

# CRIMINALISTICS

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## Wednesday

### Poster Session

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11:30 AM – 1:00 PM	<b>B1</b>	<b>WITHDRAWN</b>
11:30 AM – 1:00 PM	<b>B2</b>	<b>Exploring DNA Quality of Nucleic Acid Dye Staining for Portable Fluorescence Microscope</b> <i>Chao-hsing Fan, PhD*</i> ; <i>Ming-Sie Pan, PhDc</i>
11:30 AM – 1:00 PM	<b>B3</b>	<b>An Investigation of Trace DNA Samples From Objects Stolen in Pickpocket Scenarios</b> <i>Tiffany Kreidler, BS*</i> ; <i>Lauren Hoopes, BS</i> ; <i>Bas Kokshoorn, PhD</i> ; <i>Fabio Oldoni, PhD</i>
11:30 AM – 1:00 PM	<b>B4</b>	<b>The Optimized Recovery of DNA From Exhaled Breath Devices: From Drug Detection to Human Identification</b> <i>Kayli Carrillo, BS*</i> ; <i>Sheree Hughes, PhD</i>
11:30 AM – 1:00 PM	<b>B5</b>	<b>The Impact of 1,4-Dithiothreitol (DTT) on the Microbial Community Structures Associated With Human Semen Samples</b> <i>Christian Blaise, MS</i> ; <i>Denise Wohlfahrt, BS*</i> ; <i>Tomasz Arodz, PhD</i> ; <i>Sarah Seashols-Williams, PhD</i> ; <i>Baneshwar Singh, PhD</i>
11:30 AM – 1:00 PM	<b>B6</b>	<b>Can We Predict DNA Shedding Propensity From Other Individual Characteristics?</b> <i>Genesis Echavarria, BS*</i> ; <i>Ines Cedillo, MS</i> ; <i>Nicholas D.K. Petraco, PhD</i> ; <i>Mechthild Prinz, PhD</i>
11:30 AM – 1:00 PM	<b>B7</b>	<b>The Multiple Reaction Monitoring Tandem Mass Spectrometry Approach: A Tool for Latent Stains of Biological Fluids Identification in Forensic Sciences Laboratory</b> <i>Aldo Di Nunzio, MS*</i> ; <i>Anna Illiano, MS</i> ; <i>Chiara Melchiorre, MS</i> ; <i>Gabriella Pinto, MS</i> ; <i>Ciro Di Nunzio, BS*</i> ; <i>Nadia Tinto, MD</i> ; <i>Francesco Sessa, MS, PhD</i> ; <i>Massimiliano Esposito, MD</i> ; <i>Piero Pucci, MS</i> ; <i>Angela Amoresano, MS</i>
11:30 AM – 1:00 PM	<b>B8</b>	<b>The Enhanced Collection and Recovery of Touch DNA Samples From Challenging Surfaces Using A Venturi Vacuum Device (VVD) Across Two Forensic DNA Workflows</b> <i>Joseph Rahm, BS*</i> ; <i>Charday Ward, BS</i> ; <i>DeEtta Mills, PhD</i>
11:30 AM – 1:00 PM	<b>B9</b>	<b>Touch DNA: An Evaluation of a Novel Collection Method</b> <i>Jamie Fredericks, PhD*</i> ; <i>Hannah Varner, BSc</i>
11:30 AM – 1:00 PM	<b>B10</b>	<b>Exploring Target Areas for Recovering Informative DNA Profiles From Eyeglasses</b> <i>Isabel Melhado, BS*</i> ; <i>Krista Latham, PhD</i> ; <i>Cynthia Cale, MS</i> ; <i>Alex Wong, BA*</i>
11:30 AM – 1:00 PM	<b>B11</b>	<b>The DNA Transfer to Bedsheets in Differing Cohabitation Environments</b> <i>Jordan Roberson, BA*</i> ; <i>Olivia Messenger, BA*</i> ; <i>Krista Latham, PhD</i> ; <i>Cynthia Cale, MS</i>
11:30 AM – 1:00 PM	<b>B12</b>	<b>Morphological and Autofluorescence Signatures for the Identification of Vaginal Cells in Mixture Samples Containing Saliva and/or Epidermal Cells</b> <i>Hannah Burden, BS*</i> ; <i>Arianna DeCorte, MS</i> ; <i>Sarah Ingram, PhD</i> ; <i>Christopher Ehrhardt, PhD</i>
11:30 AM – 1:00 PM	<b>B13</b>	<b>The Application of an Improved Processing Method of Touch DNA Samples</b> <i>Deborah Soares Bispo Santos Silva, PhD</i> ; <i>Hannah Calista</i> ; <i>Caitlyn Martinez</i> ; <i>Ryan Smith, PhD</i> ; <i>Georgiana Gibson-Daw, PhD*</i>
11:30 AM – 1:00 PM	<b>B14</b>	<b>Trace DNA: Recovery Efficiency From Patrimonial Crimes in the Brazilian Federal Police</b> <i>Camila Maciel, BS</i> ; <i>Bruno Trindade, PhDc*</i>

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- 11:30 AM – 1:00 PM     **B15**     **Improving the Analysis of Forensic Samples Using a Microwave Treatment and Rapid, Direct Polymerase Chain Reaction (PCR)**  
*Fabiana Taglia, PhD\**; *Nicole Fernandez-Tejero, MS*; *Cassandra Setser, PhD*; *Ling Wang, PhD*;  
*Kevin Lothridge, MS*; *Bruce McCord, PhD*; *Steven Lee, PhD*
- 11:30 AM – 1:00 PM     **B16**     **Finding the DNA: How Much Was Recovered and Where Did the Rest Go?**  
*Kyra Uramoto, MS\**; *Robin Cotton, PhD*
- 11:30 AM – 1:00 PM     **B17**     **Using Exact Likelihood Ratio (LR) Distributions for Probabilistic Genotyping Software Validation**  
*Mark Perlin, PhD, MD\**; *Jennifer Hornyak Bracamontes, MS*; *Erin Estus, MS*
- 11:30 AM – 1:00 PM     **B18**     **The Algorithm Performance on a Firearm Examiner Black Study**  
*Eric Law, PhD\**; *Makia Maxey\**; *Keith Morris, PhD*
- 11:30 AM – 1:00 PM     **B19**     **An Assessment of a Novel Method for Physical Fit Examinations Using an Extensive Database of Casework-Like Samples and Interlaboratory Studies**  
*Zachary Andrews, MS\**; *Meghan Prusinowski, MS*; *Tatiana Trejos, PhD*
- 11:30 AM – 1:00 PM     **B20**     **A Case Report: Identification of AP-238 and 2-Fluorodeschloroketamine in Internet-Available Powder Samples**  
*Karissa Resnik, MS*; *Justin Poklis, BS*; *Michelle Peace, PhD*; *Frederick Moeller, MD*;  
*Emanuele Alves, PhD\**
- 11:30 AM – 1:00 PM     **B21**     **The Evaluation of Three Derivatization Reagents for the Identification of Eight Aminoindanes by Gas Chromatography/Mass Spectrometry (GC/MS)**  
*Thomas Brettell, PhD\**; *Amber Rose, MS*; *Monica Joshi, PhD*; *Matthew Wood, PhD*;  
*Marianne Staretz, PhD*
- 11:30 AM – 1:00 PM     **B22**     **Investigating the Effect of Substitution Location on Fentanyl Analog Identification for Methyl-Substituted Fentanyl Analogs Using Gas Chromatography/Electron Ionization/Mass Spectrometry (GC/EI/MS)**  
*Alexis Pollard, BS\**; *J. Tyler Davidson, PhD*
- 11:30 AM – 1:00 PM     **B23**     **Multiple Micro-Abrasions on the Shooter's Hand and the Recharge of Ammunition at Home**  
*Benedetta Pia De Luca, MD\**; *Alessandra Stellacci, MD*; *Luigi Buongiorno, MD*;  
*Pierluigi Caricato, MD*; *Carlo Angeletti, MD*; *Fortunato Pititto, MD*; *Mariela Marrone, MD*;  
*Giuseppe Strisciullo, BES*; *Francesco Vinci, MD*
- 11:30 AM – 1:00 PM     **B24**     **The Sampling of Materials Using Laser Ablation and Electrostatic Capture, and the Analysis of Captured Particles Using Thermal Desorption Electrospray Ionization (TD-ESI) and an Ion Trap Mass Spectrometer**  
*Brendan Minick\**; *Kenyon Evans-Nguyen, PhD*
- 11:30 AM – 1:00 PM     **B25**     **Spectral Trends in Gas Chromatography/Electron Ionization/Mass Spectrometry (GC/EI/MS) Data From the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) Library and Literature**  
*William Feeney, PhD\**; *Arun Moorthy, PhD*; *Edward Sisco, PhD*
- 11:30 AM – 1:00 PM     **B26**     **Statistical Discrimination Methods for Forensic Source Interpretation: The Application to Micromorphometric Feature Measurement of Aluminum Powders Used in Explosives**  
*Danica Ommen, PhD\**; *Christopher Saunders, PhD*; *JoAnn Buscaglia, PhD\**

