

# CRIMINALISTICS

## Wednesday

### Poster Session

- 11:30 am – 1:00 pm **B1** **Revisiting Guidance on Sampling of Populations for Highly Polymorphic Forensic Loci**  
*Sanne Aalbers, PhD\**; *Katherine Gettings, PhD*
- 11:30 am – 1:00 pm **B2** **Assessing the Added Value of Non-Human DNA Analysis for Forensic Soil Analysis**  
*Kelly Meiklejohn, PhD\**; *Melissa Scheible, MFS*; *Tiffany Layne, PhD*; *Teresa Tiedge, PhD*;  
*Jack Hietpas, PhD*; *Jodi Webb, MS*; *Libby Stern, PhD*
- 11:30 am – 1:00 pm **B3** **A Small-Scale Ancestry Informative DIP-STR Marker Set for Biogeographic Ancestry Inference in United States Populations**  
*Lauren Hoopes, MSFS*; *Nicole DeWald*; *Diana Hall, PhD*; *Daniele Podini, PhD*;  
*Fabio Oldoni, PhD\**
- 11:30 am – 1:00 pm **B4** **Addressing the Challenges of the ISFG Minimum Sequence Ranges When Implementing NGS Technologies for STR Typing**  
*Christina Scott, MS\**; *Kevin Cheng, PhD*; *Kyleen Teague, PhD*; *Kim Eskey, MS*;  
*Tracy Ferguson, MS*; *Jo-Anne Bright, PhD*; *Rebecca Just, PhD*; *Rebecca Mitchell, PhD*
- 11:30 am – 1:00 pm **B5** **Assessing the Viability of DNA Yields From Taphonomically Altered Bone and Teeth**  
*Shelby Feirstein, MS\**; *Maria Castagnola, MA*; *Mayaas Hassan, BA*; *Alixs Pujols, BS*;  
*Sara C. Zapico, PhD*; *Luis Cabo, MS*; *Joe Adserias-Garriga, PhD*
- 11:30 am – 1:00 pm **B6** **It's Common Cents—How to Spend a Million Dollars in Five Months!**  
*Julie Ferragut, BS\**
- 11:30 am – 1:00 pm **B7** **The Molecular Diversity of 23 Y-STR Genetic Markers in an Endogamous Ramgharia Population of Punjab, India**  
*Amandeep Kaur Bhambara, PhD\**; *Shivkant Sharma, PhD\**; *Vivek Sahajpal, PhD*
- 11:30 am – 1:00 pm **B8** **A Comprehensive Drug Analysis of Vaporizer Products From Pennsylvania High Schools**  
*Alexis Quinter, MASc\**; *Joshua DeBord, PhD*; *Alex Krotulski, PhD*; *Barry Logan, PhD*;  
*Max Denn, MS*
- 11:30 am – 1:00 pm **B9** **Field Testing of Drug-Incorporated Edible Jellies Using Portable Raman-Based Analyzers and Colorimetric Tests**  
*Abid Naseer, MS\**; *Tahir Jamshaid, MPhil*; *Muhammad Usman, MS*; *Laraib Batool, PharmD*;  
*Muhammad Saqib Kabir Khan, MS*
- 11:30 am – 1:00 pm **B10** **Source Attribution of Fentanyl Via Metals Analysis**  
*Edward Bentil, PhD\**; *Marie Taylor, BSFS*; *Brian Eckenrode, PhD*
- 11:30 am – 1:00 pm **B11** **Determination of Plant DNA Recovery After Extraction of Ephedrine From Ephedra: A Pilot Study**  
*Nurdan Sandikçi, MS\**; *Tuğba Ünsal Sapan, PhD*; *Sevil Atasoy, PhD*; *Salih Tuncay, PhD*  
(FSF Emerging Forensic Scientist Award Poster Presentation)
- 11:30 am – 1:00 pm **B12** **A Simple DNA Extraction Method and a Rapid PCR-Based Assay for Detecting Ricinus Communis L. DNA Co-Extracted With Ricin**  
*Renato Paranaiba, PhD\**

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11:30 am – 1:00 pm	<b>B13</b>	<b>A Rapid Method for Identifying Source Species of Body Fluids: Implications for Wildlife Investigations</b> <i>Kate Jones*;</i> Christopher Ehrhardt, PhD
11:30 am – 1:00 pm	<b>B14</b>	<b>The Mysterious Case of a Fatal Accident During Skydiving: A Fracture of the Pelvis From Parachute Opening Shock (POS)?</b> <i>Naomi Iacoponi, MD*;</i> Julia Lazzari, MD; Carla Occhipinti, MD; Giacomo Visi, MD; Matteo Leoni, MD; Alessandra Cicchini, MD; Giorgio Chianducci, PEng; Roberto Testi, MD; Marco Di Paolo, MD
11:30 am – 1:00 pm	<b>B15</b>	<b>A 3D-Printed Object Topography Analysis and the Viability for Forensic Examination</b> <i>Cooper Blair, BS*;</i> Eric Law, PhD
11:30 am – 1:00 pm	<b>B16</b>	<b>WITHDRAWN</b>
11:30 am – 1:00 pm	<b>B17</b>	<b>A Characterization of Decomposing Human and Animal Tissue in a Micro-Scale Biotope Through Simulated Rainwater Extraction</b> <i>Nicholas Lyde, BSFS*;</i> Edward Bentil, PhD; Brian Eckenrode, PhD; Ivory Krise, MSFS; Nana Kennedy, MSFS
11:30 am – 1:00 pm	<b>B18</b>	<b>Analyzing the Case of a Fatal Shooting on a Movie Set</b> <i>Peter Diaczuk, PhD*;</i> Lexy Dejesus, BA
11:30 am – 1:00 pm	<b>B19</b>	<b>Developing a Method for the Analysis of Products Claiming to Treat COVID-19</b> <i>Christopher Poulos, MS*;</i> Travis Falconer, PhD; Michael Thatcher, BS; Adam Lanzarotta, PhD; Martin Kimani, PhD
11:30 am – 1:00 pm	<b>B20</b>	<b>Forensic Intelligence Derived From Crime Scene Evidence Using Text Embeddings</b> <i>Vinicius Lima, MEng*;</i> Umit Karabiyik, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)
11:30 am – 1:00 pm	<b>B21</b>	<b>Deep Ultraviolet Raman Spectroscopy for the Forensic Analysis of Oral Fluids</b> <i>Mohamed Amin, PhD*;</i> Fatima Matroodi, PhD; Entesar Al-Hetlani, PhD; Barbara Rossi, PhD; Igor Lednev, PhD (FSF Emerging Forensic Scientist Award Poster Presentation)
11:30 am – 1:00 pm	<b>B22</b>	<b>The Distribution of Retroreflective Glass Beads in Soil Samples</b> <i>Shirly Montero, PhD*</i>
11:30 am – 1:00 pm	<b>B23</b>	<b>Forensic Profiling of Cigarette Paper Using ATR/FTIR Spectroscopy and Machine Learning/Algorithms</b> <i>Vishal Sharma, PhD*;</i> Akanksha Sharma, MS
11:30 am – 1:00 pm	<b>B24</b>	<b>Low-Field and Benchtop NMR in the Forensic Science: Challenges and Opportunities</b> <i>Caroline D’Oca, PhD*;</i> Kahlil Salome, PhD; Anelize Bahniuk, PhD; Marcio Fernandes, PhD
11:30 am – 1:00 pm	<b>B25</b>	<b>Cracking the Case: Toward the Development of Mass Spectral Analysis of Blow Fly Eggs for Postmortem Interval Determination</b> <i>Alexa Figueroa, BS*;</i> Jennifer Rosati, PhD; Rabi Musah, PhD
11:30 am – 1:00 pm	<b>B26</b>	<b>The Contamination of Training Aid Substrates</b> <i>Fernando Zaldivar Eyre, BS*</i>

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- 11:30 am – 1:00 pm    **B27**    **A Rapid Hand-Held Detector for Drugs and Explosives and Their Signature VOCs Using Novel Nano-Porous Molecularly Imprinted Polymer Sensors**  
*Kenneth Furton, PhD\**; *Abuzar Kabir, PhD*; *Patrick Roman, PhD*
- 11:30 am – 1:00 pm    **B28**    **Exploring Alternative Solvents for Dichloromethane as an Extraction Solvent of Sexual Lubricant Components Using Gas Chromatography/Mass Spectroscopy**  
*Safiya Best, MScFS\**; *Ashley Gamache*; *Candice Bridge, PhD*

