



Volume 4: Issue 2  
September 2023



# ASCLD FORENSIC RESEARCH COMMITTEE BULLETIN

## FRC HOT TOPICS

The ASCLD Forensic Research Committee (FRC) publication of their second article in a three-part series that aims to enhance research and collaboration in forensic science among (or between) government, academic and private laboratories is coming soon.

The first article, authored by Michael Marciano and Henry Maynard, is a primer on data sharing and data sharing agreements. The article is published within *Forensic Science International: Synergy* and can be freely accessed [here](#).

The Forensic Technology Center of Excellence has a Research Symposium planned during Forensic Science Week with seven oral presentations and thirty-two posters. This year, the FTCOE is combining the NIJ Forensic Science Graduate Research Symposium with the National Forensic Science Week FTCOE Student Research Poster Session to provide a platform for undergraduate students, graduate students, and early career scientists to present their research to a broad audience. This virtual symposium will be held on Wednesday, September 20, 2023 from 1:00 PM – 3:30 PM ET and will include a series of 15-minute oral presentations followed by a live question and answer session. 2023 Graduate Research Symposium and Poster Session – [register here](#).

If you are a researcher looking for practitioners to participate in your study, complete the project [form](#) to advertise your project to practitioners looking for research opportunities. If you are a practitioner looking to become involved in research opportunities, the following researchers are looking for participants:

### **Cognitive Bias Mitigation Techniques: Overcoming Barriers and Finding Solutions**

Research Organization: Duquesne University

Principal Investigator: Taylor Hopkins

Funding Source: Duquesne University

Other Collaborators Involved: Dr. Lyndsie Ferrara (Faculty Advisor)

Email Address: [hopkinst1@duq.edu](mailto:hopkinst1@duq.edu)

Website/URL:

[https://duq.az1.qualtrics.com/jfe/form/SV\\_4SzyNzflGJdjd1Y](https://duq.az1.qualtrics.com/jfe/form/SV_4SzyNzflGJdjd1Y)

Discipline: Human Factors

Abstract:

One of the challenges in the modern forensic science world is acknowledging and mitigating cognitive bias. Cognitive bias is a natural phenomenon that can unintentionally cause scientists to let extraneous information guide their decisions as opposed to the actual evidence. Literature provides a variety of potential solutions such as the case manager or linear sequential unmasking models to reduce the risk of bias in the laboratory. While these and other mitigation techniques may appear simple in concept, implementation of such techniques requires effort and commitment to overcome barriers. The goal of this project is to investigate the specific barriers to implementing techniques faced by forensic laboratories in the United States. Those employed by forensic laboratories in the U.S. will be contacted primarily via email and asked to voluntarily participate in an interview or complete a survey. Regardless of the mode of participation, participants will be asked to share their role in their laboratory, knowledge of bias mitigation methods, what methods, if any, are being used at their laboratory of employment, and what barriers the laboratory faced to implement such changes, if applicable. Furthermore, they will be asked to share what solutions they feel are needed to make implementation of such techniques easier. Participant responses will reveal important information that can help the field better understand the obstacles that laboratories face when attempting to reduce the effects of cognitive bias. Additionally, the viability of commonly discussed bias mitigation techniques will be explored.

Study Dates: April 20, 2023 – August 31, 2023

## **COLLABORATION HUB**

The FRC Collaboration Hub connects researchers and practitioners to promote active engagement and participation to support forensic science research projects.

The FRC Collaboration Hub provides a “one-stop-shop” for researchers to solicit participation in specific projects and for practitioners to contribute their knowledge and experience to support research projects.

Forensic science practitioners can quickly and easily identify research projects related to their field of expertise and connect with the researchers to contribute to the success of the research while also advancing their field.

Practitioners gain additional professional development opportunities while supporting and engaging in research projects.

“Scientific research consists in seeing what everyone else has seen but thinking what no one else has thought.”