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11:30 AM – 1:00 PM	<b>B27</b>	<b>A Survey of Mounting Media Used for Hair and Fiber Microscopy</b> <i>Maria Lawas, MS; Linda Otterstatter, BS; Joshua Friedman, MS; Joseph Donfack, PhD*</i>
11:30 AM – 1:00 PM	<b>B28</b>	<b>The Application of Surface-Enhanced Raman Spectroscopy (SERS) for the Detection of Synthetic Cathinones</b> <i>Mario Vendrell-Dones, MS*; Bruce McCord, PhD</i>
11:30 AM – 1:00 PM	<b>B29</b>	<b>The Unique Capability of Direct Analysis in Real-Time Mass Spectrometry (DART®-MS) for the Detection of Less Volatile Components in Ignitable Liquids</b> <i>Shruthi Perna, MS*; Briza Marie Dedicataria, BS; Ngee Sing Chong, PhD; Mengliang Zhang, PhD*</i>
11:30 AM – 1:00 PM	<b>B30</b>	<b>The Volatile Organic Compounds (VOCs) of Training Aids Used for Human Remains Detection Canines: A Survey on the Impact of Storage Conditions on Odor Signature</b> <i>Fantasia Whaley, PhDc*; Lauryn DeGreeff, PhD</i>
11:30 AM – 1:00 PM	<b>B31</b>	<b>An Assessment of Field-Portable Instrumentation for Pre-Blast Explosives Detection</b> <i>Makenzie Kuehn, BS*; J. Tyler Davidson, PhD; Geraldine Monjardez, PhD</i>
11:30 AM – 1:00 PM	<b>B32</b>	<b>Dating Crime Evidence With Microbes: The Ideal Forensic Clock?</b> <i>Josep De Alcaraz-Fossoul, PhD*; Yue Wang, PhD; Ruoqian Liu, MS; Michelle Mancenido, PhD; Pamela Marshall, PhD; Celeste Núñez, BS; Jennifer Broatch, PhD; Lara Ferry, PhD</i>
11:30 AM – 1:00 PM	<b>B33</b>	<b>The Development of a Self-Assembled Gold Nanoparticle Thin Film to Support Field Detection of Trace Chemicals</b> <i>Taylor Parmer, BS*; Geraldine Monjardez, PhD; Jorn (Chi-Chung) Yu, PhD; Sarah Stewart, MS</i>
11:30 AM – 1:00 PM	<b>B34</b>	<b>An Analysis of Polymer-Coated Bullets Using Spectroscopic Methods</b> <i>Liana Albano, BS*; Peter Diaczuk, PhD</i>
11:30 AM – 1:00 PM	<b>B35</b>	<b>Differentiation of Delta-9-Tetrahydrocannabinol (Delta-9-THC) and Cannabidiol (CBD) Using Silver-Ligand Ion Complexation and Electrospray Ionization Tandem Mass Spectrometry (ESI-MS/MS)</b> <i>Alleigh Couch, BS*; Jayleigh Lanza, BS; Christopher Zall, PhD; J. Tyler Davidson, PhD</i>
11:30 AM – 1:00 PM	<b>B36</b>	<b>Assessing the Individual and Joint Use of Ultraviolet/Visible (UV/VIS) Microspectrophotometry and Scanning Electron Microscopy/Energy Dispersive Spectroscopy (SEM/EDS) to the Differentiation of Colored Spray Paint</b> <i>Morgan Carpenter, BS*; Jared Estevanes, BS; Patrick Buzzini, PhD</i>
11:30 AM – 1:00 PM	<b>B37</b>	<b>Tool Mark Matching Using 3D Structures</b> <i>Nam-Kyu Park, PhD*; Hoyong Yie, ME; Young-Il Seo, MS</i>

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## Thursday—Session I

### The Past, Present, and Future

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Moderator: Charlotte Word

Co-Moderator: Pamela Marshall

- 9:00 AM – 9:15 AM     **B38**     **Standards Development Activities in Human Forensic Biology**  
*Beth Ordeman, BS, MS\**
- 9:15 AM – 9:30 AM     **B39**     **DNA Testing: Looking Back and Looking Forward**  
*Robin Cotton, PhD\**
- 9:30 AM – 9:45 AM     **B40**     **“Back to the Future”—Bayes’ Theorem Goes Around, Comes Around**  
*Patrick Buzzini, PhD; Tim Kalafut, PhD\**
- 9:45 AM – 10:00 AM     **BREAK**

### Differential Extraction and BFID

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Moderator: Rachelle Turiello