## Thursday

### Poster Session

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- 11:30 am – 1:00 pm    **B29**    **Time-Since-Deposition Signatures for the Analysis of Canine Body Fluids**  
*Alysia Townsley\**; *Christopher Ehrhardt, PhD*
- 11:30 am – 1:00 pm    **B30**    **Implementing Y-Screen Protocols as a Tool for Sexual Assault Forensic Examination Kit Backlog Reduction**  
*Lake Prescott, MSFS\**
- 11:30 am – 1:00 pm    **B31**    **The Use of Quantitation Values to Infer the Possible Presence of Spermatozoa**  
*Ashley Luther, MS\**; *Kate DeHeer, MPS*; *Joanna Johnson, MS*
- 11:30 am – 1:00 pm    **B32**    **Seminal Fluid Identification in Different Semen Sample Types**  
*Gabriela Roca, PhD\**; *Mercedes Aler*; *Maria Castagnola, MA*; *Scarlet Neilson, MSFS*;  
*Francisco Medina Paz, PhD*; *Maik Schlieper*; *Nora Ronan-Milz*; *Polina Khalizov*;  
*Elizabeth Brusacoram, BS*; *Maria Isabella Negretti, BS*; *Amy Brodeur, MFS*;  
*Mirna Ghemrawi, PhD*
- 11:30 am – 1:00 pm    **B33**    **Increased DNA Quantification Sensitivity: An Evaluation of Investigator Quantiplex Pro FLX**  
*Julia Wang, MS\**; *Ya-Chih Cheng, PhD*; *Joshua Boster, BS*; *Rachel Houston, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*
- 11:30 am – 1:00 pm    **B34**    **A Novel Method for the Identification of Source Tissue in Biological Mixtures**  
*Gabrielle Wolfe\**; *Nicole Dailey, MS*; *Christopher Ehrhardt, PhD*
- 11:30 am – 1:00 pm    **B35**    **QIAxcel vs. qPCR: Evaluating Versatility for Forensic DNA Screening**  
*Susana Garcia, BS\**; *Natalia Czado, MSFS*; *Damani Johnson, BS*; *Cesar Cantu, BS*;  
*Sheree Hughes, PhD*; *Rachel Houston, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*
- 11:30 am – 1:00 pm    **B36**    **The Simultaneous Recovery of DNA, RNA, and Protein From Biological Samples for Forensic Applications Using a Novel Method**  
*Jacob Hetzke, BS\**; *Coral Smith, MS*; *Brian Davis, PhD*; *Michael Rishel, PhD*;  
*Chrystal Chadwick, BS*; *John Nelson, PhD*; *Arati Iyengar, PhD*
- 11:30 am – 1:00 pm    **B37**    **An In-Depth Look at DNA Casework on Fired Cartridge Casings Extracted Using a Modified Swabbing and Extraction Technique**  
*Jennifer Belna, BS\**; *Rhonda Carter, BS*
- 11:30 am – 1:00 pm    **B38**    **Streamlining Forensic Workflows: Field Test Results of Forensic Samples Using the HID NIMBUS Presto QNA System**  
*Kayli Carrillo, BS\**; *Sheree Hughes, PhD*  
*(FSF Emerging Forensic Scientist Award Poster Presentation)*

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- 11:30 am – 1:00 pm    **B39**    **The Simultaneous Determination of Time-Since-Deposition and Source Tissue for Forensic Biological Samples**  
*Caitlin Lydon, BS\**; *Christopher Ehrhardt, PhD*; *Catherine Connon, PhD*; *Susan Greenspoon, PhD*
- 11:30 am – 1:00 pm    **B40**    **Modified Extraction Protocols for Nuclear DNA Extraction From Human Hair Shafts**  
*Holly Zhao, BS\**; *Vinalon Mones, BS*; *Elaine Lewis, PhD*; *Glenn Fahrig, MS*; *Gregory Peiffer, PhD*; *Rebecca Sloman, MFS*; *Katherine Hargett, MFS*; *Todd Bille, MS*; *Daniele Podini, PhD*  
(FSF Emerging Forensic Scientist Award Poster Presentation)
- 11:30 am – 1:00 pm    **B41**    **Direct to DNA: Revolutionizing Forensic Analysis by Streamlining the Process**  
*Darcy Machado, MSFS\**; *Francesca Spatola, MS\**
- 11:30 am – 1:00 pm    **B42**    **Rapid DNA—Friend or Foe? Comparing Rapid DNA Analysis With Conventional Methodologies for Sexual Assault and Identification Cases**  
*Tania Dominguez González, BS\**; *Jenny Acevedo González, PhD*
- 11:30 am – 1:00 pm    **B43**    **The Impact of Various Substrates and Deposition Time on Bacteria Associated With Saliva Samples and Its Implication on the Accuracy of a Bacterial Signature- Based Body Fluid Identification Method**  
*Olisdey Galano Cruz, BS\**; *Sarah Seashols-Williams, PhD*; *Paul Brooks, PhD*; *Baneshwar Singh, PhD*; *Denise Wohlfahrt, PhD*  
(FSF Emerging Forensic Scientist Award Poster Presentation)
- 11:30 am – 1:00 pm    **B44**    **Enhancing Success Rates in Sexual Assault Investigations With the SpermX Differential Extraction System**  
*Huma Nasir, MS\**; *Amanda Walker, MS*; *Kelsy Lowther, MS*
- 11:30 am – 1:00 pm    **B45**    **Expanding On-Site Crime Scene Reconstruction Capabilities by Uncovering Microscopic Clues Using Mobile Laser-Induced Breakdown Spectroscopy (LIBS)**  
*Leah Thomas, BS\**; *Roger Jefferys, MS*; *Luis Arroyo, PhD*; *Tatiana Trejos, PhD*
- 11:30 am – 1:00 pm    **B46**    **Analysis of Inorganic Oxidizing Salts in Intact and Chemically Reacted Consumer Fireworks Using Microscopical and Spectroscopic Approaches**  
*Sydney Hampton, BS\**; *Cassidy Callaway, MS*; *Jared Estevanes, PhD*; *Patrick Buzzini, PhD*; *Geraldine Monjardez, PhD*  
(FSF Emerging Forensic Scientist Award Poster Presentation)
- 11:30 am – 1:00 pm    **B47**    **An Artificial Intelligence-Based Detection of Ignitable Liquid Residues in Fire Debris Using a Deep Convolutional Neural Network**  
*Ting-Yu Huang, PhD\**; *Jorn Yu, PhD*
- 11:30 am – 1:00 pm    **B48**    **The Detection of Organic Explosive Residues From Outdoor Explosions Using Confocal Raman Microscopy**  
*Nicholas Jernigan, BS\**; *Jared Estevanes, PhD*; *Geraldine Monjardez, PhD*  
(FSF Emerging Forensic Scientist Award Poster Presentation)
- 11:30 am – 1:00 pm    **B49**    **The Application of a Hand-Held Raman Spectrometer for the Classification of Synthetic and Petroleum-Based Hydrocarbon Fluids**  
*Javier Hodges, BS\**; *Kailee Marchand, BS*; *Jorn Yu, PhD*  
(FSF Emerging Forensic Scientist Award Poster Presentation)
- 11:30 am – 1:00 pm    **B50**    **The Impact of Glass Vial Type in Measuring Raman Spectrum of Liquid Hydrocarbon Samples**  
*Kailee Marchand, BS\**; *Javier Hodges, BS*; *Jorn Yu, PhD*

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11:30 am – 1:00 pm	<b>B51</b>	<b>The Detection of Bio-Based Lighter Fluid and Biodiesel Residues on Wood and Fabric Debris</b> <i>Mengliang Zhang, PhD*</i>
11:30 am – 1:00 pm	<b>B52</b>	<b>Real Bullets, Plastic Guns: Evaluating the Strength of 3D-Printed Gun Parts</b> <i>Maria Mayol, BA* ; Peter Diaczuk, PhD</i>
11:30 am – 1:00 pm	<b>B53</b>	<b>The Collection Efficiency of the Activated Charcoal Adsorbent for the Detection and Identification of the DMNB by GC/MS From the Headspace of the Suspected Post-Blast Debris</b> <i>Khalid Feras, MS*</i>
11:30 am – 1:00 pm	<b>B54</b>	<b>The Characterization and Discrimination of Soil by Major Elemental Analysis Using Laser-Induced Breakdown Spectroscopy: A Case Study of Nirasaki in Central Japan</b> <i>Kento Kumisaka, MD* ; Ritsuko Sugita, PhD</i>
11:30 am – 1:00 pm	<b>B55</b>	<b>An Investigation Into Chromatographic Methods for the Preservation, Stability, and Analysis of Organic Gunshot Residue</b> <i>Addio Fiordigigli, BS* ; Kourtney Dalzell, MS ; Thomas Ledergerber, BS ; Tatiana Trejos, PhD ; Luis Arroyo, PhD</i>
11:30 am – 1:00 pm	<b>B56</b>	<b>A Study of Casing Markings of Semi-Automatic Firearms Modified With a Glock® Switch</b> <i>Nicole Sachman, BS* ; Lawrence Quarino, PhD ; Carol Ritter, MS ; Peter Diaczuk, PhD</i>
11:30 am – 1:00 pm	<b>B57</b>	<b>One-Step Non-Contact Sampling and Analysis of Trace Chemical Residues Using an Electrostatic Wand and Paper Spray Mass Spectrometry</b> <i>Kimberly Edmunds* ; La’Nyah Nance ; Kenyon Evans-Nguyen, PhD</i>
11:30 am – 1:00 pm	<b>B58</b>	<b>A Quantitative Assessment of the Stability of New AR-Style Rifle Breech Face Characteristics</b> <i>Teagan Trent* ; Eric Law, PhD</i>
11:30 am – 1:00 pm	<b>B59</b>	<b>A Modified Procedure for Extracting Primer Gunshot Residue From Scanning Electron Microscopy Carbon Stubs and Trace Analysis Utilizing the Graphite Furnace-Atomic Absorption Spectrometry Technique</b> <i>Khalid Feras, MS*</i>
11:30 am – 1:00 pm	<b>B60</b>	<b>Outpacing the Law: NPS—A Global Threat Challenging Forensic Analysis</b> <i>Tahir Jamshaid, MPhil* ; Khalid Feras, MS* ; Umair Ilkram Dar ; Memoona Ishtiaq, PhD</i>
11:30 am – 1:00 pm	<b>B61</b>	<b>The Enhancement of Latent Fingerprints Using Waste Biomass-Derived Biocompatible Fluorescent Graphene Nanosheets</b> <i>Kajol Bhati, PhD* ; Divya Tripathy, PhD</i>
11:30 am – 1:00 pm	<b>B62</b>	<b>An Assessment of the Permeability of VOCs Between Containers Housing Detection Canine Training Aids</b> <i>Kayla Hogan, BA* ; Lauryn DeGreeff, PhD ; Kenneth Furton, PhD</i>
11:30 am – 1:00 pm	<b>B63</b>	<b>The Prevalence of GSR on Ammunition Packaging</b> <i>Brittany Claassen, MS* ; Kailyn Thomas ; Jason Schroeder, MS</i> <i>(FSF Emerging Forensic Scientist Award Poster Presentation)</i>
11:30 am – 1:00 pm	<b>B64</b>	<b>Advancing Trace Evidence Identification Through ATR/FTIR Spectroscopy and Machine Learning for Textile Fibers Analysis</b> <i>Vishal Sharma, PhD* ; Akanksha Sharma, MS</i>

