationships with commercial entities.

Joseph A. DelTondo, DO - E40
Discloses no financial relationships with commercial entities.

Emmy L. Demchak - B102
Discloses no financial relationships with commercial entities.

Chiara Deriu, MS - K2
Discloses no financial relationships with commercial entities.

Stefano D’Errico, MD - H98, H99
Discloses no financial relationships with commercial entities.

Jannick De Tobel, MD - G30, G31
Discloses no financial relationships with commercial entities.

Abdulrhman M. Dhabbah, PhD - E83
Discloses no financial relationships with commercial entities.

Lauren Diaz-Albertini, BA - A117
Discloses no financial relationships with commercial entities.

Ruben Darío Diaz-Martin, PhD - E87
Discloses no financial relationships with commercial entities.

Khalifa Dieng, DDS - G32
Discloses no financial relationships with commercial entities.

Elizabeth A. DiGangi, PhD - A51
Discloses no financial relationships with commercial entities.

Alessandro Di Luca, MD - H66, H134
Discloses no financial relationships with commercial entities.

Pero Dimoskis, PhD - B104
Discloses no financial relationships with commercial entities.

Aldo Di Nunzio - H43, H44
Discloses no financial relationships with commercial entities.

Ciro Di Nunzio, MFS, PhD - H12, H43, H44, H45
Discloses no financial relationships with commercial entities.
FINANCIAL DISCLOSURE

Michele Di Nunzio, BS - H45
Discloses no financial relationships with commercial entities.
Giancarlo Di Vella, MD, PhD - E1, E2, E69, G1, I6
Discloses no financial relationships with commercial entities.
Tara Dixon, MD - H119
Discloses no financial relationships with commercial entities.
Daniela Djidrovskaja - J20
Discloses no financial relationships with commercial entities.
Lawrence A. Dobrin, DMD - G8
Discloses no financial relationships with commercial entities.
Leslie Ethan Dodson, BA - I29
Discloses no financial relationships with commercial entities.
Stephanie Domitrovich, JD, PhD - W24, D28, F3, F16, F19
Discloses no financial relationships with commercial entities.
John Donahue - B30
Discloses no financial relationships with commercial entities.
Robert B.J. Dorion, DDS - G15, G16
Discloses no financial relationships with commercial entities.
Meaghan C. Dougher
Discloses no financial relationships with commercial entities.
Liotta N. Dowdy, MA - A153
Discloses no financial relationships with commercial entities.
James Downs, MD - F4, W22
Discloses no financial relationships with commercial entities.
Steven L. Downs, MFS - W03
Discloses no financial relationships with commercial entities.
Derek M. Draft, DDS - G24
Discloses no financial relationships with commercial entities.
Gwenola Drogou, DDS - G46
Discloses no financial relationships with commercial entities.
Nicholas L. Drury, BSc - K19
Discloses no financial relationships with commercial entities.
Beatrix Dudzik, PhD - A140
Discloses no financial relationships with commercial entities.
Jonathan J. Duffy, BS - B161
Discloses no financial relationships with commercial entities.
Aurora Dumitra, MS - J9
Discloses no financial relationships with commercial entities.
Rhian Dunn, BA - A138
Discloses no financial relationships with commercial entities.
Thomas B. Duong, BS - H16
Discloses no financial relationships with commercial entities.
R. Gregg Dwyer, MD, EdD - I7, I22
Discloses no financial relationships with commercial entities.
Angeline Eliasson, MD - E32
Discloses no financial relationships with commercial entities.
Kelly M. Elkins, PhD - B46, B47, B114
Discloses no financial relationships with commercial entities.
Patrick A. Eller, MS - C3
Discloses no financial relationships with commercial entities.
Sarah Ellingham, PhD - W11
Discloses no financial relationships with commercial entities.
Ransom A. Ellis IV - H94
Discloses no financial relationships with commercial entities.
Alexandra L. Emmons, MA - A136
Discloses no financial relationships with commercial entities.
Felix Engel, MA - W07
Discloses no financial relationships with commercial entities.
Sandra R. Enslow, BA - E14
Discloses no financial relationships with commercial entities.
David Errickson - A84
Discloses no financial relationships with commercial entities.
Elizabeth A. Evangelou, MA - A51
Discloses no financial relationships with commercial entities.
David D. Evanoff, Jr, PhD
Discloses no financial relationships with commercial entities.
- B56, B118
Synthesized SERS swabs (Discussion of Unlabeled/Investigational Use of Product/Device) - B78
Amy Evans, BS - H135
Discloses no financial relationships with commercial entities.
Merve Eyüp, BSc - E16
Discoses no financial relationships with commercial entities.
Roger W. Falcone, PhD - S1
Discloses no financial relationships with commercial entities.
Armin A. Farid, DMD - G21
Discloses no financial relationships with commercial entities.
Amanda L. Farrell, PhD - E71
Discloses no financial relationships with commercial entities.
J. Paul Fedoroff, MD - I8
Discloses no financial relationships with commercial entities.
Joseph A. Felo, DO - W05
Discloses no financial relationships with commercial entities.
Lyndsie N. Ferrara, MS - B164
Discloses no financial relationships with commercial entities.
Pamela A. Ferreira, MD - H83
Discloses no financial relationships with commercial entities.
Jillian C. Fesolovich - B143, B163
Discloses no financial relationships with commercial entities.
Alejandra Figueroa, BSc - B10
Discloses no financial relationships with commercial entities.
Marisia A. Fikiet, MS - E20
Discloses no financial relationships with commercial entities.
Gonul Filoglu - B111
Discloses no financial relationships with commercial entities.
Janet E. Finlayson, MA - A124
Discloses no financial relationships with commercial entities.
Sheree J. Finley, MS - H138
Discloses no financial relationships with commercial entities.
Tais R. Fiorentin, PhD - B23, B157
Discloses no financial relationships with commercial entities.
Shera Fisk, BSc - A91, A126
Discloses no financial relationships with commercial entities.
Amanda Fitch, MS - W10
Discloses no financial relationships with commercial entities.
Colleen M. Fitzpatrick, PhD - E68, LW1, LW7
Discloses no financial relationships with commercial entities.
Julie M. Fleischman, PhD - A70
Discloses no financial relationships with commercial entities.
Barbara Fliss, MD, MSc - H64
Discloses no financial relationships with commercial entities.
Kathleen Flor-Stagnato, BA - A19
Discloses no financial relationships with commercial entities.
Megan M. Foley, MSFS - B80
Discloses no financial relationships with commercial entities.
David R. Foran, PhD - H51, H55
Discloses no financial relationships with commercial entities.
Jonathan M. Ford, PhD - A144
Discloses no financial relationships with commercial entities.
Luisa Forger - E44
Discloses no financial relationships with commercial entities.
Alexander Robert W. Forrest, LLM - F5
Discloses no financial relationships with commercial entities.
Alexander S. Forrest, MDS - G23
Discloses no financial relationships with commercial entities.
Lauren N. Fox, MSFS - K17
Discloses no financial relationships with commercial entities.
Carlos Fraga, PhD - W24
Discloses no financial relationships with commercial entities.
Angelique Franchi, MD - A37
Discloses no financial relationships with commercial entities.
Darren Franck, MSME - D10
Discloses no financial relationships with commercial entities.
Harold Franck, MSEE - D10
Discloses no financial relationships with commercial entities.
Kelvin J. Frank, Jr., BS - E90
Discloses no financial relationships with commercial entities.
Kimberly Frazier, MS - E26
Discloses no financial relationships with commercial entities.
Ellen M. Freeman - H121
Discloses no financial relationships with commercial entities.
Michael Freeman, MD, PhD - H130
Discloses no financial relationships with commercial entities.
Clare Fried, MSFS - B152
Discloses no financial relationships with commercial entities.
Will Frizzell, MD - I23
Discloses no financial relationships with commercial entities.
Alexandria Frye, MA - W07
Discloses no financial relationships with commercial entities.
Stephanie Fuehr, MA - A47
Discloses no financial relationships with commercial entities.
Tatsuya Fukuoka - D2
Discloses no financial relationships with commercial entities.
Christine Funk, JD - E1
Discloses no financial relationships with commercial entities.
L.R. Funte, MD - H136
Discloses no financial relationships with commercial entities.
Winnie Furnari, MS - G36
Discloses no financial relationships with commercial entities.
Ryan Gabrielson - E1
Discloses no financial relationships with commercial entities.
Arsene Gambier, MD - I26
Discloses no financial relationships with commercial entities.
Brett Gardner, PhD - I34
Discloses no financial relationships with commercial entities.
Taylor L. Gardner, BFS - G4, G5
Discloses no financial relationships with commercial entities.
Paolo Garofano, MD, PhD - B137
Discloses no financial relationships with commercial entities.
Adam M. Garver, MSFS - B45
Discloses no financial relationships with commercial entities.
Heather M. Garvin, PhD - A111
Discloses no financial relationships with commercial entities.
Dominic Gascho - H61
Discloses no financial relationships with commercial entities.
Quentin T. Gauthier, MSFS - B79
Discloses no financial relationships with commercial entities.
Nora Gayzur, PhD - I30
Discloses no financial relationships with commercial entities.
Benetta A. George, BA - B180
Discloses no financial relationships with commercial entities.
Zhanna Georgievskaya - H77
Discloses no financial relationships with commercial entities.
Zeno J. Geradts, PhD - C14, C16, W24
Discloses no financial relationships with commercial entities.
Kaveh Cyrus Ghaedi, DO - I11, I17
Discloses no financial relationships with commercial entities.
Danielle K. Gibbes, BS - B58
Discloses no financial relationships with commercial entities.
James R. Gill, MD - I73
Discloses no financial relationships with commercial entities.
Richard A. Gilliland, MSFS - K6
Discloses no financial relationships with commercial entities.
Cinzia Gimelli, PsyD, PhD - I10
Discloses no financial relationships with commercial entities.
Aline Girod-Frais - E17
Discloses no financial relationships with commercial entities.
Melissa Gische, MSFS - L2
Discloses no financial relationships with commercial entities.
Lorenzo Gitti, MD - H118
Discloses no financial relationships with commercial entities.
Lindsay Glicksberg, BS - K48, S2
Discloses no financial relationships with commercial entities.

PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Matthew C. Go, MA - A5
  Discloses no financial relationships with commercial entities.
Timothy P. Gocha, PhD - A93
  Discloses no financial relationships with commercial entities.
Tony Godet - I27
  Discloses no financial relationships with commercial entities.
Zachary Carl Goecker, MPS - B57
  Discloses no financial relationships with commercial entities.
Bruce A. Goldberger, PhD - BS5
  Discloses no financial relationships with commercial entities.
Justin Goldstein, MA - A23
  Discloses no financial relationships with commercial entities.
Samantha M. Gonzalez - A57
  Discloses no financial relationships with commercial entities.
Alice Fazlollah Gooding, PhD - A103
  Discloses no financial relationships with commercial entities.
Alexis C. Goots, MA - A35
  Discloses no financial relationships with commercial entities.
Michelle K. Gordon, MS - B107
  Discloses no financial relationships with commercial entities.
Ludovica Gorza - G43
  Discloses no financial relationships with commercial entities.
Emily D. Gottfried, PhD - I7, I22
  Discloses no financial relationships with commercial entities.
Kari A. Graham, BA - B71
  Discloses no financial relationships with commercial entities.
Michael A. Graham, MD - H73
  Discloses no financial relationships with commercial entities.
Timothy J. Graham, BA - B33, B37
  Discloses no financial relationships with commercial entities.
Abigail J. Grande, MPH - H30, H120
  Discloses no financial relationships with commercial entities.
Chandler Marie Grant, MS - K45
  Discloses no financial relationships with commercial entities.
Ignazio Grattagliano, PsyD - I1, I12
  Discloses no financial relationships with commercial entities.
Santo Gratteri, MD - C30, E41, H8, H10, H11, H12, H13, H14, I18, K21
  Discloses no financial relationships with commercial entities.
Raquel Green, BS - H26
  Discloses no financial relationships with commercial entities.
Sean Y. Greer, MS - A66
  Discloses no financial relationships with commercial entities.
Catalin Grigoras, PhD - C9
  Discloses no financial relationships with commercial entities.
Joy Grise, MS - E40
  Discloses no financial relationships with commercial entities.
Kelly Grisedale, PhD - B72
  Discloses no financial relationships with commercial entities.
Rianne Groot - A142
  Discloses no financial relationships with commercial entities.
Kristen M. Grow, BA - A88
  Discloses no financial relationships with commercial entities.
Julia Grzymkowski - K50
  Discloses no financial relationships with commercial entities.
Richard A. Guerrieri, MS - B100
  Discloses no financial relationships with commercial entities.
Mark D. Guido, MS - C12
  Discloses no financial relationships with commercial entities.
Annemarie C. Gundel, MA - E96
  Discloses no financial relationships with commercial entities.
Torfinn Gustafsson, MD - H1105, H106
  Discloses no financial relationships with commercial entities.
Carlos A. Gutierrez, MS - H40
  Discloses no financial relationships with commercial entities.
Pierre M.M. Guyomarc’h, PhD - A68, S2
  Discloses no financial relationships with commercial entities.

Sandra Haddad, PhD - W08
  Discloses no financial relationships with commercial entities.
Sarah V. Hainsworth, PhD - D11, D12
  Discloses no financial relationships with commercial entities.
Mindy Hair - B76, E55, E61
  Discloses no financial relationships with commercial entities.
Jan Halamek, PhD - B76, E21, E55, E61
  Discloses no financial relationships with commercial entities.
Amanda R. Hale, MA - A131, S2
  Discloses no financial relationships with commercial entities.
Ashley Hall, PhD - B28
  Discloses no financial relationships with commercial entities.
David Hallman, MS - D6
  Discloses no financial relationships with commercial entities.
Greg Hampikian, PhD - B183, S2
  Discloses no financial relationships with commercial entities.
Peter F. Hampl, DDS - G20
  Discloses no financial relationships with commercial entities.
Erik S. Hansen, PhD - E93
  Discloses no financial relationships with commercial entities.
Brett E. Harding, MBA - E94
  Discloses no financial relationships with commercial entities.
LeAnn M. Harrel, BS - B2
  Discloses no financial relationships with commercial entities.
Megan Harries - B69
  Discloses no financial relationships with commercial entities.
Alyssa R. Harrison, BS - A25
  Discloses no financial relationships with commercial entities.
William T. Harrison, MD - H74
  Discloses no financial relationships with commercial entities.
Richard C. Harruff, MD, PhD - K54
  Discloses no financial relationships with commercial entities.
Alexandra M. Hart, MD - H1132
  Discloses no financial relationships with commercial entities.
Rebecca Hart, BS - B5
  Discloses no financial relationships with commercial entities.
Gabrielle A. Hartley - B43
  Discloses no financial relationships with commercial entities.
Susan Hatters-Friedman, MD - W02
  Discloses no financial relationships with commercial entities.
Allison Hansen - H23
  Discloses no financial relationships with commercial entities.
Kathleen Hauther - A127
  Discloses no financial relationships with commercial entities.
Donald Hayden, MFS - W18
Discloses no financial relationships with commercial entities.

Beverly Hedgepeth, DDS - G33
Discloses no financial relationships with commercial entities.

Robert F. Hedges, JD - F14
Discloses no financial relationships with commercial entities.

Joseph T. Hefner, PhD - A112, W21
Discloses no financial relationships with commercial entities.

Jakob Heimer, MD - H61, H62
Discloses no financial relationships with commercial entities.

Nicholas P. Herrmann, PhD - W07
Discloses no financial relationships with commercial entities.

R. Austin Hicklin, MS - B94
Discloses no financial relationships with commercial entities.

Maureen Hickman, MS - B110
Discloses no financial relationships with commercial entities.

Paige L. Hinnors, MS - B169
Discloses no financial relationships with commercial entities.

Manato Hirabayashi, MS - C11
Discloses no financial relationships with commercial entities.

Sally F. Ho, PhD - B191
Discloses no financial relationships with commercial entities.

Valeria Hofer - H67
Discloses no financial relationships with commercial entities.

Lisa M. Hofstad, DMD - G34
Discloses no financial relationships with commercial entities.

Tiffany A. Hollenbeck, DO - H101
Discloses no financial relationships with commercial entities.

Brian J. Holoya, MD - W02
Discloses no financial relationships with commercial entities.

Nicole Homburger - E85
Discloses no financial relationships with commercial entities.

Mary F. Horvath, MFS - C4, C5, C19
Discloses no financial relationships with commercial entities.

Max M. Houck, PhD - B85
Discloses no financial relationships with commercial entities.

Rachel M. Houston, BS - B140
Discloses no financial relationships with commercial entities.

Barbara L. Hovanec - BS4
Discloses no financial relationships with commercial entities.

Ashley Hudgings, MS - B163
Discloses no financial relationships with commercial entities.

Anthony W. Hudson - A38
Discloses no financial relationships with commercial entities.

Renée Hudson, BSc - B129
Discloses no financial relationships with commercial entities.

Marilyn A. Huestis, PhD - K27
Discloses no financial relationships with commercial entities.

Cris E. Hughes, PhD - A80
Discloses no financial relationships with commercial entities.

Cortney N. Hulse, MA - A30
Discloses no financial relationships with commercial entities.

Cheryl D. Hunter - S2
Discloses no financial relationships with commercial entities.

Crystal Huynh, BS - E21, E55, E61
Discloses no financial relationships with commercial entities.

Lavinia Ianuc, PhD - H50
Discloses no financial relationships with commercial entities.

Bushra Iftikhar, MPhil - J1
Discloses no financial relationships with commercial entities.

Megan E. Ingvoldstad, PhD - A12, A55
Discloses no financial relationships with commercial entities.

Keith Inman, MCrnm - B31
Discloses no financial relationships with commercial entities.

Brandi L. Iorio - B35
Discloses no financial relationships with commercial entities.

Kendra Oghomwen Iriegbe - I123
Discloses no financial relationships with commercial entities.

Mariyam I. Ibraheem, MA - A33
Discloses no financial relationships with commercial entities.

Mobin Ul Islam, MD, MPH - E31
Discloses no financial relationships with commercial entities.

Caitlin Izzo - B146
Discloses no financial relationships with commercial entities.

Christine James, DO - H103, H104, H128
Discloses no financial relationships with commercial entities.

Yu Ryang Jang, PhD - A82
Discloses no financial relationships with commercial entities.

Brian L. Janysek, MFS - W18
Discloses no financial relationships with commercial entities.

Hannah C. Jarvis, MRCS - H5
Discloses no financial relationships with commercial entities.

Gulnaz T. Javan, PhD - H56
Discloses no financial relationships with commercial entities.

Amy M. Jeanguenat, MFS - B182
Discloses no financial relationships with commercial entities.

Jasmine M. Jefferson, BS - B166
Discloses no financial relationships with commercial entities.

Christopher D. Jenkins - C27
Discloses no financial relationships with commercial entities.

Jeffrey M. Jentzen, MD - F3, W14
Discloses no financial relationships with commercial entities.

Bryan Johnson, MSFS - E82, H72
Discloses no financial relationships with commercial entities.

Rick Jones, JD - S1
Discloses no financial relationships with commercial entities.

Sandra E. Jones - E39
Discloses no financial relationships with commercial entities.
FINANCIAL DISCLOSURE

Heather R. Jordan, PhD - H60
   Discloses no financial relationships with commercial entities.
A. Skylar Joseph, MS - H49
   Discloses no financial relationships with commercial entities.
Chelsey A. Juarez, PhD - A152
   Discloses no financial relationships with commercial entities.
Mary Juno, MSc - E108
   Discloses no financial relationships with commercial entities.
Calvin R. Justus, PhD - B51
   Discloses no financial relationships with commercial entities.

Ke’La Kimble - B92
   Discloses no financial relationships with commercial entities.
Erin H. Kimmerle, PhD - A100
   Discloses no financial relationships with commercial entities.
Pamela A.W. King, JD - W22
   Discloses no financial relationships with commercial entities.
Tetsushi Kitayama, PhD - B109
   Discloses no financial relationships with commercial entities.
Alexandra R. Klales, PhD - A36
   Discloses no financial relationships with commercial entities.
Sandra Koch, MS - B151
   Discloses no financial relationships with commercial entities.
Katrin Koel-Abt, PhD - G11
   Discloses no financial relationships with commercial entities.
Anthony Koertner, MS - E56, E60
   Discloses no financial relationships with commercial entities.
Martin Kolopp - H63, H129
   Discloses no financial relationships with commercial entities.
Katharine E. Kolpan, PhD - A151
   Discloses no financial relationships with commercial entities.
Seungbum Koo, PhD - D1
   Discloses no financial relationships with commercial entities.
Robyn Theresa Kramer, BA - A96
   Discloses no financial relationships with commercial entities.
Katie Kranz, BS - B32
   Discloses no financial relationships with commercial entities.
Carl R. Kriigel, MA - C29
   Discloses no financial relationships with commercial entities.
Kewal Krishan, PhD - G3
   Discloses no financial relationships with commercial entities.
Daniel Krona, MD - I46
   Discloses no financial relationships with commercial entities.
Robert Kronstrand, PhD - K34
   Discloses no financial relationships with commercial entities.
Alex J. Krotulski, MS - B5, K33, W20
   Discloses no financial relationships with commercial entities.
John L. Krstenansky, PhD - K14
   Discloses no financial relationships with commercial entities.
Kaitlin Kruglak, BS - B66
   Discloses no financial relationships with commercial entities.
Thomas Kubic, JD, PhD - B89
   Discloses no financial relationships with commercial entities.
Rajesh Kumar, PhD - C17
   Discloses no financial relationships with commercial entities.
Stephanie Kumor, MA - K38
   Discloses no financial relationships with commercial entities.
Tervin Kun, BS - E25
   Discloses no financial relationships with commercial entities.
Timothy D. Kupferschmid, MFS, MBA - W17
   Discloses no financial relationships with commercial entities.
Monica J. Kupasco, MS - E59
   Discloses no financial relationships with commercial entities.
Kelsey Kyllonen, MA - A17
   Discloses no financial relationships with commercial entities.
Xenia Paula Kyriakou - A104
   Discloses no financial relationships with commercial entities.

K

Sherri L. Kacinko, PhD - B81, K51
   Discloses no financial relationships with commercial entities.
Kristy Kadash, PhD - W01
   Discloses no financial relationships with commercial entities.
Kelly R. Kamnikar, MA - A3, W21
   Discloses no financial relationships with commercial entities.
A. Bakarr Kanu, PhD - B59
   Discloses no financial relationships with commercial entities.
Erin L. Karschner, PhD - K49
   Discloses no financial relationships with commercial entities.
Demet Karsili, MA - A97
   Discloses no financial relationships with commercial entities.
David Kaye, JD - L2
   Discloses no financial relationships with commercial entities.
Anna L. Kelleher, BS - B117
   Discloses no financial relationships with commercial entities.
Haeli Kennedy - A123
   Discloses no financial relationships with commercial entities.
Larkin F. Kennedy, PhD - A47
   Discloses no financial relationships with commercial entities.
Roderick T. Kennedy, JD - B53, LW2
   Discloses no financial relationships with commercial entities.
John P. Kenney, DDS, MS - W22
   Discloses no financial relationships with commercial entities.
Linda Kenney Baden, JD - F4, W22
   Discloses no financial relationships with commercial entities.
Jamie E. Kerka - B121
   Discloses no financial relationships with commercial entities.
Nadeem-Ul-Hassan Khan, MPhil - J1, J3
   Discloses no financial relationships with commercial entities.
Jennifer R. Kiely, BS - A118
   Discloses no financial relationships with commercial entities.
Cristine S. Kilburn, MA - I30
   Discloses no financial relationships with commercial entities.
Jeeun Kim, PhD - A8
   Discloses no financial relationships with commercial entities.
Su-Min Kim - E15
   Discloses no financial relationships with commercial entities.
Ashley N. Kimble, BS - K10
   Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Laura M. Labay, PhD - W14
Discloses no financial relationships with commercial entities.

Ericka N. L’Abbe, PhD - W11
Discloses no financial relationships with commercial entities.

Sirena Lam, BA, BS - E91
Discloses no financial relationships with commercial entities.

S. Sharee Lambert - K18
Discloses no financial relationships with commercial entities.

Zachariah A. Landhuis, BA - A108
Discloses no financial relationships with commercial entities.

Natalie R. Langley - A12
Discloses no financial relationships with commercial entities.

Patrick E. Lantz, MD - W15
Discloses no financial relationships with commercial entities.

Antonietta Lanzarone - H78
Discloses no financial relationships with commercial entities.

Gerald M. LaPorte, MSFS - H72, W22
Discloses no financial relationships with commercial entities.

S.B. Addison Larson, MS - D4
Discloses no financial relationships with commercial entities.

Heather LaSalle, MS - E65
Discloses no financial relationships with commercial entities.

Gregory E. Laskowski, MPA - B97, BS2
Discloses no financial relationships with commercial entities.

Donatella La Tegola, PhD - H16
Discloses no financial relationships with commercial entities.

Krista E. Latham, PhD - A94
Discloses no financial relationships with commercial entities.

Eric S. Lavins, BS - W05
Discloses no financial relationships with commercial entities.

Igor K. Lednev, PhD - E18, E23
Discloses no financial relationships with commercial entities.

Choong Sik Lee, MS - E92
Discloses no financial relationships with commercial entities.

F.L. Jim Lee, Jr., MS - J19
Discloses no financial relationships with commercial entities.

Carrie B. LeGarde, MA - A45
Discloses no financial relationships with commercial entities.

Kevin M. Legg, PhD - B77, K39
Discloses no financial relationships with commercial entities.

Nikolas P. Lemos, PhD - K42
Discloses no financial relationships with commercial entities.

DeAnn L. Lemus, BA - H29
Discloses no financial relationships with commercial entities.

John J. Lentiini, BA - W19, W22
Discloses no financial relationships with commercial entities.

Mark M. LeVaughn, MD - H68, H71
Discloses no financial relationships with commercial entities.

Rebecca Levine - B116
Discloses no financial relationships with commercial entities.

Jane A. Lewis, MFS - J13
Discloses no financial relationships with commercial entities.

Jason Lewis, PhD - C28
Discloses no financial relationships with commercial entities.

Krystle Lewis, BS - A130
Discloses no financial relationships with commercial entities.

Anne-Claire Lhoumeau, MD - E34
Discloses no financial relationships with commercial entities.

Chi Keung Li, PhD - J14
Discloses no financial relationships with commercial entities.

Ling Li, MD - H22
Discloses no financial relationships with commercial entities.

Sun Yi Li, BSc - B20, B67
Discloses no financial relationships with commercial entities.

Emily Lynn Lichtenberger, BS - B160
Discloses no financial relationships with commercial entities.

Dory K. Lieblein - B22
Discloses no financial relationships with commercial entities.

Peter T. Lin, MD - W23
Discloses no financial relationships with commercial entities.

Brandon C. Linton - A98
Discloses no financial relationships with commercial entities.

Laura L. Liptai, PhD - D28, D31, F19, W24
Discloses no financial relationships with commercial entities.

Ginesse A. Listi, PhD - A20
Discloses no financial relationships with commercial entities.

Randall Lockwood, PhD - W10
Discloses no financial relationships with commercial entities.

Barry K. Logan, PhD - B55, W20
Discloses no financial relationships with commercial entities.

Gretchen Lomboy - C13
Discloses no financial relationships with commercial entities.

Gina Londino-Smolar, MS - W08
Discloses no financial relationships with commercial entities.

Kaitlin Long - B173
Discloses no financial relationships with commercial entities.

Carlos J. Lopez-Gobernado, PhD - E10
Discloses no financial relationships with commercial entities.

Jennifer C. Love, PhD - H113
Discloses no financial relationships with commercial entities.

Rebekah Loveless, MA - A98
Discloses no financial relationships with commercial entities.

Tara Lovestead, PhD - B186
Discloses no financial relationships with commercial entities.

Micheline Lubin, MD - H131
Discloses no financial relationships with commercial entities.

Nick J. Lucas, MSc - B132, B193
Discloses no financial relationships with commercial entities.

Victoria S. Lucas, PhD - G27
Discloses no financial relationships with commercial entities.

James Luong, MSc - A9
Discloses no financial relationships with commercial entities.

Francesco Lupariello, MD - A74, E1, G1, I4, I24
Discloses no financial relationships with commercial entities.

Thanh Ly, BSc - I8
Discloses no financial relationships with commercial entities.

James R. Lyle, PhD - C6
Discloses no financial relationships with commercial entities.

Jeffrey James Lynch, MSc - W07
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Paige A. Lynch, BA - A122
Discloses no financial relationships with commercial entities.
David S. Lynn, DDS - G9
Discloses no financial relationships with commercial entities.
Aaron M. Lynne, PhD - H25
Discloses no financial relationships with commercial entities.
Bailey D. Lytle, BA - E6
Discloses no financial relationships with commercial entities.