- Albert Szent-Györgyi

Support Requested: Participants needed! May participate via interview or survey

Estimated Participant Time Involved: 20-30min

Deliverable Anticipated: Oral Presentation

### **Comparison of SpermX™ and Current Differential Extractions with Low Level Sperm Samples**

Research Organization: InnoGenomics

Principal Investigator: Dr. Sudhir K. Sinha

Funding Source: Previous: National Institute of Justice

Other Collaborators Involved: Joanne B. Sgueglia

Email Address: [ssinha@innogenomics.com](mailto:ssinha@innogenomics.com)

Phone Number: 504-598-5235

Website/URL: <http://InnoGenomics.com>

Discipline: Biology/Serology

Instrumentation Involved: Whatever lab currently uses for their differential extraction

Abstract:

The SpermX™ differential extraction kit has been validated to process sexual assault samples either manually or automated. We are interested in having crime laboratories test mock samples of female:male mixtures with their in-house current differential extraction method. The mock sample set consists of 4 mixtures, E-H, with approximately 1500 ng of female DNA (saliva) and approximate male DNA (semen) of 2.5 ng (600:1 ratio), 1.25 ng (1200:1 ratio), 0.33 ng (4545:1) and 0.0825 ng (18182:1 ratio), respectively. The 4 mixture swabs will be provided in duplicate for the processing of 8 samples. Laboratories will process samples and provide the quantification and, if applicable, STR results and accompanying statistics if there is an inclusion of the male component. These results will be compared to previous results obtained for similar mixture swabs with the SpermX method. These studies will help evaluate if the SpermX method increases the likelihood of obtaining probative male DNA profiles from SAK with low sperm evidence. The goal is to improve the success rate for SAK processing given current rates for probative findings is approximately 50%.

Study Dates: April 15, 2023 – April 15, 2024

Support Requested: Participation

Estimated Participant Time Involved: 15 to 20 Hours

Deliverable Anticipated: Peer-reviewed article, Oral Presentation, Poster Presentation

## **An Investigation of the Two-Premise Approach to Firearm and Tool Mark Identification**

Research Organization: Oklahoma State University

Principal Investigator: Jordan Green

Funding Source: OSU, Ultra Forensic Technology

Other Collaborators Involved:

Email Address: [jordan.green11@okstate.edu](mailto:jordan.green11@okstate.edu)

Discipline: Firearms/Toolmarks

Abstract:

Work has been completed investigating machine-based technology to define uniqueness of tool marks created by various tools; error rate studies have separately been conducted to examine the accuracy and sensitivity of firearm and tool mark examiners when tasked with various comparisons. There remains a dearth of rigorous tests, however, that combine machine-based technology and error rate evaluations in comparisons of consecutively manufactured pistol barrels. This study will examine the uniqueness of tool marks created by similar tools and how these unique qualities are identified by firearm examiners in the field of firearm and tool mark identification.

Study Dates: March 10, 2023 – March 10, 2024

Support Requested: Firearm examiner volunteers for error rate portion of the study

Estimated Participant Time Involved: 10 hours

Deliverable Anticipated: Doctoral Dissertation

## **Rapid Characterization of Cellular Material in Trace DNA Samples**

Research Organization: Rapid Forensic Cell Typing Inc. & Virginia Commonwealth University

Principal Investigator: Christopher Ehrhardt

Funding Source: National Institute of Justice, Virginia Center for Innovative Technology

Other Collaborators Involved: Virginia Department of Forensic Science, Ontario Centre for Forensic Science, San Francisco Police Department

Email Address: [cchrhardt@vcu.edu](mailto:cchrhardt@vcu.edu)

Discipline: Biology/Serology

Instrumentation Involved: Flow cytometry, qPCR assays, STR profiling (flexible on specific instrument platforms)

Abstract:

We have developed a new method for estimating the time-since-deposition (TSD) for trace DNA samples. TSD signatures are based on morphological and autofluorescence properties of individual epithelial cells that change over time as the sample degrades. These are measured in a rapid and non-destructive fashion using flow cytometry.

Previous studies ('proof-of-concept') have shown that TSD estimates can establish probative time-intervals for an evidentiary sample, e.g., sample is less than a week old, between one week and one month old, more than six months old. Importantly, this method has been demonstrated for epithelial cells derived from 'touch' DNA samples with deposition times ranging between one day and two years.