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- 11:30 am – 1:00 pm     **B65**     **Addressing Challenges in Mineral Identification by Raman Spectroscopy**  
*Jasmine Kaur, MFS\**; *Drew Kuroda, BS*; *Joshua Christensen*; *Marisia Fikiet, PhD*;  
*Peter De Forest, DCrim*; *Brooke Kammrath, PhD*
- 11:30 am – 1:00 pm     **B66**     **The Characterization of Residues Left by the Impact of Different Types of Firearm-Propelled Projectiles**  
*Jesus Velho, PhD\**; *Aline Bruni, PhD*; *Michele Dos Santos, MD, PhD*; *Milena Souza, MD*

## Thursday—Session I

### Collection and Extraction

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Moderator: Amy Brodeur, MFS

Co-Moderator: Ashley Morgan, PhD

- 8:00 am – 8:30 am     **B67**     **Standards Development Activities in Human Forensic Biology**  
*Jillian Conte, PhD\**; *Charlotte Word, PhD*; *Jarrah Kennedy, MSFS*
- 8:30 am – 8:45 am     **B68**     **An Evaluation of Semen Extraction Efficiency and Recovery After Washing From Reusable Period Underwear**  
*Caitlyn Spencer, BS\**; *Sarah Seashols-Williams, PhD*  
*(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 8:45 am – 9:00 am     **B69**     **Swab Technology Is Advancing: Are We Putting Research Evidence Into Action?**  
*Jillian Conte, PhD\**; *Tracey Johnson, MSFS*
- 9:00 am – 9:15 am     **B70**     **A Quantitative Assessment of Extraction Efficiencies Obtained From Various Methods and Sample Types**  
*Lauren Mullen, MFS\**; *Erica Romsos, MFS*; *Peter Vallone, PhD*  
*(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 9:15 am – 9:30 am     **B71**     **Innovative Lab-on-a-Disc Technology for Rapid Differential DNA Extraction in Forensic Science**  
*Beomseok Lee, PhD\**; *Kyusang Lee, PhD*; *Beomhee Ahn*; *Hanna Kim, BS*; *Hwanghee Ryu, MS*;  
*Myunghee Jang, BS*; *Yoon-Kyoung Cho, PhD*
- 9:30 am – 9:45 am     **B72**     **A New DNA Collection Tool Kit: Bringing Versatility and Flexibility to Analysts**  
*Jamie Fredericks, PhD\**; *Eric Wooldridge, MS*
- 9:45 am – 10:15 am     **B73**     **Differential Extractions—Defining the Problem**  
*Robin Cotton, PhD\**; *Ashley Lara, MS*; *Anna Berberoglu, MS*; *Xiaoyu Zhang, MS*
- 10:15 am – 10:30 am     **BREAK**

### Criminalistics Gone Wild

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Moderator: Tiffany Rodriguez, MS

Co-Moderator: C. Ken Williams, MS, JD

- 10:30 am – 11:30 am     **B74**     **Criminalistics Gone Wild (in the Courtroom)—Human Factors, Activity Level, and Probability, Oh My!**  
**\*Interactive Panel Discussion**  
*Agnes Winokur, PhD\**; *Tiffany Rodriguez, MS\**; *Claude Roux, PhD, FRSN\**;  
*Christopher Palenik, PhD\**; *Joseph Remy\**; *Tim Kalafut, PhD\**

11:30 am – 1:00 pm

**BREAK**

# CRIMINALISTICS

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## Biomarkers, Body Fluids, and Y-STRs

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Moderator: Robin Cotton, PhD

Co-Moderator: Kelly Elkins, PhD

- 1:00 pm – 1:15 pm     **B75**     **A Proteomic Analysis of Semen for Human Identification and Body Fluid Classification**  
*Zachary Goecker, PhD\**; *Zheng Zhang, MD*; *Erica Romsos, MFS*; *Meghan Burke, PhD*;  
*Glendon Parker, PhD*; *Stephen Stein, PhD*; *William Wallace, PhD*; *Peter Vallone, PhD*
- 1:15 pm – 1:30 pm     **B76**     **An Advanced Nucleic Acid Lateral Flow Assay for Rapid and Sensitive Identification of Human Vaginal Fluid Using Molecular Beacon Technology**  
*Nidhi Subhashini, PhD\**
- 1:30 pm – 1:45 pm     **B77**     **Integrating Genetic and Epigenetic Sequencing for Forensic Application in a Single Workflow**  
*Mirna Ghemrawi, PhD\**; *Lindsay Kotchey, MSFS*
- 1:45 pm – 2:00 pm     **B78**     **WITHDRAWN**
- 2:00 pm – 2:15 pm     **B79**     **The Identification and Optimization of MicroRNA Biomarkers for Accurate Body Weight Prediction in Forensic Samples**  
*Kimberly Lettner, BS\**; *Xiaomeng Yang, MS*; *Sarah Seashols-Williams, PhD*  
*(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 2:15 pm – 2:30 pm     **B80**     **Dead or Alive? Biomarker Identification for Postmortem Blood Detection**  
*Sara C. Zapico, PhD\**; *Amy Brodeur, MFS*; *Tai-Hua Tsai, MS*; *Gulnaz Javan, PhD*;  
*Christian Stadler, PhD*; *Gabriela Roca, PhD*
- 2:30 pm – 2:45 pm     **B81**     **The Design and Development of Novel Single Multiplex System Incorporating 26 Rapidly Mutating Y-STRs: 26 RM Yplex**  
*Rashed Alghafri, PhD\**
- 2:45 pm – 3:00 pm     **B82**     **The Recovery of Probative aSTR and Y-STR Profiles From Single or a Few Micromanipulated Sperm Cells**  
*Morgan Peters, MS\**; *Kaitlin Huffman, PhD*; *John Ballantyne, PhD*; *Erin Hanson, PhD*  
*(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 3:00 pm – 3:15 pm     **BREAK**

## FIGG and UHR

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Moderator: Lori Seman, MS

Co-Moderator: Janine Kishbaugh, MS

- 3:15 pm – 3:45 pm     **B83**     **The Humanitarian DNA Database (HDD): An Update**  
*Michael Coble, PhD\**; *Melody Josserand, MS*; *Erika Ziemak, MS*
- 3:45 pm – 4:15 pm     **B84**     **When You Come to a Fork in the Road, Recognize It: Mapping the FIGG Decision-Making Landscape**  
*Colleen Fitzpatrick, PhD\**; *Valerie Mattimore Fuller, PhD*
- 4:15 pm – 4:35 pm     **B85**     **Building Branches: Navigating Practical and Ethical Considerations for the Responsible Use of Forensic Investigative Genetic Genealogy (FIGG)**  
*Claire Glynn, PhD\**



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- 4:35 pm – 4:55 pm     **B86**     **Down the Rabbit Hole—Now Up a Tree: Solving Cold Cases Using Forensic Investigative Genetic Genealogy at the New York City Office of Chief Medical Examiner and the Queens District Attorney’s Office**  
*Lisa Mertz, MS\*; Karen Ross, JD\**
- 4:55 pm – 5:15 pm     **B87**     **The Development of Artificial Single Nucleotide Polymorphism (SNP) Data for Investigative Genetic Genealogy (IGG) Research and Training: A Preliminary Study**  
*Jessica Whitney, MS\*; Keith Morris, PhD; Aldo Romero, PhD*  
*(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 5:15 pm – 5:35 pm     **B88**     **The Coldest Cold Case in Croatia: The Body in the Chest Freezer**  
*Tina Smoljanović, BAsC\*; Hrvoje Senješ, MAS; Jerković Ivan, PhD*