M
Daniel Madrzykowski, MS - D5, W19
Discloses no financial relationships with commercial entities.
Teresa Magalhães, PhD - E4
Discloses no financial relationships with commercial entities.
Khurram W. Mahmood, MPhil - J1
Discloses no financial relationships with commercial entities.
Christopher A. Maier, PhD - A76
Discloses no financial relationships with commercial entities.
Heli Maijanen, PhD - A121
Discloses no financial relationships with commercial entities.
Joseph J. Maleszewski, MD - W23
Discloses no financial relationships with commercial entities.
Lise Malfroy Camine, DDS - G42
Discloses no financial relationships with commercial entities.
Rick Malone, MD - W18
Discloses no financial relationships with commercial entities.
Sergey Mamedov, PhD - B90
Discloses no financial relationships with commercial entities.
Christy J. Mancuso, MS - A148
Discloses no financial relationships with commercial entities.
Sarah Mannix - W18
Discloses no financial relationships with commercial entities.
Alberto Marchese - F12
Discloses no financial relationships with commercial entities.
Michael Marciano, MS - B138
Discloses no financial relationships with commercial entities.
Mark Marie, PhD - B91
Discloses no financial relationships with commercial entities.
Luisa Marinho, MSc - A126, A146
Discloses no financial relationships with commercial entities.
Aretha Marshall, BA - E1
Discloses no financial relationships with commercial entities.
Judy Y. Marshall, DMD - G40
Discloses no financial relationships with commercial entities.
Pamela L. Marshall, PhD - S2
Discloses no financial relationships with commercial entities.
Daniel A. Martell, PhD - S1
Discloses no financial relationships with commercial entities.
Daniel G. Martin - F27
Discloses no financial relationships with commercial entities.
Teri L. Martin, MSc - K46
Discloses no financial relationships with commercial entities.
Rosa M. Martinez, MD - H67
Discloses no financial relationships with commercial entities.
Pardon T. Masarirambi, BSc - H91
Discloses no financial relationships with commercial entities.
Gregory B. Matheson, BS - B83
Discloses no financial relationships with commercial entities.
Mackenzie Matney, BS - B54
Discloses no financial relationships with commercial entities.
Edward Mazuchowski II, MD, PhD - W18
Discloses no financial relationships with commercial entities.
Michael McCarrin, PhD - C12
Discloses no financial relationships with commercial entities.
Carl R. McClary, BA - J10
Discloses no financial relationships with commercial entities.
Jorge McCormack, MD - W14
Discloses no financial relationships with commercial entities.
Kyle A. McCormick, PhD - A43
Discloses no financial relationships with commercial entities.
Mark R. McCoy, EdD - W08
Discloses no financial relationships with commercial entities.
Keith M. McCullen, MFS - E74
Discloses no financial relationships with commercial entities.
Gary McDonald, Jr., JD - W22
Discloses no financial relationships with commercial entities.
John D. McDowell, DDS - G19
Discloses no financial relationships with commercial entities.
Michael McFarlane, MSc - B188
Discloses no financial relationships with commercial entities.
Aminna M. McGee, MS - B11
Discloses no financial relationships with commercial entities.
James McGivney, DMD - G17
Discloses no financial relationships with commercial entities.
Leif McGoldrick, BS - E21
Discloses no financial relationships with commercial entities.
Gregory L. McIntire, PhD - K15
Discloses no financial relationships with commercial entities.
Selena M. McKay-Davis, MFS - I14
Discloses no financial relationships with commercial entities.
Gwendolyn McMillin, PhD - E74
Discloses no financial relationships with commercial entities.
Mary S. Megyesi, PhD - A41
Discloses no financial relationships with commercial entities.
Iqbal Mehmood, BSc - J2
Discloses no financial relationships with commercial entities.
Kimberly Meline, BS - C5
Discloses no financial relationships with commercial entities.
Judy Melinek, MD - W22
Discloses no financial relationships with commercial entities.
Kenneth E. Melson, JD - F10
Discloses no financial relationships with commercial entities.
Edward Meng, BA - H77
Discloses no financial relationships with commercial entities.
Marianna Meroni - H84
Discloses no financial relationships with commercial entities.
Lisa Mertz, MS - L1
Discloses no financial relationships with commercial entities.
Paul Messner, JD - W19
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Suzanna Michener, MSc - A69
Discloses no financial relationships with commercial entities.
Robert A. Middleberg, PhD - K34, W20
Discloses no financial relationships with commercial entities.
Charles E. Middleton IV, MD - H116
Discloses no financial relationships with commercial entities.
Jennifer S. Mihalovich, MPH - B179
Discloses no financial relationships with commercial entities.
Jennifer A. Milan, BS - B15
Discloses no financial relationships with commercial entities.
Chantal Milani, DMD, MS - H42
Discloses no financial relationships with commercial entities.
Suzanne Miles, BS - E67
Discloses no financial relationships with commercial entities.
Jennifer Miller, BS - B177
Discloses no financial relationships with commercial entities.
Michelle Miller, PsyD - W18
Discloses no financial relationships with commercial entities.
James Millette, PhD - D26
Discloses no financial relationships with commercial entities.
Colleen F. Milligan, PhD - A42
Discloses no financial relationships with commercial entities.
Terry Mills - W10
Discloses no financial relationships with commercial entities.
Heather V. Mlinthorp, MSFS - B148
Discloses no financial relationships with commercial entities.
Jisook Min, PhD - E38
Discloses no financial relationships with commercial entities.
Ewelina M. Mistek, BS - E19, E84
Discloses no financial relationships with commercial entities.
Ivan D. Miziara, MD, PhD - E35
Discloses no financial relationships with commercial entities.
Audris Mockus, PhD - C15
Discloses no financial relationships with commercial entities.
Linton Mohammed, PhD - J10, S1
Discloses no financial relationships with commercial entities.
Amanda L.A. Mohr, MSFS - BS4, W20
Discloses no financial relationships with commercial entities.
Sehrish Mohnsi, MS - J1
Discloses no financial relationships with commercial entities.
Benjamin Mokdad - E30, H70
Discloses no financial relationships with commercial entities.
Cristina Mondello, MD - H2, K7
Discloses no financial relationships with commercial entities.
Lisa Monetti - A139
Discloses no financial relationships with commercial entities.
Geraldine Monjardez, PhD - B118
Discloses no financial relationships with commercial entities.
Domenico Montalbo, MD - I16
Discloses no financial relationships with commercial entities.
Simone Montaldo - E47
Discloses no financial relationships with commercial entities.
Marykathryn Tynon Moody, MSFS - K37
Discloses no financial relationships with commercial entities.
Katherine N. Moore, MS - H123
Discloses no financial relationships with commercial entities.

Sara Moore, PsyD - W02
Discloses no financial relationships with commercial entities.
Ronald L. Moore, Esq., JD - F21, F23
Discloses no financial relationships with commercial entities.
Kayla M. Moquin - B126
Discloses no financial relationships with commercial entities.
Konstantinos Moraitis, PhD - A46
Discloses no financial relationships with commercial entities.
Kimberlee Sue Moran, MSc - E95
Discloses no financial relationships with commercial entities.
Matteo Moretti, MD - H96
Discloses no financial relationships with commercial entities.
Lee Morgan - H15
Discloses no financial relationships with commercial entities.
Sharon K. Moses, PhD - E95
Discloses no financial relationships with commercial entities.
Yasmine Moustafa, MS - B93
Discloses no financial relationships with commercial entities.
Noly Moyssis, PhD - A97
Discloses no financial relationships with commercial entities.
Ashraf Mozayani, PharmD, PhD - E12, K59
Discloses no financial relationships with commercial entities.
Marzena H. Mulawka, MFS - E82
Discloses no financial relationships with commercial entities.
Laura Muscatello, MD - F31
Discloses no financial relationships with commercial entities.
Wade C. Myers, MD - I11
Discloses no financial relationships with commercial entities.

N

Marcela Najarro, MFS - B167
Discloses no financial relationships with commercial entities.
Sherry Nakhlaeizadeh - E64
Discloses no financial relationships with commercial entities.
John B. Nase, DDS - G37
Discloses no financial relationships with commercial entities.
Stephen P. Nawrocki, PhD - A113
Discloses no financial relationships with commercial entities.
Olivia Negron, BS - B4
Discloses no financial relationships with commercial entities.
Heather Nelson, MS - L1
Discloses no financial relationships with commercial entities.
Vernon M. Neppe, MD, PhD - I25, S1
Discloses no financial relationships with commercial entities.
Yolanda Nerkowski, BA - G4, G5
Discloses no financial relationships with commercial entities.
Tara L. Newcomb, MS - G35
Discloses no financial relationships with commercial entities.
Charlotte Allison Newton - B124
Discloses no financial relationships with commercial entities.
Yi Hui Ngor - J18
Discloses no financial relationships with commercial entities.
Juan Ning, MD - H22, H23
Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

John Nixon, CEng, MBA - D23, D24
Discloses no financial relationships with commercial entities.

Rebecca S. Noe, MPH, MN - E103
Discloses no financial relationships with commercial entities.

Maher Noureddine, PhD - E22
Discloses no financial relationships with commercial entities.

Kimberly Nugent, MSc - E107
Discloses no financial relationships with commercial entities.

Carolina Núñez-Vázquez, PhD - H27
Discloses no financial relationships with commercial entities.

Laura Ann Nutton - H20
Discloses no financial relationships with commercial entities.

W. Milton Nuzum III, JD - F16
Discloses no financial relationships with commercial entities.

Emilio Nuzzolese, PhD - E106, G1, G10
Discloses no financial relationships with commercial entities.

O

Cecilia Marisol Ochoa, BA - B171
Discloses no financial relationships with commercial entities.

Kerry J. O’Connell, JD - F26, F33
Discloses no financial relationships with commercial entities.

Kathrin Ogris, MD - H17
Discloses no financial relationships with commercial entities.

Fabio Oldoni, PhD - B74
Discloses no financial relationships with commercial entities.

Kevin Oliver, BA - E1
Discloses no financial relationships with commercial entities.

Bianca Olivieri - K41
Discloses no financial relationships with commercial entities.

Kelly C. O’Neill - B168
Discloses no financial relationships with commercial entities.

Antonio M.M. Oscurati, MD - H96
Discloses no financial relationships with commercial entities.

Alessio Ostuni, MD - I2, I13
Discloses no financial relationships with commercial entities.

Mary Ellen O’Toole, PhD - BS1
Discloses no financial relationships with commercial entities.

Stephen D. Ousley, PhD - W07
Discloses no financial relationships with commercial entities.

Gareth Owenson, PhD - C24
Discloses no financial relationships with commercial entities.

P

Emily C. Paavola, JD - F17
Discloses no financial relationships with commercial entities.

Tyrish Y. Page, MA - E7
Discloses no financial relationships with commercial entities.

Christopher S. Palenik, PhD - D3, E52, W04
Discloses no financial relationships with commercial entities.

Julie R. Pallister, MSc - B18
Discloses no financial relationships with commercial entities.

Nicole J. Palmer, BS - A150
Discloses no financial relationships with commercial entities.

Andrea Palmiotto, PhD - A48
Discloses no financial relationships with commercial entities.

Donna M. Papsun, MS - K24
Discloses no financial relationships with commercial entities.

Emily R. Parchuke, BS - K28
Discloses no financial relationships with commercial entities.

Hillary R. Parsons, PhD - E45
Discloses no financial relationships with commercial entities.

Nicholas V. Passalaquca, PhD - A85
Discloses no financial relationships with commercial entities.

Sachin Pawaskar, PhD - W03
Discloses no financial relationships with commercial entities.

Jennifer L. Pechal, PhD - H57
Discloses no financial relationships with commercial entities.

Kelsey J. Pelosi - B115
Discloses no financial relationships with commercial entities.

Dorianis Perez, BS - A138
Discloses no financial relationships with commercial entities.

Mark W. Perlin, PhD, MD - F13
Discloses no financial relationships with commercial entities.

Katelynn A. Perrault, PhD - H80
Discloses no financial relationships with commercial entities.

Derek E. Peters, MS - G11
Discloses no financial relationships with commercial entities.

Jeremy R. Peters, DO - I21
Discloses no financial relationships with commercial entities.

Jeramy R. Peters, DO - I21
Discloses no financial relationships with commercial entities.

Gisela Pettersson, MD - H125
Discloses no financial relationships with commercial entities.

Pierre-Antoine Peyron, MD - H133
Discloses no financial relationships with commercial entities.

Lauren R. Pharr, PhD - A99
Discloses no financial relationships with commercial entities.

Angelina I. Phillips, MD - H37
Discloses no financial relationships with commercial entities.

Jennifer Piel, MD - I35
Discloses no financial relationships with commercial entities.

David Pienkowski, PhD - D13
Discloses no financial relationships with commercial entities.

Marin A. Pilloud, PhD - A83
Discloses no financial relationships with commercial entities.

Kari M. Pitts, PhD - B88
Discloses no financial relationships with commercial entities.

Amber M. Plemons, MA - W21
Discloses no financial relationships with commercial entities.

Daniele S. Podini, PhD - W13
Discloses no financial relationships with commercial entities.

Carrie Polston, BA - J16
Discloses no financial relationships with commercial entities.
Donald Poon, BA - A51
Discloses no financial relationships with commercial entities.
Melissa Ann Pope, MA - A107
Discloses no financial relationships with commercial entities.
Lindsey J. Porter - E57
Discloses no financial relationships with commercial entities.
Caitlin E. Porterfield, MS - W08
Discloses no financial relationships with commercial entities.
Deborah L. Powers, BA - K25
Discloses no financial relationships with commercial entities.
Mark C. Pozzi, MS - D15, D19, D20, D22, D25
Discloses no financial relationships with commercial entities.
Joseph A. Prahlow, MD - H73, S2
Discloses no financial relationships with commercial entities.
Sebastien S. Prat, MD - I38
Discloses no financial relationships with commercial entities.
Dragan Primorac, MD, PhD - S2
Discloses no financial relationships with commercial entities.
Mechthild K. Prinz, PhD - B145
Discloses no financial relationships with commercial entities.
Q Da Qin, PhD - J15
Discloses no financial relationships with commercial entities.
R Roberto Raffaele - C30, E41, H9, H10, H11, H13, H14
Discloses no financial relationships with commercial entities.
Mithun Rajshekar, MFSc - G25
Discloses no financial relationships with commercial entities.
Kelli B. Raley, MSFS - B7
Discloses no financial relationships with commercial entities.
Donald J. Ramsell, JD - F22
Discloses no financial relationships with commercial entities.
Anjali A. Ranadive, JD - W22
Discloses no financial relationships with commercial entities.
Sara Raponi, JD - F29
Discloses no financial relationships with commercial entities.
Lionel Raymon, PhD - W20
Discloses no financial relationships with commercial entities.
Linda Razzano, MS - W17
Discloses no financial relationships with commercial entities.
Matthew F. Redle, JD - S1
Discloses no financial relationships with commercial entities.
Sarah Davis Redman, PhD - E104
Discloses no financial relationships with commercial entities.
Brittany N. Reed, BSc - H81
Discloses no financial relationships with commercial entities.
Erin C. Reed, JD - W05
Discloses no financial relationships with commercial entities.
John A. Reffner, PhD - B150
Discloses no financial relationships with commercial entities.
Pamela Reid, PhD - W10
Discloses no financial relationships with commercial entities.
Gary W. Reinecke, MA - E82
Discloses no financial relationships with commercial entities.
Robin C. Reineke, PhD - A92
Discloses no financial relationships with commercial entities.
Jenise Reyes-Rodriguez, BS - C7
Discloses no financial relationships with commercial entities.
Agathe J.G. Ribereau-Gayon, MSc - A86
Discloses no financial relationships with commercial entities.
Sarah M. Richer, PhD - A135
Discloses no financial relationships with commercial entities.
Michelle Richmond, BA - E1
Discloses no financial relationships with commercial entities.
Douglas A. Ridolfi, MS - B165
Discloses no financial relationships with commercial entities.
Michael F. Rieders, PhD - BS5
Discloses no financial relationships with commercial entities.
Paulina Riess, MD - I19
Discloses no financial relationships with commercial entities.
Anders Rietz - H48
Discloses no financial relationships with commercial entities.
Amber D. Riley, MS - E106
Discloses no financial relationships with commercial entities.
Meaghan Ringel, BS - K32
Discloses no financial relationships with commercial entities.
Leann G. Rizor, BS - B181
Discloses no financial relationships with commercial entities.
Zackery Roberson - B170
Discloses no financial relationships with commercial entities.
Graham J. Roberts, MDS - G26
Discloses no financial relationships with commercial entities.
C. Andrew Robinson, Jr., PhD - K3
Discloses no financial relationships with commercial entities.
Thomas Rodriguez, MD - I37
Discloses no financial relationships with commercial entities.
Sandra E. Rodriguez-Cruz, PhD - B184
Discloses no financial relationships with commercial entities.
Amanda L. Roe, PhD - E43
Discloses no financial relationships with commercial entities.
Marcus Rogers, PhD - C25, S2
Discloses no financial relationships with commercial entities.
Douglas E. Rohde, MS - W05
Discloses no financial relationships with commercial entities.
Meghan Roig, BS - B13
Discloses no financial relationships with commercial entities.
Kendra Rollins, MFS - F28
Discloses no financial relationships with commercial entities.
Madeline G. Roman, BS - B49
Discloses no financial relationships with commercial entities.
Jeri D. Ropero-Miller, PhD - BS5
Discloses no financial relationships with commercial entities.
Roberto Rosa, PhD - BS5
Discloses no financial relationships with commercial entities.
**Financial Disclosure**

<table>
<thead>
<tr>
<th>Name</th>
<th>DO</th>
<th>Financial Disclosures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomas G. Rosano, PhD</td>
<td>K54</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Karen B. Rosenbaum, MD</td>
<td>I36, S1</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Ann H. Ross, PhD</td>
<td>A131</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Katie M. Rubin, MS</td>
<td>A32</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Norah Rudin, PhD</td>
<td>B103</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Katarina G. Ruehl</td>
<td>B56, B118</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Eric R. Ruiz Hernandez, MD</td>
<td>E66, E72</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Catherine G. Rushton, EdD</td>
<td>E110, W08</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Kenneth J. Saczalski, PhD</td>
<td>D20, D22, D25</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Lydie Samie</td>
<td>B34</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Robert M. Sanger, JD</td>
<td>F20</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jana Andrea D.S. Santos, BA</td>
<td>A5</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Laura Sare</td>
<td>E76</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>D. Sarzinski, MSc</td>
<td>A44</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Kelly Sauerwein, MA</td>
<td>A106</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Tiffany B. Saul, PhD</td>
<td>A149</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Vincent J. Sava, MA</td>
<td>A79</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Madison R. Schackmuth, BS</td>
<td>K11</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Audrey D. Schaefer, BA</td>
<td>A4</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Stefan Schlager, PhD</td>
<td>W07</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Carl J. Schmidt, MD</td>
<td>K54, W09</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Christopher W. Schmidt, PhD</td>
<td>W11</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Candace H. Schoppe, MD</td>
<td>W15</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Willem A. Schreuder, PhD</td>
<td>D29</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jason L. Schroeder, MS, MBA</td>
<td>B194</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Cassidy M. Schultz, BSc</td>
<td>B196</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Leah M. Schuppener, DO</td>
<td>H21</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Andrew J. Schweighardt, PhD</td>
<td>B36</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Piper Schwenke, MS</td>
<td>E28</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Sarah Schwing, BA</td>
<td>A61</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Veronica Scotti, LLM</td>
<td>F8</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Francesco Sessa, MS</td>
<td>E13</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Puneet Setia, MD</td>
<td>H93</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Andrew C. Seidel, MA</td>
<td>A2</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Kathryn C. Seigfried-Spellar, PhD</td>
<td>C25</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Francesco Sessa, MS</td>
<td>E13</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Brandy Shattuck, MD</td>
<td>H85</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Melvin Shaw, MS</td>
<td>J9</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Donald E. Shelton, JD</td>
<td>F30</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Kevin E. Sheridan, PhD</td>
<td>A51</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Feng Shi, MS</td>
<td>H23</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Iris L. Shields, DDS</td>
<td>G39</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Jessica Shiffert, BA</td>
<td>E88</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Shelly Y. Shih, MS</td>
<td>B73</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Samira Shirri, D</td>
<td>D30</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
<tr>
<td>Elisa N. Shoff, BS</td>
<td>S2</td>
<td>Discloses no financial relationships with commercial entities.</td>
</tr>
</tbody>
</table>
**Financial Disclosure**

Dina A. Shokry, MD - B176, G45
Discloses no financial relationships with commercial entities.

Nicole D. Siegel, DVM - A62
Discloses no financial relationships with commercial entities.

Courtney C. Siegert, BA - A105
Discloses no financial relationships with commercial entities.

Asha Sigei - H39
Discloses no financial relationships with commercial entities.

Michael E. Sigman, PhD - B154
Discloses no financial relationships with commercial entities.

Richard H.A. Silva, PhD - E106
Discloses no financial relationships with commercial entities.

Susan Sincerbox, BS - K40
Discloses no financial relationships with commercial entities.

Rachel S. Singer, JD - L1
Discloses no financial relationships with commercial entities.

Michale K. Smith, MS - C4
Discloses no financial relationships with commercial entities.

Elham Tabassi, MS - E58
Discloses no financial relationships with commercial entities.

Mohammad A. Tahir, PhD - J1, J3
Discloses no financial relationships with commercial entities.

Chikako Takei - B65
Discloses no financial relationships with commercial entities.

Tobin A. Tanaka, BS - J4
Discloses no financial relationships with commercial entities.

Brad E. Taylor - E86
Discloses no financial relationships with commercial entities.

Melissa K. Taylor, BA - L2
Discloses no financial relationships with commercial entities.

Denice M. Teem, BS - K26
Discloses no financial relationships with commercial entities.

Tobin A. Tanaka, BS - J4
Discloses no financial relationships with commercial entities.

Brad E. Taylor - E86
Discloses no financial relationships with commercial entities.

Discloses no financial relationships with commercial entities.

Tobin A. Tanaka, BS - J4
Discloses no financial relationships with commercial entities.

Brad E. Taylor - E86
Discloses no financial relationships with commercial entities.

Discloses no financial relationships with commercial entities.
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Riya Thekdi, BA - B39
Discloses no financial relationships with commercial entities.

Jennifer Thomas, PhD - K52
Discloses no financial relationships with commercial entities.

Christopher R. Thompson, MD - S1
Discloses no financial relationships with commercial entities.

Robert M. Thompson, MFS - B98
Discloses no financial relationships with commercial entities.

Drake Thrasher - H100
Discloses no financial relationships with commercial entities.

Cristina Tica, MA - E36
Discloses no financial relationships with commercial entities.

Lauren Todd, BS - B64
Discloses no financial relationships with commercial entities.

Joshua M. Toman, LLM - W24, D31
Discloses no financial relationships with commercial entities.

Jeffery K. Tomberlin, PhD - E76, W24
Discloses no financial relationships with commercial entities.

Steve Toupenay, DDS - G12, G13, G42
Discloses no financial relationships with commercial entities.

Rachel Touroo, DVM - W10
Discloses no financial relationships with commercial entities.

Brittany M. Trapp, BA - A137
Discloses no financial relationships with commercial entities.

Kristy Tredway - C31
Discloses no financial relationships with commercial entities.

An Truong, BS - B175
Discloses no financial relationships with commercial entities.

Nilesh K. Tumram, MD - H87, H88, H89, H90
Discloses no financial relationships with commercial entities.

Douglas H. Ubelaker, PhD - W11
Discloses no financial relationships with commercial entities.

Samantha Upton, BA - A106
Discloses no financial relationships with commercial entities.

Tugba Ünsal, PhD - E77
Discloses no financial relationships with commercial entities.

Michele Vaira, JD - F31
Discloses no financial relationships with commercial entities.

Lorena Valencia Caballero, PhD - E87
Discloses no financial relationships with commercial entities.

Julie L. Valentine, PhD - E67
Discloses no financial relationships with commercial entities.

Jas R. Valenzuela, BA - C5
Discloses no financial relationships with commercial entities.

Anne Marie R. Valera, BA - A5
Discloses no financial relationships with commercial entities.

Joshua Vandeburgh - H75
Discloses no financial relationships with commercial entities.

Giswinne van de Wijdeven, MS - A5
Discloses no financial relationships with commercial entities.

Oluwaseyi A. Vanderpuye, PhD - E89
Discloses no financial relationships with commercial entities.

Wesley Vandiver - D16
Discloses no financial relationships with commercial entities.

Michael L. VanErp, JD - W09
Discloses no financial relationships with commercial entities.

Katrina Van Pelt, DO - H18
Discloses no financial relationships with commercial entities.

Eduard Van Zalen, MSc - W24
Discloses no financial relationships with commercial entities.

Thomas W. Vastrick, BS - J12, S2
Discloses no financial relationships with commercial entities.

Mark Vecellio, MFS - W03
Discloses no financial relationships with commercial entities.

Jessica Ann Veltri, PhD - I32
Discloses no financial relationships with commercial entities.

Elvira Ventura Spagnolo, MD - F12, H2, K7
Discloses no financial relationships with commercial entities.

Nicole Marie C. Vesagas, BA - A5
Discloses no financial relationships with commercial entities.

Morgan Vesco - B47
Discloses no financial relationships with commercial entities.

Vivian Visnapuu - LW4
Discloses no financial relationships with commercial entities.

Silvia D. Visona, MD - H97, H112
Discloses no financial relationships with commercial entities.

Eleanor B. Vo, MD - I11
Discloses no financial relationships with commercial entities.

Ling Wang, MS - B26
Discloses no financial relationships with commercial entities.

Jane Wankmiller, PhD - A81
Discloses no financial relationships with commercial entities.

Parris Ward, JD - C10, E73
Discloses no financial relationships with commercial entities.

Eric T. Washington, DDS - G14
Discloses no financial relationships with commercial entities.

Nickolas P. Walker - B142
Discloses no financial relationships with commercial entities.

Mackenzie Walls - A6
Discloses no financial relationships with commercial entities.

Brian J. Walsh, JD - F15
Discloses no financial relationships with commercial entities.

Erin E. Walsh, MS - K47
Discloses no financial relationships with commercial entities.

Heather E. Waltke, MS - E65
Discloses no financial relationships with commercial entities.

Ling Wang, MS - B26
Discloses no financial relationships with commercial entities.

Jane Wankmiller, PhD - A81
Discloses no financial relationships with commercial entities.

Parris Ward, JD - C10, E73
Discloses no financial relationships with commercial entities.

Eric T. Washington, DDS - G14
Discloses no financial relationships with commercial entities.

224  Financial Disclosure
PRESENTING AUTHOR
FINANCIAL DISCLOSURE

Elena O. Watson, BA - A34
Discloses no financial relationships with commercial entities.

Steven B. Watson, BA - C4, C19, C26, C32
Discloses no financial relationships with commercial entities.

Paul Wax, MD - W20
Discloses no financial relationships with commercial entities.

Lauren Weidner, PhD - H28
Discloses no financial relationships with commercial entities.

Kerry Weintraub, MD - H19
Discloses no financial relationships with commercial entities.

Kurt D. Weiss, MS - D8, D14
Discloses no financial relationships with commercial entities.

Nicole M. Weiss, BS - A15
Discloses no financial relationships with commercial entities.

Karin E. Wells, BA - E100
Discloses no financial relationships with commercial entities.

Kelsa West, BS - A145
Discloses no financial relationships with commercial entities.

Jan Westberry, DMD - G38
Discloses no financial relationships with commercial entities.

Stanton W. Wheasler, BS - W05
Discloses no financial relationships with commercial entities.

Joseph Levi White, MS - C3, C18, C21
Discloses no financial relationships with commercial entities.

Mackenzie E. Whiting - B3
Discloses no financial relationships with commercial entities.

Gary Whitman, BS - D27
Discloses no financial relationships with commercial entities.

Timothy Wiegand, MD - W20
Discloses no financial relationships with commercial entities.

Emily F. Wiegers, MA - E78
Discloses no financial relationships with commercial entities.

Jason M. Wiersema, PhD - E5
Discloses no financial relationships with commercial entities.

Carl Wigren, MD - W02
Discloses no financial relationships with commercial entities.

Emily J. Will, MA - L2
Discloses no financial relationships with commercial entities.

Andrew S. Williams, MD - H35, W20
Discloses no financial relationships with commercial entities.

John A. Williams, PhD - E109, W08
Discloses no financial relationships with commercial entities.

Karl E. Williams, MD - B81
Discloses no financial relationships with commercial entities.

Mary R. Williams, MS - B128
Discloses no financial relationships with commercial entities.

Sheila Willis, PhD - B82, F35, LW3, S2
Discloses no financial relationships with commercial entities.

Lori J. Wilson, PhD - E75
Discloses no financial relationships with commercial entities.

Teresa V. Wilson, PhD - A141
Discloses no financial relationships with commercial entities.

Rebecca J. Wilson-Taylor, PhD - A50
Discloses no financial relationships with commercial entities.

Melissa Wils-Owens, BS - H79
Discloses no financial relationships with commercial entities.

Allysha P. Winburn, PhD - A72
Discloses no financial relationships with commercial entities.

Mark Windschitl, PhD - W08
Discloses no financial relationships with commercial entities.

Hannah Wines, BS - B106
Discloses no financial relationships with commercial entities.

Carl Johan Wohlfahrt, BS - H126, H52
Discloses no financial relationships with commercial entities.

Emily Wolak, DO - H137
Discloses no financial relationships with commercial entities.

David A. Wold, DDS - E99
Discloses no financial relationships with commercial entities.

Matthew R. Wood, PhD - W08
Discloses no financial relationships with commercial entities.

Robert E. Wood, DDS, PhD - G4, G5
Discloses no financial relationships with commercial entities.

Charlotte J. Word, PhD - F17
Discloses no financial relationships with commercial entities.

Erin M. Worrell, BSc - B81, E49, W20
Discloses no financial relationships with commercial entities.

Travis J. Worst, PhD - B27
Discloses no financial relationships with commercial entities.

Thomas Wortman, BS - B95
Discloses no financial relationships with commercial entities.

Jessica Wright - C1
Discloses no financial relationships with commercial entities.

Alan H. Wu, PhD - W14
Discloses no financial relationships with commercial entities.

Richard T. Wyatt, MS - B99
Discloses no financial relationships with commercial entities.

Timothy Wysozan, BS - H102
Discloses no financial relationships with commercial entities.