Co-Moderator: Brian Higgins

- 10:00 AM – 10:15 AM     **B41**     **When and “Y” to Screen With QIAGEN® Investigator® Casework GO!**  
*Julia Wang, MS\*; Grace Rutledge, MS; Rachel Houston, PhD; Sheree Hughes, PhD*
- 10:15 AM – 10:30 AM     **B42**     **An Interlaboratory Comparison of SpermX™ and Conventional Differential Extractions for DNA Analysis of Sexual Assault Samples**  
*Sudhir Sinha, PhD\*; Joanne Sgueglia, BA\*; Hailey Holt, BS; Erin Hanson, PhD; Justina Nichols, MSFB; Tim Kalafut, PhD; Mah-Ro Khan, MS; Thomas Walsh, MSFS; Megan Foley, MSFS; John (Jack) Ballantyne, PhD; Hiromi Brown, PhD*
- 10:30 AM – 10:45 AM     **B43**     **Modified Differential Cell Lysis Using a Combined prepGEM™ and Alkaline Approach**  
*Brittany Hudson, MS\*; Tracey Dawson Green, PhD*
- 10:45 AM – 11:00 AM     **B44**     **WITHDRAWN**
- 11:00 AM – 11:15 AM     **B45**     **Evil Under the Sun: An Assessment of Body Fluid Identification and DNA Profiling After Exposure to Tropical Weather Conditions**  
*Sara C. Zapico, PhD\*; Christian Stadler, PhD; Gabriela Roca, PhD*
- 11:15 AM – 11:30 AM     **B46**     **The Impact of Various Storage Temperatures and Times on the Microbiome of Forensically Relevant Biological Samples**  
*Denise Wohlfahrt, BS\*; Sarah Seashols-Williams, PhD; Baneshwar Singh, PhD*
- 11:30 AM – 11:45 AM     **B47**     **Forensic Body Fluid Classification Using a Panel of MicroRNAs in DNA Extracts**  
*Ciara Rhodes, BS\*; Kelsey Price, MS; Anaya Valentine, MS; Carolyn Lewis, PhD; Edward Boone, PhD; Sarah Seashols-Williams, PhD*
- 11:45 AM – 12:00 PM     **B48**     **A Field-Forward Microfluidic Method for Transcriptomic Serological Analysis**  
*Renna Nouwairi, BS\*; Larissa Cunha, BS; Tiffany Layne, PhD; Rachel Fleming, PhD; James Landers, PhD*
- 12:00 PM – 1:30 PM     **BREAK**

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\*Presenting Author

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## Probabilistic Genotyping

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Moderator: *Tim Kalafut*

Co-Moderator: *Taylor Dickerson*

- 1:30 PM – 1:45 PM    **B49**    **My Results are Unintuitive, Now What? Casework Studies on Unintuitive STRmix™ Results and the Approaches Utilized for Reporting**  
*Alicia Cadenas, MS\**; *Samantha Wandzek, MS*
- 1:45 PM – 2:00 PM    **B50**    **Probabilistic Genotyping With Microhaplotypes**  
*Daniele Podini, PhD\**; *Helene Douglas, BS*; *Sofia Arichavala Centeno, BS*; *Angie Zhao, MFS*; *Katherine Rizzolo, MFS*; *Fabio Oldoni, PhD*
- 2:00 PM – 2:15 PM    **B51**    **Identifying Victim Remains Using Kinship Genotype Inference**  
*Mark Perlin, PhD, MD\**; *William Allan, MS*
- 2:15 PM – 2:30 PM    **BREAK**

## Trace DNA and Mixtures

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Moderator: *Lisa Burdett*

Co-Moderator: *Fabio Oldoni*

- 2:30 PM – 2:45 PM    **B52**    **DNAmix 2021—Inter-laboratory Variation in Interpretations, Comparisons, and Statistical Analyses of DNA Mixtures**  
*R. Austin Hicklin, PhD\**; *Nicole Richetelli, PhD\**; *Brandi Emerick, PhD*; *Jonathan Davoren, MSc*
- 2:45 PM – 3:00 PM    **B53**    **Selectively Analyzing and Interpreting DNA From Multiple Donors With a Full Single-Cell Strategy**  
*Nidhi Sheth, MSc\**; *Leah O'Donnell, MS*; *Madison Mulcahy, BS*; *Ken Duffy, PhD*; *Desmond Lun, PhD*; *Catherine Grgicak, PhD*
- 3:00 PM – 3:15 PM    **B54**    **Using a Non-Destructive Method to Predict DNA Yield and the Presence of a Mixture in Touch DNA**  
*Sarah Roisch, BS\**; *Susan Greenspoon, PhD*; *Christopher Ehrhardt, PhD*; *Sarah Ingram, PhD*
- 3:15 PM – 3:30 PM    **B55**    **Is This Fingermark Suitable for Dactyloscopy or Genotyping? It Depends on the Minimum Surface Requirement (MSR)!**  
*Michele Di Nunzio, MSc\**; *Josep De Alcaraz-Fossoul, PhD\**; *Carme Barrot-Feixat, PhD*
- 3:30 PM – 3:45 PM    **B56**    **Using Attenuated Total Reflectance/Fourier Transform Infrared (ATR/FTIR) to Characterize Circulating Free DNA (cfDNA) Interactions With Metal Surfaces to Optimize The Collection and Processing of Touch DNA Samples**  
*Jessica Thornton, BS\**; *Tina Moroose, MS*; *Keith Morris, PhD*
- 3:45 PM – 4:00 PM    **B57**    **Updating Research Data on Firearms Cases Using Expanded Autosomal Short Tandem Repeat (STR) Kits**  
*Rachel Oefelein, MS\**
- 4:00 PM – 4:15 PM    **B58**    **Generating Short Tandem Repeat (STR) Profiles on a Porous Substrate Using Nile Red Detection**  
*Ryan Hinojosa, BS\**; *Janine Kishbaugh, MS*; *Lawrence Quarino, PhD*; *Jillian Conte, PhD*
- 4:15 PM – 4:30 PM    **B59**    **An Automated Genotype Database for Associating Counterfeit Drug Evidence**  
*Mark Perlin, PhD, MD\**; *William Allan, MS*; *Matthew Legler, BS*

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## Thursday—Session II

### Standard Development and Related Activities Strengthening Forensic Science

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Moderator: Beth Saucier Goodspeed

Co-Moderator: Jason Bory

8:30 AM – 8:45 AM	<b>B60</b>	<b>Standards Development Activities in Firearm and Toolmark Examination</b> <i>Robert Sanger, JD*</i>
8:45 AM – 9:00 AM	<b>B61</b>	<b>Standards Development Activities in Trace Materials</b> <i>Celeste Grover, MSFS*</i>
9:00 AM – 9:15 AM	<b>B62</b>	<b>Standards Development Activities Related to Ignitable Liquids, Explosives, and Gunshot Residue</b> <i>Brenda Christy, MS*</i>
9:15 AM – 9:30 AM	<b>B63</b>	<b>Standards Development Activities Related to the Examination of Friction Ridge Detail</b> <i>Heidi Eldridge, PhD*</i>
9:30 AM – 9:45 AM	<b>B64</b>	<b>Current and Future Standards Development Activities in Seized Drugs</b> <i>Agnes Winokur, MS*</i>
9:45 AM – 10:00 AM	<b>B65</b>	<b>The Development of a Standard Guide for the Use of X-Ray Diffraction in the Forensic Examination of Geological Materials</b> <i>Libby Stern, PhD*; Ian Saginor, PhD; Alastair Ruffell, PhD</i>
10:00 AM – 10:15 AM	<b>B66</b>	<b>Seized Drugs Process Map</b> <i>David Gouldthorpe, MS*; Melissa Taylor, BA; Heather Waltke, MFS, MPH</i>
10:15 AM – 10:30 AM	<b>B67</b>	<b>An Inter-Laboratory Study to Assess Practical Utility of the Organization of Scientific Area Committees (OSAC) -Proposed Standard 2021-S-0006 (Standard for the Use of GenBank for Taxonomic Assignment of Wildlife)</b> <i>Khushi Patel; Melissa Scheible, MFS; Kelly Meiklejohn, PhD*</i>
10:30 AM – 10:45 AM	<b>B68</b>	<b>An Update on the Status of the Department of Justice, Office of Justice Programs, National Institute of Justice (NIJ), National Center on Forensics (NCF) Grant</b> <i>Joseph DiZinno, DDS*</i>
10:45 AM – 11:00 AM		<b>BREAK</b>

