



## WORKSHOP ABSTRACTS

May 12-15, 2020 - Newport News, VA

### BIOLOGY SECTION WORKSHOPS

#### **(W1) Into to NGS for forensics single platform multi application package**

*Presented by Melissa Kotkin and Danny Hall, Verogen (MAAFS Vendor)*

Half Day Workshop - Morning - Tuesday, May 12 (Member \$100/Non-Member \$150)

The fundamentals of CE-based forensic DNA testing have changed little in the last decade. Massively parallel sequencing (MPS) revolutionizes human identification by unlocking the true potential of forensic genomics to aid or solve more cases.

In this workshop, we will discuss the approach that MPS provides the forensic laboratory: one instrument enables many solutions for human identification and investigative intelligence. We will describe how data generated from a forensically validated instrument, chemistry and software system enable practical MPS as an alternative to legacy sizing based genotyping or Sanger sequencing. We demonstrate how recent advances in knowledge of the human mtDNA genome and design improvements provide more comprehensive variant detection, heteroplasmy analyses, and sensitivity using the MiSeq FGx platform and ForenSeq software. Finally, we will discuss current Forensic Genetic Genealogy applications and the possibilities it holds for the future of forensic testing in the modern criminalistics laboratory.

#### **(W2) Advanced Topics in DNA Analysis: Developing and Implementing two Different Types of Validation Studies: Massively Parallel Sequence**

*Presented by Teresa Snyder-Leiby, Softgenetics, LLC (MAAFS Vendor)*

Half Day Workshop - Afternoon - Tuesday, May 12 (Member \$100/Non-Member \$150)

This four-hour workshop will be divided into two sessions. The first session will cover the approach and results of a laboratory's validation of MiSeq® (Illumina) mtDNA data analysis and an example of a concordance study of capillary electrophoresis genotypes compared to genotypes from 672 paired fastq.gz data files from PowerSeq® Auto/Y System (Promega Corp.). The second session will detail a probabilistic genotyping validation study approach using data amplified with PowerPlex Fusion® (Promega Corp.)

**(W3) Becoming Trace Evidence Aware**

*Presented by Robyn Weimer, Virginia Department of Forensic Science*

Half Day Workshop - Afternoon - Tuesday, May 12 (Member \$100/Non-Member \$150)

This half-day workshop is aimed towards non-trace evidence examiners, new or experienced. Trace evidence is often invisible to the naked eye, and sometimes what cannot be seen is easily forgotten or overlooked. Standard processing techniques in other sections of the forensic laboratory can affect subsequent trace evidence examinations. After attending the workshop, attendees will become more aware of Trace Evidence, its meaning, and how to ensure it is not lost when examining evidence outside of the Trace Evidence section. The course will include hands-on exercises to spark interest, discussion of casework scenarios, and a better understanding of the role trace evidence can take in a forensic inquiry.

**(W4) Emerging cell separation techniques for analysis of sexual assault evidence**

*Presented by Dr. Tracey Dawson Cruz and Dr. Sarah Williams, Virginia Commonwealth University*

Full Day Workshop - Wednesday, May 13 - (Member \$150/Non-Member \$200)

Separation of individual contributions of mixed forensic samples is readily acknowledged as critical for analysis of biological evidence, and is of particular interest with the sexual assault samples frequently encountered in forensic casework. Interpretation of mixed samples is significantly simplified when those mixed cell populations are separated prior to DNA isolation. This workshop will provide an overview to a range of methods that separate cells prior to DNA isolation, and will introduce both methods currently in use for casework as well as those still under development. These methods range from simple size and filtration methods to laser-capture microdissection, optical trapping, DEP Array, flow cytometry and microchip-based automated methods. Upon completion of this workshop, participants will have attained a higher understanding of the morphological, structural and biochemical differences between the cells of interest to the forensic scientist, as well as an understanding of the methods that could soon be implemented for differential cell separation.