Nicole A. Yarid - H47, H86, H124, W20
Discloses no financial relationships with commercial entities.

Stephen J. Yerka, MA - A143
Discloses no financial relationships with commercial entities.

Hatice Yilmaz, BSc - F1, F2
Discloses no financial relationships with commercial entities.

Julia Yip, BS - A134
Discloses no financial relationships with commercial entities.

Jessica Yopak, BA - A125
Discloses no financial relationships with commercial entities.

Carmen Young - B8
Discloses no financial relationships with commercial entities.

John L. Young, MD - 19
Discloses no financial relationships with commercial entities.

Jorn Chi-Chung Yu, PhD - B127
Discloses no financial relationships with commercial entities.

Financial Disclosure 225
Nandar Yukyi, MA - A63
  Discloses no financial relationships with commercial entities.
Laura Yurka, MA - A78
  Discloses no financial relationships with commercial entities.

David J. Zeliff, MFS - W18
  Discloses no financial relationships with commercial entities.
Xiang Zhang, MD - H22, H23
  Discloses no financial relationships with commercial entities.
Eric Zimmerman, BS - W12
  Discloses no financial relationships with commercial entities.
James Zjalic, BSc - C8
  Discloses no financial relationships with commercial entities.
Joel A. Zlotnick, MSFS - J7, J8, W06
  Discloses no financial relationships with commercial entities.
Walter F. Zoller, DMD - G38
  Discloses no financial relationships with commercial entities.
<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
</tr>
<tr>
<td>16S RDNA-H26</td>
</tr>
<tr>
<td>16S RRNA-H56</td>
</tr>
<tr>
<td>16S RRNA Gene-A87</td>
</tr>
<tr>
<td><strong>2</strong></td>
</tr>
<tr>
<td>25I-NBOH-K16</td>
</tr>
<tr>
<td><strong>3</strong></td>
</tr>
<tr>
<td>3D Imaging-A24, E57</td>
</tr>
<tr>
<td>3D Modeling-E73</td>
</tr>
<tr>
<td>3D Motion Capture-C30</td>
</tr>
<tr>
<td>3D Photogrammetry-A143</td>
</tr>
<tr>
<td>3D Printing-B127, H19</td>
</tr>
<tr>
<td>3D Reconstruction-H63</td>
</tr>
<tr>
<td>3D Scanning-A141</td>
</tr>
<tr>
<td>3D Scans-A8</td>
</tr>
<tr>
<td><strong>8</strong></td>
</tr>
<tr>
<td>87Sr/86Sr Ratios-B159</td>
</tr>
<tr>
<td>8th Amendment-F30</td>
</tr>
<tr>
<td><strong>A</strong></td>
</tr>
<tr>
<td>Aaron Hernandez-F4</td>
</tr>
<tr>
<td>AASs-E51</td>
</tr>
<tr>
<td>Abundance-B100</td>
</tr>
<tr>
<td>Abuse-G41, H23, I1</td>
</tr>
<tr>
<td>Abusive Head Trauma-E63</td>
</tr>
<tr>
<td>Acceptance Criteria-B62</td>
</tr>
<tr>
<td>Accidental Strangulation-H103</td>
</tr>
<tr>
<td>Accreditation-A70, H69</td>
</tr>
<tr>
<td>Accreditation Standards-E110</td>
</tr>
<tr>
<td>Accumulated Degree Days-A127</td>
</tr>
<tr>
<td>Accumulated Degree Hours-E81, H81</td>
</tr>
<tr>
<td>Accuracy Assessment-E15</td>
</tr>
<tr>
<td>Acetyl Fentanyl-H95</td>
</tr>
<tr>
<td>Acid Phosphatase-B1</td>
</tr>
<tr>
<td>Active Learning-W08</td>
</tr>
<tr>
<td>Activity-B34, B82, F35</td>
</tr>
<tr>
<td>Actual Innocence-F15</td>
</tr>
<tr>
<td>Acute Stress Disorder-I5</td>
</tr>
<tr>
<td>Additive Manufacturing-A1</td>
</tr>
<tr>
<td><strong>Adhesive Tape-B65</strong></td>
</tr>
<tr>
<td>Admissibility-A25, BS3, F16, S1</td>
</tr>
<tr>
<td>Adobe® Photoshop® (CS-8)-J5</td>
</tr>
<tr>
<td>Adolescents-I5, I21</td>
</tr>
<tr>
<td>Adrenal Gland-H2</td>
</tr>
<tr>
<td>ADS-A129</td>
</tr>
<tr>
<td>Adulterant Test Strips-K41</td>
</tr>
<tr>
<td>Adulterants-K41</td>
</tr>
<tr>
<td>Advanced Chemical Analysis-B195</td>
</tr>
<tr>
<td>Advancing-L1</td>
</tr>
<tr>
<td>Advertisements-C1</td>
</tr>
<tr>
<td>AFIS-E79</td>
</tr>
<tr>
<td>African American-G14</td>
</tr>
<tr>
<td>Age Assessment-G1, G28</td>
</tr>
<tr>
<td>Age-at-Death-A4, G2</td>
</tr>
<tr>
<td>Age-at-Death Estimation-A2, A8, A26</td>
</tr>
<tr>
<td>Age Determination-H17</td>
</tr>
<tr>
<td>Age Estimation-A15, A18, A58, A69, A72, A74, A112, A144, G29, G30, G31</td>
</tr>
<tr>
<td>Aged Fingerprints-B119</td>
</tr>
<tr>
<td>Aging-B44, E57</td>
</tr>
<tr>
<td>AH-7921-K14</td>
</tr>
<tr>
<td>Air Disaster-G6</td>
</tr>
<tr>
<td>Air Filter DNA-E22</td>
</tr>
<tr>
<td>Ajnala Skeletal Remains-A147</td>
</tr>
<tr>
<td>Alcohol-E86, K22</td>
</tr>
<tr>
<td>Alcohol Extrapolations-K29</td>
</tr>
<tr>
<td>Alexander-H1</td>
</tr>
<tr>
<td>Algorithm-G17</td>
</tr>
<tr>
<td>Allelic Ladder-B109</td>
</tr>
<tr>
<td>Allergic Eosinophilia-H79</td>
</tr>
<tr>
<td>ALS-W03</td>
</tr>
<tr>
<td>Alternate Light Photography-G5</td>
</tr>
<tr>
<td>Amazon® Echo™-C29</td>
</tr>
<tr>
<td>Amino Acids-E91</td>
</tr>
<tr>
<td>Amorphous Silica-D3</td>
</tr>
<tr>
<td>Analgesics, Opioid-H122</td>
</tr>
<tr>
<td>Analysis-B92, LW1</td>
</tr>
<tr>
<td>Analytical-BS1</td>
</tr>
<tr>
<td>Analytical Sequence-B66</td>
</tr>
<tr>
<td>Anatomy-A22</td>
</tr>
<tr>
<td>Ancestry-A13, A14, A60, A63, B41, W21</td>
</tr>
<tr>
<td>Ancient DNA and Stable Isotope-A147</td>
</tr>
<tr>
<td>ANCOVA-A113</td>
</tr>
<tr>
<td>Animal Cruelty-W10</td>
</tr>
<tr>
<td>Animals-H90</td>
</tr>
<tr>
<td>Anomalous Variation-A124</td>
</tr>
<tr>
<td>Anoxic-H1</td>
</tr>
<tr>
<td>Antemortem Data-E106, G46</td>
</tr>
<tr>
<td>Antemortem Dental Records-E99</td>
</tr>
<tr>
<td>Anthropology-A50, A78, LW2</td>
</tr>
<tr>
<td>Antibiotic Resistance-H60</td>
</tr>
<tr>
<td>Anticoagulation-H100</td>
</tr>
<tr>
<td>Antidepressants-E102</td>
</tr>
<tr>
<td>Antifreeze-H30</td>
</tr>
<tr>
<td>Antioxidants-B112</td>
</tr>
<tr>
<td>Anti-Testosterone Antibody-B177</td>
</tr>
<tr>
<td>Aortic Dissection-H98, H99</td>
</tr>
<tr>
<td>Apoptosis-H82</td>
</tr>
<tr>
<td>Apple® iOS®-C20</td>
</tr>
<tr>
<td>Applied Learning-B165</td>
</tr>
<tr>
<td>Apron-H103</td>
</tr>
<tr>
<td>Aptamer-B26</td>
</tr>
<tr>
<td>Ar DART®/MS-B16</td>
</tr>
<tr>
<td>Archaeological-LW5</td>
</tr>
<tr>
<td>Archaeology-A98</td>
</tr>
<tr>
<td>Arnmanni-Ebstein-H118</td>
</tr>
<tr>
<td>Army-C3</td>
</tr>
<tr>
<td>Arson-B124, E83</td>
</tr>
<tr>
<td>Arthroplasty-H100</td>
</tr>
<tr>
<td>Arthropods-A88</td>
</tr>
<tr>
<td>Artificial Neural Networks-A73, A112</td>
</tr>
<tr>
<td>Artwork-J8</td>
</tr>
<tr>
<td>ASB-B97</td>
</tr>
<tr>
<td>Asbestos-D26</td>
</tr>
<tr>
<td>Asia-A40</td>
</tr>
<tr>
<td>Asian-A63</td>
</tr>
<tr>
<td>Asphyxia-H74</td>
</tr>
<tr>
<td>Assessment-E75</td>
</tr>
<tr>
<td>Asthma-H122</td>
</tr>
<tr>
<td>Astronomy-LW2</td>
</tr>
<tr>
<td>Asymmetry-A60</td>
</tr>
<tr>
<td>ATR/FTIR Spectroscopy-B47, E19</td>
</tr>
<tr>
<td>Attitudes-I30</td>
</tr>
<tr>
<td>Atypical Suicide-H129</td>
</tr>
<tr>
<td>Audio-C4</td>
</tr>
<tr>
<td>Audio Enhancement-C8</td>
</tr>
<tr>
<td>Audio Forensics-C9</td>
</tr>
<tr>
<td>Audit-W01</td>
</tr>
<tr>
<td>Autism Spectrum Disorder-I23</td>
</tr>
<tr>
<td>Automation-B115</td>
</tr>
<tr>
<td>Automotive Paint-B91</td>
</tr>
<tr>
<td>Automotive Paint Analysis-B67</td>
</tr>
<tr>
<td>Autonomus-D28, F19</td>
</tr>
<tr>
<td>Autopen-I9</td>
</tr>
<tr>
<td>Autophagy-H82</td>
</tr>
<tr>
<td>Autopsied/Non-Autopsied-A116</td>
</tr>
<tr>
<td>Autopsies-F3</td>
</tr>
<tr>
<td>Autopsy-H15, H16, H60, H102</td>
</tr>
<tr>
<td>Key Word Index</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td><strong>B</strong></td>
</tr>
<tr>
<td>BAC-K18</td>
</tr>
<tr>
<td>Bacteria-B149, H50</td>
</tr>
<tr>
<td>Bacterial 16S Sequencing-H51</td>
</tr>
<tr>
<td>Bacterial Profiling-H55</td>
</tr>
<tr>
<td>Ballistic-H130</td>
</tr>
<tr>
<td>Ballistic Gelatin-B136</td>
</tr>
<tr>
<td>Barnacle-H53</td>
</tr>
<tr>
<td>Bath-Related Death-H11</td>
</tr>
<tr>
<td>Bathtub-Related Deaths-H48</td>
</tr>
<tr>
<td>Battered Baby Syndrome-H110</td>
</tr>
<tr>
<td>Battlefield Forensics-B126</td>
</tr>
<tr>
<td>Bayesian Analysis-H105</td>
</tr>
<tr>
<td>Bayesian Computing-B139</td>
</tr>
<tr>
<td>Bayesian Modeling-A43</td>
</tr>
<tr>
<td>Bayesian Network-B34</td>
</tr>
<tr>
<td>Bayesian Statistics-A115</td>
</tr>
<tr>
<td>Behavioral Evidence in Common-E72</td>
</tr>
<tr>
<td>Benchmarking-B85</td>
</tr>
<tr>
<td>Bestiality-W02</td>
</tr>
<tr>
<td>Bias-D24, I34</td>
</tr>
<tr>
<td>BigMouth-G7</td>
</tr>
<tr>
<td>Bilateral Adrenal Hemorrhage-H100</td>
</tr>
<tr>
<td>Bilateral Asymmetry-A12</td>
</tr>
<tr>
<td>Bioaffinity-E21, E55</td>
</tr>
<tr>
<td>Bioelectric Impedance Analysis-E93</td>
</tr>
<tr>
<td>Biogeographic Ancestry-B40</td>
</tr>
<tr>
<td>Biogeographic Ancestry Predict-B5</td>
</tr>
<tr>
<td>Bioinformatic-E24</td>
</tr>
<tr>
<td>Biological Anthropology-A22, A27</td>
</tr>
<tr>
<td>Biological Data-A49</td>
</tr>
<tr>
<td>Biological Fluid-B176</td>
</tr>
<tr>
<td>Biological Mixtures-B55</td>
</tr>
<tr>
<td>Biological Profile-A10, A12, A53, A54, A77</td>
</tr>
<tr>
<td>Biological Specimen Collection-B107</td>
</tr>
<tr>
<td>Biological Stain-E23</td>
</tr>
<tr>
<td>Biomarkers-E21</td>
</tr>
<tr>
<td>Biomechanics-A31, D13, D17, D18</td>
</tr>
<tr>
<td>Biometrics-A106, E79, F28</td>
</tr>
<tr>
<td>Biosocial Criminology-E12</td>
</tr>
<tr>
<td>BioSPME-K45</td>
</tr>
<tr>
<td>Biostatistics-A113</td>
</tr>
<tr>
<td>Biracial Sample-A75</td>
</tr>
<tr>
<td>Bitemark-G15, G16, G17, G18, G21</td>
</tr>
<tr>
<td>Bitemark Analysis-G22</td>
</tr>
<tr>
<td>Bitemarks-G20, G23</td>
</tr>
<tr>
<td>Black Tar Heroin-H86</td>
</tr>
<tr>
<td>Blast Suppression Foam-B51</td>
</tr>
<tr>
<td>Blind-B95</td>
</tr>
<tr>
<td>Blood-B44, B112, E19, E84</td>
</tr>
<tr>
<td>Blood Alcohol-K28</td>
</tr>
<tr>
<td>Blood Alcohol Concentration-K1</td>
</tr>
<tr>
<td>Blood Groups-G45</td>
</tr>
<tr>
<td>Bloodstain-D30</td>
</tr>
<tr>
<td>Blood Tetrahydrocannabinol-H101</td>
</tr>
<tr>
<td>Bloodstain Aging-B52</td>
</tr>
<tr>
<td>Blow Flies-H28</td>
</tr>
<tr>
<td>Blow Fly-H52</td>
</tr>
<tr>
<td>Blunt Butterfly Fractures-A31</td>
</tr>
<tr>
<td>Blunt Force Injury-H41</td>
</tr>
<tr>
<td>Blunt Force Trauma-A33, A34, A35, A103, A128, A141, H116</td>
</tr>
<tr>
<td>Blunt Trauma-H10</td>
</tr>
<tr>
<td>BMI-H137</td>
</tr>
<tr>
<td>Body Fluid Identification-B79, B116, B178, H26</td>
</tr>
<tr>
<td>Body Fluids-E20</td>
</tr>
<tr>
<td>Body Mass Estimation-A115</td>
</tr>
<tr>
<td>BOLD-B144</td>
</tr>
<tr>
<td>Bone-A118, B2, B36</td>
</tr>
<tr>
<td>Bone Fractures-H112</td>
</tr>
<tr>
<td>Bone Histology-A9</td>
</tr>
<tr>
<td>Bone Stiffness-A146</td>
</tr>
<tr>
<td>Bone Trauma-E109</td>
</tr>
<tr>
<td>Borewell-H88</td>
</tr>
<tr>
<td>Botany Forensic-B10</td>
</tr>
<tr>
<td>BPA-B53</td>
</tr>
<tr>
<td>Brady Claim-F7</td>
</tr>
<tr>
<td>Brake Dust-B192</td>
</tr>
<tr>
<td>Breach of Confidentiality-D25</td>
</tr>
<tr>
<td>Breathalyzer-B186</td>
</tr>
<tr>
<td>Bruises-E2, H46</td>
</tr>
<tr>
<td>Buccal Swab-B20</td>
</tr>
<tr>
<td>Bullet Impact-B99</td>
</tr>
<tr>
<td>Burial-A136</td>
</tr>
<tr>
<td>Burial Practices-E45</td>
</tr>
<tr>
<td>Buried Bodies-A100</td>
</tr>
<tr>
<td>Buried Carcasses-H50</td>
</tr>
<tr>
<td>Burned Bone-A105</td>
</tr>
<tr>
<td>Burning-A66</td>
</tr>
<tr>
<td>Burnt Bone-E87</td>
</tr>
<tr>
<td>Burnt Remains-W11</td>
</tr>
<tr>
<td>Caliber-B129</td>
</tr>
<tr>
<td>Calliphora vicina-H29</td>
</tr>
<tr>
<td>Camera Identification-C14</td>
</tr>
<tr>
<td>Canal-LW7</td>
</tr>
<tr>
<td>Canine-F34</td>
</tr>
<tr>
<td>Canine Detection-B24</td>
</tr>
<tr>
<td>Canine DNA-E25</td>
</tr>
<tr>
<td>Canine DNA Profiling-H45</td>
</tr>
<tr>
<td>Cannabinoids-E89</td>
</tr>
<tr>
<td>Cannabis-B186, H101, I21, K53</td>
</tr>
<tr>
<td>Cannabis sativa-B140</td>
</tr>
<tr>
<td>Cannellure-B129</td>
</tr>
<tr>
<td>Capacity-F32, I37</td>
</tr>
<tr>
<td>Capacity to Consent-I38</td>
</tr>
<tr>
<td>Capstone-E75, E107</td>
</tr>
<tr>
<td>Car Accident-E11</td>
</tr>
<tr>
<td>Cardiomyopathy-I3</td>
</tr>
<tr>
<td>Cardiovascular Pathology-W23</td>
</tr>
<tr>
<td>Caregivers-I1</td>
</tr>
<tr>
<td>Care Withdrawal-F5</td>
</tr>
<tr>
<td>Carfentanil-K4, K26</td>
</tr>
<tr>
<td>Cartridge Casings-B54, B145, B148</td>
</tr>
<tr>
<td>Cascades-B76</td>
</tr>
<tr>
<td>Case Histories-LW3</td>
</tr>
<tr>
<td>Case Report-A80</td>
</tr>
<tr>
<td>Case Study-B136</td>
</tr>
<tr>
<td>Casework-B45</td>
</tr>
<tr>
<td>Catastrophe Preparedness-G36</td>
</tr>
<tr>
<td>Cattle Genotyping-E13</td>
</tr>
<tr>
<td>Cause of Death-A30, H71</td>
</tr>
<tr>
<td>CB1 Receptor-K31</td>
</tr>
<tr>
<td>CBCT-G28</td>
</tr>
<tr>
<td>CBG-K30</td>
</tr>
<tr>
<td>CBN-K30</td>
</tr>
<tr>
<td>Cementochronology-G11</td>
</tr>
<tr>
<td>Central Nervous System-J11</td>
</tr>
<tr>
<td>Cephalogram-G33</td>
</tr>
<tr>
<td>Ceramic Tiles-B53</td>
</tr>
<tr>
<td>Cerebral Palsy-H77</td>
</tr>
<tr>
<td>Cerebral Venous Sinus Thrombosis-H75</td>
</tr>
<tr>
<td>Certification-A71</td>
</tr>
<tr>
<td>Cervical Spine Injuries-H115</td>
</tr>
<tr>
<td>Challenges-B51</td>
</tr>
<tr>
<td>CHAOS-H37</td>
</tr>
<tr>
<td>Characteristic Particles-B195</td>
</tr>
<tr>
<td>Characterization-B60</td>
</tr>
<tr>
<td>Charred Document-J15</td>
</tr>
<tr>
<td>Chemical-E61</td>
</tr>
<tr>
<td>Chemical Analysis-B69</td>
</tr>
<tr>
<td>Chemical Characterization-E101</td>
</tr>
<tr>
<td>Chemiluminescence-B112</td>
</tr>
</tbody>
</table>
### Key Word Index

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemometrics</td>
<td>B38, E18, E20, E23</td>
</tr>
<tr>
<td>Child-G41, K46, W18</td>
<td></td>
</tr>
<tr>
<td>Child Abuse-E2, E3, E69, H110, H111, I6, I24, W9</td>
<td></td>
</tr>
<tr>
<td>Child Custody-K51</td>
<td></td>
</tr>
<tr>
<td>Child Neglect-E3, I3</td>
<td></td>
</tr>
<tr>
<td>Children-A58, E4, E66, H88, I13</td>
<td></td>
</tr>
<tr>
<td>Child Sex Offender-C25</td>
<td></td>
</tr>
<tr>
<td>Child Sexual Abuse-E1</td>
<td></td>
</tr>
<tr>
<td>Chinese Handwriting-J14</td>
<td></td>
</tr>
<tr>
<td>Chinese Herbs-K50</td>
<td></td>
</tr>
<tr>
<td>Choline Dietary Supplement-B48</td>
<td></td>
</tr>
<tr>
<td>Christmas Tree Stain-B1</td>
<td></td>
</tr>
<tr>
<td>Chromatography-B171</td>
<td></td>
</tr>
<tr>
<td>Chronic Alcohol Drinkers-K23</td>
<td></td>
</tr>
<tr>
<td>Chronic Allograft Vasculopathy-H4</td>
<td></td>
</tr>
<tr>
<td>Churg-Strauss Syndrome-H79</td>
<td></td>
</tr>
<tr>
<td>Circos-A135</td>
<td></td>
</tr>
<tr>
<td>Circumstantial Evidence-F26</td>
<td></td>
</tr>
<tr>
<td>Class Characteristics-G23</td>
<td></td>
</tr>
<tr>
<td>Classification-B25</td>
<td></td>
</tr>
<tr>
<td>Clinical Forensic Medicine-H46</td>
<td></td>
</tr>
<tr>
<td>Clue Spray-E52</td>
<td></td>
</tr>
<tr>
<td>Coban-D8</td>
<td></td>
</tr>
<tr>
<td>Cocaine-H99, H127</td>
<td></td>
</tr>
<tr>
<td>CODIS-B12</td>
<td></td>
</tr>
<tr>
<td>CODIS Short Tandem Repeats-B32</td>
<td></td>
</tr>
<tr>
<td>Cognition-E71</td>
<td></td>
</tr>
<tr>
<td>Cognitive Bias-B182</td>
<td></td>
</tr>
<tr>
<td>Cold Case-A107</td>
<td></td>
</tr>
<tr>
<td>Cold Cases-A153, LW6</td>
<td></td>
</tr>
<tr>
<td>Collaboration-A81, F4</td>
<td></td>
</tr>
<tr>
<td>Collagen-A126, A146</td>
<td></td>
</tr>
<tr>
<td>College Transition-B163</td>
<td></td>
</tr>
<tr>
<td>Color Deconvolution-J18</td>
<td></td>
</tr>
<tr>
<td>Colorimetrics-A68</td>
<td></td>
</tr>
<tr>
<td>Commingled-A41, A47</td>
<td></td>
</tr>
<tr>
<td>Commingled Human Remains-A45, A50, A55</td>
<td></td>
</tr>
<tr>
<td>Commingled Remains-A42, A46, A102</td>
<td></td>
</tr>
<tr>
<td>Commingled Skeletal Remains-A48, A49</td>
<td></td>
</tr>
<tr>
<td>Commingling-A43, A44, A53, A117, A135</td>
<td></td>
</tr>
<tr>
<td>Communication-E1, E17</td>
<td></td>
</tr>
<tr>
<td>Competency-F32, J14</td>
<td></td>
</tr>
<tr>
<td>COMPAS-E90</td>
<td></td>
</tr>
<tr>
<td>Computation-J6</td>
<td></td>
</tr>
<tr>
<td>Computational Anatomy-A37</td>
<td></td>
</tr>
<tr>
<td>Computational Methods-A26</td>
<td></td>
</tr>
<tr>
<td>Computed Tomography-A73, E33</td>
<td></td>
</tr>
<tr>
<td>Computer-W12</td>
<td></td>
</tr>
<tr>
<td>Computer Animation-C10</td>
<td></td>
</tr>
<tr>
<td>Computer-Assisted Tomography-G5</td>
<td></td>
</tr>
<tr>
<td>Computer Automation-B30</td>
<td></td>
</tr>
<tr>
<td>Concentration-H95, K20</td>
<td></td>
</tr>
<tr>
<td>Concussion-D21, H76</td>
<td></td>
</tr>
<tr>
<td>Conduct-B83</td>
<td></td>
</tr>
<tr>
<td>Condyles-A117</td>
<td></td>
</tr>
<tr>
<td>Confidence Intervals-D29</td>
<td></td>
</tr>
<tr>
<td>Confirmatory Tests-B59</td>
<td></td>
</tr>
<tr>
<td>Conflicts-A121</td>
<td></td>
</tr>
<tr>
<td>Congenital Abnormalities-E1</td>
<td></td>
</tr>
<tr>
<td>Congenital Laryngeal Stenosis-H37</td>
<td></td>
</tr>
<tr>
<td>Consensus Body-B97</td>
<td></td>
</tr>
<tr>
<td>Consensus Standards-F25</td>
<td></td>
</tr>
<tr>
<td>Consolidant-A105</td>
<td></td>
</tr>
<tr>
<td>Consultant-BS2</td>
<td></td>
</tr>
<tr>
<td>Consumer Cameras-H67</td>
<td></td>
</tr>
<tr>
<td>Contact-H18</td>
<td></td>
</tr>
<tr>
<td>Contamination-B131, K18</td>
<td></td>
</tr>
<tr>
<td>Contemplative-I36</td>
<td></td>
</tr>
<tr>
<td>Contemporary-B179</td>
<td></td>
</tr>
<tr>
<td>Contextual Effects-I34</td>
<td></td>
</tr>
<tr>
<td>Continuous Education-B166</td>
<td></td>
</tr>
<tr>
<td>Controlled Substance-B22</td>
<td></td>
</tr>
<tr>
<td>Controls-D28</td>
<td></td>
</tr>
<tr>
<td>Conviction Integrity Unit-W22</td>
<td></td>
</tr>
<tr>
<td>Cooling Time-H83</td>
<td></td>
</tr>
<tr>
<td>Cooperation-E39</td>
<td></td>
</tr>
<tr>
<td>Coroner/Medical Examiner-E7</td>
<td></td>
</tr>
<tr>
<td>Corpse-H56</td>
<td></td>
</tr>
<tr>
<td>Corrections-G34</td>
<td></td>
</tr>
<tr>
<td>Cortical Bone-A23, A67</td>
<td></td>
</tr>
<tr>
<td>Counterfeit-J7, J8</td>
<td></td>
</tr>
<tr>
<td>Counterfeit Currency-J1</td>
<td></td>
</tr>
<tr>
<td>Counterintelligence-E8</td>
<td></td>
</tr>
<tr>
<td>Countertransference-I19</td>
<td></td>
</tr>
<tr>
<td>Court-I36</td>
<td></td>
</tr>
<tr>
<td>Cranial Abnormalities-H102</td>
<td></td>
</tr>
<tr>
<td>Cranial Architecture-A128</td>
<td></td>
</tr>
<tr>
<td>Cranial Base-A62</td>
<td></td>
</tr>
<tr>
<td>Cranial Fracture-A33</td>
<td></td>
</tr>
<tr>
<td>Cranial Fracture Patterns-A34, A35</td>
<td></td>
</tr>
<tr>
<td>Cranial Measurements-A17</td>
<td></td>
</tr>
<tr>
<td>Cranial Morphoscoptic Traits-A76</td>
<td></td>
</tr>
<tr>
<td>Cranial Traits-A10, A111</td>
<td></td>
</tr>
<tr>
<td>Craniofacial Reconstruction-E15</td>
<td></td>
</tr>
<tr>
<td>Craniofacial Traits-A60</td>
<td></td>
</tr>
<tr>
<td>Craniotics-A120</td>
<td></td>
</tr>
<tr>
<td>Crash-D17, D18, D27</td>
<td></td>
</tr>
<tr>
<td>Crash Reconstruction-D6</td>
<td></td>
</tr>
<tr>
<td>Credit Card Fraud-C22</td>
<td></td>
</tr>
<tr>
<td>Cremated Remains-B72, B110</td>
<td></td>
</tr>
<tr>
<td>Cremation-A38, A139</td>
<td></td>
</tr>
<tr>
<td>Crime-I5</td>
<td></td>
</tr>
<tr>
<td>Crime Fear-E9</td>
<td></td>
</tr>
<tr>
<td>Crime Prevention-E9</td>
<td></td>
</tr>
<tr>
<td>Crime Scene-E10, F36, G21, H11, I11</td>
<td></td>
</tr>
<tr>
<td>Crime Scene Investigation-E37, E72, E95, F33</td>
<td></td>
</tr>
<tr>
<td>Crime Scene Investigator-I14</td>
<td></td>
</tr>
<tr>
<td>Crime Scener-F17</td>
<td></td>
</tr>
<tr>
<td>Criminal-I36</td>
<td></td>
</tr>
<tr>
<td>Criminal Behavior Analysis-E72</td>
<td></td>
</tr>
<tr>
<td>Criminalistic-I2</td>
<td></td>
</tr>
<tr>
<td>Criminalistics-B132, B184, B193</td>
<td></td>
</tr>
<tr>
<td>Criminal Procedure-F2</td>
<td></td>
</tr>
<tr>
<td>Criminal Trial-F31</td>
<td></td>
</tr>
<tr>
<td>Criminological Analysis – I32</td>
<td></td>
</tr>
<tr>
<td>Critical Angle-B99</td>
<td></td>
</tr>
<tr>
<td>Cross Examination-F1</td>
<td></td>
</tr>
<tr>
<td>Cruel and Unusual-F30</td>
<td></td>
</tr>
<tr>
<td>CSI-E108</td>
<td></td>
</tr>
<tr>
<td>“CSI Effect”-E62</td>
<td></td>
</tr>
<tr>
<td>CSI Syndrome-E62</td>
<td></td>
</tr>
<tr>
<td>CT-A144</td>
<td></td>
</tr>
<tr>
<td>CT-3D Postmortem-H9</td>
<td></td>
</tr>
<tr>
<td>CT Scan-E34</td>
<td></td>
</tr>
<tr>
<td>CT Scan Project-H36</td>
<td></td>
</tr>
<tr>
<td>Cultivation Theory-E62</td>
<td></td>
</tr>
<tr>
<td>Cupping Therapy-E2</td>
<td></td>
</tr>
<tr>
<td>Curriculum-E110</td>
<td></td>
</tr>
<tr>
<td>Cutaneous-H120</td>
<td></td>
</tr>
<tr>
<td>Cutting-D12</td>
<td></td>
</tr>
<tr>
<td>Cutting Agent-H127</td>
<td></td>
</tr>
<tr>
<td>Cutting Agents-B157</td>
<td></td>
</tr>
<tr>
<td>Cyanocrylate Fuming-B50, B168</td>
<td></td>
</tr>
<tr>
<td>Cytochrome P450-E89</td>
<td></td>
</tr>
</tbody>
</table>