## Thursday – Session II

### SWGMAT Update and Fentanyl

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Moderator: Glen Jackson, PhD

Co-Moderator: Mariah Carson, MSFS

- 8:00 am – 8:20 am     **B89**     **A 2025 Update From the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG)**  
*Jaclyn Iera, PhD\**
- 8:20 am – 8:40 am     **B90**     **Reference-Free Identification of Fentanyl Analogs**  
*Tom Metz, PhD\*; Katherine Schultz, MS; Adam Hollerbach, PhD; Christopher Harrilal, PhD; Dylan Ross, PhD; Danielle Ciesielski, PhD; Yehia Ibrahim, PhD; Simone Raugei, PhD; Bobbie-Jo Webb-Robertson, PhD; Robert Ewing, PhD*
- 8:40 am – 9:00 am     **B91**     **Using Chemical Profiling and Chemometrics for Predictive Fentanyl Geographic Associations**  
*Agnes Winokur, PhD\**
- 9:00 am – 9:20 am     **B92**     **Profiling Fentanyl in a Local Drug Market and Characterizing Variability Through Quantitative Chemical Analysis**  
*Joshua DeBord, PhD\*; Alexis Quinter, MASc; Max Denn, MS; Barry Logan, PhD; Alex Krotulski, PhD*
- 9:20 am – 9:40 am     **B93**     **Longitudinal Insights Into the United States’ Illicit Fentanyl Supply From the Characterization of Counterfeit Fentanyl Tablets**  
*Barry Logan, PhD\*; Sarah Shuda, MS; Mia Borrelli, MS; M.J. Menendez, JD; Thom Browne, MA; Amanda Mohr, MS*
- 9:40 am – 9:55 am     **BREAK**

### Drug Chemistry Instrumental Analysis

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Moderator: Liguo Song, PhD

Co-Moderator: Abdallah Malik Naanaa, MS

- 9:55 am – 10:10 am     **B94**     **The Optimization of Soft Ionization by Chemical Reaction in Transfer Coupled to a Time-of-Flight Mass Spectrometer for Rapid Seized Drug Screening**  
*Joanna Eldon-Edington, BASc*



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10:10 am – 10:30 am	<b>B95</b>	<b>The Development of an Analytical Scheme for the Identification of Nitazene Compounds</b> <i>Sarah Caceres, MS*</i> ; <i>Russel Ford, PhD*</i> ; <i>Sherri Tupik, BS*</i>
10:30 am – 10:45 am	<b>B96</b>	<b>Novel Approaches to Increase Specificity for Difficult Isomeric Separations With Ultra-High Performance Liquid Chromatography (UHPLC) for the Analysis of Seized Drugs</b> <i>Jerimiah Seba, BS*</i> ; <i>Ira Lurie, PhD</i>
10:45 am – 11:00 am	<b>B97</b>	<b>Determining the Utility of Gas Chromatography/Derivative Vacuum Ultraviolet Spectroscopy for Seized Drug Analysis Through a Comparison to Gas Chromatography/Mass Spectrometry Capabilities</b> <i>Alexa Mehlman, BS*</i> ; <i>Ira Lurie, PhD</i> <i>(FSF Emerging Forensic Scientist Award Oral Presentation)</i>
11:00 am – 11:15 am	<b>B98</b>	<b>Chemometrics as a Tool for Transformation: Addressing the Limitations of Gas Chromatography/Infrared Spectroscopy for Synthetic Cathinone Analysis</b> <i>Jennifer Bonetti, MS*</i> ; <i>Ruben Kranenburg, PhD</i> ; <i>Stephen Hokanson, BS</i> ; <i>Matthew Pothier, MS</i> ; <i>Saer Samanipour, DSc</i> ; <i>Arian van Asten, PhD</i>
11:15 am – 11:30 am	<b>B99</b>	<b>An Additional Analysis of Drug Test Strips by Mass Spectrometry for Rapid Comprehensive Drug Checking</b> <i>Meghan Appley, PhD*</i> ; <i>Edward Sisco, PhD</i>
11:30 am – 1:00 pm		<b>BREAK</b>

## Detector Dogs

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Moderator: A. Bakarr Kanu, PhD, MRSC

Co-Moderator: Mikaela Romanelli, MS

1:00 pm – 1:20 pm	<b>B100</b>	<b>Detector Dogs: Advancing Drug Detection Operations Using Science at the United States Customs and Border Protection</b> <i>Jonathan McGrath, PhD*</i> ; <i>Armando Avallone, MS</i>
1:20 pm – 1:40 pm	<b>B101</b>	<b>The Development of Fentanyl Training Aids to Advance Canine Detection Strategies</b> <i>Jonathan McGrath, PhD*</i> ; <i>Armando Avallone, MS</i>
1:40 pm – 2:00 pm	<b>B102</b>	<b>Canine Training Aid Development of Novel Target Odors to Advance Strategies to Combat Fentanyl Precursors at the Border</b> <i>Jonathan McGrath, PhD*</i> ; <i>Armando Avallone, MS</i>
2:00 pm – 2:20 pm	<b>B103</b>	<b>The Evolution of VOC Profiles During Early Human and Animal Decomposition in Application for Canine Detection</b> <i>Fantasia Whaley, MSFS*</i> ; <i>Valerie Albizu, BS</i> ; <i>Joel Fuentes Carrasco, BS</i> ; <i>Emily Millan, BS</i> ; <i>Jordi Cruz, PhD</i> ; <i>Lauryn DeGreeff, PhD</i>
2:20 pm – 2:40 pm	<b>B104</b>	<b>Assessing the Accuracy and Reliability of Canine Explosives Detection Using OSAC Training and Certification Standards</b> <i>Adele Quigley-McBride, PhD*</i> ; <i>Haylie Browning, BS*</i> ; <i>Lauryn DeGreeff, PhD</i> ; <i>Paola A. Prada-Tiedemann, PhD</i>
2:40 pm – 3:00 pm	<b>B105</b>	<b>Developing a Universal Smokeless Powder Training Aid</b> <i>Rushali Dargan, PhD*</i> ; <i>Lauryn DeGreeff, PhD</i>
3:00 pm – 3:20 pm		<b>BREAK</b>

# CRIMINALISTICS

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## Firearm and Toolmark Examinations

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Moderator: Jack Hietpas, PhD

Co-Moderator: Zoë Krohn

- 3:20 pm – 3:40 pm      **B106**      **OSAC/ASB Standards Development Activities in Firearm and Toolmark Examination**  
*Xiaoyu Zheng, MS\*; Robert Sanger\**
- 3:40 pm – 4:00 pm      **B107**      **A Quantitative Topography Comparison of Toolmarks Made by Tongue-and- Groove Pliers**  
*Eunah Joo, MS\*; Thomas Renegar, AA; Johannes Soons, PhD; Michael Stocker, BS;  
Robert Thompson, MFS; Xiaoyu Zheng, MS*
- 4:00 pm – 4:20 pm      **B108**      **The Interoperability of 3D Firearm Toolmark Measurements**  
*Xiaoyu Zheng, MS\*; Johannes Soons, PhD; James Yen, PhD*
- 4:20 pm – 4:40 pm      **B109**      **The Generation and Interpretation of the Similarity Score Distribution for Matched and Non-Matched Bullets and Cartridge Cases**  
*Neal Schrode, BS\**
- 4:40 pm – 5:00 pm      **B110**      **Quantitative Assessment of Barrel Wear From Solid Copper Bullets**  
*Natali Hassett, MS\*; Eric Law, PhD*
- 5:00 pm – 5:20 pm      **B111**      **A Quantitative Determination of Muzzle-to-Target Distance in Shooting Cases**  
*Taqiyah Chernesky, MScFS\*; Sophie Knier, MFS; Stephanie Walcott, MScFS; Emanuele Alves, PhD*
- 5:20 pm – 5:40 pm      **B112**      **Close Non-Matches and Database Searches: How Often Can We Expect to See a True Match Among the K Highest Correlations?**  
*Blanca Parker, BA\*; Heike Hofmann, PhD; Alicia Carriquiry, PhD*

## Thursday – Session III

### Challenging Samples From Human Remains

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Moderator: Sheree Hughes, PhD

- 8:30 am – 9:00 am      **B113**      **Deep Ocean Recovery and DNA Identification of Human Remains From the Titan Submersible**  
*Nancy Stokes, MSFS\*; Taylor Dickerson, MSFS; John Walsh, MD; Timothy McMahon, PhD*
- 9:00 am – 9:15 am      **B114**      **An Evaluation of DNA Recovery From Chemically Treated Human Remains**  
*Jennifer Snedeker, BS\*; Rachel Houston, PhD; Sheree Hughes, PhD  
(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 9:15 am – 9:30 am      **B115**      **The Use of Mitochondrial DNA to Provide Ancestry of Skeletal Remains Discovered in the East Marshall Street Well (EMSW)**  
*Martin MacStudy, BS\*; Filipa Simao, PhD; Baneshwar Singh, PhD; Tal Simmons, PhD  
(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 9:30 am – 9:45 am      **B116**      **An Optimized Demineralization Method Using Bone Slices for Improved DNA Recovery of 19th-Century Human Skeletal Remains**  
*Ciara Rhodes, BS\*; Reilly Price, MS; Celeste Willetts, BS; Tal Simmons, PhD;  
Sarah Seashols-Williams, PhD  
(FSF Emerging Forensic Scientist Award Oral Presentation)*