## **CRIMINALISTICS SECTION WORKSHOPS**

### **(W5) Round Table Session: Plant Material Analysis and Identification Post Legalization of Hemp**

*Presented by Meghan Melnyk, Baltimore (City) Police Department*

Half Day Workshop - Morning - Tuesday, May 12 (Member \$100/Non-Member \$150)

As a direct result of recent legislative changes, as well as the establishment of programs such as the Maryland Industrial Hemp Research Pilot Program, current testing methods utilized by most Maryland-based seized drug laboratories to analyze plant material are no longer adequate.

Accurate and legal identification of a plant material, such as marijuana, can only occur using an established and validated quantitative method.

This session will provide up-to-date developments on this topic, identify areas of concern and facilitate breakout groups to discuss the challenges that arise when conforming analytical techniques and identification schema to satisfy new legal requirements.

### **(W6) Practical Identification of Environmental Particles Similar to Gunshot Residue and Unusual Elemental Profiles Found in Test Fired Ammunition**

*Presented by Doug DeGaetano and Mary Keehan, Virginia Department of Forensic Science*

Half Day Workshop - Morning - Tuesday, May 12 (Member \$100/Non-Member \$150)

The recognition and identification of environmental particles similar to gunshot residue (GSR) has long been the goal of every GSR examiner. In this workshop we will give a brief overview of GSR analysis and identification by SEM/EDS, an overview of environmental sources of particles similar to GSR, and provide tools and practical exercises to assist GSR examiners in distinguishing environmental particles from gunshot residue. We will also go over various types of ammunition and the elemental profiles they produce, including some non toxic or “green ammunition, as well as, ammunition produced in Europe and Eastern block countries. The workshop will consist of short lecture portions followed by practical exercises involving data interpretation. The goal of the workshop is to provide both new and seasoned GSR examiners with practical tools to assist them in casework.

## **(W7) No Court Date Left Behind: Case Management Strategies**

*Presented by Rachel Lucas, Baltimore (City) Police Department*

Half Day Workshop - Afternoon - Tuesday, May 12 (Member \$100/Non-Member \$150)

Forensic science, at its core, is science driven by the prospect of being applied to a legal matter. In our field, policies and procedures are in place to ensure that the quality of analysis satisfies both legal and scientific standards. In order to perform scientific analyses to meet these standards, many aspects must be considered; notably, the time it takes to process a case from start to finish whilst yielding accurate results.

When the results of diligent analyses do not reach the customer by the due date, time, energy and resources are wasted. This workshop will identify key aspects of laboratory workflows, provide tools for evaluation of efficiency and offer solutions to improve turnaround time.

## **(W8) Analytical Considerations, Requirements and Methodologies for the Opioid Crisis**

*Presented by: Melissa Fogarty, Scott Freeto, Jon Danaceau, Peter Harrsch, Waters Corporation (MAAFS Vendor)*

Half Day Workshop - Afternoon - Tuesday, May 12 (Member \$100/Non-Member \$150)

There is an increasing need for toxicologists to have awareness of, and access to the most appropriate analytical tools to help them in their roles with respect to numerous challenges and the complexity of the opioid crisis/epidemic.

This workshop will provide attendees with a review of the numerous challenges related to opioid toxicological investigations in biological samples and describe potential solutions to these using liquid chromatography [LC] and various hyphenated mass spectrometry [MS] techniques, along with adjacent technology for the identification of opioid and other drug substances in non-biological matrices.

The workshop content will describe LC-MS applications using accurate mass detection for the identification of novel drug compounds and metabolites, comprehensive quantitation of an extended opioid panel, confirmation of fentanyl analog drugs within blood, 'designer' opioid confirmation, and the use of mass spectrometry to enhance specificity and speed with respect to the of an unknown chemical substance in powders and pills.