### Forensic Science Principles—A Closer Look at the Sydney Declaration

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Moderator: Patrick Buzzini

Co-Moderator: Michelle Miranda

11:00 AM – 11:15 AM	<b>B69</b>	<b>Revisiting the Essence of Forensic Science: The Sydney Declaration Coming of Age?</b> <i>Claude Roux, PhD*; Rebecca Bucht, PhD; Patrick Buzzini, PhD; Frank Crispino, PhD; Peter De Forest, DCrim; Keith Inman, MCrim; Pierre Margot, MSc, PhD; Michelle Miranda, PhD; Olivier Ribaux, PhD; Niamh Nic Daeid, PhD; Sheila Willis, PhD</i>
11:15 AM – 11:30 AM	<b>B70</b>	<b>The Sydney Declaration: Should We Care About Forensic Science Principles?</b> <i>Claude Roux, PhD*; Rebecca Bucht, PhD; Patrick Buzzini, PhD; Frank Crispino, PhD; Olivier Ribaux, PhD</i>

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11:30 AM – 11:45 AM	<b>B71</b>	<b>An Exercise in Scientific Problem Solving</b> <i>Peter De Forest, DCrim; Michelle Miranda, PhD; Patrick Buzzini, PhD*; Sheila Willis, PhD</i>
11:45 AM – 12:00 PM	<b>B72</b>	<b>Ficta Vivos Docent: Learning From Detective Fiction</b> <i>Michelle Miranda, PhD*; Peter De Forest, DCrim</i>
12:00 PM – 1:00 PM		<b>BREAK</b>

## Fire Debris, Explosives, and Firearms

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Moderator: Rita Newman

1:00 PM – 1:15 PM	<b>B73</b>	<b>A Study Comparing the Use of Agilent® QP Gas Chromatography/Mass Spectrometry (GC/MS) for Screening and Gas Chromatography/Tandem Mass Spectrometry (GC/MS/MS) for the Confirmation of Smokeless Powders</b> <i>Monica Joshi, PhD*; Blake Kerstetter, BS; Kirk Lokits, MS, PhD</i>
1:15 PM – 1:30 PM	<b>B74</b>	<b>Assessing the Evidentiary Value in Fire Debris Analysis: A Proposed Workflow</b> <i>Frances Whitehead, MS; BS*; Michael Sigman, PhD; Mary Williams, MS</i>
1:30 PM – 1:45 PM	<b>B75</b>	<b>The Detection of Gasoline in Fire Debris Using Artificial Intelligence: Image Transformation of Gas Chromatography and Mass Spectrometry Data and Deep Learning</b> <i>Ting-Yu Huang, MSc*; Jorn (Chi-Chung) Yu, PhD</i>
1:45 PM – 2:00 PM	<b>B76</b>	<b>Method Optimization and Validation for a Confined Thermal Desorption-Direct Analysis in Real-Time Mass Spectrometry (TD-DART-MS) Sampling Interface Developed for Ignitable Liquid Analysis</b> <i>Briana Capistran, PhD*; Matthew Staymates, MS; Edward Sisco, PhD</i>
2:00 PM – 2:15 PM	<b>B77</b>	<b>Population Statistics and a Reference Population Database of Firearm Toolmarks</b> <i>Xiaoyu Zheng, MS*; Johannes Soons, PhD; Erich Smith, MS; Martin Baiker-Sørensen, PhD</i>
2:15 PM – 2:30 PM	<b>B78</b>	<b>Reporting Likelihood Ratio (LR) for Case Work in Firearm Evidence Identification</b> <i>John Song, PhD*</i>
2:30 PM – 2:45 PM	<b>B79</b>	<b>The Role of Adsorption on the Detectability of Contained Explosives and Drugs</b> <i>Emma Calabrese, BS*; Lauryn DeGreeff, PhD</i>
2:45 PM – 3:00 PM	<b>B80</b>	<b>The Combined Solid Phase Extraction Procedure for the Analysis of Organic and Inorganic Explosives Residue</b> <i>Courtney Cruse, PhD*; Amara Borchers, BS; Kristen Fowble, PhD; David Pavone, MFS; Jennifer Thomas, PhD; Stephanie Armas, MS; Mark Miller, PhD; Sarah Sipe, PhD</i>
3:00 PM – 3:15 PM	<b>B81</b>	<b>The Statistical Characterization of the Discriminating Power of Trace Elemental Concentrations of Aluminum Foils Used in Improvised Explosive Devices</b> <i>Anjuli Bhandari, PhD*; Michelle Jordan, PhD; Danica Ommen, PhD; Christopher Saunders, PhD; JoAnn Buscaglia, PhD</i>
3:15 PM – 3:30 PM	<b>B82</b>	<b>Gunshot Suicides Caused by Cane-Gun and Alarm Garden Gun Cannon: Two Case Reports</b> <i>Lea-Helena Rossi, MD*; Nathalie Jousset, MD; Stephane Malbranque, MD</i>
3:30 PM – 3:45 PM		<b>BREAK</b>



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## Drugs I

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Moderator: DeMia Pressley

Co-Moderator: Mariel Candelario-Gorbea

- 3:45 PM – 4:00 PM     **B83**     **The Application of the Expert Algorithm for Substance Identification (EASI) on Synthetic Cathinones Using Mass Spectrometry (MS)**  
*Glen Jackson, PhD\**; *Alexandra Adeoye, MS*; *Jessica Orris, BS*; *Stephen Hokanson, BS*
- 4:00 PM – 4:15 PM     **B84**     **The Application of the Expert Algorithm for Substance Identification (EASI) to the Mass Spectral Identification of Fentanyl Analogs**  
*Alexandra Adeoye, MS\**; *Glen Jackson, PhD*
- 4:15 PM – 4:30 PM     **B85**     **The Development and Validation of a Quantitative Method for the Analysis of Fentanyl Containing “Dope” Samples**  
*Joshua DeBord, PhD\**; *Jennifer Shinefeld, MS*; *Barry Logan, PhD*; *Alex Krotulski, PhD*
- 4:30 PM – 4:45 PM     **B86**     **Distinguishing Piperazine and 12 Analogs Using Raman Microspectroscopy and Chemometrics**  
*Brianna Zettlemoyer, BS\**; *Thomas Brettell, PhD*; *Monica Joshi, PhD*; *Lawrence Quarino, PhD*
- 4:45 PM – 5:00 PM     **B87**     **Untargeted Headspace/Solid-Phase Microextraction Coupled to Gas Chromatograph/Mass Spectrometer (HS/SPME-GC/MS)? An HS/SPME-GC/MS Analysis of Terpenes and Cannabinoids for the Geographical Sourcing of Marijuana Using Multivariable Data Analysis**  
*Janet Crespo Cajigas, MS\**; *Howard Holness, PhD*; *Lauryn DeGreeff, PhD*; *Kenneth Furton, PhD*
- 5:00 PM – 5:15 PM     **B88**     **The Development and Validation of a Method for the Differentiation of Hemp and Marijuana by Gas Chromatography/Mass Spectrometry (GC/MS)**  
*Sarah Shuda, MSFS\**; *Joshua Folger, BS*; *Barry Logan, PhD*