# CRIMINALISTICS

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9:45 am – 10:00 am     **B117**     **Biparental and Uniparental Ancestry of the Unidentified Human Remains From the East Marshall Street Well**  
*Christopher Twene, MS\**; *Filipa Simao, PhD*; *Baneshwar Singh, PhD*; *Tal Simmons, PhD*  
(FSF Emerging Forensic Scientist Award Oral Presentation)

10:00 am – 10:15 am     **BREAK**

## Forensic Investigations, NIST Libraries, and Source Identification

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Moderator: Geraldine Monjardez, PhD

Co-Moderator: Beth Saucier Goodspeed, MS

10:15 am – 10:30 am     **B118**     **Non-Destructive Brand Classification From Automobile Tire Rubber Traces Using ATR/FTIR Spectroscopy and Machine Learning for Forensic Investigations**  
*Vishal Sharma, PhD\**; *Akanksha Sharma, MS*

10:30 am – 10:45 am     **B119**     **The Development of a Protocol for the Elemental Analysis of Tire Marks in Road Crime Forensics**  
*Matthieu Baudelet, PhD\**; *John Lucchi, PhD*; *Micaela Hernandez, BS*; *Alex Curto, BA*

10:45 am – 11:05 am     **B120**     **The National Institute of Standards and Technology (NIST) Mass Spectral Reference Libraries**  
*Edward Erisman, MS\**

11:05 am – 11:30 am     **B121**     **The Development and Evaluation of a Contrastive Learning Framework for Source Identification: Technology for Transformation in the Interpretation of Forensic Data**  
*Danica Ommen, PhD\**; *Christopher Saunders, PhD*; *JoAnn Buscaglia, PhD*

11:30 am – 1:00 pm     **BREAK**

## An Elusive Generalist, Measurement Uncertainty, Standards Implementation, and the Tyranny of Universal Standards

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Moderator: Brooke Weinger Kamrath, PhD

Co-Moderator: Alyssa Berthiaume, MS

1:00 pm – 1:30 pm     **B122**     **The Curious Case of the Elusive Generalist**  
*Sheila Willis, DSc\**; *Michelle Miranda, PhD*

1:30 pm – 1:50 pm     **B123**     **The Implementation of a Uniform Approach to Determine Measurement Uncertainty in Routine Chemical Forensic Casework**  
*Ivo Alberink, PhD\**; *Ingrid Bosman, PhD*; *Marzena Glama, MS*; *Dick-Paul Kloos, PhD*; *Annette Sprong, BS*; *Camille van Dijk, MS*

1:50 pm – 2:10 pm     **B124**     **A Study of Standards Implementation Across the Forensic Sciences: Notes, Trends, and Future Directions**  
*Vincent Desiderio, MS\**; *John Paul Jones, MBA*; *Allison Getz, MS*; *Crystal DeGrange, MS*; *Mark Stolorow, MS, MBA*; *Steven Johnson, BS*

2:10 pm – 2:40 pm     **B125**     **Problematic Exclusionary Differences: The Tyranny of Universal Standards for Determining Exclusionary Differences**  
*Janean Hanka, MS\**; *JoAnn Buscaglia, PhD\**; *Jack Hietpas, PhD*; *Danica Ommen, PhD*; *Christopher Saunders, PhD*

2:40 pm – 3:00 pm     **BREAK**

# CRIMINALISTICS

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## Friction Ridge Applications in Research and Practice I

Moderator: Bryan T. Johnson, MSFS

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|-------------------|-------------|--|
| 3:00 pm – 3:20 pm | <b>B126</b> | <b>Standards Development Activities Related to Friction Ridge Examination</b><br><i>Heidi Eldridge, PhD*</i>   |
| 3:20 pm – 3:40 pm | <b>B127</b> | <b>Forensic Lab’s Phoenix Rise: The Remarkable Redemption of a Lost Latent Fingerprint Unit</b><br><i>Angelic Rountree, BS*; Alice White, BS</i>                         |
| 3:40 pm – 4:00 pm | <b>B128</b> | <b>Assessing the Performance of Fingerprint Laboratories Through Collaborative Exercises: The ENFSI Fingerprint Working Group Experience</b><br><i>Aldo Mattei, PhD*</i> |
| 4:00 pm – 4:20 pm | <b>B129</b> | <b>An Investigation of Fingerprint Residue Components and Differentiation From Contaminants</b><br><i>Katelynn Perrault Uptmor, PhD*; Emma Macturk, BS</i>               |
| 4:20 pm – 4:30 pm |             | <b>BREAK</b>   |

## Friction Ridge Applications in Research and Practice II

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Moderator: Marianne Staretz, PhD

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|-------------------|-------------|---|
| 4:30 pm – 4:50 pm | <b>B130</b> | <b>Developing Reproducible Protocols and Definitions for Selecting Combined Minutiae: Applications in Research and Practice</b><br><i>Adele Quigley-McBride, PhD*; Heidi Eldridge, PhD*; Brett Gardner, PhD</i>                 |
| 4:50 pm – 5:10 pm | <b>B131</b> | <b>Likelihood Ratios for Fingerprint and Palm Impressions</b><br><i>Thomas Busey, PhD*; Meredith Coon, MS</i>   |
| 5:10 pm – 5:30 pm | <b>B132</b> | <b>One Size Does Not Fit All: Variations in Documenting the ACE-V Process Among Latent Print Examiners</b><br><i>Ivy Walker, MS*; John Grassel, MA; Micaela Ascolese, BA; Rebecca Shute, MS</i>                                 |
| 5:30 pm – 5:50 pm | <b>B133</b> | <b>Visualizing and Enhancing Latent Fingerprints Using Different Floral Powders: An Eco-Friendly Approach</b><br><i>Kajol Bhati, PhD*; Amandeep Kaur Bhambara, PhD*; Ankit Singh, MSc; Rajeev Kumar, PhD; Vinny Sharma, PhD</i> |

## Friday

### Poster Session

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| 11:30 am – 1:00 pm | <b>B134</b> | <b>Enhanced Genetically Variant Peptide Profiling From Human Hair Using Keratinase and Trypsin</b><br><i>Zheng Zhang, MD*; William Wallace, PhD; Stephen Stein, PhD</i> |
| 11:30 am – 1:00 pm | <b>B135</b> | <b>Developing Digital Polymerase Chain-Based Assays for the Detection and Speciation of Foodborne Illness</b><br><i>Sylvia Etim, MS*; Bruce McCord, PhD</i>             |
| 11:30 am – 1:00 pm | <b>B136</b> | <b>Statistical Analysis of Fairness in Forensic Source Identification Problems</b><br><i>Semhar Michael, PhD*; Christopher Saunders, PhD</i>                            |

# CRIMINALISTICS

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- 11:30 am – 1:00 pm **B137** **Enhancing the Number of Contributor Inference Using mtDNA Haplotypes for Mixture Deconvolution**  
*Zack Beyerl, BS\*; Nicole Mischak, BS\*; Regan Fenske, BA; Helene Douglas, BS; Daniele Podini, PhD*
- 11:30 am – 1:00 pm **B138** **Different True Allele Users, Same DNA Answer: A Multi-Center Proficiency Study**  
*William Allan, MASc\*; Jennifer Bracamontes, MS; Matthew Legler, BS; Jonathan Perlin, MS; Mark Perlin, MD, PhD*
- 11:30 am – 1:00 pm **B139** **The Advancement and Practical Application of a Kinship Identification System Through the Exploration of Genetically Shared Chromosomal Regions Using High-Density SNP Data**  
*Sohee Cho, PhD\*; Eunsoon Shin, PhD; Yong-Seok Kim, PhD; Soong Deok Lee, MD, PhD*
- 11:30 am – 1:00 pm **B140** **DNA Metabarcoding: Can It Reliably Be Used to Characterize Pollen From Surface Soils?**  
*Kelly Meiklejohn, PhD\*; Ozge Kuddar, MS; Benjamin Callahan, PhD; Christopher Bernhardt, PhD*
- 11:30 am – 1:00 pm **B141** **An Analysis of DNA Preservation in Human Remains Embedded in Solid Building Materials**  
*Hayle Boechler, BS\*; Mayra Mayr-Eduardoff, PhD; Sheree Hughes, PhD*
- 11:30 am – 1:00 pm **B142** **A Decade of ForenSeq in Forensics: Where Are We Now?**  
*Laurence Devesse, PhD\*; Melissa Kotkin, BS*
- 11:30 am – 1:00 pm **B143** **Microhaplotypes: A Double-Edged Sword in Forensic Genetics**  
*Pegah Farhadi, PhD\*; Arash Alipourtabrizi, MD*
- 11:30 am – 1:00 pm **B144** **Investigating a Different Forensic Workflow for DNA Paternity Testing**  
*Franzoni Anna, MS\*; Michele Rosso, PhD*
- 11:30 am – 1:00 pm **B145** **Enhancing Rapid DNA Programs: Implementing a Metrics Tracker to Improve Performance and Measure Success**  
*Emily Strelka, MFS\*; Erin Forry, MS; Jason Chute, MSFS; Mikalaa Martin, BS; Misty Marra, MSFS; Patricia Melton, PhD; Shannon Krauss, PhD*
- 11:30 am – 1:00 pm **B146** **Upgrading to STRmix v2.11: A Chance to Do It All Again**  
*Ut Dinh, MS\*; Alicia Cadenas, MS*
- 11:30 am – 1:00 pm **B147** **The Application of Deep Learning in Latent Fingerprint Enhancement**  
*Daye Kim, MS\*; Ming-Sie Pan; Chao-Hsing Fan, PhD; Jorn Yu, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)*
- 11:30 am – 1:00 pm **B148** **Elucidating the Mechanism of Unwanted and Uncontrolled Water Adducts in the Tandem Mass Spectra of Synthetic Cannabinoids**  
*McKenna Oaks\*; Christopher Poulos, MS; Emmanuel Ubana, BS; Fabien Goulay, PhD; Glen Jackson, PhD*
- 11:30 am – 1:00 pm **B149** **Utilizing a Field-Deployable, High-Resolution Mass Spectrometry System for Screening of Seized Drugs by DART-MS Analysis**  
*Elizabeth Robinson, MS\*; Edward Sisco, PhD; Thomas Forbes, PhD*
- 11:30 am – 1:00 pm **B150** **The Effect of Mass Spectral Selection on Discrimination of Fentanyl Analog Positional Isomers**  
*Alexandra Rahn, BS\*; Ruth Waddell Smith, PhD; Victoria McGuffin, PhD*
- 11:30 am – 1:00 pm **B151** **Structural Characterization of Nitazene Analogs Using Electrospray Ionization- Tandem Mass Spectrometry (ESI-MS/MS)**  
*Emma Hardwick, BA\*; J. Tyler Davidson, PhD  
(FSF Emerging Forensic Scientist Award Poster Presentation)*