**D**

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAQS-G26</td>
<td></td>
</tr>
<tr>
<td>Daredevil Selfie-E41</td>
<td></td>
</tr>
<tr>
<td>Darknet-C23, C24</td>
<td></td>
</tr>
<tr>
<td>Darknet Markets-B158</td>
<td></td>
</tr>
<tr>
<td>DART™-MS-B91, B167, B185, E50, K19</td>
<td></td>
</tr>
<tr>
<td>DART™-TOF/MS-B60, B93</td>
<td></td>
</tr>
<tr>
<td>Data-A80, B82, E56</td>
<td></td>
</tr>
<tr>
<td>Data Analysis-B109</td>
<td></td>
</tr>
<tr>
<td>Data Analytics-W07</td>
<td></td>
</tr>
<tr>
<td>Database-B154</td>
<td></td>
</tr>
<tr>
<td>Data Centers-D32</td>
<td></td>
</tr>
</tbody>
</table>
### KEY WORD INDEX

<table>
<thead>
<tr>
<th>Key Word</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Manipulation</td>
<td>D23</td>
</tr>
<tr>
<td>Data Recovery</td>
<td>C19, C21</td>
</tr>
<tr>
<td>Data Spoliation</td>
<td>C20</td>
</tr>
<tr>
<td>Data Standardization</td>
<td>E33</td>
</tr>
<tr>
<td>Daubert</td>
<td>F16</td>
</tr>
<tr>
<td>DEA-H123</td>
<td></td>
</tr>
<tr>
<td>Death-E41, H99, I33, W18</td>
<td></td>
</tr>
<tr>
<td>Death Investigation-E49, E102, H73</td>
<td></td>
</tr>
<tr>
<td>Death Review-H34</td>
<td></td>
</tr>
<tr>
<td>Death Scene Investigation-E5</td>
<td></td>
</tr>
<tr>
<td>Decapititation</td>
<td>H123</td>
</tr>
<tr>
<td>Decibels-H18</td>
<td></td>
</tr>
<tr>
<td>Decision Making-E64</td>
<td></td>
</tr>
<tr>
<td>Decision Tree-A111</td>
<td></td>
</tr>
<tr>
<td>Decomposed-E80</td>
<td></td>
</tr>
<tr>
<td>Decontamination-B27</td>
<td></td>
</tr>
<tr>
<td>Deep Learning-C14</td>
<td></td>
</tr>
<tr>
<td>Defense POW/MIA Accounting Age-A7</td>
<td></td>
</tr>
<tr>
<td>Degradation-A91, B44, B117</td>
<td></td>
</tr>
<tr>
<td>Degraded DNA-B11</td>
<td></td>
</tr>
<tr>
<td>Demirjian-G26</td>
<td></td>
</tr>
<tr>
<td>Demonstrative Evidence-F4</td>
<td></td>
</tr>
<tr>
<td>Dendrochronology Dating-B10</td>
<td></td>
</tr>
<tr>
<td>Dental-G40, G46</td>
<td></td>
</tr>
<tr>
<td>Dental Age Determination-G32</td>
<td></td>
</tr>
<tr>
<td>Dental Age Estimation-G24</td>
<td></td>
</tr>
<tr>
<td>Dental Development-G29</td>
<td></td>
</tr>
<tr>
<td>Dental Enamel-A150</td>
<td></td>
</tr>
<tr>
<td>Dental Evidence-G3</td>
<td></td>
</tr>
<tr>
<td>Dental Formation-A57</td>
<td></td>
</tr>
<tr>
<td>Dental Hygiene Curriculum-G36</td>
<td></td>
</tr>
<tr>
<td>Dental Identification-G5, G7, G38</td>
<td></td>
</tr>
<tr>
<td>Dental Morphology-A75, A76, A114</td>
<td></td>
</tr>
<tr>
<td>Dental Staging-G37</td>
<td></td>
</tr>
<tr>
<td>Dental Tissues-G12</td>
<td></td>
</tr>
<tr>
<td>Dentist-G34</td>
<td></td>
</tr>
<tr>
<td>Dentition-A64, A137</td>
<td></td>
</tr>
<tr>
<td>Dentoskeletal Relationship-G33</td>
<td></td>
</tr>
<tr>
<td>Derivatization-B19, B187</td>
<td></td>
</tr>
<tr>
<td>Design-J8</td>
<td></td>
</tr>
<tr>
<td>Designer Fentanyl Analougues-E49</td>
<td></td>
</tr>
<tr>
<td>Designer Opioids-E85, K37</td>
<td></td>
</tr>
<tr>
<td>Detection-F34</td>
<td></td>
</tr>
<tr>
<td>Detoxification Enzymes-B71</td>
<td></td>
</tr>
<tr>
<td>Development-A124, I9</td>
<td></td>
</tr>
<tr>
<td>Developmental Neuropathology-H77</td>
<td></td>
</tr>
<tr>
<td>Diabetes Mellitus-E32</td>
<td></td>
</tr>
<tr>
<td>Diagenesis-A145</td>
<td></td>
</tr>
<tr>
<td>Diagnosis Utilizing Biopsies-G19</td>
<td></td>
</tr>
<tr>
<td>Diagnostic Management Teams-H111</td>
<td></td>
</tr>
<tr>
<td>Diaphragmatic Hernia-H96</td>
<td></td>
</tr>
<tr>
<td>Diaphyseal Dimensions-A57</td>
<td></td>
</tr>
<tr>
<td>Diatoms-H117</td>
<td></td>
</tr>
<tr>
<td>Dibutylone-K33</td>
<td></td>
</tr>
<tr>
<td>Differential Diagnosis-I24</td>
<td></td>
</tr>
<tr>
<td>Differential Extration-B42</td>
<td></td>
</tr>
<tr>
<td>Digital-C29, C31</td>
<td></td>
</tr>
<tr>
<td>Digital Bone Collection-A82</td>
<td></td>
</tr>
<tr>
<td>Digital Decoration-B53</td>
<td></td>
</tr>
<tr>
<td>Digital Evidence-C4, C5, C9, C19, C22</td>
<td></td>
</tr>
<tr>
<td>Digital Forensics-C6, C7</td>
<td></td>
</tr>
<tr>
<td>Digital Forensics Tool-C25</td>
<td></td>
</tr>
<tr>
<td>Digitalization-G21</td>
<td></td>
</tr>
<tr>
<td>Digital Photography-W16</td>
<td></td>
</tr>
<tr>
<td>Digital Reference Tool-A3</td>
<td></td>
</tr>
<tr>
<td>Digital Technologies-A97</td>
<td></td>
</tr>
<tr>
<td>Digital Video-D33</td>
<td></td>
</tr>
<tr>
<td>Disposition-I35</td>
<td></td>
</tr>
<tr>
<td>Diplootypes-B37</td>
<td></td>
</tr>
<tr>
<td>Diquat-K47</td>
<td></td>
</tr>
<tr>
<td>Direct Amplification-B7, B108</td>
<td></td>
</tr>
<tr>
<td>Direct Lysis-B106</td>
<td></td>
</tr>
<tr>
<td>Direct Metal Laser Sintering-B127</td>
<td></td>
</tr>
<tr>
<td>Direct PCR-B13</td>
<td></td>
</tr>
<tr>
<td>Direct-to-Consumer-E68</td>
<td></td>
</tr>
<tr>
<td>Disaster-E104</td>
<td></td>
</tr>
<tr>
<td>Disaster Victim Identification-G42, G44, H40</td>
<td></td>
</tr>
<tr>
<td>Disasters-E103</td>
<td></td>
</tr>
<tr>
<td>Discoloration-E32</td>
<td></td>
</tr>
<tr>
<td>Dishonesty-D24</td>
<td></td>
</tr>
<tr>
<td>Dismemberment-A29, H54</td>
<td></td>
</tr>
<tr>
<td>Disparities-I20</td>
<td></td>
</tr>
<tr>
<td>Dissecting Microscope-B105</td>
<td></td>
</tr>
<tr>
<td>Distal Humerus-A39</td>
<td></td>
</tr>
<tr>
<td>Diversity-E1</td>
<td></td>
</tr>
<tr>
<td>DNA-A92, B34, B36, B43, B50, B103, B179, E26, E59, L1, W01</td>
<td></td>
</tr>
<tr>
<td>DNA Analysis-B51</td>
<td></td>
</tr>
<tr>
<td>DNA Bottlenecks-B30</td>
<td></td>
</tr>
<tr>
<td>DNA Contributors-B33</td>
<td></td>
</tr>
<tr>
<td>DNA Damage-Repair-B12</td>
<td></td>
</tr>
<tr>
<td>DNA Database-B140</td>
<td></td>
</tr>
<tr>
<td>DNA Degradation-A108</td>
<td></td>
</tr>
<tr>
<td>DNA Errors-B185</td>
<td></td>
</tr>
<tr>
<td>DNA Evidence-B139</td>
<td></td>
</tr>
<tr>
<td>DNA Extraction-B2, B117, B146, B148</td>
<td></td>
</tr>
<tr>
<td>DNA Identification-B72</td>
<td></td>
</tr>
<tr>
<td>DNA Interpretation-F15</td>
<td></td>
</tr>
<tr>
<td>DNA Methylation-B122, B176, F14</td>
<td></td>
</tr>
<tr>
<td>DNA Mixture Interpretation-B137, W13</td>
<td></td>
</tr>
<tr>
<td>DNA Mixtures-B32, B181, F13</td>
<td></td>
</tr>
<tr>
<td>DNA Quantitation-B58</td>
<td></td>
</tr>
<tr>
<td>DNA Recovery-B107</td>
<td></td>
</tr>
<tr>
<td>DNA Repair-B4</td>
<td></td>
</tr>
<tr>
<td>DNase-B149</td>
<td></td>
</tr>
<tr>
<td>DNA Sequencing-E28</td>
<td></td>
</tr>
<tr>
<td>DNA Sequencing Strategy-A49</td>
<td></td>
</tr>
<tr>
<td>DNA Testing-B77</td>
<td></td>
</tr>
<tr>
<td>DNA Typing of Eucalyptus globulus-B10</td>
<td></td>
</tr>
<tr>
<td>DNA-VIEW®-B33</td>
<td></td>
</tr>
<tr>
<td>DNA Workflows-B182</td>
<td></td>
</tr>
<tr>
<td>Document-W06</td>
<td></td>
</tr>
<tr>
<td>Document Examination-J4</td>
<td></td>
</tr>
<tr>
<td>Documentation-A125</td>
<td></td>
</tr>
<tr>
<td>Documents-E59, J6, J19</td>
<td></td>
</tr>
<tr>
<td>Dog Attacks-E13</td>
<td></td>
</tr>
<tr>
<td>Dog Bites-H45</td>
<td></td>
</tr>
<tr>
<td>Dog Identification-E13</td>
<td></td>
</tr>
<tr>
<td>Dog Mailing-H115</td>
<td></td>
</tr>
<tr>
<td>Dogfighting-W10</td>
<td></td>
</tr>
<tr>
<td>Doll Reenactment-E5</td>
<td></td>
</tr>
<tr>
<td>Domestic Disappearance-G39</td>
<td></td>
</tr>
<tr>
<td>Domestic Violence-H131</td>
<td></td>
</tr>
<tr>
<td>Dopamine-H15</td>
<td></td>
</tr>
<tr>
<td>Dorsal Hand-C2</td>
<td></td>
</tr>
<tr>
<td>Dorsal Pubic Pitting-A16</td>
<td></td>
</tr>
<tr>
<td>DPAA-A79</td>
<td></td>
</tr>
<tr>
<td>Drag Injury-H85</td>
<td></td>
</tr>
<tr>
<td>Driver Identification-D13, D16</td>
<td></td>
</tr>
<tr>
<td>Driver Identity-D15, D19</td>
<td></td>
</tr>
<tr>
<td>Driverless Cars and Drones-W24</td>
<td></td>
</tr>
<tr>
<td>Driving-D31, F21</td>
<td></td>
</tr>
<tr>
<td>Driving Under the Influence-K1</td>
<td></td>
</tr>
<tr>
<td>Drone Forensics-C26</td>
<td></td>
</tr>
<tr>
<td>Drones-C26</td>
<td></td>
</tr>
<tr>
<td>Drowning-E30, H48, H116, H117, H120</td>
<td></td>
</tr>
<tr>
<td>Drug-E86</td>
<td></td>
</tr>
<tr>
<td>Drug Analysis-B162, B184, B185, E50</td>
<td></td>
</tr>
<tr>
<td>Drug Degradation-K43</td>
<td></td>
</tr>
<tr>
<td>Drug Forum-B158</td>
<td></td>
</tr>
<tr>
<td>Drug Overdose-B180</td>
<td></td>
</tr>
<tr>
<td>Drug Overdose Investigation-H124</td>
<td></td>
</tr>
<tr>
<td>Drug Poisoning-E3</td>
<td></td>
</tr>
<tr>
<td>Drug Scheduling-W05</td>
<td></td>
</tr>
<tr>
<td>Drug Trends-B158</td>
<td></td>
</tr>
<tr>
<td>Drugs and Explosives-B5</td>
<td></td>
</tr>
<tr>
<td>Drugs of Abuse-K6</td>
<td></td>
</tr>
<tr>
<td>Duchenne’s Muscular Dystrophy-H92</td>
<td></td>
</tr>
<tr>
<td>Due Process-F15</td>
<td></td>
</tr>
</tbody>
</table>

230 Key Word Index
KEY WORD INDEX

DUI-F22, F23, K12
DUI Drugs-F21
DUID-K27
Dummy Skin-D2
Dumped Remains-A100
DVI-E106, H42
Dye-B63

E
Early Diagnosis-E69
Earthquake-H40
Ecosystems in Mexico-H27
Education-B163, B164, B165, E53, E54, E75, E107, E108, E109, G35, LW6, S2
Egyptian-G45
Elder-I1
Elder Abuse-A119
Elderly Homicide-H23
E-Learning-J7
Electrochemical Identification-K16
Electrocuition-H93, H132
Electromagnetic Field (EMF)-C33
Elephant-B143
ELISA-K41
Elliptical Fourier-A77
Elucidation-B18
Enzymes-E55
Eosinophilic Myocarditis-H12
Epidemiology-H106
Epigenetics-F14
Epilepsy-H35, H74
Equivocal Death-I10

F
Facial Approximations-E14
Facilitation-W06
Failures-D32
False Declaration of Age-G32
False Positives-B80
FAME Analysis-K50
Family Interview-E99
Fatal-D31
Fatal Intoxication-H106
Fatalities-K26
FATM-B97
FEM Analysis-D2
Female Homicides-H131
Female Murder-F11
Female Perpetrators-I6
Female Serial Killer-I18
Female Sexual Offenders-I22
Femicide-E36
Fentanyl-B18, B27, B188, B189, B190, B191, E50, E85, F24, H132, K15, K44, K45
Fentanyl Analogs-B81, W20
Fibers-B64
Fidget Spinners-D11
Field Sobriety Test-F23
Financial Fraud-I2
Fingernails-B146
Fingerprint-B28
Fingerprint Analysis-E55
Fingerprints-B50, B96, B169, E61, E80, F6, H15
Fire-D5
Fire Death-H128
Fire Debris-B128, B152, B153, B154, B155
Fire Debris Investigation-B156
Fire Disaster Modeling-G12, G13
Fire Investigation-D4, F25
Fire Marshal-D4
Fire Scene-W11
Fire Scenes-F18
Fire Science Research-W19
Firearm Homicides-E37
Firearm Incidents-E74
Firearm Injuries-E31
Firearms Examination-B127
Fire/Arson Investigation-W19
Fitness for Duty-F7
Flesh-Eating Insects-H91
Flow Cytometry-B55
Fluorescence Microscopy-B177
Fluorobutyryl Fentanyl-B189
Focused Ion Beam-B132
Football Helmet Testing-D20
Footwear-B86, E60
FOREIGN DNA-B146
Forensic-B84, C31, LW1
Forensic Archaeology-A7, A97, A101, A138, E95, F29
Forensic Art-E14
Forensic Artifact-C1
Forensic Artifacts-C29
Forensic Audio-C8
Forensic Autopsy-E34, H22, H23
Forensic Biology-B105
Forensic Botany-B140
Forensic Careers-BS4
Forensic Collaboration-G9
Forensic Databases-C15
Forensic Deaths-H34
Forensic Dentistry-G36
Forensic DNA Analysis-B75, H20
Forensic DNA Decision Making-B182
Forensic Document Examination-J10
Forensic Education-W08
Forensic Entomology-A132, E98, H27, H28, H29, H107
Forensic Epidemiology-H121
Forensic Error-B183
Forensic Examination-J128
Forensic Evidence-D14
Forensic Examination-E1
Forensic Facilities-H69
Forensic Identification-E82, W11
Forensic Images-C12
Forensic Imaging-E14, H3, H61
Forensic Mathematics-B29
Forensic Medical Evaluation-E4
Forensic Medicine-H70
Forensic Metrology-F8
Forensic Microbiology-H58
Forensic Neuropathology-H76
Forensic Nursing-E16, H67
Forensic Odontologist-E99
Forensic Odontology-G3, G10, G12, G13, G23, G25, G39, G42, G44
Forensic Pathology-H6, H7, H37, H57, H73, H105, H117, H118, H133, W09, W23
Forensic Photography-F28, H67
Forensic Provenancing-B21
Forensic Psychiatry-I27, I38
Forensic Psychology-I10
Forensic Radiology-H36
Forensic Reconstruction-A145
Forensic Recovery-A105
Forensic Results-E17
Forensic Science-B181, B196, BS2, BS3, C30, E41, E43, E78, E97, F1, H8, H9, H10, H11, H12, H13, H14, H43, H44, H45, H57, H66, H78, H122, I18, I26, K21, K25, S1
Forensic Science Education-E76
Forensic Science in Turkey-E77
Forensic Sciences-A130, E8
Forensic Scientists-E67
Forensic Soil-E92
Forensic Taphonomy-A86, A122
Forensic Toxicology-K12, K17, K19, K25, K28, K37, K45
Forensics-D10, H92, I14
FORESIGHT-B85
F orensic Radiation Studies-H134
Fractography-A28
Fracture Analysis-A51, A139
Fracture Direction-A31
Fracture Healing-A32
Fracture Patterns-A119
Fracture Risk Evaluation-D2
Fracture Timing-A146
Fragmentary-A55
Fragmentation-K13
Fragmentation ROUNDS-H104
Fraud-F26
Freedom Hosting-C24
Frequency Occurrence-J12
Frequency Tables-A30
Frontal Sinus-A25
Frozen-A129
Frozen Newborn-H114
FTIR-B92
Fuel Residues-E83
Fulgurite-D3
Furanyl Fentanyl-B191
Fuzzy Logic-A114

G
Gait Reconstruction-D1
Gasoline-B133
Gastric Perforation-H134
Gastrostomy Tube-H5
GC/FID-K50
GC/IRMS-B21
GC/MS-B23, B25, B62, B124, B156, B170, E91, K36
GenBank®-B144
Gender-Specific Factors-I16
Genealogy-E68, LW7
Genetically Variant Peptides-B15, B57
Genetics-E12
Geometric Morphometrics-A11, A59, A62
Geophysics-A143
Geoprofiling-A153
Geospatial Analysis-A95
GHB-B19, K52
GIS-A99, A103, A125, E96
Glass-B89
Glass-Containing GSR-B195
Glass Reference Materials-B61
Glasses-B90
Global Illumination-H63, H129
GlobalFiler®-B120
Glycolic Acid-H30
Gold Nanoparticles-B26
GPS-A99
Graduate Education-E77
Graze Grinding Fracture-H87
Graze Laceration-H87
Growth Chart-E6
Growth Rate-H53
GSR-B194
Guideline-I28
Gunshot-H18
Gunshot Residue-B130, B131, B132, B192, B193, B194, E18
Gunshot Residue (GSR)-B196
Gunshot Trauma-H128
Gunshot Wound-H130
Gunshot Wounds-A51, E35

H
Hair-A152, B15, B47, B57, B151, H135
Hair Analysis-B14, K5, K52
Hair Proteins-E91
# KEY WORD INDEX

| Hair Reference Material-K5                | Hornady®-B129                  |
| Hair Samples-K23                        | Hotel and Motel Deaths-H6     |
| Hair Shafts-B117                       | Household Acid Exposure-A137  |
| Hair Testing-K51                       | HS/SPME-B20                   |
| Hamilton® STAR-B115                    | Human Age Estimation-B173     |
| Handcuffs-D8                          | Human Decomposition-A106, A127, A132, A149, B49, C15 |
| Handling Method-J15                    | Human Dental Identification-G44 |
| Handwriting-J13                       | Human Factors-L2              |
| Handwriting Examination-L2            | Human Fatality-H88            |
| Hanging-H108                         | Human Fingernails-A148        |
| Hawaii-A21                           | Human Identification-A150, B14, B49, G2 |
| Head Injury Severity-D20             | Human Motion-D1               |
| Headspace/SPME-B187                   | Human Origin-E19              |
| Health of Children-F12                | Human Race-E84                |
| Helmet Repeat Impacts-D20             | Human Remains-A38, A68, H28, H65 |
| Hematoma-H17                         | Human Rights-A93              |
| Hemorrhage-H5                        | Human Scent-B68               |
| Henna-B47                            | Human Smuggling-I32           |
| Heroin-B159, H43, K36, K42           | Human Variation-W21          |
| Heroin Abuse-H24                     | Humanitarian Science-A94      |
| Heroin Inhalation-H44                 | Humerus-A45                   |
| Heteroplasmy-B102                    | Humic Acid-B4                 |
| High Court-G22                      | Hydrochloric Acid-A133        |
| Higher Education-E110                | Hydrogen Sulfide-K7           |
| High Mortality-H39                   | Hydromorphone-K46             |
| High-Order Transfer-E52              | Hypoglycemia-A118             |
| High-Resolution Melt-B46, B114        | Hypoglycemia-A118             |
| High-Resolution Melt Analysis-B116    | Hypoglycemia-A118             |
| High-Resolution Melt Curve-B106       | Hypoglycemia-A118             |
| High-Resolution MicroCT-A24          | Hypoglycemia-A118             |
| High-Resolution Proteomics-B173       | Hypoglycemia-A118             |
| HIPAA-G38, G39                       | Hypoglycemia-A118             |
| Hispanic-A63                         | Hypoglycemia-A118             |
| Hispanic Ancestry-A76                | Hypoglycemia-A118             |
| Hispanic (Mexico And Colombia)-A59    | Hypoglycemia-A118             |
| Histology-A109, A131                 | Hypoglycemia-A118             |
| Histopathology-H114                  | Hypoglycemia-A118             |
| Historical-LW3                      | Hypoglycemia-A118             |
| Historical Cases-G18                 | Hypoglycemia-A118             |
| Historical Records-A53               | Hypoglycemia-A118             |
| History-G6                          | Hypoglycemia-A118             |
| Holder-G40                           | Hypoglycemia-A118             |
| Home Personal Assistant-C1          | Hypoglycemia-A118             |
| Homeless Deaths-E100                 | Hypoglycemia-A118             |
| Homelessness-H119                   | Hypoglycemia-A118             |
| Homicidal-E31                        | Hypoglycemia-A118             |
| Homicide Followed by Suicide-E36     | Hypoglycemia-A118             |
| Homicide/Suicide-B180                | Hypoglycemia-A118             |
| Homicide w/o Corpus Delicti-F26     | Immersion Pulmonary Edema-E30 |
|                                       | Immunochromatographic Assays-B80 |
|                                       | Immunohistochemistry-H2       |
|                                       | Impact-B95                    |
|                                       | Impaired Driving-F23          |
|                                       | Impartiality-I27              |
|                                       | Import/Export-B188            |
|                                       | Improvised Explosive Devices-B135 |
|                                       | Inattentional Blindness-D7    |
|                                       | Incompetence-D24              |
|                                       | Incorporation of Xenobiotics-K5|
|                                       | Increased Toxicity-H125       |
|                                       | In-Custody Deaths-H71         |
|                                       | Indel-B111                    |
|                                       | Indented Writing-J5           |
|                                       | Indirect Ophthalmoscopy-W15   |
|                                       | Individual Identification-A121|
|                                       | Infant-E6, E63                |
|                                       | Infant Death-E5               |
|                                       | Infanticide-H114              |
|                                       | Infants of Diabetic Mothers-H21|
|                                       | Information Literacy-E76      |
|                                       | Information Management-W07    |
|                                       | Infotainment and Telematics Systems-D16 |
|                                       | Infotainment Systems-C27      |
|                                       | Infrared Spectroscopy-B22     |
|                                       | Inhibitors-B108               |
|                                       | Initials-J13                  |
|                                       | Injection Drug Use-K42        |
|                                       | Injuries-H120                 |
|                                       | Injury-D14, D17, D18          |
|                                       | Ink Dating-J20                |
|                                       | Inkjet-J17                    |
|                                       | Inks Examination-J18          |
|                                       | Innocence Project-F2, F7      |
|                                       | Inorganic-B88                 |
|                                       | Insanity-I35                  |
|                                       | Insect Activity-E98           |
|                                       | Insect Biodiversity in Mexico-H27|
|                                       | Insects-H50                   |
|                                       | Institutional Review Board-A83|
|                                       | Insulin-K39                   |
|                                       | Insulin Infusion-H47          |
|                                       | Insulin Pump-H47              |
|                                       | Intellectual Functioning-17   |
|                                       | Interdisciplinary-I9          |
|                                       | International Migration-A95   |
|                                       | International Partnerships-H58|
|                                       | Intern-E54                    |
|                                       | Internet of Things-C28        |
|                                       | Interorbital Distance-C28     |

I

| Identification-A41, A44, A55, B76, B176, C2, E61, E64, E68, G4, G9, G10, G43, G46, H42, H65, J13, LW5, W04 | Identification Coordinator-G4 |
| Identification of Plastics-B65 | Identification Process-A98 |
| Identifications-G6 | Identification of Inorganic Plastics-A96 |
| Identity Concealment-A137 | Ignitability of Inorganic Substances-B152 |
| Ignitable Liquid Residues-B152 | Ignitability of Liquids-B69 |
| Illegal Migration-A74 | Illicit Drugs-B16, B17, E48 |
| Image-C5 | Image Analysis-B135, C13, C15, C17 |
| Image Processing-D33, E53, W16 | Imaging-A84, C31 |
| Interorganizational-IP4 | Intermediary-IP5 |
| International Migration-A95 | International Partnerships-H58 |
| International Partnerships-H58 | Intern-E54 |
| Internet of Things-C28 | Interorbital Distance-C28 |
| Interpersonal-IP6 | Interpersonal-IP6 |
| Interprofessional-IP7 | Interprofessional-IP7 |
| Interrelationship-IP8 | Interrelationship-IP8 |
| Interpersonal-IP9 | Interpersonal-IP9 |
| International Migration-A95 | International Partnerships-H58 |
| International Partnerships-H58 | Intern-E54 |
| Internet of Things-C28 | Interorbital Distance-C28 |

Key Word Index
<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter-Population Variation-A14</td>
</tr>
<tr>
<td>Intimal Arteritis-H4</td>
</tr>
<tr>
<td>Intl. Digital Bone Collection Center-A82</td>
</tr>
<tr>
<td>Intrahepatic Hemorrhage-H32</td>
</tr>
<tr>
<td>Investigation-D5, E8, E104</td>
</tr>
<tr>
<td>Investigative Database-B30</td>
</tr>
<tr>
<td>Investigator® 24plex GO!-B108</td>
</tr>
<tr>
<td>Investigator Mental Health-E71</td>
</tr>
<tr>
<td>Involuntary Hospitalization-I37</td>
</tr>
<tr>
<td>Ion Mobility Mass Spectrometry-B59</td>
</tr>
<tr>
<td>Ion Torrent™ Chef System-B40</td>
</tr>
<tr>
<td>IPCRp-B104</td>
</tr>
<tr>
<td>IRMS-B125</td>
</tr>
<tr>
<td>Islet Cell Hyperplasia-H21</td>
</tr>
<tr>
<td>Isoallele-B100</td>
</tr>
<tr>
<td>Isoalleles-B45</td>
</tr>
<tr>
<td>Isomer Determination-B189</td>
</tr>
<tr>
<td>Isotope-A152</td>
</tr>
<tr>
<td>Isotope Analysis-A149, A153</td>
</tr>
<tr>
<td>Isotope Ratios of Human Hair-A149</td>
</tr>
<tr>
<td>Isotopes-A151</td>
</tr>
<tr>
<td>IT Solution-E106</td>
</tr>
</tbody>
</table>