## Poster Session

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- 11:30 AM – 1:00 PM     **B89**     **The Commercialization of a Universal Method for Body Fluid Identification for Forensic Purposes**  
*Alexis Weber, MS\**; *Igor Lednev, PhD*
- 11:30 AM – 1:00 PM     **B90**     **The Evaluation of Demineralization Parameters for DNA Extraction Methods From Skeletal Remains**  
*Jennifer Snedeker, BS\**; *Erin Gorden, MFS*; *Gina Parada, MSFS*; *Christina Neal, MS*; *Carmen Reedy, PhD*; *Rachel Houston, PhD*
- 11:30 AM – 1:00 PM     **B91**     **Improving Allele Call Rates for Challenging Samples With ePCR1 Buffer**  
*Brooke Ouwerkerk, BTech, BSc\**; *Georgina Lush, BS*; *Renee Leduc, PhD*; *Steen Hartsen, MBA, BSc, BTech*; *Jason Moore, MA, BSc*
- 11:30 AM – 1:00 PM     **B92**     **The Differentiation of *Cannabis Sativa* Crop Type and Biogeographical Origin Using Nine Novel Chloroplast Single Nucleotide Polymorphism (SNP) Markers**  
*Michele Di Nunzio, MSc\**; *Carme Barrot-Feixat, PhD*; *David Gangitano, PhD*
- 11:30 AM – 1:00 PM     **B93**     **Maximum DNA Recovery From Cold Case Victims Using Ancient and Forensic DNA Extraction Methods**  
*Erin Rawls, BS\**; *Amber Coffman, BS*; *Cody Parker, PhD*; *Laura Fulginiti, PhD*; *Anne Stone, PhD*; *Matthew Emery, PhD*; *Jane Buikstra, PhD*; *Amanda Wissler, PhD*; *Robert Oldt, BS*; *Sreetharan Kanthaswamy, PhD*; *Stevie Winingear, MA*



# CRIMINALISTICS

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- 11:30 AM – 1:00 PM    **B94**    **Mitochondrial DNA Sequence Variation in the Lebanese Population**  
*Breanna Nickels, BS\**; *Kimberly Andreaggi, PhD*; *Elise Anderson, MSFS*;  
*Jennifer Higginbotham, MFS*; *Mirna Ghemrawi, PhD*; *Susan Walsh, PhD*;  
*Dennis De Luca, PhD*; *Charla Marshall, PhD*
- 11:30 AM – 1:00 PM    **B95**    **Utilizing Environmental DNA (eDNA) from Geologic Materials for Sample-to-Sample Comparisons**  
*Teresa M. Tiedge, MPS\**; *Kelly Meiklejohn, PhD*
- 11:30 AM – 1:00 PM    **B96**    **Optimizing DNA Extraction in Highly Degraded Bone**  
*Michelle Woo, BS\**; *Daniela Frausto, BS\**; *Tal Simmons, PhD*; *Joseph Jones, PhD*;  
*Baneshwar Singh, PhD*
- 11:30 AM – 1:00 PM    **B97**    **The Development of a Screening Tool to Determine Optimal Sampling Sites for DNA Recovery From Human Skeletal Remains**  
*Kathleen Smith, BS\**; *Angie Ambers, PhD*; *Brooke Kammrath, PhD*
- 11:30 AM – 1:00 PM    **B98**    **The Generation of High-Quality Libraries for the Prediction of External Visible Characteristics and Biogeographical Ancestry Using a Low-Cost Automation Platform**  
*Riya Thekdi, MFS\**; *Juan Carlos Perez, BS*; *Richelle Barta, BS*; *Erin McCarthy, BS*;  
*Elmira Forouzmand, PhD*; *Samantha Dowles, BS*; *Gothami Padmabandu, MS*;  
*Kathryn Stephens, PhD*
- 11:30 AM – 1:00 PM    **B99**    **The Optimization of Single Nucleotide Polymorphism (SNP) SNaPshot™ Multiplexes to Distinguish Fiber and Drug-Type Cannabis Sativa**  
*Natalia Czado, MSFS\**; *Sheree Hughes, PhD*; *Rachel Houston, PhD*
- 11:30 AM – 1:00 PM    **B100**    **Creating a Forensic Reference Ladder and Multiplex to Be Used in Animal Abuse Cases**  
*Vallarie Ostenson, BS\**; *DeEtta Mills, PhD*
- 11:30 AM – 1:00 PM    **B101**    **The Creation of a Presumptive Multiplex Kit to Test for the Presence of Domestic Animal Mitochondrial DNA in Cases of Presumed Animal Abuse**  
*Lindsey Kaufman, BA*; *DeEtta Mills, PhD*
- 11:30 AM – 1:00 PM    **B102**    **The Potential of the 165 Ancestry-Informative Single Nucleotide Polymorphisms (SNPs) in Further Discriminating Asian Populations**  
*Sohee Cho, PhD\**; *Soong Deok Lee, MD, PhD*; *Haeun You, BS*
- 11:30 AM – 1:00 PM    **B103**    **The Use of Optical Trapping Coupled With a Microfluidic Device for Cell Separation**  
*Brittney Hackworth, BS\**; *Samantha Pagel, MSFS*; *Sarah Seashols-Williams, PhD*;  
*Joseph Reiner, PhD*; *Mackenzie Lally, MSFS*; *Tracey Dawson Green, PhD*
- 11:30 AM – 1:00 PM    **B104**    **The Effects of the Composition of Whole Saliva/Oral Fluids on the Development of Epigenetic Markers**  
*Nicole Fernandez-Tejero, MS\**; *Mirna Ghemrawi, PhD*; *Bruce McCord, PhD*
- 11:30 AM – 1:00 PM    **B105**    **A Snapshot of Current Opinions on Sequencing Technology in Forensics**  
*Megan Foley, MSFS*; *Fabio Oldoni, PhD\**
- 11:30 AM – 1:00 PM    **B106**    **A Side-by-Side Evaluation of Presumptive Blood Identification Tests**  
*Hillary Culbertson, PhD\**
- 11:30 AM – 1:00 PM    **B107**    **The Development of Carbon Nanotubes-Assisted Solid-Phase Microextraction for Fire Debris Analysis**  
*Ting-Yu Huang, MSc\**; *Jorn (Chi-Chung) Yu, PhD*
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# CRIMINALISTICS