We are currently looking for collaborators to evaluate and test this method under the operational constraints of DNA casework. Possible areas of collaboration could include (1) resolving TSD signatures from mixture samples, (2) correlating ratio of cells at different TSDs to contributor ratio determined from DNA profiling, (3) optimizing methods for collecting both DNA and TSD from the same sample, (4) examining reliability of TSD for samples collected from different substrates.

Study Dates: May 1, 2023 – May 1, 2024

Support Requested: Practitioner feedback and evaluation, collaborative laboratory activities when possible

Estimated Participant Time Involved: 10-20 hrs month (but flexible depending on scope of collaborator interest/involvement)

Deliverable Anticipated: Peer-reviewed article, Oral Presentation, Poster Presentation

### **Solving the DNA Mixture Conundrum with Single-Cell analysis**

Research Organization: Rutgers University Camden

Principal Investigator: Catherine Grgicak

Other Collaborators Involved: Desmond S. Lun; Ken R. Duffy

Email Address: [c.grgicak@rutgers.edu](mailto:c.grgicak@rutgers.edu)

Funding Source: National Institute of Justice

Phone Number: 617-913-9728

Website/URL: <http://www.lftdi.com>

Discipline: Biology/Serology

Instrumentation Involved: Bespoke Software

Study Dates: January 1, 2023 – December 31, 2024

Estimated Participant Time Involved: 2 hours per month

Deliverable Anticipated: Peer-reviewed article, Oral Presentation

Abstract:

We are interested in collaborating with a crime laboratory partner interested in exploring single-cell analysis for forensic purposes. We have a bespoke algorithm capable of interpreting single-cell EPGs from diploid cells across multiple clusters and are now working on expanding the model to be able to address haploid results. This work is of forensic relevance since the single cell likelihood ratio (LR) simplifies to its most informative form – i.e., the number of contributors being one and only one – which means that multiple contributors would not have jointly contributed to the group of cells.



Recently, we developed an extension to the bespoke algorithm that allows us to report the weight of evidence (WoE) across all clusters of an admixture of cells, and these WoE were ca. [25-30) regardless of the TrueNOCs. We seek laboratories willing to alpha-test the software using their own samples, or samples we can provide.

## **StegoAppDB: a reference database with variational sources for mobile steganography image forensics**

Research Organization: Iowa State University

Principal Investigator: Dr. Jennifer Newman

Funding Source: National Institute of Standards and Technology

Other Collaborators Involved: Roy Maxion (Carnegie Mellon)

Email Address: [jlnewman@iastate.edu](mailto:jlnewman@iastate.edu)

Website/URL: <https://forensicstats.org/digital-evidence/>

Discipline: Digital Evidence

Abstract:

The CSAFE team at ISU has developed and made public a reference dataset, StegoAppDB, comprised of more than 960,000 highly-provenanced image data created using our unique approach of modeling the steganography (stego) software applications (because their algorithms are not public). The data is used to develop and test algorithms and create new models of the camera pipeline. The next generation of algorithms for detecting hidden images will rely on deep learning algorithms with millions of free parameters (see, e.g., Boroumand et al., 2019). We are growing the database substantially through automation of the image data collection and stego creation process, such as using a drone to collect copious amounts of image data – in order to allow investigators to work with deep learning methods. We propose to add image data selectively to enhance the attractiveness of StegoAppDB for wider use in the forensic imaging community, in the following manner:

1. Add several million outdoor images so that the most successful machine learning techniques, deep learning neural networks, have access to ample data.
2. Add images that have been photo-edited before embedding payload, which we suspect is a common occurrence. In fact, it is speculated that image editing operations may affect steganalysis error rates, but little to nothing is known about this, and certainly nothing for mobile stego images.
3. Include stego apps beyond those currently in StegoAppDB and create an in-house detection tool for verification of our stego process, since no software package exists specifically to detect stego images created with

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mobile stego apps. We will use emulators and reverse engineering for the stego app analysis to retain accurate parameters for data provenance.