**J**

<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisprudence-K51, W09</td>
</tr>
<tr>
<td>Jury-F20</td>
</tr>
<tr>
<td>Jury Instruction-I35</td>
</tr>
<tr>
<td>Juvenile-A73, A91</td>
</tr>
<tr>
<td>Juvenile Age Estimation-A64</td>
</tr>
<tr>
<td>Juvenile Justice-I20</td>
</tr>
<tr>
<td>Juvenile Skeletal Age-A14</td>
</tr>
</tbody>
</table>

**L**

<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Analysis-F36</td>
</tr>
<tr>
<td>Laboratory Concept and Design-A79</td>
</tr>
<tr>
<td>Laboratory Construction-A79</td>
</tr>
<tr>
<td>LAMP-B142</td>
</tr>
<tr>
<td>Language Use-E78</td>
</tr>
<tr>
<td>Laser Microdissection (LMD)-B7</td>
</tr>
<tr>
<td>Laser Scanning-E73</td>
</tr>
<tr>
<td>Latent Fingerprint-E57</td>
</tr>
<tr>
<td>Latent Fingerprints-E81</td>
</tr>
<tr>
<td>Latent Print-E56</td>
</tr>
<tr>
<td>Latent Print Analysis-I34</td>
</tr>
<tr>
<td>Latent Print Examination-L2</td>
</tr>
<tr>
<td>Latent Prints-B94, E59</td>
</tr>
<tr>
<td>Latin Hypercube Sampling-A65</td>
</tr>
<tr>
<td>Latino Violence-E12</td>
</tr>
<tr>
<td>Laundered-B43</td>
</tr>
<tr>
<td>Law-B53, F1</td>
</tr>
<tr>
<td>Law Enforcement-E70</td>
</tr>
<tr>
<td>LC/ESI-MS-B162</td>
</tr>
<tr>
<td>LC/MS-B191, K6, K10, K37</td>
</tr>
<tr>
<td>LC/MS-ESI-E88, K11, K36, K39</td>
</tr>
<tr>
<td>LC/qTOF-B23</td>
</tr>
<tr>
<td>LC/qTOF-MS-K13, K35, K48</td>
</tr>
<tr>
<td>Leafcutter Bee-H85</td>
</tr>
<tr>
<td>Lean-W17</td>
</tr>
<tr>
<td>Leaving-I37</td>
</tr>
<tr>
<td>Legal-K29</td>
</tr>
<tr>
<td>Legal Proceedings-H19</td>
</tr>
<tr>
<td>Legalization-H126, I21</td>
</tr>
<tr>
<td>Leukodystrophy-H1</td>
</tr>
<tr>
<td>Levamisole-H127</td>
</tr>
<tr>
<td>Liability-F19, I33</td>
</tr>
<tr>
<td>Libraries-E76</td>
</tr>
<tr>
<td>Lifestyle-B169</td>
</tr>
<tr>
<td>Lightening-D3</td>
</tr>
<tr>
<td>Lightning Strike-H132</td>
</tr>
<tr>
<td>Likelihood Ratio-B96, B154, B155, K23, W13</td>
</tr>
<tr>
<td>Likelihood Ratios-B128</td>
</tr>
<tr>
<td>Limit Handling-D9</td>
</tr>
<tr>
<td>Limits of Detection-B118</td>
</tr>
<tr>
<td>Linear Enamel Hypoplasia-A23</td>
</tr>
<tr>
<td>Linear Regression-A17</td>
</tr>
<tr>
<td>Lines of Evidence-A121</td>
</tr>
<tr>
<td>Linguistics-C25</td>
</tr>
<tr>
<td>Linked Markers-B37</td>
</tr>
<tr>
<td>Lipidomics-A140</td>
</tr>
<tr>
<td>Lip Print-G45</td>
</tr>
<tr>
<td>Liquid Damage-C32</td>
</tr>
<tr>
<td>Live Streaming-I33</td>
</tr>
<tr>
<td>Liver-K40</td>
</tr>
<tr>
<td>LIWC-I17</td>
</tr>
<tr>
<td>LLE-K52</td>
</tr>
<tr>
<td>LMW Alcohols-H81</td>
</tr>
<tr>
<td>Load Limiters-D27</td>
</tr>
<tr>
<td>Logistic Regression-B153</td>
</tr>
<tr>
<td>Long-Bone Measurements-A52</td>
</tr>
<tr>
<td>Longitudinal-K18</td>
</tr>
<tr>
<td>Looming-D7</td>
</tr>
<tr>
<td>Low Copy DNA-B104</td>
</tr>
<tr>
<td>Low Explosives-B123</td>
</tr>
<tr>
<td>Low Template-B28, B103</td>
</tr>
<tr>
<td>Low-Field NMR-B161</td>
</tr>
<tr>
<td>Low-Molecular-Weight Heparin-H32</td>
</tr>
<tr>
<td>Lubricant Degradation-B93</td>
</tr>
<tr>
<td>Lucilia sericata-H20</td>
</tr>
<tr>
<td>Luminescence-J20</td>
</tr>
<tr>
<td>Lung Cancer-H31</td>
</tr>
<tr>
<td>Lung Weight-H105, H106</td>
</tr>
</tbody>
</table>

**M**

<table>
<thead>
<tr>
<th>Key Word Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Learning-A112, B138</td>
</tr>
<tr>
<td>Macromorphoscopic Traits-W21</td>
</tr>
<tr>
<td>Magnetic Flux-J16</td>
</tr>
<tr>
<td>Magnetic Resonance Imaging-A142, G30, G31</td>
</tr>
<tr>
<td>MALDI-MSI-B169</td>
</tr>
<tr>
<td>Male Cell Screening-B177</td>
</tr>
<tr>
<td>Malingering-I31</td>
</tr>
<tr>
<td>Maltreatment-I3</td>
</tr>
<tr>
<td>Malware-C18</td>
</tr>
<tr>
<td>Mandatory Vaccination-F12</td>
</tr>
<tr>
<td>Mandible-A20, A56, A61</td>
</tr>
<tr>
<td>Mantrailing Dog-E47</td>
</tr>
<tr>
<td>Marijuana-B20, H126</td>
</tr>
<tr>
<td>Markers-G14</td>
</tr>
<tr>
<td>MARS-A57</td>
</tr>
<tr>
<td>MAS-H8</td>
</tr>
<tr>
<td>Mass Disaster-H91</td>
</tr>
<tr>
<td>Mass Disasters-H42</td>
</tr>
<tr>
<td>Mass Fatality Incident-E103</td>
</tr>
<tr>
<td>Mass Fatality Planning-E103</td>
</tr>
<tr>
<td>Mass Graves-A66</td>
</tr>
<tr>
<td>Mass Immunization-F12</td>
</tr>
<tr>
<td>Mass Spectrometry Imaging-B168</td>
</tr>
<tr>
<td>Massive Pulmonary Embolization-E11</td>
</tr>
</tbody>
</table>
### KEY WORD INDEX

<table>
<thead>
<tr>
<th>Massively Parallel Sequencing</th>
<th>Misdiagnosis</th>
<th>Munchausen Syndrome by Proxy</th>
</tr>
</thead>
<tbody>
<tr>
<td>B5, B11, B12, B70, B74, B75, B79, B100, B101, B102, B110</td>
<td>H111</td>
<td>I24</td>
</tr>
<tr>
<td>Mastoid Triangle</td>
<td>Misrepresentation</td>
<td>Murder</td>
</tr>
<tr>
<td>A11</td>
<td>D23</td>
<td>F31</td>
</tr>
<tr>
<td>Material Effects</td>
<td>Misrepresentation of DNA</td>
<td>Muriatic Acid</td>
</tr>
<tr>
<td>B160</td>
<td>F17</td>
<td>A133</td>
</tr>
<tr>
<td>Mathematical Model</td>
<td>Missing</td>
<td></td>
</tr>
<tr>
<td>B133</td>
<td>People</td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>Missing Persons</td>
<td></td>
</tr>
<tr>
<td>G17</td>
<td>A92, A97</td>
<td></td>
</tr>
<tr>
<td>Maturity Score</td>
<td>Mississippi</td>
<td></td>
</tr>
<tr>
<td>G37</td>
<td>H68, H71</td>
<td></td>
</tr>
<tr>
<td>Maximum Contaminant Limits</td>
<td>Mis-Type</td>
<td></td>
</tr>
<tr>
<td>D29</td>
<td>B103</td>
<td></td>
</tr>
<tr>
<td>Measurement Uncertainty</td>
<td>Mitochondrial DNA</td>
<td></td>
</tr>
<tr>
<td>F8</td>
<td>B6, B46, B102, B110, B151</td>
<td></td>
</tr>
<tr>
<td>Medical Examiner</td>
<td>Mobile</td>
<td></td>
</tr>
<tr>
<td>G38</td>
<td>Device</td>
<td>C21</td>
</tr>
<tr>
<td>Medical Examiner/Coroner</td>
<td>Mobile Devices</td>
<td></td>
</tr>
<tr>
<td>E80, H123</td>
<td>C20</td>
<td></td>
</tr>
<tr>
<td>Medical Intervention</td>
<td>Mobile Forensics</td>
<td></td>
</tr>
<tr>
<td>A104</td>
<td>C7, C19</td>
<td></td>
</tr>
<tr>
<td>Medical Responsibility</td>
<td>Mobile Identification</td>
<td></td>
</tr>
<tr>
<td>H96, H97</td>
<td>E79</td>
<td></td>
</tr>
<tr>
<td>Medicolegal</td>
<td>Model Comparison</td>
<td></td>
</tr>
<tr>
<td>E94</td>
<td>B31</td>
<td></td>
</tr>
<tr>
<td>Medicolegal Autopsy</td>
<td>Molten Metal</td>
<td></td>
</tr>
<tr>
<td>H2, H46, H92</td>
<td>B12</td>
<td></td>
</tr>
<tr>
<td>Megyesi Method</td>
<td>Monozygotic Twins</td>
<td></td>
</tr>
<tr>
<td>A122</td>
<td>F14</td>
<td></td>
</tr>
<tr>
<td>Mental Health</td>
<td>Morgan</td>
<td></td>
</tr>
<tr>
<td>I20, I31</td>
<td>K31</td>
<td></td>
</tr>
<tr>
<td>Metabolism</td>
<td>Morbidity</td>
<td></td>
</tr>
<tr>
<td>E89</td>
<td>H47</td>
<td></td>
</tr>
<tr>
<td>Metadata</td>
<td>Mortuary Review</td>
<td></td>
</tr>
<tr>
<td>C17</td>
<td>A44</td>
<td></td>
</tr>
<tr>
<td>Metal Fuel</td>
<td>Mothers Who Kill</td>
<td></td>
</tr>
<tr>
<td>B135</td>
<td>E66</td>
<td></td>
</tr>
<tr>
<td>Metatarsal Fracture</td>
<td>Motor Vehicle</td>
<td></td>
</tr>
<tr>
<td>E11</td>
<td>H101</td>
<td></td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>Motor Vehicle Crash</td>
<td></td>
</tr>
<tr>
<td>B161, H94, K20</td>
<td>D13</td>
<td></td>
</tr>
<tr>
<td>Methodology</td>
<td>Motorcycle Helmet</td>
<td></td>
</tr>
<tr>
<td>B51, C8</td>
<td>B21</td>
<td></td>
</tr>
<tr>
<td>Methods</td>
<td>MPS</td>
<td></td>
</tr>
<tr>
<td>A80, E95</td>
<td>B45</td>
<td></td>
</tr>
<tr>
<td>Method Validation</td>
<td>MRI</td>
<td></td>
</tr>
<tr>
<td>C27, K11, K35</td>
<td>H17, H64</td>
<td></td>
</tr>
<tr>
<td>Methodomyl</td>
<td>MRNA</td>
<td></td>
</tr>
<tr>
<td>B21</td>
<td>B18, E85</td>
<td></td>
</tr>
<tr>
<td>Methoxyacetyl Fentanyl</td>
<td>Multianalyte</td>
<td></td>
</tr>
<tr>
<td>K24</td>
<td>B9</td>
<td></td>
</tr>
<tr>
<td>Methylation-Specific PCR</td>
<td>Multidimensional</td>
<td></td>
</tr>
<tr>
<td>B116</td>
<td>B171</td>
<td></td>
</tr>
<tr>
<td>Metric Analysis</td>
<td>Multidisciplinary</td>
<td></td>
</tr>
<tr>
<td>A65</td>
<td>E94</td>
<td></td>
</tr>
<tr>
<td>Metrology</td>
<td>Multidisciplinary Approach</td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>H54</td>
<td></td>
</tr>
<tr>
<td>Microbial Ecology</td>
<td>Multimedia</td>
<td></td>
</tr>
<tr>
<td>A136</td>
<td>C9</td>
<td></td>
</tr>
<tr>
<td>Microbial Forensics</td>
<td>Multiple Drug Analysis</td>
<td></td>
</tr>
<tr>
<td>W24</td>
<td>B160</td>
<td></td>
</tr>
<tr>
<td>Microbial Transmigration</td>
<td>Multiple Myeloma</td>
<td></td>
</tr>
<tr>
<td>H59</td>
<td>H109</td>
<td></td>
</tr>
<tr>
<td>Microbiology</td>
<td>Multiple Toxicants</td>
<td></td>
</tr>
<tr>
<td>A118</td>
<td>K8</td>
<td></td>
</tr>
<tr>
<td>Microbiome</td>
<td>Multiplex</td>
<td></td>
</tr>
<tr>
<td>A132, H25, H26, H60</td>
<td>B141</td>
<td></td>
</tr>
<tr>
<td>Micro-Chemical Analysis</td>
<td>Multiplex Development</td>
<td></td>
</tr>
<tr>
<td>B61</td>
<td>B143</td>
<td></td>
</tr>
<tr>
<td>Micro-CT</td>
<td>Multiplex STR</td>
<td></td>
</tr>
<tr>
<td>A67</td>
<td>E27</td>
<td></td>
</tr>
<tr>
<td>Microfluidic Chip</td>
<td>Multivariate Analysis</td>
<td></td>
</tr>
<tr>
<td>B42</td>
<td>B160</td>
<td></td>
</tr>
<tr>
<td>Microfluidic Mass Spectrometry</td>
<td>Multiple STR</td>
<td></td>
</tr>
<tr>
<td>B160</td>
<td>E27</td>
<td></td>
</tr>
<tr>
<td>Microhaplotypes</td>
<td>Multivariate Analysis</td>
<td></td>
</tr>
<tr>
<td>B5, B74, B101</td>
<td>B52, E92</td>
<td></td>
</tr>
<tr>
<td>Microscopy</td>
<td>Multivariate Data Analysis</td>
<td></td>
</tr>
<tr>
<td>B151, D26</td>
<td>B156</td>
<td></td>
</tr>
<tr>
<td>Microtraces</td>
<td>Mummification</td>
<td></td>
</tr>
<tr>
<td>A142</td>
<td>H15</td>
<td></td>
</tr>
<tr>
<td>Migrant Death</td>
<td>Misdiagnosis of DNA</td>
<td></td>
</tr>
<tr>
<td>A94</td>
<td>F17</td>
<td></td>
</tr>
<tr>
<td>Migrant Identification</td>
<td>Missing</td>
<td></td>
</tr>
<tr>
<td>A93</td>
<td>People</td>
<td></td>
</tr>
<tr>
<td>Migrants</td>
<td>Missing Persons</td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>A92</td>
<td></td>
</tr>
<tr>
<td>Migration</td>
<td>Mississippi</td>
<td></td>
</tr>
<tr>
<td>J20</td>
<td>H68, H71</td>
<td></td>
</tr>
<tr>
<td>Military</td>
<td>Misrepresentation</td>
<td></td>
</tr>
<tr>
<td>C3, E46</td>
<td>DNA</td>
<td></td>
</tr>
<tr>
<td>Mineral</td>
<td>Mobile</td>
<td></td>
</tr>
<tr>
<td>A126</td>
<td>Device</td>
<td>C21</td>
</tr>
<tr>
<td>Minimum</td>
<td>Mobile Devices</td>
<td></td>
</tr>
<tr>
<td>E108</td>
<td>C20</td>
<td></td>
</tr>
<tr>
<td>Minute Evidence</td>
<td>Mobile Forensics</td>
<td></td>
</tr>
<tr>
<td>B105</td>
<td>C7, C19</td>
<td></td>
</tr>
<tr>
<td>N2 DART®/MS</td>
<td>Mixture</td>
<td></td>
</tr>
<tr>
<td>B17</td>
<td>B138</td>
<td></td>
</tr>
<tr>
<td>Nailfold Videocapillaroscopy</td>
<td>Mixture Deconvolution</td>
<td></td>
</tr>
<tr>
<td>H84</td>
<td>B74, B75</td>
<td></td>
</tr>
<tr>
<td>Naive Bayes</td>
<td>Mixture Interpretation</td>
<td></td>
</tr>
<tr>
<td>B153</td>
<td>B55</td>
<td></td>
</tr>
<tr>
<td>NAME Requirements</td>
<td>Mixture Validation</td>
<td></td>
</tr>
<tr>
<td>H69</td>
<td>B139</td>
<td></td>
</tr>
<tr>
<td>NamUS</td>
<td>Molten Metal</td>
<td></td>
</tr>
<tr>
<td>H72</td>
<td>B89</td>
<td></td>
</tr>
<tr>
<td>Narcrotizing Fasciitis</td>
<td>Monozygotic Twins</td>
<td></td>
</tr>
<tr>
<td>E51</td>
<td>F14</td>
<td></td>
</tr>
<tr>
<td>Neonatal Appendicitis</td>
<td>Morphometrics</td>
<td></td>
</tr>
<tr>
<td>H39</td>
<td>A78</td>
<td></td>
</tr>
<tr>
<td>Neonatal Hypoglycemia</td>
<td>Mortality</td>
<td></td>
</tr>
<tr>
<td>H21</td>
<td>H47</td>
<td></td>
</tr>
<tr>
<td>Neonatal Line</td>
<td>Mortuary Review</td>
<td></td>
</tr>
<tr>
<td>LW4</td>
<td>A44</td>
<td></td>
</tr>
<tr>
<td>Neonates</td>
<td>Mothers Who Kill</td>
<td></td>
</tr>
<tr>
<td>H115</td>
<td>E66</td>
<td></td>
</tr>
<tr>
<td>N-Ethyl Pentylone</td>
<td>Motor Vehicle</td>
<td></td>
</tr>
<tr>
<td>K3, K33</td>
<td>H101</td>
<td></td>
</tr>
<tr>
<td>Network</td>
<td>Motor Vehicle Crash</td>
<td></td>
</tr>
<tr>
<td>BS4</td>
<td>D13</td>
<td></td>
</tr>
<tr>
<td>Network Forensics</td>
<td>Motorcycle Helmet</td>
<td></td>
</tr>
<tr>
<td>C23</td>
<td>B21</td>
<td></td>
</tr>
<tr>
<td>Neuroplasticity</td>
<td>MPS</td>
<td></td>
</tr>
<tr>
<td>H78</td>
<td>B45</td>
<td></td>
</tr>
<tr>
<td>Neuroscience</td>
<td>MRI</td>
<td></td>
</tr>
<tr>
<td>F31</td>
<td>H17, H64</td>
<td></td>
</tr>
<tr>
<td>Neutron Activation Analysis</td>
<td>MRNA</td>
<td></td>
</tr>
<tr>
<td>B61</td>
<td>B178</td>
<td></td>
</tr>
<tr>
<td>New Psychoactive Substances</td>
<td>Multianalyte</td>
<td></td>
</tr>
<tr>
<td>B161, E48</td>
<td>B9</td>
<td></td>
</tr>
<tr>
<td>New York City</td>
<td>Multidimensional</td>
<td></td>
</tr>
<tr>
<td>A29</td>
<td>B171</td>
<td></td>
</tr>
<tr>
<td>Next Generation Identification</td>
<td>Multidisciplinary</td>
<td></td>
</tr>
<tr>
<td>H72</td>
<td>E94</td>
<td></td>
</tr>
<tr>
<td>Next Generation Sequencing</td>
<td>Multidisciplinary Approach</td>
<td></td>
</tr>
<tr>
<td>B70, B72, B73, B175, E24, E44, H51, H55</td>
<td>H54</td>
<td></td>
</tr>
<tr>
<td>NFLIS</td>
<td>Multimedia</td>
<td></td>
</tr>
<tr>
<td>H123</td>
<td>C9</td>
<td></td>
</tr>
<tr>
<td>NFPA Standards</td>
<td>Multiple Drug Analysis</td>
<td></td>
</tr>
<tr>
<td>F25</td>
<td>B160</td>
<td></td>
</tr>
<tr>
<td>NGS</td>
<td>Multiple Myeloma</td>
<td></td>
</tr>
<tr>
<td>B41</td>
<td>H109</td>
<td></td>
</tr>
<tr>
<td>NIK Tests</td>
<td>Multiple Toxicants</td>
<td></td>
</tr>
<tr>
<td>B22</td>
<td>K8</td>
<td></td>
</tr>
<tr>
<td>Ninhydrin</td>
<td>Multiplex</td>
<td></td>
</tr>
<tr>
<td>B119</td>
<td>B141</td>
<td></td>
</tr>
<tr>
<td>NMR</td>
<td>Multiplex Development</td>
<td></td>
</tr>
<tr>
<td>B18, E85</td>
<td>B143</td>
<td></td>
</tr>
<tr>
<td>No/Minimal Injury</td>
<td>Multiplex STR</td>
<td></td>
</tr>
<tr>
<td>E74</td>
<td>E27</td>
<td></td>
</tr>
<tr>
<td>Non-Accidental Injury</td>
<td>Multivariate Analysis</td>
<td></td>
</tr>
<tr>
<td>H113</td>
<td>B52, E92</td>
<td></td>
</tr>
<tr>
<td>Non-Differential Extraction</td>
<td>Multivariate Data Analysis</td>
<td></td>
</tr>
<tr>
<td>B8</td>
<td>B156</td>
<td></td>
</tr>
<tr>
<td>Non-Human Forensics</td>
<td>Mummification</td>
<td></td>
</tr>
<tr>
<td>E25, E26, E29</td>
<td>H15</td>
<td></td>
</tr>
</tbody>
</table>
KEY WORD INDEX

Novel Opioids-W20
Novel Psychoactive Substances-K3, K10, K24, K35
NPS-B188, F24, H125, K16, K49
Nuclear Forensics-B134
Nuclear Magnetic Resonance-B52
Number of Contributors-B138
Numerals-J12
Nunchaku-E42
Nylon Fiber-B63

O

Objective Comparison-B98
Obliterative Arteriopathy-H4
Observational Science-G20
Observer Error-A8
Obsolescent-G26
Occupational Accident-K7
Occupational Exposure-B27
Odontologist-G34
Odontology-G14
OdontoSearch-G7, G8
Odor-E38, F34
Offenders-I30
Officer Safety-E70
Onsite-K27
OPD-A18
Open Field-K34
Open-Source-B31, W12
Operation Identification-A115
Opate-H24
Opiates-K40, K53
Opioid-W05
Opioid Epidemic-H86, W20
Opioid/Opiate Crisis-E49
Opioid Overdose-K42
Opioids-B55, K24, K26, K44
Oral Fluid-K2, K27, K28
Oral Malignancies-G19
Organ Waitlist-E7
Organ Weight-H137
Organic Acid-B80
Orthopedic Device-A104
Osteoarthritis-A72
Osteology-A98
Osteometric Reassociation-A43
Osteometric Sorting-A46
Osteon Banding-A67
Outline Shape Analysis-A39

Outreach-E54
Overdose-K39, K46
Overdose Fatality-H44
Overdoses-K4
Overeating-H134
Oxytocin-I15

PH-K32
Phoenix-LW7
Photo Response Non-Uniformity-C17
Photogrammetry-A19, A101, H66
Photograph-LW1
Photographic Comparison-C2
Photography-LW2, W03
Physical Evidence Recognition-F36
Physical Findings-E69
Physical Traces-E17
Pickup Truck Rollover-D15
Pig Head Model-H10
Plane Crash-H41
PLM-B150
PMCTA-H61
PMI-A19, A131, H13
PMMA-K34
PMSI-A87, H53
Police-I29
Police Custody-I26
Police Officer Murder-F33
Policy-B55
Polymerases-B6
Polymerization-B168
Polyomorph Primer Sites-B32
Poppy Seed-K17
Poppy Seed Tea-K25
Poppy Tea-K17
Population Distribution-B155
Population Study-B66
Porcine Model-H130
Portable GC/MS-B126
Portable Nano-LC-B162
Portable X-Ray Fluorescence-A42
Positional Isomers-B190
Positive Identification-A25, A106, H36
Post-Blast-A103
Post-Conviction-L1
Post-Conviction Relief-F17
Postcranial Skeleton-A13
Post-Detonation-B134
Posterior Rib Fractures-H38, H113
Postmortem-G8, G40, H125, K15, K20, K22, K33, K47, K54
Postmortem Angio CT-H3
Postmortem Angio MR-H3
Postmortem Concentration-K4
Postmortem CT-H19, H62, H63, H65
Postmortem Estimation-H29
Postmortem Examination-H102
Postmortem Fingerprint-E82

P

Paint-B66
Pair Matching-A45
Panel Development-B111
Paper Microfluidics-B123
Paraphilia-I8
Paraquat-K47
Parens patriae-F5
Parental Responsibility-F5
Parity Status-A27
Parricide-I11
Particle Combination Analysis-B87
Particle Signals-B86
Parturition-A27
Passive Sampler-B172
Passport Images-F28
Pathology-A89, H80
Pattern Analysis-H135
Pattern Injuries-G20
Pattern Recognition-J6
PCA-B90
PCAST-F9, F10
PCR-B51
Pediatric-A128, H113, K54
Pediatric Death-H8
Pediatric Fractures-H110
Pediatric Organ Donation-E7
Penal Code-F29
Penetrating Head Injuries-E35
Penetration-D11, D12
Personal Identification-A74, G3
Persuasive Strategies-I2
Pharmacogenetics-W14
Pharmacogenomics-B71, W14
Pharmacology-B81, K34
Pharmacophore-W05
Phase Mapping-B67
Phenibut-K49
Phenotype-B40
Phenotypic Characteristicst-I16
Phenotypic SNPs-B71
Philippines-A5
KEY WORD INDEX

Postmortem Imaging-H64
Postmortem Interval-A68, A90, A91, A122, A123, A140, E44, E93, H25, H49, H52, H59, H81, H82, H84, K9
Postmortem Microbiome-H57
Postmortem Redistribution-K48
Potassium-K9
Power Tools-H103
Practice-B5
Predictive Modeling-E96
Prescription Drugs-K43
Prescription Medications-J11
Preservation-B152
Preservative-K32
Pressure Cycling-B13
Presumptive Drug Testing-B26
Priests-I13
Primary-G41
Primary Tooth-LW4
Primer Residue-B192
Principles-B82
Private Security-E9
PRNU-C14, C16
Probabilistic Genotyping-B31, W13
Probe Capture-B73
Process Improvement-W17
Professionalism-A85
Professionalization-A71
Proficiency Testing Programs-J14
Profilometry-B98
Program Overview-C3
Progress-I9
Propositions-F35
Prosecution-D31
Prostate-H138
Protein Adducts-K6
Protein Extraction-E87
Protein Sequencing-B145
Proteobacteria-H58
Proteomics-A134, B14, B15, B57, B77, E87, H13
Provenance-A152
Pseudozeurue-H74
Psychiatric Assessment-I27
Psychiatric Evaluation-I26
Psychiatric Treatment-I38
Psychological-E94
Psychological Autopsy-I10
Psychology-F32
Psychopathy-I11, I16, I17, I19
Psychosomatics-I31

Pubic Bones-A2
Pubic Symphysis-A4
Pubic Symphysis Asymmetry-A26
Public Sequence Databases-B144
Pulmonary-E40
Pulmonary Embolism-H109
Pulmonary Thrombembolism-H64
Pulp-G27
Pulp/Tooth Volume-G28
Pupils-G32
Putrefaction-K43
Py-GC/MS-B91
Pyrosequencing-B122

Q

QA-B137
QPCR-B106
QTOF-K49
Qualifications-A85
Quality-W01
Quality Assurance-A70, B85
Quality Management-B166
Quantification-F20
Quantifier® Trio-H20
Quantitation-B115
Quantitative-B89
QuECHERS-K10
Questioned Documents-J1, J5, J9, J16
Quicksheets-G24