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- 11:30 AM – 1:00 PM    **B108**    **Trace Metal Profiling of Polymer Filaments Used in 3D Printing**  
*Thomas Gluodenis, PhD; John Stallworth\**
- 11:30 AM – 1:00 PM    **B109**    **The Elemental Analysis of Recently Manufactured Automotive Glasses and a Comparison of Data Processing Programs**  
*Seongshin Gwak, PhD\*; Dongkye Lee, PhD; Kiwook Kim, MS; Sangcheol Heo, MS; Seung-jin Ryu, PhD; Hyun Jee Kim, PhD*
- 11:30 AM – 1:00 PM    **B110**    **Femicide During the COVID-19 Pandemic: The Italian Context**  
*Gianluca Rossi, MD\*; Alice Porceddu, MD; Camilla Bonci, MD; Francesca Capello, MD; Giancarlo Di Vella, PhD*
- 11:30 AM – 1:00 PM    **B111**    **The Forensic Analysis of 3D-Printed Polymers Using Direct Analysis in Real-Time Mass Spectrometry (DART®-MS)**  
*Jenna Covey, MSFS\*; Brian Musselman, PhD; Maria-Isabel Carnasciali, PhD; Brooke Kammrath, PhD*
- 11:30 AM – 1:00 PM    **B112**    **Improving the Delta-9-Tetrahydrocannabinol (delta-9-THC) Quantitative Measurements in Forensic Laboratories by The National Institute of Standards and Technology (NIST) CannaQAP**  
*Walter Wilson, PhD\*; Andrea Yarberry, PhD; Jerome Mulloor, MS*
- 11:30 AM – 1:00 PM    **B113**    **The Investigation and Quantitation Using Ultraviolet/Visible (UV/Vis) Spectrophotometry of the Products of the 4-Aminophenol Reaction With Cannabinoids**  
*Juliet Pearsall, BS\*; Marianne Staretz, PhD; Matthew Wood, PhD; Jeanne Berk, PhD*
- 11:30 AM – 1:00 PM    **B114**    **An Investigation of Organic Gunshot Residues by Direct Analysis in Real-Time Mass Spectrometry (DART®-MS)**  
*Thomas Ledergerber, BS\*; William Feeney, PhD; Edward Sisco, PhD; Luis Arroyo, PhD; Tatiana Trejos, PhD*
- 11:30 AM – 1:00 PM    **B115**    **A Mass Spectral Interpretation of Pinaca-Type Novel Psychoactive Substances (NPS)**  
*Christopher Poulos, BS\*; Glen Jackson, PhD*
- 11:30 AM – 1:00 PM    **B116**    **The Application of the Expert Algorithm for Substance Identification (EASI) on N-Alkanes**  
*Alexander Pfeffer, BS\*; Alexandra Adeoye, MS; Glen Jackson, PhD*
- 11:30 AM – 1:00 PM    **B117**    **The Influence of Instrument Parameters on Replicate Mass Spectra and Spectral Comparison Algorithms**  
*Isabel Galvez Valencia, BS\*; Glen Jackson, PhD*
- 11:30 AM – 1:00 PM    **B118**    **Boar Hunt or Manhunt? Fatality During Boar Hunting Expedition**  
*Andrea Costantino, MD\*; Naomi Iacoponi, MD\*; Julia Lazzari, MD; Alice Chiara Manetti, MD; Valentina Bugelli, MD, PhD; Paride Minervini; Marco Di Paolo, MD*
- 11:30 AM – 1:00 PM    **B119**    **The Quantitative Analysis of Δ9-Tetrahydrocannabinol (Δ9-THC) in Cannabis Plants Using the Fast Blue BB Colorimetric Test**  
*Nicole Valdes, MS\*; Roberta Gorziza, PhD; Jose Almirall, PhD*
- 11:30 AM – 1:00 PM    **B120**    **Open Fire**  
*Abigail Wilson, BS\*; Peter Diaczuk, PhD*

# CRIMINALISTICS

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- 11:30 AM – 1:00 PM     **B121**     **Accounting for Household Substrates in a Model for Predicting the Weathering of Ignitable Liquids**  
*Max Denn, MS, BS\*; Glen Jackson, PhD*
- 11:30 AM – 1:00 PM     **B122**     **The Qualitative Identification of Delta-8-Tetrahydrocannabinol (delta-8-THC) and Delta-9-Tetrahydrocannabinol (delta-9-THC) Using Thin-Layer Chromatography (TLC)**  
*Sara Moreno, BS\*; Emily Kell, BS; Kimberly Burrow, BS; Lauren Richards-Waugh, PhD*
- 11:30 AM – 1:00 PM     **B123**     **The Quantitative Analysis of Mitragynine and 7-Hydroxymitragynine in Kratom Samples Commercially Available in Richmond, VA, Using Gas Chromatography/Mass Spectrometry (GC/MS)**  
*Jade Smith, BS\*; Hunter Fleming, MS; Emanuele Alves, PhD*
- 11:30 AM – 1:00 PM     **B124**     **The Raman Spectroscopic Analysis of Drugs in Contaminated Fingermarks: The Effect of Temperature and Time Since Deposition**  
*Mohamed Amin, MSc\*; Entesar Al-Hetlani, PhD; Igor Lednev, PhD*
- 11:30 AM – 1:00 PM     **B125**     **The Tools, Resources, and Collaborative Research Used to Address Seized Drugs Measurement Challenges**  
*Edward Sisco, PhD\**

## Friday—Session I

### Next Generation Sequencing

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Moderator: Sheree Hughes

Co-Moderator: Charla Marshall

- 9:00 AM – 9:15 AM     **B126**     **One Laboratory's Experience With Next Generation Sequencing (NGS) Using the Verogen MiSeq® FGx System and Signature Prep Kit: The Decision, the Validation, and the Implementation**  
*Mandi Van Buren, MPharm\*; Brooke Ramirez, BS*
- 9:15 AM – 9:30 AM     **B127**     **The Internal Validation of Verogen ForenSeq™ DNA Signature Prep Kit Primer Set B Using the Hamilton Nimbus HD and MiSeq® FGx**  
*Mandi Van Buren, MPharm\*; Brooke Ramirez, BS*
- 9:30 AM – 9:45 AM     **B128**     **The Evaluation of the ForenSeq™ MainstAY Kit for Mixed Forensic DNA Samples**  
*Damani Johnson, BS\*; Lucio Avellaneda, BS; Rachel Houston, PhD; Tim Kalafut, PhD*
- 9:45 AM – 10:00 AM     **B129**     **The Identification of Trends of Sequenced-Based Allelic Drop-Out in Autosomal Short Tandem Repeats (STRs)**  
*Megan Foley, MSFS\*; Gerwald Koehler, PhD; Jun Fu, PhD; Robert Allen, PhD; Jarrad Wagner, PhD*
- 10:00 AM – 10:15 AM     **B130**     **WITHDRAWN**
- 10:15 AM – 10:30 AM     **B131**     **Mitochondrial Genome Sequences From 6,025 Population Samples**  
*Charla Marshall, PhD\*; Kimberly Andreaggi, PhD; Jennifer Higginbotham, MFS; Elise Anderson, MSFS; Walther Parson, PhD*

# CRIMINALISTICS

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10:30 AM – 10:45 AM    **B132**    **Perceptions of Forensic Scientists on Statistical Models and Ethical Implications in DNA Evidence Evaluations Using Sequence Data**  
*Sanne Aalbers, MSc\*; Bruce Weir, PhD*

10:45 AM – 11:00 AM    **BREAK**

## Forensic Genetic Genealogy

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*Moderator: Sheree Hughes*

*Co-Moderator: Charla Marshall*

11:00 AM – 11:15 AM    **B133**    **Trends in Profiles of Offenders Caught Using Forensic Genetic Genealogy (FGG)**  
*Will Vause, BA\*; Pamela Marshall, PhD*