Study Dates: March 1, 2022 – May 31, 2024

Support Requested: Availability to discuss the issues with steganography/digital image forensics the crime lab currently has or is looking to address in the future; if a topic of mutual interest is identified, then some sample of data plus a description of the issues encountered.

Estimated Participant Time Involved: The time is TBD. We would work with the lab to identify some aspect of the issue that could be studied based on the availability of the lab personnel.

Deliverable Anticipated: Peer-reviewed article, Database of stego images and analysis tools

### **Forensic Processing at Crime Labs**

Research Organization: University of Virginia

Principal Investigator: Dr. Brett Gardner

Funding Source: National Institute of Standards and Technology

Other Collaborators Involved: Robin Mejia (Carnegie Mellon), Dan Murrie (UVA), Sharon Kelley (UVA)

Email Address: [bg2dd@virginia.edu](mailto:bg2dd@virginia.edu)

Discipline: Latent Prints

Abstract:

A primary goal of this project is to provide field data regarding the practice of latent print comparison in crime laboratories. We intend to collaborate with laboratory personnel to examine case management procedures and related data in multiple laboratories. This will expand the limited research of real-world outcomes and allow for inter-laboratory comparison. We will study actual casework and laboratory procedures with the goal of offering recommendations for practices that promote increased accuracy, reliability, and/or efficiency.

Study Dates: April 1, 2022 – May 31, 2024

Support Requested: CSAFE researchers have successfully collaborated with crime laboratories to examine case processing variables and clarify work flow procedures in latent print comparison units in recent years (e.g., Rairden et al., 2018; Gardner et al., 2021). Researchers are seeking to collaborate with laboratory personnel to generate and answer questions about each laboratory's case processing and workflow. Collaboration will aim to answer the laboratories' specific questions and inform the larger field of case processing within latent print units.

Estimated Participant Time Involved: Time for the collaboration can vary according to a lab's specific aims. For laboratories with available case processing data, a roughly one-hour consultation with researchers to develop/finalize research questions and explain existing datasets might be all that's needed at the outset. Laboratories with the desire to begin collecting case processing data can collaborate with researchers as needed to facilitate the development of research questions, data collection, analysis, and interpretation of results.

Deliverable Anticipated: Peer-reviewed article

### **Characterization of Footwear in Local Populations**

Research Organization: University of Nebraska, Lincoln

Principal Investigator: Dr. Susan Vanderplas

Funding Source: National Institute of Justice, National Institute of Standards and Technology

Other Collaborators Involved: Dr. Richard Stone (Iowa State), Steve Lund (NIST), Marty Herman (NIST)

Email Address: [susan.vanderplas@unl.edu](mailto:susan.vanderplas@unl.edu)

Website/URL: <https://forensicstats.org/footwear/>

Discipline: Footwear

Instrumentation Involved: Footwear scanner developed as part of NIJ-funded effort

Abstract:

This project will develop scanning equipment which will be used to capture population footwear class characteristics. In concert, we will develop statistical software which will automatically identify class characteristics and other comparison features. We will collect data from several different populations and compare the prevalence of class characteristics in those populations, using these results to develop guidelines for future data collection projects.

Study Dates: June 1, 2022 – May 31, 2024

Support Requested: We are looking for practitioners and law enforcement partners to collect data from local populations

Estimated Participant Time Involved: Ongoing and dependent on agency

Deliverable Anticipated: Peer-reviewed article

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Next up...

## **DATA-DRIVEN APPROACHES TO THE FORENSIC ANALYSIS OF AUTO THEFT**

Date: Thursday, **September 21st** at 1:00pm EST

Speakers: Rachel Harmon and Collin Knaub from Colorado Bureau of Investigation, Denver Forensic Science Laboratory will share the evolution of DNA testing on vehicle thefts.

Registration Link: [Register Here](#)

Missed a Talk? All episodes can be viewed on [YouTube](#).

Recent Lightning Talks...