R

Race-B39
Racial Trauma-I28
Radiation Safety-G35
Radiation Technique-G35
Radiodensity-H62
Radiographs-A2, A58, G43
Radiography-H16
Raman-J17
Raman Spectroscopy-E18, E20, E23, E84, W04
Ransomware-C18
Rapid DNA-B109
Rare Clinical Entity-H39
RCM-D8
Real Data Corpus-C12
Real-Time PCR-B46, B114
Real-Time Surveillance-H124
Reasoning-B164
Recent Cannabis Use Markers-K30
Recovery-A138, E105
Reference Calculator-H105
Refractory Asthma-H79
Registers-E78
Rehabilitation-E86
Reliability-S1
Reliability and Validity-G25
Repeatability-E58
Reproducibility-E58
Research-A83, B84, C12, E1, S2
Research Database-E33
Residential HVAC DNA-E22
Respiratory Failure-H134
Restraints-D27
Retinal Hemorrhage-H75, W15
Retrograde Extrapolation-K12
Retrospective Validation-K38
Reverse Transcription LAMP-B113
RFID-H83
Rhabdomyolysis-H7
Rib Histomorphometry-A18
Ricochet-B99
R.I.P.®-H104
Risk Assessment-I23
RNA-H138
RNA Degradation-B174
RNA Quantitation-B174
Road Traffic Crashes-K1
Robotic Writing-J9
ROC Analysis-B128
Root-G27
Root Transparency-G2
Rubber Buckshot-B136
Rubber (Hand) Stamps-J4

S

SAEK-B179
SALgAE®-B3
Saliva-B3
Saliva Identification-B113
Sample Age-B174
Sample Preparation-K4
Sampling Methods-H107
Sampling Strategy-B147
SANEs-E67
<table>
<thead>
<tr>
<th>Key Word</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santa Clara County, CA</td>
<td>E100</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>G29</td>
</tr>
<tr>
<td>Scalp Lacerations</td>
<td>H48</td>
</tr>
<tr>
<td>Scanning Electron Microscope</td>
<td>H112</td>
</tr>
<tr>
<td>Scanning Electron Microscopy</td>
<td>A9, B131</td>
</tr>
<tr>
<td>Scapula</td>
<td>A5</td>
</tr>
<tr>
<td>Scars of Parturition</td>
<td>A16</td>
</tr>
<tr>
<td>Scene Documentation</td>
<td>A101</td>
</tr>
<tr>
<td>Scheduling</td>
<td>F24</td>
</tr>
<tr>
<td>Science</td>
<td>F6</td>
</tr>
<tr>
<td>Scientific Formula</td>
<td>K29</td>
</tr>
<tr>
<td>Scientific Foundation</td>
<td>F9</td>
</tr>
<tr>
<td>Scientific Investigation</td>
<td>F18</td>
</tr>
<tr>
<td>Scientific Validity</td>
<td>F8</td>
</tr>
<tr>
<td>Score-Based Likelihood Ratio</td>
<td>E58</td>
</tr>
<tr>
<td>SCRAM®</td>
<td>F22</td>
</tr>
<tr>
<td>Screening</td>
<td>B185</td>
</tr>
<tr>
<td>Seat Belt Sign</td>
<td>D14</td>
</tr>
<tr>
<td>Secondary DNA Transfer</td>
<td>B120</td>
</tr>
<tr>
<td>Security</td>
<td>J19, W06</td>
</tr>
<tr>
<td>Security Features</td>
<td>J1</td>
</tr>
<tr>
<td>Seepage Bog</td>
<td>A88</td>
</tr>
<tr>
<td>Seized Drug</td>
<td>B157</td>
</tr>
<tr>
<td>Seized Drug Analysis</td>
<td>B17</td>
</tr>
<tr>
<td>Self-Cutting</td>
<td>I4</td>
</tr>
<tr>
<td>Self-Harm</td>
<td>I4</td>
</tr>
<tr>
<td>Selfie</td>
<td>G10</td>
</tr>
<tr>
<td>SEM/EDS</td>
<td>B67, B89, B196</td>
</tr>
<tr>
<td>Semen</td>
<td>B56, B78</td>
</tr>
<tr>
<td>Semen Identification</td>
<td>B42</td>
</tr>
<tr>
<td>Seminal Fluid</td>
<td>B48</td>
</tr>
<tr>
<td>Semi-Quantitation</td>
<td>K38</td>
</tr>
<tr>
<td>Semi-Volatile Organic Compound</td>
<td>B172</td>
</tr>
<tr>
<td>Seriological</td>
<td>B9</td>
</tr>
<tr>
<td>Serology</td>
<td>B77, B78, B118, B178, E21</td>
</tr>
<tr>
<td>SERS-B56</td>
<td>B78, B118, K2</td>
</tr>
<tr>
<td>Sex Assessment</td>
<td>A40</td>
</tr>
<tr>
<td>Sex Determination</td>
<td>A37</td>
</tr>
<tr>
<td>Sex Estimation</td>
<td>A6, A11, A36, A39, A54, A56, A111, A134, A144</td>
</tr>
<tr>
<td>Sex Offender</td>
<td>I8</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>E4, I6</td>
</tr>
<tr>
<td>Sexual Assault</td>
<td>E65, E67, W22</td>
</tr>
<tr>
<td>Sexual Assault Investigation</td>
<td>B175</td>
</tr>
<tr>
<td>Sexual Assault Kit</td>
<td>E65</td>
</tr>
<tr>
<td>Sexual Assault Kits</td>
<td>B58</td>
</tr>
<tr>
<td>Sexual Assault Samples</td>
<td>B8</td>
</tr>
<tr>
<td>Sexual Crime</td>
<td>B48</td>
</tr>
<tr>
<td>Sexual Crimes</td>
<td>I3</td>
</tr>
<tr>
<td>Sexual Lubricants</td>
<td>B60</td>
</tr>
<tr>
<td>Sexual Offender</td>
<td>W02</td>
</tr>
<tr>
<td>Sexual Offenders</td>
<td>I7</td>
</tr>
<tr>
<td>Sexual Reoffenses</td>
<td>I8</td>
</tr>
<tr>
<td>Sexually Violent Predators</td>
<td>I7, I22</td>
</tr>
<tr>
<td>Sharp Force Injury</td>
<td>H136</td>
</tr>
<tr>
<td>Sharp Force Trauma</td>
<td>A29</td>
</tr>
<tr>
<td>Sharpness</td>
<td>D11, D12</td>
</tr>
<tr>
<td>Shed Hairs</td>
<td>B6</td>
</tr>
<tr>
<td>Shooting Reconstruction</td>
<td>B130</td>
</tr>
<tr>
<td>Shootings</td>
<td>C10, E73</td>
</tr>
<tr>
<td>Short Tandem Repeats</td>
<td>B2</td>
</tr>
<tr>
<td>Short-Term Burial</td>
<td>A108</td>
</tr>
<tr>
<td>Shotgun Cartridges</td>
<td>B125</td>
</tr>
<tr>
<td>Shotgun Deaths</td>
<td>E37</td>
</tr>
<tr>
<td>Siblings</td>
<td>B35</td>
</tr>
<tr>
<td>Sibship Testing</td>
<td>B35</td>
</tr>
<tr>
<td>Sickle Cell Trait</td>
<td>H7</td>
</tr>
<tr>
<td>Signatures</td>
<td>J11</td>
</tr>
<tr>
<td>Sildenafil</td>
<td>H98</td>
</tr>
<tr>
<td>Silver Nanoparticles</td>
<td>B56</td>
</tr>
<tr>
<td>Silver-Staining</td>
<td>G11</td>
</tr>
<tr>
<td>Single Camera</td>
<td>D1</td>
</tr>
<tr>
<td>Single Nucleotide Polymorphism</td>
<td>I15</td>
</tr>
<tr>
<td>Site-Specific EmF</td>
<td>C33</td>
</tr>
<tr>
<td>Six Sigma</td>
<td>W17</td>
</tr>
<tr>
<td>Size Variation</td>
<td>E60</td>
</tr>
<tr>
<td>Skeletal Atlas</td>
<td>A119</td>
</tr>
<tr>
<td>Skeletal Degeneration</td>
<td>A72</td>
</tr>
<tr>
<td>Skeletal Histology</td>
<td>A15, A24, A69</td>
</tr>
<tr>
<td>Skeletal Measurements</td>
<td>A110</td>
</tr>
<tr>
<td>Skeletal Preservation</td>
<td>A89</td>
</tr>
<tr>
<td>Skeletal Quantification</td>
<td>A102</td>
</tr>
<tr>
<td>Skeletal Remains</td>
<td>A84, A108, A138</td>
</tr>
<tr>
<td>Skeletal Stress</td>
<td>A23</td>
</tr>
<tr>
<td>Skeletal Trauma</td>
<td>A9, A104</td>
</tr>
<tr>
<td>Skeletomed Remains</td>
<td>H85</td>
</tr>
<tr>
<td>Skimmer</td>
<td>C22</td>
</tr>
<tr>
<td>Skull Bones</td>
<td>E32</td>
</tr>
<tr>
<td>Skull Fracture</td>
<td>D21</td>
</tr>
<tr>
<td>Skydiving</td>
<td>H133</td>
</tr>
<tr>
<td>Smart Devices</td>
<td>C28</td>
</tr>
<tr>
<td>Smart Home</td>
<td>C28</td>
</tr>
<tr>
<td>Smartphone</td>
<td>W15</td>
</tr>
<tr>
<td>Smokeless Powder</td>
<td>B123</td>
</tr>
<tr>
<td>Smokeless Powders</td>
<td>B167</td>
</tr>
<tr>
<td>Smuggling</td>
<td>I32</td>
</tr>
<tr>
<td>Snapchat®</td>
<td>C21</td>
</tr>
<tr>
<td>SNP Typing</td>
<td>B41</td>
</tr>
<tr>
<td>Soaking Method</td>
<td>B54</td>
</tr>
<tr>
<td>Social Media</td>
<td>B83</td>
</tr>
<tr>
<td>Social Networks</td>
<td>C13</td>
</tr>
<tr>
<td>Soil Bacterial Profiling</td>
<td>H51</td>
</tr>
<tr>
<td>Soil Identification</td>
<td>H55</td>
</tr>
<tr>
<td>Soil Organic Matters</td>
<td>E92</td>
</tr>
<tr>
<td>Solids</td>
<td>B88</td>
</tr>
<tr>
<td>Solid Phase Microextraction</td>
<td>B19, B68, B170, E90</td>
</tr>
<tr>
<td>Solitary Confinement</td>
<td>F30</td>
</tr>
<tr>
<td>Solventless</td>
<td>B187</td>
</tr>
<tr>
<td>Soundscape</td>
<td>C33</td>
</tr>
<tr>
<td>Source Camera Comparison</td>
<td>C16</td>
</tr>
<tr>
<td>Spatial Analysis</td>
<td>A96</td>
</tr>
<tr>
<td>Species Identification</td>
<td>B142, E28</td>
</tr>
<tr>
<td>Sperm</td>
<td>B7</td>
</tr>
<tr>
<td>Splash</td>
<td>H89</td>
</tr>
<tr>
<td>SPME-GC/MS</td>
<td>B24, E83</td>
</tr>
<tr>
<td>Sport Helmets</td>
<td>D22</td>
</tr>
<tr>
<td>Stabbing</td>
<td>E34</td>
</tr>
<tr>
<td>Stable Isotope Analysis</td>
<td>A154</td>
</tr>
<tr>
<td>Stable Isotopes</td>
<td>A96, A148</td>
</tr>
<tr>
<td>Staged Domestic Homicide</td>
<td>E66</td>
</tr>
<tr>
<td>Staged Homicide</td>
<td>A100</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>G24</td>
</tr>
<tr>
<td>Standard of Care</td>
<td>G19</td>
</tr>
<tr>
<td>Standard Reference Material</td>
<td>B134</td>
</tr>
<tr>
<td>Standardization</td>
<td>A3</td>
</tr>
<tr>
<td>State Medical Examiner</td>
<td>H68</td>
</tr>
<tr>
<td>Stattherin (STATH)</td>
<td>B113</td>
</tr>
<tr>
<td>Statistical Analysis</td>
<td>G25</td>
</tr>
<tr>
<td>Statistics</td>
<td>B39, B96, B121, D29, J12, J17</td>
</tr>
<tr>
<td>Stature</td>
<td>A12</td>
</tr>
<tr>
<td>Stature Determination</td>
<td>A110</td>
</tr>
<tr>
<td>Stature Estimation</td>
<td>A17, A52</td>
</tr>
<tr>
<td>Steering Failure</td>
<td>D6</td>
</tr>
<tr>
<td>Storing Methods</td>
<td>H107</td>
</tr>
<tr>
<td>STR-B11</td>
<td>B141</td>
</tr>
<tr>
<td>STR Analysis</td>
<td>B4</td>
</tr>
<tr>
<td>STR Genotyping</td>
<td>B58</td>
</tr>
<tr>
<td>STR Typing</td>
<td>B49</td>
</tr>
<tr>
<td>STRs-B106</td>
<td>B143</td>
</tr>
<tr>
<td>Strangulation</td>
<td>E42, H116, H131</td>
</tr>
<tr>
<td>Stratigraphy</td>
<td>A7, F29</td>
</tr>
<tr>
<td>Stress</td>
<td>I14</td>
</tr>
<tr>
<td>String Search</td>
<td>C6</td>
</tr>
<tr>
<td>Strychnine</td>
<td>K44</td>
</tr>
<tr>
<td>SUAS-C26</td>
<td></td>
</tr>
<tr>
<td>SUBADULTS</td>
<td>G31</td>
</tr>
<tr>
<td>Subcapsular Hematoma</td>
<td>H33</td>
</tr>
<tr>
<td>Subdural Hematoma</td>
<td>H75</td>
</tr>
<tr>
<td>Subjective</td>
<td>E56</td>
</tr>
<tr>
<td>Submachine Gun</td>
<td>H129</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>A109</td>
</tr>
<tr>
<td>Sudden Cardiac Death</td>
<td>W23</td>
</tr>
<tr>
<td>Key Word</td>
<td>Index</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
</tr>
<tr>
<td>Sudden Death</td>
<td>H12, H14, H32, H35, H97, H98, H109, K21</td>
</tr>
<tr>
<td>Sudden Unexpected Infant Death</td>
<td>H38</td>
</tr>
<tr>
<td>SUDEP</td>
<td>H35</td>
</tr>
<tr>
<td>Suicidal Behaviors</td>
<td>I4</td>
</tr>
<tr>
<td>Suicide</td>
<td>E46, E102, H6, H9, H94, H133</td>
</tr>
<tr>
<td>Suicide Prevention</td>
<td>I29</td>
</tr>
<tr>
<td>Suicides</td>
<td>B194</td>
</tr>
<tr>
<td>SUID</td>
<td>E6</td>
</tr>
<tr>
<td>Suitcase Concealment</td>
<td>H49</td>
</tr>
<tr>
<td>Surface Coating</td>
<td>D30</td>
</tr>
<tr>
<td>Surface Scans</td>
<td>A4</td>
</tr>
<tr>
<td>Surveillance Video</td>
<td>W16</td>
</tr>
<tr>
<td>Survey</td>
<td>A22</td>
</tr>
<tr>
<td>Suspicious Activity Detection</td>
<td>C11</td>
</tr>
<tr>
<td>Suture</td>
<td>E40</td>
</tr>
<tr>
<td>Swab</td>
<td>B147</td>
</tr>
<tr>
<td>Swabs</td>
<td>K19</td>
</tr>
<tr>
<td>Sweat</td>
<td>B76</td>
</tr>
<tr>
<td>Swelling</td>
<td>E30</td>
</tr>
<tr>
<td>SWGDAM Guideline</td>
<td>B29</td>
</tr>
<tr>
<td>SWGD</td>
<td>C4</td>
</tr>
<tr>
<td>SWGDRCUG</td>
<td>B184</td>
</tr>
<tr>
<td>Synchrotron</td>
<td>B88</td>
</tr>
<tr>
<td>Synthetic Cannabinoid</td>
<td>K31</td>
</tr>
<tr>
<td>Synthetic Cannabinoids</td>
<td>K2, K38</td>
</tr>
<tr>
<td>Synthetic Cathinones</td>
<td>K48</td>
</tr>
<tr>
<td>Synthetic Opioids</td>
<td>B81, K14</td>
</tr>
<tr>
<td>Synthetic Phenethylamines</td>
<td>B25</td>
</tr>
<tr>
<td>Syringe</td>
<td>B23</td>
</tr>
<tr>
<td>Systemic Hypothermia</td>
<td>H119</td>
</tr>
<tr>
<td>Tablet Analysis</td>
<td>B16</td>
</tr>
<tr>
<td>Takayasu Arteritis</td>
<td>H14</td>
</tr>
<tr>
<td>Tampering</td>
<td>J3</td>
</tr>
<tr>
<td>Tape Collection</td>
<td>B64</td>
</tr>
<tr>
<td>Tarawa</td>
<td>A50</td>
</tr>
<tr>
<td>Tardive Dyskinesia</td>
<td>I25</td>
</tr>
<tr>
<td>Targeted and Unknown Toxicants</td>
<td>K8</td>
</tr>
<tr>
<td>Tattoo Inks</td>
<td>E101</td>
</tr>
<tr>
<td>TAU</td>
<td>D7</td>
</tr>
<tr>
<td>TDMR</td>
<td>B79</td>
</tr>
<tr>
<td>TDP/DART®-MS</td>
<td>B65</td>
</tr>
<tr>
<td>Teaching Strategies</td>
<td>W08</td>
</tr>
<tr>
<td>Technique Development</td>
<td>LW3</td>
</tr>
<tr>
<td>Ted Bundy</td>
<td>I17</td>
</tr>
<tr>
<td>Teenager</td>
<td>H22</td>
</tr>
<tr>
<td>Television</td>
<td>BS2</td>
</tr>
<tr>
<td>Terminal Velocity</td>
<td>D30</td>
</tr>
<tr>
<td>Terrorist Attack</td>
<td>G42</td>
</tr>
<tr>
<td>Test Impressions</td>
<td>E60</td>
</tr>
<tr>
<td>Testicle</td>
<td>H24</td>
</tr>
<tr>
<td>Testimony</td>
<td>F27</td>
</tr>
<tr>
<td>Testing</td>
<td>D10</td>
</tr>
<tr>
<td>Tetranucleotide</td>
<td>B141</td>
</tr>
<tr>
<td>Thanatology</td>
<td>H70</td>
</tr>
<tr>
<td>Thanatodemography</td>
<td>H56</td>
</tr>
<tr>
<td>Thanatotranscriptome</td>
<td>H138</td>
</tr>
<tr>
<td>THC</td>
<td>H126</td>
</tr>
<tr>
<td>The Balkans</td>
<td>A151</td>
</tr>
<tr>
<td>Theft of Scientific Records</td>
<td>D25</td>
</tr>
<tr>
<td>Therapeutic Complication</td>
<td>H5</td>
</tr>
<tr>
<td>Thermal Alteration</td>
<td>A139</td>
</tr>
<tr>
<td>Thermal Fractures</td>
<td>H41</td>
</tr>
<tr>
<td>Thermal-Gravimetry</td>
<td>J15</td>
</tr>
<tr>
<td>Third Molars</td>
<td>G30</td>
</tr>
<tr>
<td>Threshold of Identification</td>
<td>B124</td>
</tr>
<tr>
<td>Thromboembolism</td>
<td>H31</td>
</tr>
<tr>
<td>Thymic Neoplasm</td>
<td>H97</td>
</tr>
<tr>
<td>Time of Colonization</td>
<td>A90</td>
</tr>
<tr>
<td>Time Since Death</td>
<td>A127</td>
</tr>
<tr>
<td>Tire Marks</td>
<td>D6</td>
</tr>
<tr>
<td>Tire Treatments</td>
<td>B170</td>
</tr>
<tr>
<td>Tissue Regeneration</td>
<td>A32</td>
</tr>
<tr>
<td>Tobacco Smoking</td>
<td>B122</td>
</tr>
<tr>
<td>Toner</td>
<td>J16</td>
</tr>
<tr>
<td>Tool Mark</td>
<td>B98</td>
</tr>
<tr>
<td>Tool Testing</td>
<td>C6, C7</td>
</tr>
<tr>
<td>Tools</td>
<td>W12</td>
</tr>
<tr>
<td>Tooth Cementum Analysis</td>
<td>G11</td>
</tr>
<tr>
<td>Tor</td>
<td>C23, C24</td>
</tr>
<tr>
<td>Total Body Score</td>
<td>A86, A90</td>
</tr>
<tr>
<td>Touch DNA</td>
<td>B28, B54, B73, B104, B119, B145, B148, E22</td>
</tr>
<tr>
<td>Toxicity</td>
<td>B157, H95</td>
</tr>
<tr>
<td>Toxicological Analysis</td>
<td>K7</td>
</tr>
<tr>
<td>Toxicological Examinations</td>
<td>E51</td>
</tr>
<tr>
<td>Toxicology</td>
<td>H86, H124, K54, W14</td>
</tr>
<tr>
<td>Trace DNA</td>
<td>B120, B180</td>
</tr>
<tr>
<td>Trace Elements</td>
<td>A47, B159</td>
</tr>
<tr>
<td>Trace Evidence</td>
<td>B64, B69, B86, B87, W04</td>
</tr>
<tr>
<td>Trace Isotope Ratios</td>
<td>A150</td>
</tr>
<tr>
<td>Tracing</td>
<td>J2</td>
</tr>
<tr>
<td>Traffic Accident</td>
<td>E63</td>
</tr>
<tr>
<td>Traffic Death</td>
<td>H121</td>
</tr>
<tr>
<td>Training</td>
<td>E16, E104, J7</td>
</tr>
<tr>
<td>Training Programs</td>
<td>B166</td>
</tr>
<tr>
<td>Transdermal Alcohol</td>
<td>F22</td>
</tr>
<tr>
<td>Transfer DNA</td>
<td>B181</td>
</tr>
<tr>
<td>Transformation</td>
<td>K15</td>
</tr>
<tr>
<td>Transgender</td>
<td>H136</td>
</tr>
<tr>
<td>Transient Deaths</td>
<td>E100</td>
</tr>
<tr>
<td>Translocation</td>
<td>A142</td>
</tr>
<tr>
<td>Transparency</td>
<td>F35</td>
</tr>
<tr>
<td>Transplant</td>
<td>H83</td>
</tr>
<tr>
<td>Trauma</td>
<td>A32, E71, H73, H87, H90, H135</td>
</tr>
<tr>
<td>Trauma Analysis</td>
<td>A28, A30, A33, A34, A35, A141</td>
</tr>
<tr>
<td>Traumatic Brain Injury</td>
<td>H76, I25</td>
</tr>
<tr>
<td>Travel History</td>
<td>A148</td>
</tr>
<tr>
<td>Triacetonitrile (TATP)</td>
<td>E90</td>
</tr>
<tr>
<td>Trial</td>
<td>F27</td>
</tr>
<tr>
<td>Trial Tactics</td>
<td>F13</td>
</tr>
<tr>
<td>Trihybrid Ancestry</td>
<td>A52</td>
</tr>
<tr>
<td>Trocars</td>
<td>H104</td>
</tr>
<tr>
<td>Tryptase</td>
<td>H43</td>
</tr>
<tr>
<td>Tsunami</td>
<td>H40</td>
</tr>
<tr>
<td>Turkey</td>
<td>E48, G22</td>
</tr>
<tr>
<td>Tusk Injury</td>
<td>H90</td>
</tr>
<tr>
<td>Twins</td>
<td>G37</td>
</tr>
<tr>
<td>Twitter®</td>
<td>C13</td>
</tr>
<tr>
<td>U</td>
<td></td>
</tr>
<tr>
<td>U-47700</td>
<td>K14</td>
</tr>
<tr>
<td>UHPLC-MS</td>
<td>B63</td>
</tr>
<tr>
<td>UHPLC-TOF/MS</td>
<td>B190</td>
</tr>
<tr>
<td>Unaccompanied Minors</td>
<td>G1</td>
</tr>
<tr>
<td>Under the Influence</td>
<td>F21</td>
</tr>
<tr>
<td>Undergraduate Education</td>
<td>E77</td>
</tr>
<tr>
<td>Undocumented Border Crosser</td>
<td>A154</td>
</tr>
<tr>
<td>Undocumented Border Crossers</td>
<td>A95</td>
</tr>
<tr>
<td>Unexpected Complication</td>
<td>H33</td>
</tr>
<tr>
<td>Unexpected Death</td>
<td>H31, H96</td>
</tr>
<tr>
<td>Unidentified Human Remains</td>
<td>E82</td>
</tr>
<tr>
<td>Unidentified Persons</td>
<td>A107</td>
</tr>
<tr>
<td>Unidentified Remains</td>
<td>G9, H72</td>
</tr>
<tr>
<td>Unique</td>
<td>E74</td>
</tr>
<tr>
<td>United States-Mexico Border</td>
<td>A92</td>
</tr>
<tr>
<td>Universal Swab</td>
<td>E88</td>
</tr>
<tr>
<td>Unknown DNA Trace Evidence</td>
<td>B38</td>
</tr>
<tr>
<td>Unrestored Dentition</td>
<td>G43</td>
</tr>
<tr>
<td>Unsubmitted Sexual Assault Kit</td>
<td>E65</td>
</tr>
<tr>
<td>Upper Facial Breadth</td>
<td>A120</td>
</tr>
<tr>
<td>UPS Systems</td>
<td>D32</td>
</tr>
<tr>
<td>Urine</td>
<td>K32</td>
</tr>
<tr>
<td>Utility Trailer Towing</td>
<td>D9</td>
</tr>
<tr>
<td>UV and IR</td>
<td>W03</td>
</tr>
</tbody>
</table>
### KEY WORD INDEX

#### V
- Vacuum Phenomenon-H108
- Vaginal Bacteria-B175
- Validation-A70, A78, B9, B137, F9
- Validity-F6
- Vapor Pressure-B186
- Variability-B62
- Variation-J4
- Vehicle Crashworthiness-D19
- Vehicle Forensics-C27
- Vehicle Occupant Ejection-D15, D19
- Vehicle System Forensics-D16
- Vehicle Testing-D9
- Velocity-J10
- Ventilation-D5
- Verification-B95
- Vertebrae-A124
- Vertebrate DNA-H91
- Very Small Particles-B87
- Veterans-E46
- Veterinary Forensic Science-W10
- Victims-F11
- Video-C5
- Video Analysis-C10
- Videoconferencing-H70
- Video Dataset-C11
- Video Games-H34
- Video Spectral Comparator-J19
- Video Surveillance-D33, E53
- Violation of Peer Review-D25
- Violence-I12, I23, W18
- Violence Against Women-F11
- Violent Death-H78
- Virtopsy-H61, H108
- Virtual 3D Rendering-H66
- Virtual Crime Scene-C30
- Visibility-G27
- Visual Analysis-E64
- Vitality Evaluation-H112
- Vitreous Potassium-H84
- VOCs-E38
- Volatile Organic Compounds-B68, H80
- VSC-J3, J18
- Vulture Scavenging-A99

#### W
- Walker Method-A6, A36
- War Dead-A110
- Warfare-A151
- Wastewater-K53
- Water Damage-C32
- Waterlogged Bone-A87
- Wellness-I29
- WhatsApp-C16
- White-Tailed Deer-E27
- Wildlife Forensics-B142, E24, E25, E26, E27, E28, E29
- Wildlife Trafficking-E29
- Women-I22
- Wound Ballistics-E35
- Wrongful Conviction-B183, G15, G16
- Wrongful Convictions-W19
- WWII-E45