11:15 AM – 11:30 AM    **B134**    **Solving More Cases Using Search Keys and Expanded DNA Indirect Matching (EDIM)**  
*Ray Wickenheiser, DPS, MBA\**

11:30 AM – 11:45 AM    **B135**    **The Impact of Manually Degraded Single Nucleotide Polymorphism (SNP) Microarray Data on GEDmatch Top Genetic Matches for Forensic Genetic Genealogy Purposes**  
*Justin Rivera, BS\*; Claire Glynn, PhD*

11:45 AM – 1:00 PM    **BREAK**

## Challenging and Non-Human Samples

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*Moderator: Rachel Houston*

*Co-Moderator: Steven Lee*

1:00 PM – 1:15 PM    **B136**    **Experimental Maceration on Human Bones: How Does It Impact the “Forens-OME”?**  
*Noemi Procopio, PhD\*; Andrea Bonicelli, PhD; Sheree Hughes, PhD*

1:15 PM – 1:30 PM    **B137**    **The Application of Ancient DNA Methodologies to Badly Burned Forensic Samples and Their Potential to Aid in the Identification and Analysis of Difficult Samples**  
*Cody Parker, PhD\*; Erin Rawls, BS; Amber Coffman, BS; Katelyn Bolhofner, PhD; Laura Fulginiti, PhD; Giovanna Vidoli, PhD; Joanne Devlin, PhD; Robert Oldt, BS; Sreetharan Kanthaswamy, PhD; Anne Stone, PhD*

1:30 PM – 1:45 PM    **B138**    **The Recovery of Human DNA From Fly Larvae**  
*Cesar Cantu, BS\*; Sibyl Bucheli, PhD; Rachel Houston, PhD*

1:45 PM – 2:00 PM    **B139**    **The Progress on Obtaining Nuclear DNA Profiles From a Human Hair Shaft**  
*Elaine Lewis, PhD; Daniele Podini, PhD; Arely Parra López, BS\**

2:00 PM – 2:15 PM    **B140**    **The Development of a Next Generation Sequencing Panel Targeting Cannabinoid Synthase Genes to Distinguish Between Marijuana and Hemp**  
*Ya-Chih (Jessica) Cheng, MS\*; Rachel Houston, PhD*

2:15 PM – 2:30 PM    **B141**    **The Intraspecies Variation of Commercially Available Kratom Products in Common DNA Barcode Regions**  
*Kari Graham, DPhil\*; Cesar Cantu, BS; Rachel Houston, PhD*

2:30 PM – 2:45 PM    **B142**    **An investigation of Forensic Applications for Nanoplate-Based Digital Polymerase Chain Reaction (PCR)**  
*Mirna Ghemrawi, PhD\*; Nicole Fernandez-Tejero, MS; Alyssa Sanchez, BS; Bruce McCord, PhD*

# CRIMINALISTICS

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2:45 PM – 3:00 PM     **B143**     **The Social Amoeba in Forensic Science: Microbial Fingerprinting and Epigenetics**  
*Andrea Alveshere, PhD\**

3:00 PM – 3:15 PM     **BREAK**

## In the Lab and in the Field

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*Moderator: Kelly Knight*

*Co-Moderator: Baneshwar Singh*

3:15 PM – 3:30 PM     **B144**     **Developing a Rapid DNA Response Plan for Mass Identification Events: An Inter-Laboratory Approach to Mobilizing a Forensic DNA Laboratory**  
*Dana DeVito, BS\*; Amy McGuckian, MS; Julie Sikorsky, MS; Taylor Koepfler, MS; Jason Chute, MSFS; Kelly Beatty, MSFS*

3:30 PM – 3:45 PM     **B145**     **Toward a Rapid DNA Tool for Integrated Forensic Epigenetic Sample Preparation**  
*Rachelle Turiello, MS\*; Renna Nouwairi, BS; Jordan Keller, BS; Francine Garrett-Bakelman, MD, PhD; James Landers, PhD*

3:45 PM – 4:00 PM     **B146**     **Discovering the Mysteries About Degradation of Extracted DNA From Trace Evidence When Stored in Different Conditions: State-of-the-Art and Future Perspectives**  
*Noemi Procopio, PhD\*; Giulia Sguazzi, MA; Giulia Giappichini, MS; Chiara Cirioni, MS; Selena Cisana, PhD; Luciano Garofano, PhD; Paolo Garofano, MD, PhD; Pasquale Linarello; Monica Omedei, PhD; Luca Salvaderi, BSc; Debora Varrone, Sarah Gino, MD*

4:00 PM – 4:15 PM     **B147**     **Investigator® 24plex QS Amplification Kit Validation and Evaluation of New Formulation**  
*Samantha Wandzek, MS\*; Jamie Haas, MS; Sapana Prajapati, BS; Alicia Cadenas, MS*

4:15 PM – 4:30 PM     **B148**     **The Development of a Five-Dye Insertion/Deletion (INDEL) Panel for Human Identification**  
*Lucio Avellaneda, BS\*; Damani Johnson, BS; Rachel Houston, PhD*

4:30 PM – 4:45 PM     **B149**     **The Status of the DNA Backlog in South Africa**  
*Antonel Olckers, PhD\**

4:45 PM – 5:00 PM     **B150**     **The Impact of Key Factors Absent in Forensic DNA Analysis in South Africa**  
*Antonel Olckers, PhD\**

## Friday—Session II

### Drugs II

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*Moderator: Thaddeus Mostowtt*

*Co-Moderator: Carmen Masters*

8:30 AM – 8:45 AM     **B151**     **Gas Chromatography-Vacuum Ultraviolet (GC-VUV) Detection of JWH-18 Positional Isomers and Select Diastereomeric Synthetic Cannabinoids**  
*Diana Le, BS\*; Ira Lurie, PhD*

8:45 AM – 9:00 AM     **B152**     **The Investigation of Analytical Methods Using Real-Time Mass Spectrometry for the Rapid Analysis of Seized Drugs**  
*Madeline Bloom, BS\*; Edward Sisco, PhD; Ira Lurie, PhD*