# CRIMINALISTICS

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11:30 am – 1:00 pm	<b>B152</b>	<b>Fingerprint Evidence Analysis of Fraudulent Receipts in Taichung City, Taiwan</b> <i>Yu-Chih Lin, PhD*</i> ; <i>Pei-Yi Hua, MS</i> ; <i>Chi-I Wu, MS</i> ; <i>Chia-Chen Weng, MAS</i> ; <i>Kuo-Lan Liu, MD, PhD</i>
11:30 am – 1:00 pm	<b>B153</b>	<b>The Development and Validation of a New GC/MS Decision-Point Method for Marijuana and Hemp Differentiation Using Hydrogen as Carrier Gas</b> <i>Agatha Villegas, BS*</i> ; <i>Sandra Rodriguez-Cruz, PhD</i> ; <i>Michael Weaver, BS</i>
11:30 am – 1:00 pm	<b>B154</b>	<b>Evaluating the Performance of DEA's New GUARDS Method Via an Interlaboratory Study</b> <i>Mark Frisch, PhD*</i> ; <i>Sandra Rodriguez-Cruz, PhD</i>
11:30 am – 1:00 pm	<b>B155</b>	<b>Exploring Natural Aging and Depletion Processes of Latent Fingermarks With 2D and 3D Imaging</b> <i>Alexandrea Buscarello, BS*</i> ; <i>Josep De Alcaraz-Fossoul, PhD</i>
11:30 am – 1:00 pm	<b>B156</b>	<b>Utilizing Low Energy Ionization to Differentiate and Identify Fentanyl and Nitazene Analogs</b> <i>Kirk Lokits, PhD*</i>
11:30 am – 1:00 pm	<b>B157</b>	<b>The Development and Validation of a Combined Selected Ion Monitoring-Scan GC/MS Method for Nitazene Analogs</b> <i>Alleigh Couch, BS*</i> ; <i>Emma Hardwick, BA</i> ; <i>Claire Phelps, MSFS</i> ; <i>J. Tyler Davidson, PhD</i> <i>(FSF Emerging Forensic Scientist Award Poster Presentation)</i>
11:30 am – 1:00 pm	<b>B158</b>	<b>The Differentiation of Isobaric Methyl-Substituted Fentanyl Analogs Using Direct Analysis in Real-Time Mass Spectrometry (DART-MS) and All-Ion Fragmentation (AIF)</b> <i>Christany Liggins, BS*</i> ; <i>Alleigh Couch, BS</i> ; <i>J. Tyler Davidson, PhD</i>
11:30 am – 1:00 pm	<b>B159</b>	<b>Thermal Desorption-Direct Analysis in Real-Time Mass Spectrometry (TD-DART-MS) of Seized Drug Mixtures</b> <i>Keshonna Towns, BS*</i> ; <i>Alleigh Couch, BS</i> ; <i>J. Tyler Davidson, PhD</i> <i>(FSF Emerging Forensic Scientist Award Poster Presentation)</i>
11:30 am – 1:00 pm	<b>B160</b>	<b>An Evaluation of a Transportable Linear Ion Trap Mass Spectrometer for Rapid Seized Drug Screening</b> <i>Fiza Tajdin, BS*</i> ; <i>Christina Chang, MS</i> ; <i>Alleigh Couch, BS</i> ; <i>J. Tyler Davidson, PhD</i> <i>(FSF Emerging Forensic Scientist Award Poster Presentation)</i>
11:30 am – 1:00 pm	<b>B161</b>	<b>The Differentiation of CBD and <math>\Delta^9</math>-THC Isomers Using Copper Ion Complexation and Electrospray Ionization Tandem Mass Spectrometry</b> <i>Alleigh Couch, BS*</i> ; <i>Christopher Zall, PhD</i> ; <i>J. Tyler Davidson, PhD</i> <i>(FSF Emerging Forensic Scientist Award Poster Presentation)</i>
11:30 am – 1:00 pm	<b>B162</b>	<b>Enhancing Latent Print Development With Lanconide Powder</b> <i>Lydia Buxa*</i> ; <i>Chad Snyder, PhD</i>
11:30 am – 1:00 pm	<b>B163</b>	<b>A Modified and Optimized Duquenois Test for Classical and Designer Cannabis Products</b> <i>Marie Lemay*</i> ; <i>Ryan Smith, BS</i> ; <i>Ling Huang, PhD</i> ; <i>Nanetter Wachter, PhD</i>
11:30 am – 1:00 pm	<b>B164</b>	<b>Discriminating Between the Tandem Mass Spectra of Isomeric Synthetic Cannabinoids Using the Expert Algorithm for Substance Identification (EASI)</b> <i>Alexandra Adeoye, MS*</i> ; <i>Alleigh Couch, BS</i> ; <i>J. Tyler Davidson, PhD</i> ; <i>Glen Jackson, PhD</i> <i>(FSF Emerging Forensic Scientist Award Poster Presentation)</i>
11:30 am – 1:00 pm	<b>B165</b>	<b>An Analysis of <i>Mitragyna Hirsuta</i> and <i>Mitragyna Diversifolia</i> Being Offered as Legal Alternatives to Kratom</b> <i>Megan Joos, BS*</i> ; <i>Elizabeth Gardner, PhD</i>

# CRIMINALISTICS

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11:30 am – 1:00 pm	<b>B166</b>	<b>The Development of a Virtual Liquid Chromatography Method Development Tool</b> <i>Haley Berkland, MS*</i>
11:30 am – 1:00 pm	<b>B167</b>	<b>The Drug Enforcement Administration’s Basic Forensic Chemist Training Program Becomes the First Forensic Training Program Accredited by the Federal Law Enforcement Training Accreditation Board</b> <i>Jessica Rasmussen, MS*</i>
11:30 am – 1:00 pm	<b>B168</b>	<b>The Development and Testing of a Novel Sorbent Material for Headspace Analysis With Application to Illicit Drugs</b> <i>Sadie Olrogg, BS*; Lauryn DeGreeff, PhD; Joongho Moon, PhD</i>
11:30 am – 1:00 pm	<b>B169</b>	<b>The Optimization of Fast Blue B Test for Cannabis Products</b> <i>Ryan Smith, BS*; Marie Lemay*; Ling Huang, PhD</i>
11:30 am – 1:00 pm	<b>B170</b>	<b>The Detection and Quantitation of Xylazine, Medetomidine, and Detomidine as Adulterants to Heroin or Illicitly Manufactured Fentanyl Using NanoLC With Various Mass Spectrometers</b> <i>Mehdi Moini, PhD*; Brian Eckenrode, PhD</i>
11:30 am – 1:00 pm	<b>B171</b>	<b>The Development of an LC/MS/MS Method for the Identification of Psilocybin and Psilocin From Seized Drugs</b> <i>Alexia Cassman, BS*; Kristen Head, MS</i>
11:30 am – 1:00 pm	<b>B172</b>	<b>DSI-GC/MS Analysis of Designer Cannabis Gummies</b> <i>Hannah LaVena*; Kevin Bisceglia, PhD; Ling Huang, PhD</i>
11:30 am – 1:00 pm	<b>B173</b>	<b>GC/VIR Technology in Seized Drug Analysis</b> <i>Sherri Tupik, BS*</i>
11:30 am – 1:00 pm	<b>B174</b>	<b>WITHDRAWN</b>
11:30 am – 1:00 pm	<b>B175</b>	<b>The Development and Optimization of a Method for the Quantitation of Seized Drugs Using Rapid Gas Chromatography/Mass Spectrometry</b> <i>Marissa Ho, BS*; Briana Capistran, PhD; Edward Sisco, PhD; Ira Lurie, PhD</i> <i>(FSF Emerging Forensic Scientist Award Poster Presentation)</i>
11:30 am – 1:00 pm	<b>B176</b>	<b>WITHDRAWN</b>
11:30 am – 1:00 pm	<b>B177</b>	<b>WITHDRAWN</b>
11:30 am – 1:00 pm	<b>B178</b>	<b>The Proliferation of Nitazenes in the United States Drug Market: Examining Powders and Counterfeit Tablets</b> <i>Mia Borrelli, MS*; Sarah Shuda, MS; Amanda Mohr, MS; Thom Browne, MA; Barry Logan, PhD</i>
11:30 am – 1:00 pm	<b>B179</b>	<b>A Discovery of False Positive Illicit Drug Identification With Portable Surface- Enhanced Raman Spectroscopy (SERS)</b> <i>Ella Galvan*; Desmond Brown; Don Ostrowski, APM; Richard Crocombe, PhD; Pauline Leary, PhD; Brooke Kammrath, PhD</i>
11:30 am – 1:00 pm	<b>B180</b>	<b>Illicit Drug Analysis in the Field With a Portable Instrument “Toolkit”</b> <i>Brooke Kammrath, PhD*; Desmond Brown; Ella Galvan; Samuel Friday, BS; Drew Kuroda, BS; Alexander Klein, BS; Jessica Persechino, MA; Jessica Behn, BS; Jon Naples; Debbie Fuller; Isabelle Radgen-Morvant, MS; Richard Crocombe, PhD</i>