### **FRC Award Winners Present - Time Since Deposition Determination for Trace DNA & ForenSeq Kintelligence Internal Validation**

Aired: Thursday, June 15th

Speakers: Chris Ehrhardt at Virginia Commonwealth University and Michelle Peck from Signature Science

### **Analysis of Alternative Seized Drug Matrixes**

Aired: Thursday, July 20th

Speakers: Michelle Peace from Virginia Commonwealth University, Brent Wilson from NIST, Sarah Shuda from Center for Forensic Science Research & Education (CFSRE)

### **Touch DNA in Activity Level Propositions**

Aired: Thursday, August 17th

Speakers: Ashley Hall from the University of California-Davis and Ray Wickenheiser from the NY State Police, Forensic Investigation Center

Have an idea for a Lightning Talk, please email [ASCLDFRC@gmail.com](mailto:ASCLDFRC@gmail.com).

## **LIGHTNING TALKS**

Lightning Talks typically air the third Thursday of each month.

Each episode features short (~7 min) talks on a themed topic given by practitioners, researchers, and/or students.



The goal of LEAP is to facilitate collaborative research between academia and forensic science laboratories. This joint effort between the American Society of Crime Lab Directors (ASCLD) and the Council of Forensic Science Educators (COFSE) identifies forensic science needs and provides a platform for laboratories, researchers, and students to seek projects aligning with their mutual research capabilities.

Sign up for the FRC LEAP program today or share your collaborations so others can learn how to implement these partnerships. [Crime Lab Sign Up](#) / [University Sign Up](#)

### **LEAP Partner Spotlight:**

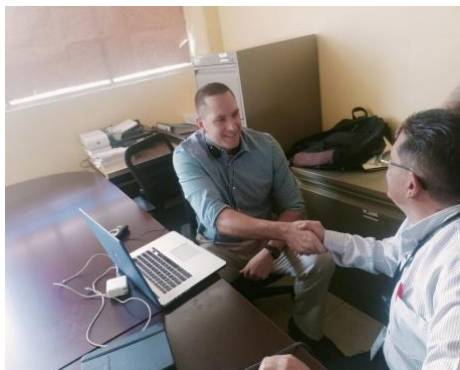
The ASCLD FRC would like to welcome several colleagues from the Forensic Science Laboratories of Hidalgo and Queretaro, Mexico. We look forward to many successful collaborations!

From Hidalgo:

1. Raul Rivera Rodriguez
2. Brianda Rodriguez
3. Reynaldo Rios Gonzalez

From Queretaro:

1. Sandra Liliana De La Vega Olvera
2. Orlando Francisco Rios Zamudio
3. Miguel Angel Martinez Hernandez
4. Marco Antonio Gomez Abrego
5. Daniel Fernando Loeza Huanosta



Mr. Raul Rivera Rodriguez moments after being the first Forensic Scientist to join the LEAP Program in Mexico!

## **LABORATORIES & EDUCATORS ALLIANCE PROGRAM**



LEAP Partners in the US



136 LEAP Partners:  
92 Universities  
44 Forensic Labs

### **Worldwide LEAP Partners**



Current World  
LEAP Partners (6):  
USA, Canada, Australia, Mexico, Italy  
& Saudi Arabia

### **Partnership Opportunities**



## EVALUATION & VALIDATION REPOSITORY

The FRC Evaluation/Validation Repository promotes transparency, information sharing, and synergy between forensic science laboratories, researchers, and other stakeholders within the criminal justice system.

The Evaluation/Validation Repository provides a centralized location for evaluation and validation plans, methods, results, reports and data to be stored. This provides accessibility for other forensic science laboratories and stakeholders to coordinate, collaborate, and build upon existing efforts to share information throughout the forensic science community.

By working together, the community can increase collaboration on future interlaboratory evaluations and validations.