#### X
- X-Chromosome-B111
- X-Ray-H16
- X-Ray Diffraction-B92
- X-Ray Fluorescence-A47
- XRF-B90, B125
- XX Scale-E81

#### Y
- YFSF-BS4, S2
- Y-Haplotypes-B29
- Young Adult-H94
- Youth Street Gangs-E70
- Y-Screening-B8

#### Z
- Z-Hypnotica-K11
- Zonation Method-A48
- Zoophilia-W02
The presenting author index can provide a quick reference to find when and in what section presenting authors are scheduled to present at the 2018 Annual Scientific Meeting. The reference table below assists you in finding the 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>A</th>
<th>Anthropology</th>
<th>J</th>
<th>Questioned Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abonamah, Jocelyn V.</td>
<td>Alsudairi, Mara M.</td>
<td>-</td>
<td>G29</td>
</tr>
<tr>
<td>Adams, Amanda L.J.</td>
<td>Ames, Colton L.</td>
<td>-</td>
<td>B141</td>
</tr>
<tr>
<td>Adams, Bradley J.</td>
<td>Ammer, Saskia</td>
<td>-</td>
<td>A39</td>
</tr>
<tr>
<td>Adams, Donovan M.</td>
<td>Anderson, Gail S.</td>
<td>-</td>
<td>S2</td>
</tr>
<tr>
<td>Adams, Wendy R.</td>
<td>Anderson, Robert L.</td>
<td>-</td>
<td>D9</td>
</tr>
<tr>
<td>Adelman, Jonathan</td>
<td>Anderson, Sara R.</td>
<td>-</td>
<td>E57</td>
</tr>
<tr>
<td>Afsin, Huseyin</td>
<td>Andersson, Jacob Johannes</td>
<td>-</td>
<td>E63</td>
</tr>
<tr>
<td>Agan, Cortnee J.</td>
<td>Andrade, Ana B.</td>
<td>-</td>
<td>K16</td>
</tr>
<tr>
<td>Agustines, Davin</td>
<td>Andras, Natalie L.</td>
<td>-</td>
<td>A11</td>
</tr>
<tr>
<td>Ahn, Janice S.</td>
<td>Andronowski, Janna M.</td>
<td>-</td>
<td>A67</td>
</tr>
<tr>
<td>Ainger, Timothy J.</td>
<td>Angi, Carolyn</td>
<td>-</td>
<td>B190</td>
</tr>
<tr>
<td>Akiyama, Cliff</td>
<td>Appel, Nicolette S.</td>
<td>-</td>
<td>A109</td>
</tr>
<tr>
<td>Akmeenana, Anuradha</td>
<td>Aquila, Isabella</td>
<td>-</td>
<td>C30, E41, H8, H9, H10, H11, H12, H13, H14, H43, H45, I18, K21</td>
</tr>
<tr>
<td>Albanese, John</td>
<td>Artigiani, Erin</td>
<td>-</td>
<td>W20</td>
</tr>
<tr>
<td>Al Mehmood, Saqib Sultan</td>
<td>Aschheim, Kenneth W.</td>
<td>-</td>
<td>E106, G7, G8</td>
</tr>
<tr>
<td>Alban, Giuseppe Davide</td>
<td>Ashiq, Muhammad</td>
<td>-</td>
<td>Irfan J1</td>
</tr>
<tr>
<td>Albasam, Ahmed</td>
<td>Atmosy, Sevil</td>
<td>-</td>
<td>E48</td>
</tr>
<tr>
<td>Alejandro, Lauren</td>
<td>Atherton, Daniel</td>
<td>-</td>
<td>K44</td>
</tr>
<tr>
<td>Aleksander, Adam</td>
<td>Aubry, Marie Christine</td>
<td>-</td>
<td>W23</td>
</tr>
<tr>
<td>Alfieri, Letizia</td>
<td>Avedschmidt, Sarah E.</td>
<td>-</td>
<td>H95</td>
</tr>
<tr>
<td>Alford, David</td>
<td>Azevedo, Amareta J.</td>
<td>-</td>
<td>A133</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B</th>
<th>Criminalistics</th>
<th>K</th>
<th>Toxicology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barayan, Mohammed A.</td>
<td>Baret, Jonathan</td>
<td>-</td>
<td>W11</td>
</tr>
<tr>
<td>Baeck, Seung Kyung</td>
<td>Barta, Robert E.</td>
<td>-</td>
<td>G18</td>
</tr>
<tr>
<td>Baigent, Christiane</td>
<td>Bartelmie, Eric</td>
<td>-</td>
<td>J1 S2</td>
</tr>
<tr>
<td>Baker, Andrew M.</td>
<td>Bartick, Edward G.</td>
<td>-</td>
<td>B48</td>
</tr>
<tr>
<td>Baker, Christine H.</td>
<td>Basiliere, Stephanie</td>
<td>-</td>
<td>K13</td>
</tr>
<tr>
<td>Baker, Michelle M.</td>
<td>Batalis, Nicholas I</td>
<td>-</td>
<td>E7</td>
</tr>
<tr>
<td>Baldaino, JenaMarie</td>
<td>Bauer, David W.</td>
<td>-</td>
<td>B139</td>
</tr>
<tr>
<td>Baldizichar, Raman</td>
<td>Baumgarten, Brooke</td>
<td>-</td>
<td>B60</td>
</tr>
<tr>
<td>Bankston, Sarah</td>
<td>Baumgarten, Sarah</td>
<td>-</td>
<td>A66</td>
</tr>
<tr>
<td>Bangs, Rachel B.</td>
<td>Benbow, M.</td>
<td>-</td>
<td>Eric H58</td>
</tr>
<tr>
<td>Banse, M.</td>
<td>Bencheikh, Aïda</td>
<td>-</td>
<td>G12, G13, G42</td>
</tr>
<tr>
<td>Basilio, John</td>
<td>Bennett, Dyer</td>
<td>-</td>
<td>W03</td>
</tr>
<tr>
<td>Bax, John</td>
<td>Berber, Güzide Sara</td>
<td>-</td>
<td>F11</td>
</tr>
<tr>
<td>Bhatt, Jonathan</td>
<td>Berg, Angela</td>
<td>-</td>
<td>H36</td>
</tr>
<tr>
<td>Bevis, Yolanda</td>
<td>Berketa, John</td>
<td>-</td>
<td>W11</td>
</tr>
<tr>
<td>Berven, Beth</td>
<td>Bermudez, Brianna B</td>
<td>-</td>
<td>S2</td>
</tr>
<tr>
<td>Bertozzi, Giuseppe</td>
<td>Bhatt, Zarina</td>
<td>-</td>
<td>J3</td>
</tr>
<tr>
<td>Bettes, G.</td>
<td>Bhatta, Zamrad Usman</td>
<td>-</td>
<td>J2, J5</td>
</tr>
<tr>
<td>Beyer, Robert</td>
<td>Bierly, Jolene</td>
<td>-</td>
<td>K36</td>
</tr>
<tr>
<td>Bhaloo, Zain</td>
<td>Bilimoria, Farshaad</td>
<td>-</td>
<td>H4</td>
</tr>
<tr>
<td>Bhatt, Zulfi</td>
<td>Bintz, Brittan J</td>
<td>-</td>
<td>B56, B78, B118</td>
</tr>
<tr>
<td>Bittner, Casey</td>
<td>Blake, Brooke H</td>
<td>-</td>
<td>H111</td>
</tr>
<tr>
<td>Bless, Bethany L</td>
<td>Blessing, Melissa M</td>
<td>-</td>
<td>H76</td>
</tr>
<tr>
<td>Bloor, Rachel</td>
<td>Bolhofner, Katelyn</td>
<td>-</td>
<td>L119</td>
</tr>
<tr>
<td>Bond, Rachel M</td>
<td>Bonisignore, Alessandro</td>
<td>-</td>
<td>H32</td>
</tr>
<tr>
<td>Boone, Alice B</td>
<td>Borengasser, Marcus</td>
<td>-</td>
<td>D33, E53, W16</td>
</tr>
<tr>
<td>Borrelli, Matteo</td>
<td>Borrini, Matteo</td>
<td>-</td>
<td>A27, A46, A47, F29, LW6</td>
</tr>
</tbody>
</table>
Borzych, Brittany - E62
Botch-Jones, Sabra R. - BS5
Bowen, Andrew M. - W04
Boyd, Derek A. - C2
Boyd, Donna C. - A128
Brandt, Helen M. - A16
Branscome, Mason H. - A101
Brehmer, Jeremy C. - F23
Brenner, Charles H. - B29
Bresler, Scott - F7
Brill, Alan E. - W12
Brixen, Eddy B. - C33
Brocato, Emily - B55
Brocato, Joanie - W17
Brodeur, Amy N. - W08
Brokaw, Ryan P. - E74
Brookshire, Tracy A. - E99
Brosz, Helmut G. - D32
Brothers, Samuel I. - C20
Brown, Carrie A. - A48, A49
Brown, Catherine O. - B77
Brown II, Donald R. - I28
Brundage, Adrienne L. - W08
Brunelle, Erica K. - B76, E21, E55, E61
Bucheli, Sibyl R. - A132, H25
Budowle, Bruce - B147
Buffelli, Francesca - H33
Bugajski, Kristi - E98
Bugelli, Valentina - H107
Bullbul, Ozlem - B40
Bumgarner, Derek - H126
Burcham, Zachary M. - H59
Burkes, Ted M. - L2
Burnham-Curtis, Mary K. - E29
But, Alane E. - B77
Butt, Nasir A. - B139
Buzzini, Patrick - W04
Bybee, Alison - H34
Byström, Philip Vasin - H92

Campbell, Allison - S1
Campbell, Rebecca - W22
Campbell, Timothy - J6
Campobasso, Carlo P. - H107
Canty, Sarah E. - A27
Caple, Jodi M. - A77
Cardia, Luigi - K7
Cardona, Vanessa M. - B63
Cardoso, Hugo - A14, A126
Carew, Rachael M. - A1
Carfora, Anna - K1
Carlson, Jocelyn R. - W01
Carpenter, Kelsey A. - A56
Carreira, Robert Kalani - A21
Carroll, Marla E. - C4, C5
Carson, Henry J. - H122
Carter, David O. - W24
Cartozzo, Claire M. - A87
Casale, John F. - B81
Cassidy, Brandt G. - A10
Cassidy, Ellen M. - B50
Castellani, Rudy J. - H73, W09
Castellanos, Daniel - A51
Caster, Donald R. - F7
Cataldo-Ramirez, Chelsea C. - A10
Cavus, Oktay - E9
Centazzo, Nicole - K53
Chabaud, Kathryn R. - B123
Chang, Joseph P. - B70, B101
Chan-Hosokawa, Ayako - K30
Chany, Christopher P. - B131
Chatzaraki, Vasiliki - H108
Chen, Chris - I33
Chen, Heather L. - H6, H7
Chenevert, Jennett M. - K5
Chesna, Elizabeth - I15
Chien, Joseph - I5
Chin, Jennifer - W10
Choi, Hyo-Jin - B21, B125
Christensen, Alexander F. - A110
Christensen, Angi M. - A28
Chu, Elaine Y. - A115
Chuah, Wei Chean - B16
Chung, Fang-Chun - B42
Chung, Grace - G41
Chung, Hee-Sun - K8, K9
Ciavarella, Mauro A. - E37
Ciruzzo, Maria Susan - S2
Clemmons, Chauneseay - A75
Coberly, Samantha W. - A60
Coble, Michael D. - W13
Codding, George A. - W19
Cole, Mary E. - A24
Colella, Olivia K. - E81
Collins, Joanna L. - W22
Collins, Stacie - I31
Connor, Melissa A. - E97
Constantino, Audrey E. - A122
Cooley, Ashley M. - B41
Coppo, Elena - E3
Coric, Djana - B136
Corsi, Nicholas J. - K4
Cortes, Sarah - C23, C24
Cotton, Robin W. - F17
Cowan, Ashley F. - B46, B114
Cox, Jr., Billy S. - D17, D18
Cox, Maria L. - A89
Creager, Rachel - B178, E54
Creecy, James P. - E24
Cromartie, Rosa L. - B9
Crouse, Andrew N. - C20
Crowe, Nicole M. - A18
Crows, Kendall V. - H115
Cuchara, Breanna M. - E102
Curran, James M. - J17
Curti, Serena Maria - E2, E69, I6, I24
Curtis, Trevor E. - E101
C. Zapico, Sara - H82, W11

D

D'Errico, Stefano - H98, H99
Dadour, Ian - H53
Dalig, Kadri - E9
Damann, Franklin E. - W07
Damaso, Natalie - B6, B144
Danielson, Phillip - B77
Darnell, James - C22
Dautartas, Angela M. - E98
David, Thomas J. - L5
Davidson, J. Tyler - B62
Davies, Catriona M. - A71
Day, Justin - B187
De Alcaraz-Fossoul, Josep - S2
de Armas, Adriana M. - B189
DeBord, Joshua S. - B159
Decker, Summer J. - A144
De Forest, Peter R. - F18, F36
DeGael, Douglas - B192
de Jong, Joyce L. - W09

Cablk, Mary E. - E105, F34
Calabrese, Enrica - H114
Cale, Cynthia - B120
Callahan, Brandon - B81
Calle, Sergio - A59
PRESENTING AUTHOR INDEX

Delic, Selma - E80
DelTondo, Joseph A. - E40
Demchak, Emmy L. - B102
Deriu, Chiara - K2
De Tobel, Jannick - G30, G31
Dhabbah, Abdulrhman M. - E83
Diaz-Albertini, Lauren - A117
Diaz-Martin, Ruben Dario - E87
Dieng, Khalifa - G32
DiGangi, Elizabeth A. - A51
Di Luca, Alessandro - H66, H134
Dimsoski, Pero - B104
Di Nunzio, Aldo - H43, H44
Di Nunzio, Ciro - H12, H43, H44, H45
Di Nunzio, Michele - H45
Di Vella, Giancarlo - E1, E2, E69, G1, I6
Dixon, Tara - H119
Djidrovska, Daniela - J20
Dobrin, Lawrence A. - G8
Dodson, Leslie Ethan - I29
Downs, Steven L. - W03
Draft, Derek M. - G24
Dwyer, R. Gregg - I7, I22
Ebert, Lars - H61
Eckberg, Melanie - K35
Edgar, Heather J.H. - E33
Eijk, Erwin Van - W24
Eklund, Natasha K. - B133
Eliaisson, Angelique - E32
Elkins, Kelly M. - B46, B47, B114
Eller, Patrick A. - C3
Ellingham, Sarah - W11
Ellis IV, Ransom A. - H94
Emmons, Alexandra L. - A136
Engel, Felix - W07
Enslow, Sandra R. - E14
Errickson, David - A84
Evangelou, Elizabeth A. - A51
Evans, Amy - H135
Eyüp, Merve - E16
Falcone, Roger W. - S1
Farid, Armin A. - G21
Farrell, Amanda L. - E71
Fedoroff, J. Paul - I8
Felo, Joseph A. - W05
Ferrara, Lyndsie N. - B164
Ferreira, Pamela A. - H83
Fesolovich, Jillian C. - B143, B163
Figueroa, Alejandra - B10
Fikiet, Marisia A. - E20
Filoglu, Gonul - B111
Finlayson, Janet E. - A124
Finley, Sheree J. - H138
Fiorentin, Taís R. - B23, B157
Fitzpatrick, Colleen M. - E68, LW1, LW7
Fleischman, Julie M. - A70
Fliess, Barbara - H64
Flor-Stagnato, Kathleen - A19
Foley, Megan M. - B80
Foran, Jonathan M. - A144
Forger, Luisa - E44
Forrest, Alexander Robert W. - F5
Forrest, Alexander S. - G23
Fox, Lauren N. - K17
Fraga, Carlos - W24
Franck, Angelique - A37
Franck, Darren - D10
Franck, Harold - D10
Frank, Jr., Kelvin J. - E90
Frazier, Kimberly - E26
Freeman, Ellen M. - H121
Fried, Clare - B152
Frye, Alexandria - W07
Fuehr, Stephanie - A47
Fukuoka, Tatsuya - D2
Funk, Christine - E1
Funte, L.R. - H136
Furnari, Winnie - G36
Gabrielson, Ryan - E1
Gambier, Arsene - I26
Gardner, Brett - I34
Gardner, Taylor L. - G4, G5
Garofano, Paolo - B137
Garver, Adam M. - B45
Garvin, Heather M. - A111
Garza, Shelby - A129
Gascho, Dominic - H61
Gauthier, Quentin T. - B79
Gayzur, Nora - I30
George, Benetta A. - B180
Georgievskaya, Zhanna - H77
Geradts, Zeno J. - C14, C16, W24
Ghaedi, Kaveh Cyrus - I11, I17
Gibbes, Danielle K. - B58
Gill, James R. - H73
Gilliland, Richard A. - K6
Gimelli, Cinzia - I10
Girod-Frais, Aline - E17
Gisiche, Melissa - L2
Gitto, Lorenzo - H118
Glicksberg, Lindsay - K48, S2
Go, Matthew C. - A5
Gocha, Timothy P. - A93
Godet, Tony - I27
Goecker, Zachary Carl - B57
Goldberger, Bruce A. - B55
Goldstein, Justin - A23
Gonzalez, Samantha M. - A57
Gooding, Alice Fazlollah - A103
Goos, Alexis C. - A35
Gordon, Michelle K. - B107
Gorza, Ludovica - G43
Gottfried, Emily D. - I7, I22
Graham, Kari A. - B71
Graham, Michael A. - H73
Graham, Timothy J. - B33, B37
Grande, Abigail J. - H30, H120
Grant, Chandler Marie - K45
Grattagliano, Ignazio - I1, I12
Gratteri, Santo - C30, E41, H8, H10, H11, H12, H13, H14, I18, K21
PRESENTING AUTHOR INDEX

Green, Raquel - H26
Greer, Sean Y. - A66
Grigoras, Catalin - C9
Grise, Joy - E40
Grisedale, Kelly - B72
Groot, Rianne - A142
Grow, Kristen M. - A88
Grzymkowski, Julia - J50
Guerrieri, Richard A. - B100
Guido, Mark D. - C12
Gundel, Annemarie C. - E96
Gustafsson, Torfinn - H105, H106
Guyomarc'h, Pierre M.M. - A68, S2

H
Haddad, Sandra - W08
Hainsworth, Sarah V. - D11, D12
Hair, Mindy - B76, E55, E61
Halánek, Jan - B76, E21, E55, E61
Hale, Amanda R. - A131, S2
Hall, Ashley - B28
Hallman, David - D6
Hampikian, Greg - B183, S2
Hamp, Peter F. - G20
Hansen, Eric S. - E93
Harding, Brett E. - E94
Harrel, LeAnn M. - B2
Harries, Megan - B69
Harrison, Alyssa R. - A25
Harrison, William T. - H74
Harruff, Richard C. - K54
Hart, Alexandra M. - H132
Hart, Rebecca - B5
Hartley, Gabrielle A. - B43
Hatters-Friedman, Susan - W02
Hausen, Allison - H23
Hauser, Kathleen - A127
Hayden, Donald - W18
Hedeguth, Beverly - G33
Hedges, Robert F. - F14
Hefner, Joseph T. - A112, W21
Heimer, Jakob - H61, H62
Herrmann, Nicholas P. - W07
Hessler, Jr., Robert Paul - B158
Hewitt, Terry-Dawn - F25, W19
Hickey, Logan D. - B19
Hicklin, R. Austin - B94
Hickman, Maureen - B110

Hiners, Paige L. - B169
Hirabayashi, Manato - C11
Ho, Sally F. - B191
Hofer, Valeria - H67
Hofstad, Lisa M. - G34
Hollenbeck, Tiffany A. - H101
Holoyda, Brian J. - W02
Homburger, Nicole - E85
Horvath, Mary F. - C4, C5, C19
Houck, Max M. - B85
Houston, Rachel M. - B140
Hovanece, Barbara L. - BS4
Hudgins, Ashley - B163
Hudson, Anthony W. - A38
Hudson, Renee - B129
Huestis, Marilyn A. - K27
Hughes, Cris E. - A80
Hulse, Cortney N. - A30
Hunter, Cheryl D. - S2
Huynh, Crystal - E21, E55, E61

I
Iancu, Lavinia - H50
Iftikhar, Bushra - J1
Ingvoldstad, Megan E. - A12, A55
Inman, Keith - B31
Iorio, Brandi L. - B35
Ireigbe, Kendra Oghomwen - H23
Isa, Mariyam L. - A33
Islam, Mobin Uli - E31
Izzo, Caitlin - B146

J
James, Christine - H103, H104, H128
Jang, Yu Yang - A82
Janyssek, Brian L. - W18
Jarvis, Hannah C. - H5
Javan, Guilnaz T. - H56
Jeanguenat, Amy M. - B182
Jefferson, Jasmine M. - B166
Jenkins, Christopher D. - C27
Jentzen, Jeffrey M. - F3, W14
Johnson, Bryan - E82, H72
Jones, Rick - S1
Jones, Sandra E. - E39
Jordan, Heather R. - H60
Joseph, A. Skylar - H49
Juarez, Chelsey A. - A152
Juno, Mary - E108
Justus, Calvin R. - B51

K
Kacinko, Sherri L. - B81, K51
Kadash, Kristy - W01
Kammikar, Kelly R. - A3, W21
Kanu, A. Bakarr - B59
Karschner, Erin L. - K49
Karsili, Demet - A97
Kaye, David - L2
Kelleher, Anna L. - B117
Kennedy, Haeli - A123
Kennedy, Larkin F. - A47
Kennedy, Roderick T. - B35, LW2
Kenney Baden, Linda - F4, W22
Kenney, John P. - W22
Kerka, Jaimie E. - B121
Khan, Nadeem-Ul-Hassan - J1, J3
Kiely, Jennifer R. - A118
Kilburn, Cristine S. - I30
Kim, Jeun - A8
Kim, Su-Min - E15
Kimble, Ashley N. - K10
Kimble, Ke’La - B92
Kimmerle, Erin H. - A100
King, Pamela A. W. - W22
Kitayama, Tetsushi - B109
Klaes, Alexandra R. - A36
Koch, Sandra - B151
Koel-Abt, Katrin - G11
Koertner, Anthony - E56, E60
Kolopp, Martin - H63, H129
Kolpan, Katharine E. - A151
Koo, Seungbum - D1
Kramer, Robyn Theresa - A96
Kranz, Katie - B32
Kriegel, Carl R. - C29
Krishan, Kewal - G3
Krona, Daniel - H46
Kronstrand, Robert - K34
Krotulski, Alex J. - BS4, K33, W20
Krostenansky, John L. - K14
Kruglik, Kaitlin - B66
Kubic, Thomas - B89
Kumar, Rajesh - C17
Kumor, Stephanie - K38
Kun, Teri - E25

244 Presenting Author Index
<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kupferschmid, Timothy D.</td>
<td>W17</td>
<td></td>
</tr>
<tr>
<td>Kupsco, Monica J.</td>
<td>E59</td>
<td></td>
</tr>
<tr>
<td>Kyllonen, Kelsey</td>
<td>A17</td>
<td></td>
</tr>
<tr>
<td>Kyriakou, Xenia Paula</td>
<td>A104</td>
<td></td>
</tr>
<tr>
<td>Labay, Laura M.</td>
<td>W14</td>
<td></td>
</tr>
<tr>
<td>L'Abbe, Ericka N.</td>
<td>W11</td>
<td></td>
</tr>
<tr>
<td>Lam</td>
<td>E91</td>
<td></td>
</tr>
<tr>
<td>Lambert, S. Sharee</td>
<td>K18</td>
<td></td>
</tr>
<tr>
<td>Landhuis, Zachariah A.</td>
<td>A108</td>
<td></td>
</tr>
<tr>
<td>Langley, Natalie R.</td>
<td>A22</td>
<td></td>
</tr>
<tr>
<td>Lantz, Patrick E.</td>
<td>W15</td>
<td></td>
</tr>
<tr>
<td>Lanzarone, Antonietta</td>
<td>H78</td>
<td></td>
</tr>
<tr>
<td>LaPorte, Gerald M.</td>
<td>H72, W22</td>
<td></td>
</tr>
<tr>
<td>Larson, S.B. Addison</td>
<td>D4</td>
<td></td>
</tr>
<tr>
<td>LaSalle, Heather</td>
<td>E65</td>
<td></td>
</tr>
<tr>
<td>Laskowski, Gregory E.</td>
<td>B97, BS2</td>
<td></td>
</tr>
<tr>
<td>La Tegola, Donatella</td>
<td>I16</td>
<td></td>
</tr>
<tr>
<td>Latham, Krista E.</td>
<td>A94</td>
<td></td>
</tr>
<tr>
<td>Lavins, Eric S.</td>
<td>W05</td>
<td></td>
</tr>
<tr>
<td>Lednev, Igor K.</td>
<td>E18, E23</td>
<td></td>
</tr>
<tr>
<td>Lee, Choong Sik</td>
<td>E92</td>
<td></td>
</tr>
<tr>
<td>Lee, Jr., F.L. Jim</td>
<td>J19</td>
<td></td>
</tr>
<tr>
<td>LeGarde, Carrie B.</td>
<td>A45</td>
<td></td>
</tr>
<tr>
<td>Legg, Kevin M.</td>
<td>B77, K39</td>
<td></td>
</tr>
<tr>
<td>Lemos, Nikolai P.</td>
<td>K42</td>
<td></td>
</tr>
<tr>
<td>Lemos, DeAnn L.</td>
<td>H29</td>
<td></td>
</tr>
<tr>
<td>Lentini, John J.</td>
<td>W19, W22</td>
<td></td>
</tr>
<tr>
<td>LeVaughn, Mark M.</td>
<td>H68, H71</td>
<td></td>
</tr>
<tr>
<td>Levine, Rebecca</td>
<td>B116</td>
<td></td>
</tr>
<tr>
<td>Lewis, Jane A.</td>
<td>J13</td>
<td></td>
</tr>
<tr>
<td>Lewis, Jason C.</td>
<td>C28</td>
<td></td>
</tr>
<tr>
<td>Lewis, Krystle</td>
<td>A130</td>
<td></td>
</tr>
<tr>
<td>Lhoumeau, Anne-Claire</td>
<td>E34</td>
<td></td>
</tr>
<tr>
<td>Li, Chi Keung</td>
<td>J14</td>
<td></td>
</tr>
<tr>
<td>Li, Ling</td>
<td>H22</td>
<td></td>
</tr>
<tr>
<td>Li, Sun Yi</td>
<td>B20, B67</td>
<td></td>
</tr>
<tr>
<td>Lichteneberger, Emily Lynn</td>
<td>B160</td>
<td></td>
</tr>
<tr>
<td>Lieblein, Dory K.</td>
<td>B22</td>
<td></td>
</tr>
<tr>
<td>Lin, Peter T.</td>
<td>W23</td>
<td></td>
</tr>
<tr>
<td>Linton, Brandon C.</td>
<td>A98</td>
<td></td>
</tr>
<tr>
<td>Liptai, Laura L.</td>
<td>D28, D31, F19, W24</td>
<td></td>
</tr>
<tr>
<td>Listi, Ginesse A.</td>
<td>A20</td>
<td></td>
</tr>
<tr>
<td>Lockwood, Randall</td>
<td>W10</td>
<td></td>
</tr>
<tr>
<td>Logan, Barry K.</td>
<td>B55, B20</td>
<td></td>
</tr>
<tr>
<td>Lombay, Gretchen</td>
<td>C13</td>
<td></td>
</tr>
<tr>
<td>Londino-Smolar, Gina</td>
<td>W08</td>
<td></td>
</tr>
<tr>
<td>Long, Kaitlin</td>
<td>B173</td>
<td></td>
</tr>
<tr>
<td>Lopez-Gobernado, Carlos J.</td>
<td>E10</td>
<td></td>
</tr>
<tr>
<td>Love, Jennifer C.</td>
<td>H113</td>
<td></td>
</tr>
<tr>
<td>Loveless, Rebekah</td>
<td>A98</td>
<td></td>
</tr>
<tr>
<td>Lovestead, Tara</td>
<td>B186</td>
<td></td>
</tr>
<tr>
<td>Lubin, Micheline</td>
<td>H131</td>
<td></td>
</tr>
<tr>
<td>Lucas, Nick J.</td>
<td>B132, B193</td>
<td></td>
</tr>
<tr>
<td>Lucas, Victoria S.</td>
<td>G27</td>
<td></td>
</tr>
<tr>
<td>Luong, James A.</td>
<td>A9</td>
<td></td>
</tr>
<tr>
<td>Lupariello, Francesco</td>
<td>A74, E1, G1, I4, I24</td>
<td></td>
</tr>
<tr>
<td>Ly, Thanh</td>
<td>I8</td>
<td></td>
</tr>
<tr>
<td>Lyle, James R.</td>
<td>C6</td>
<td></td>
</tr>
<tr>
<td>Lynch, Jeffrey James</td>
<td>W07</td>
<td></td>
</tr>
<tr>
<td>Lynch, Paige A.</td>
<td>A122</td>
<td></td>
</tr>
<tr>
<td>Lyman, David S.</td>
<td>G9</td>
<td></td>
</tr>
<tr>
<td>Lynne, Aaron M.</td>
<td>H25</td>
<td></td>
</tr>
<tr>
<td>Lyttle, Bailey D.</td>
<td>E6</td>
<td></td>
</tr>
<tr>
<td>Madrzykowski, Daniel</td>
<td>A5, W19</td>
<td></td>
</tr>
<tr>
<td>Magalhães, Teresa</td>
<td>E4</td>
<td></td>
</tr>
<tr>
<td>Mahmood, Khurram W.</td>
<td>J1</td>
<td></td>
</tr>
<tr>
<td>Maier, Christopher A.</td>
<td>A76</td>
<td></td>
</tr>
<tr>
<td>Maijane, Maida H.</td>
<td>A121</td>
<td></td>
</tr>
<tr>
<td>Maleszewski, Joseph J.</td>
<td>W23</td>
<td></td>
</tr>
<tr>
<td>Malfroy Camine, Lise</td>
<td>G42</td>
<td></td>
</tr>
<tr>
<td>Malone, Rick</td>
<td>W18</td>
<td></td>
</tr>
<tr>
<td>Mamedov, Sergey</td>
<td>B90</td>
<td></td>
</tr>
<tr>
<td>Mancuso, Christy J.</td>
<td>A148</td>
<td></td>
</tr>
<tr>
<td>Mannix, Sarah</td>
<td>A18</td>
<td></td>
</tr>
<tr>
<td>Marchese, Alberto</td>
<td>F12</td>
<td></td>
</tr>
<tr>
<td>Marciano, Michael</td>
<td>B138</td>
<td></td>
</tr>
<tr>
<td>Maric, Mark</td>
<td>B91</td>
<td></td>
</tr>
<tr>
<td>Marinho, Luisa</td>
<td>A126, A146</td>
<td></td>
</tr>
<tr>
<td>Marshall, Aretha</td>
<td>E1</td>
<td></td>
</tr>
<tr>
<td>Marshall, Judy Y.</td>
<td>G40</td>
<td></td>
</tr>
<tr>
<td>Marshall, Pamela L.</td>
<td>S2</td>
<td></td>
</tr>
<tr>
<td>Martell, Daniel A.</td>
<td>S1</td>
<td></td>
</tr>
<tr>
<td>Martin, Daniel G.</td>
<td>F27</td>
<td></td>
</tr>
<tr>
<td>Martin, Teri L.</td>
<td>K46</td>
<td></td>
</tr>
<tr>
<td>Martinez, Rosa M.</td>
<td>H67</td>
<td></td>
</tr>
<tr>
<td>Masarirambo, Pardon T.</td>
<td>H91</td>
<td></td>
</tr>
<tr>
<td>Matheson, Gregory B.</td>
<td>B83</td>
<td></td>
</tr>
<tr>
<td>Matney, Mackenzie</td>
<td>B54</td>
<td></td>
</tr>
<tr>
<td>Mazuchkowski II, Edward</td>
<td>W18</td>
<td></td>
</tr>
<tr>
<td>McCarron, Michael</td>
<td>C12</td>
<td></td>
</tr>
<tr>
<td>McCormack, Linda</td>
<td>J10</td>
<td></td>
</tr>
<tr>
<td>McCormack, Jorge</td>
<td>W14</td>
<td></td>
</tr>
<tr>
<td>McCormick, Kyle A.</td>
<td>A43</td>
<td></td>
</tr>
<tr>
<td>McCoy, Mark R.</td>
<td>W08</td>
<td></td>
</tr>
<tr>
<td>McCullen, Keith M.</td>
<td>E74</td>
<td></td>
</tr>
<tr>
<td>McDonald, Jr., Gary</td>
<td>W22</td>
<td></td>
</tr>
<tr>
<td>McDowell, John D.</td>
<td>G19</td>
<td></td>
</tr>
<tr>
<td>McFarlane, Michael</td>
<td>B188</td>
<td></td>
</tr>
<tr>
<td>McGee, Aminna M.</td>
<td>B11</td>
<td></td>
</tr>
<tr>
<td>McGivney, James</td>
<td>G17</td>
<td></td>
</tr>
<tr>
<td>McGoldrick, Leif</td>
<td>E21</td>
<td></td>
</tr>
<tr>
<td>McIntyre, Gregory L.</td>
<td>K15</td>
<td></td>
</tr>
<tr>
<td>McKay-Davis, Selena M.</td>
<td>H14</td>
<td></td>
</tr>
<tr>
<td>McMillin, Gwendolyn</td>
<td>W14</td>
<td></td>
</tr>
<tr>
<td>Megyesi, Mary S.</td>
<td>A41</td>
<td></td>
</tr>
<tr>
<td>Mehmood, Iqbal J.</td>
<td>J2</td>
<td></td>
</tr>
<tr>
<td>Meline, Kimberly</td>
<td>C5</td>
<td></td>
</tr>
<tr>
<td>Melinek, Judy</td>
<td>W22</td>
<td></td>
</tr>
<tr>
<td>Melson, Kenneth E.</td>
<td>F10</td>
<td></td>
</tr>
<tr>
<td>Meng, Yue</td>
<td>H77</td>
<td></td>
</tr>
<tr>
<td>Meroni, Marianna</td>
<td>H84</td>
<td></td>
</tr>
<tr>
<td>Mertz, Lisa</td>
<td>L1</td>
<td></td>
</tr>
<tr>
<td>Messner, Paul</td>
<td>W19</td>
<td></td>
</tr>
<tr>
<td>Michener, Suzanna</td>
<td>A69</td>
<td></td>
</tr>
<tr>
<td>Middleberg, Robert A.</td>
<td>K54, W20</td>
<td></td>
</tr>
<tr>
<td>Middleton IV, Charles E.</td>
<td>H116</td>
<td></td>
</tr>
<tr>
<td>Mihalovich, Jennifer S.</td>
<td>B179</td>
<td></td>
</tr>
<tr>
<td>Milan, Jennifer A.</td>
<td>B15</td>
<td></td>
</tr>
<tr>
<td>Milani, Chantal</td>
<td>H42</td>
<td></td>
</tr>
<tr>
<td>Miles, Suzanne</td>
<td>E67</td>
<td></td>
</tr>
<tr>
<td>Miller, Jennifer</td>
<td>B177</td>
<td></td>
</tr>
<tr>
<td>Miller, Michelle</td>
<td>W18</td>
<td></td>
</tr>
<tr>
<td>Millette, James</td>
<td>D26</td>
<td></td>
</tr>
<tr>
<td>Millichan, Colleen F.</td>
<td>A42</td>
<td></td>
</tr>
<tr>
<td>Mills, Terry</td>
<td>W10</td>
<td></td>
</tr>
<tr>
<td>Mihlthorp, Heather V.</td>
<td>B148</td>
<td></td>
</tr>
<tr>
<td>Min, Jisook</td>
<td>E38</td>
<td></td>
</tr>
<tr>
<td>Misteck, Ewelina M.</td>
<td>E19, E84</td>
<td></td>
</tr>
<tr>
<td>Miziara, Ivan D.</td>
<td>E35</td>
<td></td>
</tr>
<tr>
<td>Mockus, Audris</td>
<td>C15</td>
<td></td>
</tr>
<tr>
<td>Mohammed, Linton</td>
<td>J10, S1</td>
<td></td>
</tr>
<tr>
<td>Mohr, Amanda L.A.</td>
<td>B54, W20</td>
<td></td>
</tr>
<tr>
<td>Moshin, Sehrish</td>
<td>J1</td>
<td></td>
</tr>
<tr>
<td>Mokdad, Benjamin</td>
<td>E30, H70</td>
<td></td>
</tr>
<tr>
<td>Mondello, Cristina</td>
<td>H2, K7</td>
<td></td>
</tr>
<tr>
<td>Monetti, Lisa</td>
<td>A139</td>
<td></td>
</tr>
<tr>
<td>Monjarde, Geraldine</td>
<td>B118</td>
<td></td>
</tr>
<tr>
<td>Montalbó, Domenico</td>
<td>I16</td>
<td></td>
</tr>
<tr>
<td>Montalvo, Simone</td>
<td>E47</td>
<td></td>
</tr>
<tr>
<td>Moody, Marykathryn Tynon</td>
<td>K37</td>
<td></td>
</tr>
<tr>
<td>Moore, Esq., Ronald L.</td>
<td>F21, F23</td>
<td></td>
</tr>
<tr>
<td>Moore, Katherine N.</td>
<td>H123</td>
<td></td>
</tr>
<tr>
<td>Moore, Sara</td>
<td>W02</td>
<td></td>
</tr>
<tr>
<td>Moquin, Kayla M.</td>
<td>B126</td>
<td></td>
</tr>
<tr>
<td>Moraitis, Konstantinos</td>
<td>A46</td>
<td></td>
</tr>
</tbody>
</table>
Presenting Author Index