# CRIMINALISTICS

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11:30 am – 1:00 pm	<b>B181</b>	<b>Optimizing Extraction Methods for Cannabinoid Quantitation in Cannabis Gummies: A Comparative Study Using LC-PDA</b> <i>Ya-Chih Cheng, PhD*</i> ; <i>Walter Wilson, PhD</i>
11:30 am – 1:00 pm	<b>B182</b>	<b>The Presumptive Identification of Psilocybin and Psilocyn in Mushrooms and Food Products Using Matrix-Assisted Ionization Vacuum (MAIV) and Time-of- Flight/Mass Spectrometry (TOF/MS)</b> <i>Maci Koester, BS*</i> ; <i>Deborah Brimijoin, MS</i> ; <i>Jennifer Clary, MS</i> (FSF Emerging Forensic Scientist Award Poster Presentation)
11:30 am – 1:00 pm	<b>B183</b>	<b>A Green Method for Seized Drug Analysis Using a Portable Liquid Chromatograph</b> <i>Jayda Barber, BS*</i> ; <i>Ira Lurie, PhD</i>
11:30 am – 1:00 pm	<b>B184</b>	<b>Drug Detection in Complex Materials Using Confocal Raman Microspectroscopy</b> <i>Natasha Wheatley, MPA*</i> ; <i>Kenzie Ballinger, BS*</i>
11:30 am – 1:00 pm	<b>B185</b>	<b>WITHDRAWN</b>

## Friday—Session I

### Mixtures and Probabilities

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Moderator: Kristy Kadash, PhD

Co-Moderator: Josep De Alcarz Fossoul, PhD

8:00 am – 8:30 am	<b>B186</b>	<b>Back to the Future: Applying Decades-Old Probabilistic Models to Today's DNA Results When Activities Are of Interest</b> <i>Simone Gittelson, PhD*</i> ; <i>Franco Taroni, PhD</i> ; <i>Tim Kalafut, PhD</i> ; <i>John Buckleton, DSc</i>
8:30 am – 8:45 am	<b>B187</b>	<b>The Construction of a Microhaplotype Panel for Complex Mixture Deconvolution Using Next-Gen Sequencing</b> <i>Regan Fenske, BA*</i> ; <i>Sarah Cavanaugh, MSFS</i> ; <i>Helene Douglas, BS</i> ; <i>Daniel Standage, PhD</i> ; <i>Robert Lagace, BA</i> ; <i>Andrew Feldman, PhD</i> ; <i>Jeffrey Lin, MS</i> ; <i>Kenneth Kidd, PhD</i> ; <i>Daniele Podini, PhD</i> (FSF Emerging Forensic Scientist Award Oral Presentation)
8:45 am – 9:00 am	<b>B188</b>	<b>DNA Evidence Analysis Using the Same Number of Contributors for Prosecution and Defense Will Often Frame a Non-Contributing Suspect</b> <i>Charles Brenner, PhD*</i>
9:00 am – 9:15 am	<b>B190</b>	<b>Touch/Trace DNA in Activity-Level Propositions: Anatomy of a DNA Transfer</b> <i>Ashley Hall, PhD*</i> ; <i>Ray Wickenheiser, DPS</i> ; <i>Aldrin Alviar, MS</i>
9:15 am – 9:30 am	<b>B189</b>	<b>The Development of Universal STRmix™ Parameters for Legacy Kits</b> <i>Tim Kalafut, PhD*</i>
9:30 am – 10:00 am	<b>B191</b>	<b>Evaluating the Consistency of a DNA Mixture Interpretation Protocol</b> <i>Joseph Truppi, BS*</i> ; <i>Mario Galioto, MS</i> ; <i>Michael Donley, MS</i> ; <i>Katie Welch, MS</i>
10:00 am – 10:15 am		<b>BREAK</b>

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# CRIMINALISTICS

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## Looking Back and Moving Forward

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Moderator: Kelly Knight, MS

- 10:15 am – 10:45 am     **B192**     **A Perspective on More Than 30 Years of Forensic DNA Research and Technology Development**  
*Bruce McCord, PhD\**
- 10:45 am – 11:00 am     **B193**     **From Planning to Practice: Navigating the Implementation of Rapid DNA Technology and Tracking Success Metrics**  
*Jason Chute, MSFS\*; Patricia Melton, PhD; Emily Strelka, MFS; Erin Forry, MS; Mikalaa Martin, BS; Misty Marra, MSFS; Shannon Krauss, PhD*
- 11:00 am – 11:15 am     **B194**     **A Sensitivity Evaluation of the Applied Biosystems RapidHIT ID System v2.0 and RapidINTEL Plus Sample Cartridge**  
*Emily Yen Dang, BS\*; Morgan Eaton, MS; Raygan Harrington, BS; Tracey Dawson Green, PhD (FSF Emerging Forensic Scientist Award Oral Presentation)*
- 11:15 am – 11:30 am     **B195**     **An Assessment of the RapidHIT ID System v2.0 for Use on Evidentiary Samples and Its Suitability for Implementation Into Law Enforcement**  
*Trupti Sriram, BS\*; Jamia Mealy, MFS; Kristen Naughton, BS*
- 11:30 am – 1:00 pm     **BREAK**

## How Low Can (Should) We Go?

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Moderator: Pamela Marshall, PhD

Co-Moderator: Baneswar Singh, PhD

- 1:00 pm – 1:15 pm     **B196**     **An Analysis of Pre- and Post-Coital Microbial Transfer Using Deep Shotgun Metagenomic Studies**  
*Andrea Ramirez Torres, BS\*; Mirna Ghemrawi, PhD; George Duncan, PhD; Bruce McCord, PhD*
- 1:15 pm – 1:30 pm     **B197**     **Exploring the World of “Touch DNA” and “Touch Microbiome”: One-Shot DNA Collection and Extraction**  
*Michele Di Nunzio, PhD\*; Sarah Gino, MD; Andrea Bonicelli, PhD; Noemi Procopio, PhD*
- 1:30 pm – 1:45 pm     **B198**     **Size-Selective Purification to Separate High and Low Molecular Weight DNA**  
*Vinalon Mones, BS\*; Helene Douglas, BS; Glenn Fahrig, MS; Gregory Peiffer, PhD; Rebecca Sloman, MFS; Katherine Hargett, MFS; Jessica Broner, MS; Jonathan King, MS; Elaine Lewis, PhD; Michael Coble, PhD; Todd Bille, MS; Daniele Podini, PhD*
- 1:45 pm – 2:00 pm     **B199**     **Probabilistic Clustering of Single-Cell Investigative Evaluations**  
*Qhawe Bhembe, MSFS\*; Nidhi Sheth, PhD; Leah O’Donnell, MS; Ken Duffy, PhD; Desmond Lun, PhD; Catherine Grgicak, PhD (FSF Emerging Forensic Scientist Award Oral Presentation)*
- 2:00 pm – 2:15 pm     **B200**     **The Comparison and Evaluation of Predictors on Single-Cell Weights of Evidence**  
*Catherine Grgicak, PhD\*; Desmond Lun, PhD*
- 2:15 pm – 2:30 pm     **B201**     **Low-Level DNA Recovery From Fired Cartridge Casings, Firearms, and Explosive Devices: Comparing Conventional Methods and Sequencing-Based DNA Typing**  
*Mirna Ghemrawi, PhD\*; Leah Nangeroni, MS*
- 2:30 pm – 2:45 pm     **B202**     **Getting More From Less: Low-Level DNA Mixtures on Cartridges**  
*Kari Danser, MS\*; Jennifer Bracamontes, MS; Matthew Legler, BS; Mark Perlin, MD, PhD*