### **(W9) Forensic Drug Chemistry Fundamentals Workflow Workshop**

*Presenters: Graham Robinett and Kirk E. Lokits, Ph.D, Agilent (MAAFS Vendor)*

Full Day Workshop - Wednesday, May 13 (Member \$150/Non-Member \$200)

The MassHunter Fundamentals Workshop is designed to be a full day of hands-on exercises utilizing forensic data. Establish workflows, generate reports using tasks and features of MassHunter 10.0 Qualitative and Unknowns Analysis. Course is Limited to 11 attendees due to the number of computers available for each student. Additional students will be considered if they provide their own laptops with Windows 10 and MassHunter 10.0.

### **(W10) Forensic Paint Resources and Analytical Techniques for Determining Automotive Make and Model Information**

*Presented by Brenda Christy, Virginia Department of Forensic Science*

Half Day Workshop - Morning - Wednesday, May 13 (Member \$100/Non-Member \$150)

Forensic paint analysis can be very important in providing investigative leads to law enforcement by providing vehicle make, model, color, year, and VIN information. In cases involving hit and run accidents, Trace Evidence is often the only evidence. Investigative leads regarding vehicle information enables law enforcement to narrow down and locate a suspect vehicle, which leads to more evidence such as paint interchanges, fracture matches, glass, hairs/fibers, and fracture match.

This workshop will provide attendees with information on resources available to them for searching paint and how to utilize those resources to provide as much information as possible to law enforcement agencies to aid in their investigations. Case examples where paint was used to identify a suspect vehicle and follow up examinations will also be discussed.

### **(W11) Explosive Residue Collection, Analysis, and Determinations**

*Presented by Raleigh W. Parrott II, FBI Laboratory*

Half Day Workshop - Afternoon - Wednesday, May 13 (Member \$100/Non-Member \$150)

Post-blast scenes can be a very chaotic environment. Multiple responses from varying agencies, confusion, and the scale of the scene can add complexities. The collection and preservation of post-blast related evidence is crucial for success in the analysis and determination of explosive content of a device. This workshop will highlight best practices for the collection/preservation of such evidence. In addition, it will discuss the analysis of post-blast residues and reporting the results of such residues in forensic reports to include determinations made from the analysis.

## **QUESTIONED DOCUMENTS SECTION WORKSHOPS**

### **(W12) Forensic Examination of Handwritten Electronic Signatures**

*Presented by Kathleen Annunziata Nicolaidis, Associated Forensic Laboratory, LLC*

Full Day Workshop - Tuesday, May 12 - Morning (Member \$150/Non-Member \$200)

Attendees of this workshop will learn how to forensically examine handwritten electronic signatures captured on a wide variety of electronic signature tablets and devices. This workshop will not only include advanced instruction on how to plot electronic signatures, but also how to compare handwritten electronic signatures and data to other signatures (both electronic and original wet ink). This is a hands-on workshop with multiple practical problems. The purpose of this workshop is to familiarize document examiners with this type of signature examination.

### **(W13) Forensic Examination of Documents Prepared using Office Machines**

*Presented by: Linda Eisenhart and Joseph Stephens, FBI Laboratory*

Half Day Workshop - Morning Wednesday, May 13 - (Member \$100/Non-Member \$150)

This workshop will focus on the examination and comparison of documents prepared by office machines using digital technologies for the purposes of assessing a document's origin. The workshop will begin with the physical and microscopic evaluations of questioned documents for the presence of characteristics which may be useful for future comparisons with known machines or their exemplars. Next, we will discuss procedures for collecting exemplars from known machines for both physical and chemical analyses with special emphasis on communicating with contributors. We will also provide recommendations for digitizing exemplars for record keeping purposes and for use in future exams. In addition, we will cover the comparison of trash marks and other physical characteristics present on questioned documents with those on known exemplars or contemporaneously prepared known documents. Discussions on what constitutes a trash mark and inferences that can be drawn from documents prepared on office machines will be facilitated. A brief overview of available chemical analyses will also be provided. This workshop will include hands on activities and practical problems.