# CRIMINALISTICS

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- 9:00 AM – 9:15 AM     **B153**     **The Investigation of Cannabidiol Conversion Into Delta-9-Tetrahydrocannabinol in Electronic Cigarettes**  
*Laerissa Reveil, MS\*<sup>\*</sup>; Justin Poklis, BS; Matthew S. Halquist, PhD; Michelle Peace, PhD*
- 9:15 AM – 9:30 AM     **B154**     **The Nanogram Level Detection of Five Illicit Drugs Using the Ion Mobility Spectrometer: A Field-Testing Report**  
*John Wang, PhD\*<sup>\*</sup>; Rong Zhang, PhD*
- 9:30 AM – 9:45 AM     **B155**     **A Quantitative Determination of Four Designer Benzodiazepines by High-Performance Thin-Layer Chromatography (HPTLC)**  
*Isabella Iorio, BS\*<sup>\*</sup>; Thomas Brettell, PhD; Marianne Staretz, PhD; Matthew Wood, PhD*
- 9:45 AM – 10:00 AM     **B156**     **The Separation of Lysergic Acid Diethylamide (LSD) and its Analogs by High-Performance Thin-Layer Chromatography (HPTLC)**  
*Tori Schaffer, BS\*<sup>\*</sup>; Sandra Rodriguez-Cruz, PhD; Jeanne Berk, PhD; Thomas Brettell, PhD*
- 10:00 AM – 10:15 AM     **B157**     **The Conversion of Cannabidiol to Delta-9-Tetrahydrocannabinol (delta-9-THC) During Gas Chromatography/Mass Spectrometry (GC/MS) Analysis**  
*Sarah Shuda, MSFS\*<sup>\*</sup>; Barry Logan, PhD*
- 10:15 AM – 10:30 AM     **B158**     **The Utility of Flip-Flop Chromatography Employing Silica Hydride Stationary Phases With Diode Array Ultraviolet and Single Quadrupole Mass Spectrometric Detection for the Analysis of Seized Drugs**  
*Volda Appia-Kusi, BS\*<sup>\*</sup>; Ira Lurie, PhD*
- 10:30 AM – 10:45 AM     **B159**     **The Evaluation of Fentanyl and Fentanyl-Related Compounds on United States Paper Currency**  
*Matthew Hewes, MS\*<sup>\*</sup>; Alex Krotulski, PhD; Donna Papsun, MS; Barry Logan, PhD*
- 10:45 AM – 11:00 AM     **BREAK**

## Canines and Guns

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Moderator: Ann Geisendorfer

Co-Moderator: Carolyn Hudson

- 11:00 AM – 11:15 AM     **B160**     **The Chemical Analysis of the Surface Building Collapse Samples: Updating Decontamination Protocols for Search and Rescue Canines**  
*Michelle Karpinsky, BS\*<sup>\*</sup>; Lauryn DeGreeff, PhD; Erin Perry, MS, PhD*
- 11:15 AM – 11:30 AM     **B161**     **The Development of a Safe Canine Training Aid Mimic for Fentanyl**  
*Leann Forte, MS\*<sup>\*</sup>; Howard Holness, PhD; Kenneth Furton, PhD; Lauryn DeGreeff, PhD*
- 11:30 AM – 11:45 AM     **B162**     **A Two-Step Method for the Identification and Highly Specific Analysis of Organic Gunshot Residue Using Raman and Laser-Induced Breakdown Spectroscopies**  
*Igor Lednev, PhD\*<sup>\*</sup>; Shelby Khandasammy, BS; Lenka Halamkova, PhD; Matthieu Baudelet, PhD*
- 11:45 AM – 12:00 PM     **B163**     **Sourcing Glass Traces on Bullets as Additional Evidence for Shooting Reconstruction**  
*Crystal Rosales, BS\*<sup>\*</sup>; Gwyneth Gordon, PhD; Kyle Mueller, MS; Maia Nguyen, MPS; Shirly Montero, PhD*
- 12:00 PM – 1:00 PM     **BREAK**

# CRIMINALISTICS

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## Frictin Ridge

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Moderator: Claudine Pereira

Co-Moderator: Robin Ruth

- 1:00 PM – 1:15 PM     **B164**     **The Critical Evaluation of Various Classification Systems of Lip Prints**  
*Mukesh Thakar, PhD\*; Jagmeet Kaur, MSc*
- 1:15 PM – 1:30 PM     **B165**     **The Development of Latent Fingerprints on a Cigarette Using Ruthenium Tetroxide**  
*Young-Il Seo, MS\*; Jiho Seo, MS; Byung-sun Moon, PhD; Nam-Kyu Park, PhD*
- 1:30 PM – 1:45 PM     **B166**     **Quantitative Measurements for Fingerprint Quality Determination**  
*Hoyong Yie, ME\*; Byung-sun Moon, PhD; Nam-Kyu Park, PhD; Young-Il Seo, MS*
- 1:45 PM – 2:00 PM     **B167**     **The Standardization Process of the Fingerprint Profession: The European Approach**  
*Aldo Mattei, PhD, MSc\**
- 2:00 PM – 2:15 PM     **B168**     **The Effect of Smoking, Tobacco Chewing, and Various Pathological Conditions on Lip Prints**  
*Jagmeet Kaur, MSc\*; Mukesh Thakar, PhD*
- 2:15 PM – 2:30 PM     **B169**     **The Discrimination of Smokers and Non-Smokers Based on the Analysis of Fingermarks Using Attenuated Total Reflectance/Fourier Transform Infrared (ATR/FTIR) Spectroscopy and Chemometrics**  
*Mohamed Amin, MSc\*; Entesar Al-Hetlani, PhD; Igor Lednev, PhD*
- 2:30 PM – 3:00 PM     **BREAK**

## Paint, Hair, Fibers, and Tires

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Moderator: David Gouldthorpe

Co-Moderator: Vincent Villena

- 3:00 PM – 3:15 PM     **B170**     **The Effect of Elevated Temperatures on the Microscopical Identification of Vegetable Fibers**  
*Walter Rowe, PhD\**
- 3:15 PM – 3:30 PM     **B171**     **Optimal Machine Learning Model Selection on Tire Classification**  
*Amir Alipour Yengejeh, PhD\*; Larry Tang, PhD; John Lucchi, MS; Matthieu Baudelet, PhD*
- 3:30 PM – 3:45 PM     **B172**     **Wrestling With the Evaluation of Fiber Evidence: Transfer and Persistence Modeled Through Jiu-Jitsu Activities**  
*Victoria Lau, MSc\*; Claude Roux, PhD; Xanthe Spindler, PhD*
- 3:45 PM – 4:00 PM     **B173**     **A Chemical Approach to Tire Mark Analysis**  
*John Lucchi, MS\*; Matthieu Baudelet, PhD*
- 4:00 PM – 4:15 PM     **B174**     **Image Analysis and Neural Networks Techniques for Hair Examinations**  
*David H. Funes, MS\*; Candice Bridge, PhD*
- 4:15 PM – 4:30 PM     **B175**     **The Microscopical Recognition and Characterization of Pigmented Fibers**  
*Kelly Brinsko Beckert, BS, MS; Otyllia Abraham, BS, MS; Ethan Groves, BS; Skip Palenik, BS; Christopher Palenik, MS, PhD\**



# CRIMINALISTICS

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- 4:30 PM – 4:45 PM     **B176**     **An Analysis of Automotive Paint Layers on Plastic Substrates Using Chemical Imaging Fourier Transform Infrared (FTIR) Microscopy**  
*James Cizdziel, PhD; Kendall Wontor, MPharm\*; Carly Clisham, BS*
- 4:45 PM – 5:00 PM     **B177**     **Combatting Illegal Logging Through the Use of Direct Analysis in Real-Time High Resolution Mass Spectrometry (DART®-HRMS) and Statistical Logarithms**  
*Mónica Ventura, BS\*; Samira Beyramysoltan, PhD; Benedetta Garosi, BS; Meghan Appley, PhD; Edgard Espinoza, PhD; Rabi Musah, PhD*
- 5:00 PM – 5:15 PM     **B178**     **Electrochemical Characterization of Common Cutting Agents in Illicit Drugs**  
*George Hedlund, BS\*, Frederique T. Deiss, PhD*