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\*Presenting Author

# CRIMINALISTICS

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2:45 pm – 3:00 pm      **B203**      **Integrated On-Chip PCR-Capture-Sizing-CE Microsystems for Ultrasensitive Forensic DNA Typing**  
*Xiujun Li, PhD\**

3:00 pm – 3:15 pm      **BREAK**

## Administration and Planning

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Moderator: Fabio Oldoni, PhD

Co-Moderator: Charlotte Word, PhD

3:15 pm – 3:45 pm      **B204**      **So, You Want a Job in Forensic Science? Getting Hired as a Forensic Scientist From the Hiring Manager's Perspective**  
*Matthew Gamette, MS\*; Rylene Nowlin, BS\**

3:45 pm – 4:15 pm      **B205**      **The Role of the National Technology Validation Implementation Collaborative (NTVIC) in Forensic Technology Implementation**  
*Matthew Gamette, MS\**

4:15 pm – 4:35 pm      **B206**      **A National Survey and Interviews on Training in Forensic Science Service Laboratories in the United States Evaluative Report**  
*Kelly Elkins, PhD\**

4:35 pm – 5:05 pm      **B207**      **Planning for and Executing a Disaster Response: The Rapid DNA Mass Disaster Emergency Response and Preparedness Toolkit**  
*Mikalaa Martin, BS\*; Taylor Koepfler, MSFS; Jason Chute, MSFS; Shannon Krauss, PhD; Laura Kuyper, MFS; Katie Scott, MSFS; Jeri Roper-Miller, PhD*

## Friday—Session II

### A Morning of Trace Materials—Standards, Soils, Glass, Paint, and Textiles

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Moderator: Christopher Palenik, PhD

Co-Moderator: Susan Gross, MSFS

8:15 am – 8:35 am      **B208**      **Standards Development Activities in Trace Materials**  
*Sandra Koch, PhD\*; Celeste Grover, MSFS*

8:35 am – 8:55 am      **B209**      **Differentiating Soil by Color and Mineralogy for Soil Comparisons: An Experiment Using Soil From North Carolina**  
*Libby Stern, PhD\*; Hannah Dickson, MS; Jodi Webb, MS; Kelly Meiklejohn, PhD; Jack Hietpas, PhD; Ian Saginor, PhD; Michael Smith, PhD*

8:55 am – 9:15 am      **B210**      **Soil Discrimination by Particle-Related Raman Spectroscopy**  
*Drew Kuroda, BS\*; Jasmine Kaur, MFS; Joshua Christensen; Marisia Fikiet, PhD; Peter Harrington, PhD; Peter De Forest, DCrim; Brooke Kammrath, PhD*

9:15 am – 9:35 am      **B211**      **An Elemental Analysis of Glass Powder on Spent Projectiles**  
*Shirly Montero, PhD\*; Summer Garcia*

9:35 am – 9:55 am      **B212**      **Data Fusion From Infrared, Elemental, MSP, and Raman Analysis Techniques to the Maximization of the Efficiency of the Analytical Sequence for the Forensic Examination of Paint Evidence**  
*Patrick Buzzini, PhD\*; Morgan Carpenter, BS; Swathi Murali, MS; James Curran, PhD*

# CRIMINALISTICS

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9:55 am – 10:15 am      **B213**      **Wait, Hot Cooking Oil Turned Your Shirt From Green to Orange?**  
*Tiffany Rodriguez, MS\**; *William Perdue, MPA*

10:15 am – 10:30 am      **BREAK**

## **The River's Silent Witness, Chemometric Approaches, and Clandestine Human Burials**

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Moderator: Thaddeus Mostowtt, PhD

Co-Moderator: Tiffany Rodriguez, MS

10:30 am – 10:50 am      **B214**      **Skeleton in the Stream: Unraveling the Murder Mystery of the River's Silent Witness**  
*Akhilesh Pathak, MD\**

10:50 am – 11:10 am      **B215**      **Chemometric Approaches for Investigating Multiblock Hyperspectral Data in Forensic Biological Evidence Analysis**  
*Eugenio Alladio, PhD\**; *Alberto Mazzoleni, MS*; *Carolina Scagliarini, MS*;  
*Paolo Garofano, MD, PhD*

11:10 am – 11:30 am      **B216**      **A Layered Analytical Method for Detecting Clandestine Human Burials**  
*Brian Eckenrode, PhD\**; *Edward Bentil, PhD*

11:30 am – 1:00 pm      **BREAK**

## **An Afternoon of Fire Debris, Explosives, and GSR**

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Moderator: Andra Lewis, PhD

Co-Moderator: Edward Sisco, PhD

1:00 pm – 1:20 pm      **B217**      **Standards Development Activities Related to Ignitable Liquids, Explosives, and Gunshot Residue**  
*Brenda Christy, MS\**

1:20 pm – 1:40 pm      **B218**      **The Validation of a Rapid GC/MS Method for Forensic Fire Debris Screening Applications**  
*Briana Capistran, PhD\**; *Elizabeth Robinson, MS*; *Edward Sisco, PhD*

1:40 pm – 2:00 pm      **B219**      **An Application of the Expert Algorithm for Substance Identification (EASI) to Predict ASTM E1618-19 Ignitable Liquid Classes From Gas Chromatography/Mass Spectrometry Data of Ignitable Liquid Residues**  
*Hannah McMillen, MS\**; *Glen Jackson, PhD*

2:00 pm – 2:20 pm      **B220**      **Revealing Gunshot Residue Flow and Deposition Behaviors Using Laser Sheet Scattering, High-Speed Videography, Atmospheric Particle Analysis, and Spectrometric Analytical Techniques**  
*Thomas Ledergerber, BS\**; *Matthew Staymates, MS\**; *Kourtney Dalzell, MS*; *Luis Arroyo, PhD*;  
*Roger Jefferys, MS*; *Tatiana Trejos, PhD*

2:20 pm – 2:40 pm      **B221**      **An Assessment of the Transfer and Persistence of Gunshot Residue in Simulated Arrest Scenarios Analyzed by Screening and Confirmatory Methods**  
*Kourtney Dalzell, MS\**; *Thomas Ledergerber, BS*; *Leah Thomas, BS*; *Addio Fiordigigli, BS*;  
*Tatiana Trejos, PhD*; *Luis Arroyo, PhD*

2:40 pm – 3:00 pm      **BREAK**

# CRIMINALISTICS

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## Drug Chemistry Standards, Developments, and Applications

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Moderator: Pete Ausilli, MS

Co-Moderator: Carmen Masters, MSFS

- 3:00 pm – 3:15 pm      **B222**      **Standard Development Activities in Seized Drug Analysis: The Current Status and Challenges**  
*Agnes Winokur, PhD\**
- 3:15 pm – 3:30 pm      **B223**      **Tracking the Emergence of Medetomidine, Tetracaine, and Other Substances as Adulterants in Philadelphia, Pennsylvania, Recreational Opioid Markets**  
*Max Denn, MS\*; Joshua DeBord, PhD; Alexis Quinter, MASc; Alex Krotulski, PhD; Barry Logan, PhD*  
*(FSF Emerging Forensic Scientist Award Oral Presentation)*
- 3:30 pm – 3:45 pm      **B224**      **A Systematic Study of Liquid Chromatography in Search of the Best Separation of Cannabinoids for Potency Testing of Hemp-Based Products**  
*Liguo Song, PhD\**
- 3:45 pm – 4:00 pm      **B225**      **Sample Preparation Procedures at NIST for the Determination of  $\Delta$ 9-THC and Its Isomers in Commercial and Seized Cannabis Vape Products by GC/MS**  
*Walter Wilson, PhD\*; Ya-Chih Cheng, PhD*
- 4:00 pm – 4:15 pm      **B226**      **The Development of a  $\Delta$ 9-THC Colorimetric Breathalyzer Using 3D Printing Manufacture**  
*Savanah Allinson, BS\*; Taqiyah Chernesky, MScFS; Aron Jaffe, MScFS; Stephanie Walcott, MScFS; Emanuele Alves, PhD*
- 4:15 pm – 4:30pm      **B227**      **Psilocin Derivatives in Edibles: Issues, Extraction Tips, and Case Studies**  
*H. Ross Ehmann, MSFS\*; Oriana Ovide, MSFS*
- 4:30 pm – 4:50 pm      **B228**      **The Application of the Expert Algorithm for Substance Identification (EASI) to Differentiate Tandem Mass Spectra of 2,3-MDMA and 3,4-MDMA**  
*Glen Jackson, PhD\*; Alexandra Adeoye, MS; Sandra Rodriguez-Cruz, PhD*
- 4:50 pm – 5:10 pm      **B229**      **Standardizing and Implementing Direct Analysis in Real Time-Mass Spectrometry Methods Throughout DEA Laboratories**  
*Sandra Rodriguez-Cruz, PhD\**
- 5:10 pm – 5:30 pm      **B230**      **The Development and Validation of the Global Uniform Analysis and Reporting of Drug-Related Substances (GUARDS) Method**  
*Michael Weaver, BS\*; Sandra Rodriguez-Cruz, PhD; Mark Frisch, PhD; Corey Nida, PhD*