Moran, Kimberlee Sue - E95
Moretti, Matteo - H96
Morgan, Lee - H15
Moses, Sharon K. - E95
Moustafa, Yasmine - B93
Moysii, Noly - A97
Mozayani, Ashraf - E12, K29
Mulawka, Marzena H. - E82
Muscatello, Laura - F31
Myers, Wade C. - I11

Najarro, Marcela - B167
Nakhaeizadeh, Sherry - E64
Nase, John B. - G37
Nawrocki, Stephen P. - A113
Negron, Olivia - B4
Nelson, Heather - L1
Neppe, Vernon M. - I25, S1
Nerkowski, Yolanda - G4, G5
Newcomb, Tara L. - G35
Newton, Charlotte Allison - B124
Ngor, Yi Hui - J18
Ning, Juan - H22, H23
Nixon, John - D23, D24
Noe, Rebecca S. - E103
Noureddine, Maher - E22
Nugent, Kimberly - E107
Núñez-Vázquez, Carolina - H27
Nutton, Laura Ann - H20
Nuzum III, W. Milton - F16
Nuzzolese, Emilio - E106, G1, G10

Ochoa, Cecilia Marisol - B171
O’Connell, Kerry J. - F26, F33
Ogris, Kathrin - H17
Oldoni, Fabio - B74
Oliver, Kevin - E1
Olivieri, Bianca - K41
O’Neill, Kelly C. - B168
Osculati, Antonio M.M. - H96
Ostuni, Alessio - I2, I13
O’Toole, Mary Ellen - B51
Ousley, Stephen D. - W07
Owenson, Gareth - C24
Paavola, Emily C. - F17
Page, Tyrish Y. - E7
Palenik, Christopher S. - D3, E52, W04
Pallister, Julie R. - B18
Palmer, Nicole J. - A150
Palmiotto, Andrea - A48
Papsun, Donna M. - K24
Parchuke, Emily R. - K28
Parsons, Hillary R. - E45
Passalacqua, Nicholas V. - A85
Pauly, David G. - W03
Pawaskar, Sachin - W07
Peat, Michael A. - S2
Pechal, Jennifer L. - H57
Peloso, Kelsey J. - B115
Perez, Dorianis - A138
Perlin, Mark W. - F13
Perrault, Katelynn A. - H80
Peters, Derek E. - G11
Peters, Jeremy R. - I21
Peters, Megan - B1
Pettersson, Gisela - H125
Peyron, Pierre-Antoine - H133
Pharr, Lauren R. - A99
Phillips, Angelina L. - H37
Piel, Jennifer - I35
Pienkowski, David - D13
Pilloud, Marin A. - A83
Pitts, Kari M. - B88
Plemons, Amber M. - W21
Podini, Daniele S. - W13
Polston, Carrie - J16
Poon, Donald - A51
Pope, Melissa Ann - A107
Porter, Lindsey J. - E57
Porterfield, Caitlin E. - W08
Powers, Deborah L. - K25
Pozzi, Mark C. - D15, D19, D20, D22, D25
Prahlow, Joseph A. - H73, S2
Prat, Sebastien S. - I38
Primorac, Dragan - S2
Prinz, Mechthild K. - B145
Prichett, William D. - F66
Pronk, Elke - I1
Pruitt, Amanda - W21
Puangpinyo, Charan - B54
Puckett, Mark - D27
Pulley, Brent - E104
Putterill, Jonathan - M10
Pueschel, Steven M. - E45
Pugh, Rebecca - W14
Pugh, Ryan - W14
Quemener, Fanny - A8
Quintal, Jean-Luc - I17
Quintini, Michel - A8
Raffaele, Roberto - C30, E41, H9, H10, H11, H13, H14
Rajeshkar, Mithun - G25
Raley, Kelli B. - B7
Ramsell, Donald J. - F22
Randive, Anjali A. - W22
Raponi, Sara - F29
Raymon, Lionel - W20
Razzano, Linda - W17
Redle, Matthew F. - S1
Redman, Sarah Davis - E104
Reed, Brittany N. - H81
Reed, Erin C. - W05
Reffner, John A. - B150
Reid, Pamela - W10
Reinecke, Gary W. - E82
Reineke, Robin C. - A92
Reyes-Rodriguez, Jenise - C7
Ribereau-Gayon, Agathe J.G. - A86
Richer, Sarah M. - A135
Richmond, Michelle - E1
Ridolfi, Douglas A. - B165
Rieders, Michael F. - B55
Riess, Paulina - I19
Riet, Anders - H48
Riley, Amber D. - E106
Ringel, Meaghan - K32
Rizor, Leann G. - B181
Roberson, Zackery - B170
Roberts, Graham J. - G26
Robinson, Jr., C. Andrew - K3
Rodriguez, Thomas - I37
Rodriguez-Cruz, Sandra E. - B184
Roe, Amanda L. - E43
Rogers, Marcus - C25, S2
Rohde, Douglas E. - W05
Roig, Meghan - B13
Rollins, Kendra - F28
Roman, Madeline G. - B49
Ropero-Miller, Jeri D. - B55
Rosa, Roberto - B52, B53
Rosano, Thomas G. - K54
Rosenbaum, Karen B. - I36, S1
Ross, Ann H. - A131
Rubin, Katie M. - A32
Rudin, Norah - B103
Ruehl, Katariina G. - B56, B118
Ruiz Hernandez, Eric R. - E66, E72
Rushton, Catherine G. - E110, W08

Qin, Da - J15
### Presenting Author Index

**S**

<table>
<thead>
<tr>
<th>Name</th>
<th>Presenting Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saczalski, Kenneth J.</td>
<td>D20, D22, D25</td>
</tr>
<tr>
<td>Samie, Lydie</td>
<td>B34</td>
</tr>
<tr>
<td>Sanger, Robert M.</td>
<td>F20</td>
</tr>
<tr>
<td>Santos, Jana Andrea D.S.</td>
<td>A5</td>
</tr>
<tr>
<td>Sare, Laura</td>
<td>E76</td>
</tr>
<tr>
<td>Sarzinski, D.</td>
<td>A44</td>
</tr>
<tr>
<td>Sauerwein, Kelly</td>
<td>A106</td>
</tr>
<tr>
<td>Saul, Tiffany B.</td>
<td>A149</td>
</tr>
<tr>
<td>Sava, Vincent J.</td>
<td>A4</td>
</tr>
<tr>
<td>Schackmuth, Madison R.</td>
<td>K11</td>
</tr>
<tr>
<td>Schaefer, Audrey D.</td>
<td>A4</td>
</tr>
<tr>
<td>Schlager, Stefan</td>
<td>W07</td>
</tr>
<tr>
<td>Schmidt, Carl J.</td>
<td>K54, W09</td>
</tr>
<tr>
<td>Schmidt, Christopher W.</td>
<td>W11</td>
</tr>
<tr>
<td>Schoppe, Candace H.</td>
<td>W15</td>
</tr>
<tr>
<td>Schneider, Willem A.</td>
<td>D29</td>
</tr>
<tr>
<td>Schroeder, Jason L.</td>
<td>B194</td>
</tr>
<tr>
<td>Schultheis, Cassidy M.</td>
<td>B196</td>
</tr>
<tr>
<td>Schuppener, Leah M.</td>
<td>H21</td>
</tr>
<tr>
<td>Schweighardt, Andrew J.</td>
<td>B36</td>
</tr>
<tr>
<td>Schweitzer, Wolf</td>
<td>H61, H67</td>
</tr>
<tr>
<td>Schwenke, Piper</td>
<td>E28</td>
</tr>
<tr>
<td>Schwing, Sarah</td>
<td>A61</td>
</tr>
<tr>
<td>Scotti, Veronica</td>
<td>F8</td>
</tr>
<tr>
<td>Seaman Kelly, Jan</td>
<td>J11</td>
</tr>
<tr>
<td>Sebetan, Ismail M.</td>
<td>E8, F28, I14</td>
</tr>
<tr>
<td>Sehrawat, Jagmahender Singh</td>
<td>A147</td>
</tr>
<tr>
<td>Seidel, Andrew C.</td>
<td>A2</td>
</tr>
<tr>
<td>Seigfried-Spellar, Kathrynn C.</td>
<td>C25</td>
</tr>
<tr>
<td>Sessa, Francesco</td>
<td>E13</td>
</tr>
<tr>
<td>Setia, Puneet</td>
<td>H93</td>
</tr>
<tr>
<td>Setser, Amanda L.</td>
<td>B25</td>
</tr>
<tr>
<td>Seyfang, Kelsey E.</td>
<td>B61, B195</td>
</tr>
<tr>
<td>Sgeizea, Valerie</td>
<td>A102</td>
</tr>
<tr>
<td>Shaller, Nathan S.</td>
<td>H38</td>
</tr>
<tr>
<td>Shattuck, Brandy</td>
<td>H85</td>
</tr>
<tr>
<td>Shaw, Melvin</td>
<td>J9</td>
</tr>
<tr>
<td>Shelton, Donald E.</td>
<td>F30</td>
</tr>
<tr>
<td>Sheridan, Kevin E.</td>
<td>A51</td>
</tr>
<tr>
<td>Shi, Feng</td>
<td>H23</td>
</tr>
<tr>
<td>Shields, Iris L.</td>
<td>G39</td>
</tr>
<tr>
<td>Shiffert, Jessica</td>
<td>E88</td>
</tr>
<tr>
<td>Shih, Shelly Y.</td>
<td>B73</td>
</tr>
<tr>
<td>Shiri, Samira</td>
<td>D30</td>
</tr>
<tr>
<td>Shoff, Elisa N.</td>
<td>S2</td>
</tr>
<tr>
<td>Shokry, Dina A.</td>
<td>B176, G45</td>
</tr>
<tr>
<td>Siegel, Nicole D.</td>
<td>A62</td>
</tr>
<tr>
<td>Siegert, Courtney C.</td>
<td>A105</td>
</tr>
<tr>
<td>Sigei, Asha</td>
<td>H39</td>
</tr>
<tr>
<td>Sigman, Michael E.</td>
<td>B154</td>
</tr>
<tr>
<td>Silva, Ricardo H.A.</td>
<td>E106</td>
</tr>
<tr>
<td>Sincerbox, Susan</td>
<td>A19</td>
</tr>
<tr>
<td>Singer, Rachel S.</td>
<td>L1</td>
</tr>
<tr>
<td>Singleton, Michael</td>
<td>D21</td>
</tr>
<tr>
<td>Sisco, Edward</td>
<td>B185, E50</td>
</tr>
<tr>
<td>Skipper, Cassie E.</td>
<td>H41</td>
</tr>
<tr>
<td>Skorpinsiki, Katherine</td>
<td>A53</td>
</tr>
<tr>
<td>Smit, Nadine</td>
<td>E64</td>
</tr>
<tr>
<td>Smith, Amber J.</td>
<td>B119</td>
</tr>
<tr>
<td>Smith, Angelina</td>
<td>A120</td>
</tr>
<tr>
<td>Smith, Jeff M.</td>
<td>C4</td>
</tr>
<tr>
<td>Solheim, Tore T.</td>
<td>G6</td>
</tr>
<tr>
<td>Solomon, Nadia</td>
<td>H127</td>
</tr>
<tr>
<td>Somogyi, Tessa</td>
<td>A51</td>
</tr>
<tr>
<td>Song, Liguio</td>
<td>B17</td>
</tr>
<tr>
<td>Sorrentino, Renee</td>
<td>W02</td>
</tr>
<tr>
<td>Spake, Laure</td>
<td>A14</td>
</tr>
<tr>
<td>Spencer, Caroline</td>
<td>K31</td>
</tr>
<tr>
<td>Spencer, Casey</td>
<td>K40</td>
</tr>
<tr>
<td>Spiros, Micayla C.</td>
<td>A13</td>
</tr>
<tr>
<td>Sprague, Jon E.</td>
<td>B121, W05</td>
</tr>
<tr>
<td>Spyhalski, Paul R.</td>
<td>F32</td>
</tr>
<tr>
<td>Stein, Paul</td>
<td>E8, F28, I14</td>
</tr>
<tr>
<td>Stephan, Carl N.</td>
<td>W07</td>
</tr>
<tr>
<td>Stock, Michala K.</td>
<td>A65</td>
</tr>
<tr>
<td>Stockholm, Braden</td>
<td>E8</td>
</tr>
<tr>
<td>Stone, Jonathan W.P.</td>
<td>181</td>
</tr>
<tr>
<td>Stoney, David A.</td>
<td>B86, B87</td>
</tr>
<tr>
<td>Stout, Peter R.</td>
<td>A2</td>
</tr>
<tr>
<td>Stoyanova, Detelina</td>
<td>A26</td>
</tr>
<tr>
<td>Stroebber-Reed, Mary</td>
<td>A90</td>
</tr>
<tr>
<td>Stull, Kyra E.</td>
<td>A73</td>
</tr>
<tr>
<td>Stubdaker-Reed, Mary</td>
<td>A90</td>
</tr>
<tr>
<td>Suzuki, Michael P.</td>
<td>K12</td>
</tr>
<tr>
<td>Sussman, Nicole</td>
<td>I20</td>
</tr>
<tr>
<td>Suzuki, Edward</td>
<td>M. W.04</td>
</tr>
<tr>
<td>Swofford, Henry J.</td>
<td>B96, F6</td>
</tr>
<tr>
<td>Symes, Steven A.</td>
<td>A31, H54, W11</td>
</tr>
</tbody>
</table>

**T**

<table>
<thead>
<tr>
<th>Name</th>
<th>Presenting Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ta’ala, Sabrina C.</td>
<td>A7</td>
</tr>
<tr>
<td>Tabassi, Elham</td>
<td>E58</td>
</tr>
<tr>
<td>Tahir, Mohammad A.</td>
<td>J1, J3</td>
</tr>
<tr>
<td>Takei, Chikako</td>
<td>B65</td>
</tr>
<tr>
<td>Tallman, Sean D.</td>
<td>A40</td>
</tr>
<tr>
<td>Tanaka, Tobin A.</td>
<td>J4</td>
</tr>
<tr>
<td>Taylor, Braden E.</td>
<td>E86</td>
</tr>
<tr>
<td>Taylor, Melissa K.</td>
<td>L2</td>
</tr>
<tr>
<td>Teem, Denice M.</td>
<td>K26</td>
</tr>
<tr>
<td>Thali, Michael</td>
<td>H61, H67</td>
</tr>
<tr>
<td>Thekdi, Riya</td>
<td>B39</td>
</tr>
<tr>
<td>Thomas, Jennifer</td>
<td>K52</td>
</tr>
<tr>
<td>Thompson, Christopher R.</td>
<td>S1</td>
</tr>
<tr>
<td>Thompson, Robert M.</td>
<td>B98</td>
</tr>
<tr>
<td>Thrasher, Drake</td>
<td>H100</td>
</tr>
<tr>
<td>Tica, Cristina</td>
<td>E36</td>
</tr>
<tr>
<td>Todd, Lauren</td>
<td>B64</td>
</tr>
<tr>
<td>Toman, Joshua M.</td>
<td>W24, D31</td>
</tr>
<tr>
<td>Tomberlin, Jeffery K.</td>
<td>E76, W24</td>
</tr>
<tr>
<td>Toupenay, Steve</td>
<td>G12, G13, G42</td>
</tr>
<tr>
<td>Tourou, Rachel</td>
<td>W10</td>
</tr>
<tr>
<td>Trapp, Brittany M.</td>
<td>A137</td>
</tr>
<tr>
<td>Tredway, Kristy</td>
<td>C31</td>
</tr>
<tr>
<td>Truong, An</td>
<td>B175</td>
</tr>
<tr>
<td>Tumram, Nilesh K.</td>
<td>H87, H88, H89, H90</td>
</tr>
</tbody>
</table>

**U**

<table>
<thead>
<tr>
<th>Name</th>
<th>Presenting Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ubelaker, Douglas H.</td>
<td>W11</td>
</tr>
<tr>
<td>Unsal, Tugba</td>
<td>E77</td>
</tr>
<tr>
<td>Upton, Samantha</td>
<td>A106</td>
</tr>
</tbody>
</table>

**V**

<table>
<thead>
<tr>
<th>Name</th>
<th>Presenting Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaira, Michele</td>
<td>F31</td>
</tr>
<tr>
<td>Valencia Caballero, Lorena</td>
<td>E87</td>
</tr>
<tr>
<td>Valentine, Julie L.</td>
<td>E67</td>
</tr>
<tr>
<td>Valenzuela, Jesus R.</td>
<td>C5</td>
</tr>
<tr>
<td>Valera, Anne Marie R.</td>
<td>A5</td>
</tr>
<tr>
<td>Vandeburgh, Joshua</td>
<td>H75</td>
</tr>
<tr>
<td>Vanderpuye, Oluseyi A.</td>
<td>E89</td>
</tr>
<tr>
<td>Van de Wijdeven, Giswinne</td>
<td>A5</td>
</tr>
<tr>
<td>Vandiver, Wesley</td>
<td>D16</td>
</tr>
<tr>
<td>VanErp, Michael L.</td>
<td>W09</td>
</tr>
<tr>
<td>Van Pelt, Katrina</td>
<td>H18</td>
</tr>
<tr>
<td>Van Zalen, Eduard</td>
<td>W24</td>
</tr>
<tr>
<td>Vastrick, Thomas W.</td>
<td>J12, S2</td>
</tr>
<tr>
<td>Vecellio, Mark</td>
<td>W03</td>
</tr>
<tr>
<td>Veltri, Jessica Ann</td>
<td>W18</td>
</tr>
<tr>
<td>Ventura Spagnolo, Elvira</td>
<td>F12, H2, K7</td>
</tr>
<tr>
<td>Vesagas, Nicole Marie C.</td>
<td>A5</td>
</tr>
<tr>
<td>Vesco, Morgan</td>
<td>B47</td>
</tr>
<tr>
<td>Visnapud, Vivian</td>
<td>LW4</td>
</tr>
<tr>
<td>Visona, Silvia D.</td>
<td>H97, H112</td>
</tr>
<tr>
<td>Vo, Eleanor B.</td>
<td>I11</td>
</tr>
<tr>
<td>Vogelsberg, Caitlin C.M.</td>
<td>A95</td>
</tr>
<tr>
<td>Volpini, Laura</td>
<td>I32</td>
</tr>
</tbody>
</table>
## PRESENTING AUTHOR INDEX

### W
- Walker, Nickolas P. - B142
- Walls, Mackenzie - A6
- Walsh, Brian J. - F15
- Walsh, Erin E. - K47
- Waltke, Heather E. - E65
- Wang, Ling - B26
- Wankmiller, Jane - A81
- Ward, Parris - C10, E73
- Washington, Eric T. - G14
- Watson, Elena O. - A34
- Watson, Steven B. - C4, C19, C26, C32
- Wax, Paul - W20
- Weidner, Lauren - H28
- Weintraub, Kelly - H19
- Weiss, Kurt D. - D8, D14
- Weiss, Nicole M. - A15
- Wells, Karin E. - E100
- West, Kelsa - A145
- Westberry, Jan - G38
- Wheasler, Stanton W. - W05
- White, Joseph Levi - C3, C18, C21
- Whiting, Mackenzie E. - B3
- Whitman, Gary - D27
- Wiegand, Timothy - W20
- Wiegers, Emily F. - E78
- Wiersema, Jason M. - E5
- Wigren, Carl - W02
- Will, Emily J. - L2
- Williams, Andrew S. - H35
- Williams, Audrey M. - W20
- Williams, John A. - E109, W08
- Williams, Karl E. - B81
- Williams, Mary R. - B128
- Willis, Sheila - B82, F35, LW3, S2
- Wilson, Lori J. - E75
- Wilson, Teresa V. - A141
- Wilson-Taylor, Rebecca J. - A50
- Wils-Owens, Melissa - H79
- Winburn, Allysha P. - A72
- Windschitl, Mark - W08
- Wines, Hannah - B106
- Wingren, Carl Johan - E32
- Winokur, Agnes D. - B81, BS5
- Wohlfahrt, Denise - H26, H52
- Wolak, Emily - H137
- Wold, David A. - E99
- Wood, Matthew R. - W08
- Wood, Robert E. - G4, G5
- Word, Charlotte J. - F17
- Worrell, Erin M. - B81, E49, W20
- Worst, Travis J. - B27
- Wortman, Thomas - B95
- Wright, Jessica - C1
- Wu, Alan H. - W14
- Wyant, Richard T. - B99
- Wysozan, Timothy - H102

### Y
- Yarid, Nicole A. - H47, H86, H124, W20
- Yerka, Stephen J. - A143
- Yilmaz, Hatice - F1, F2
- Yip, Julia - A134
- Yopak, Jessica - A125
- Young, Carmen - B8
- Young, John L. - I9
- Yu, Jorn Chi-Chung - B127
- Yukyi, Nandar - A63
- Yurka, Laura - A78

### Z
- Zeliff, David J. - W18
- Zhang, Xiang - H22, H23
- Zimmerman, Eric - W12
- Zjalic, James - C8
- Zlotnick, Joel A. - J7, J8, W06
- Zoller, Walter F. - G38


Subject
For more than a century, fingerprints have been useful in a wide range of applications, because they can be used for identification due to fundamental principles: immutability in the course of life (they are permanent) and uniqueness because always different (they are individual). In forensics, there are very large databases that allow the recognition of aliases, traces found at a crime scene and unknown bodies.

Features
This Handbook is organized into 4 Sections. It is divided into 25 Chapters.

<table>
<thead>
<tr>
<th>SECTION</th>
<th>Title</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Toolbox</td>
<td>Related to the basic knowledge of the field, i.e., history, anatomy, embryology and the morphology of the friction ridges.</td>
</tr>
<tr>
<td>2</td>
<td>Known Prints</td>
<td>Related to personal identification field, including print-taking techniques and search procedures.</td>
</tr>
<tr>
<td>3</td>
<td>Latent Prints</td>
<td>Related to latent print field, including the analysis and comparison of traces found at a crime scene.</td>
</tr>
<tr>
<td>4</td>
<td>Other Fields</td>
<td>Related to different fields such as deceased and missing persons, attempts to counterfeit fingerprints, biometric recognition, cross-border service applications and the use of fingerprints in archaeology and anthropology.</td>
</tr>
</tbody>
</table>

Key Words

<table>
<thead>
<tr>
<th>Key Words</th>
<th>ACE-V</th>
<th>AFIS</th>
<th>BIOMETRIC RECOGNITION</th>
<th>COURT EXHIBIT</th>
<th>EDGEOSCOPY</th>
<th>FAKE PRINTS</th>
<th>FINGERPRINTS</th>
<th>FRICITION RIDGES</th>
<th>MINUTIAE</th>
<th>PALMPRINTS</th>
<th>POOR QUALITY PRINTS</th>
<th>POROSCOPY</th>
<th>SOLEPRINTS</th>
<th>UNKOWN BODY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HISTORY</td>
<td>HAND AND SKIN</td>
<td>EMBRYOGENESIS OF FRICTION RIDGES</td>
<td>FINGERPRINTS</td>
<td>LOWER PHALANGE PRINTS (LOWER JOINTS)</td>
<td>PALMPRINTS</td>
<td>SOLEPRINTS</td>
<td>FRICTION RIDGE DISORDERS (POOR QUALITY PRINTS)</td>
<td>RECORDING CRIMINAL METHODS</td>
<td>TAKING KNOWN PRINTS</td>
<td>RECOGNITION BY MANUAL CLASSIFICATIONS</td>
<td>RECOGNITION BY AFIS</td>
<td>CRIME SCENE INVESTIGATION AND COLLECTION OF EVIDENCE</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>LATENT PRINT STATES</td>
<td>LATENT PRINT DEVELOPMENT</td>
<td>LATENT PRINT REVERSED</td>
<td>ANALYSIS</td>
<td>COMPARISON</td>
<td>LATENT PRINT RECOGNITION BY AFIS AND APIS</td>
<td>EVALUATION AND VERIFICATION</td>
<td>IDENTIFYING THE DECEASED AND MISSING PERSONS</td>
<td>ATTEMPTS TO COUNTERFEIT FINGERPRINTS</td>
<td>BIOMETRIC RECOGNITION</td>
<td>DACTYLOSCOPY AND ARCHAEOLOGY</td>
<td>DACTYLOSCOPY AND ANTHROPOLOGY</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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