Recent evaluations and validations submitted to the repository:

### **Analysis of Benzodiazepines using Liquid-Chromatography Mass Spectrometry-Mass Spectrometry**

Keywords: benzodiazepines, solid-phase extraction, LC/MS/MS

Laboratory: Wisconsin Division of Forensic Science

Discipline: Toxicology

Contact Name: Jonathan Tomko ([tomkojt@doj.state.wi.us](mailto:tomkojt@doj.state.wi.us)) or Leah Macans ([MacansLJ@doj.state.wi.us](mailto:MacansLJ@doj.state.wi.us))

Email: [tomkojt@doj.state.wi.us](mailto:tomkojt@doj.state.wi.us)

File [link](#) Web link: <https://www.doj.state.wi.us/dfs/contact-information>

### **STRmix V2.6.2**

Keywords: STRmix, Powerplex Fusion 6C, 3500

Laboratory: Palm Beach County Sheriff's Office Crime Laboratory

Discipline: Biology/Serology

Contact Name: Amy McGuckian

Email: [mcguckiana@pbso.org](mailto:mcguckiana@pbso.org)

File link: <https://www.ascd.org/wp-content/uploads/formidable/13/Estimation-of-STRmix-V2.6-Parameters-for-Palm-Beach-County-Sheriffs-Office-PowerPlex-Fusion-6C-3.pdf>,

<https://www.ascd.org/wp-content/uploads/formidable/13/PBSO-STRmix-v2.6.2-Internal-Validation-Powerplex-Fusion-6C-3500xl-CE.pdf>,

<https://www.ascd.org/wp-content/uploads/formidable/13/STRmix-2.6.2-internal-functional-testing-evaluation-summary.pdf>

### **Internal Validation with PowerPlex Fusion 6C, Proflex PCR System, and 3500xL Series Genetic Analyzer Validation Report**

Keywords: Fusion 6C, PowerPlex, ProFlex

Laboratory: Palm Beach County Sheriff's Office Crime Laboratory

Discipline: Biology/Serology

Contact Name: Amy McGuckian

Email: [mcguckiana@pbso.org](mailto:mcguckiana@pbso.org)

File link: <https://www.ascd.org/wp-content/uploads/formidable/13/Internal-Validation-with-PowerPlex-Fusion-6C-Proflex-PCR-System-and-3500xL-Series-Genetic-Analyz.pdf>

### **Validation for the Qualitative Analysis of Seized Drugs by GC-IRD**

Keywords: GC-IRD, Seized Drug, Cathinones

Laboratory: Palm Beach County Sheriff's Office Crime Laboratory

Discipline: Seized Drugs

Contact Name: Ilene Alford

Email: [alforda@pbso.org](mailto:alforda@pbso.org)

File link: <https://www.ascd.org/wp-content/uploads/formidable/13/Validation-for-the-Qualitative-Analysis-of-Seized-Drugs-by-GC-IRD.pdf>

## **Validation Report for Quantitation and/or Qualitative Identification of Benzodiazepines, Opioids and Select Hypnotics in Whole Blood by LC MSMS**

Keywords: Opioids, Benzodiazepines, Hypnotics, LC-MSMS, Whole Blood

Laboratory: Palm Beach County Sheriff's Office Crime Laboratory

Discipline: Toxicology

Contact Name: Nick Tiscione

Email: [tiscionen@pbso.org](mailto:tiscionen@pbso.org)

File link: <https://www.asclcd.org/wp-content/uploads/formidable/13/Validation-Report-for-Quantitation-and-or-Qualitative-Identification-of-Benzodiazepines-Opioids-.pdf>

## **Validation Report for Quantitation of Select Stimulants in Whole Blood by LC-MSMS**

Keywords: Stimulants, LC-MSMS, Whole Blood

Laboratory: Palm Beach County Sheriff's Office Crime Laboratory

Discipline: Toxicology

Contact Name: Nick Tiscione

Email: [tiscionen@pbso.org](mailto:tiscionen@pbso.org)

File link: <https://www.asclcd.org/wp-content/uploads/formidable/13/Validation-Report-for-Quantitation-of-Select-Stimulants-in-Whole-Blood-by-LC-MSMS.pdf>

## **Validation Summary for Alcohol Analysis by Headspace GC-FID/MS**

Keywords: BAC, ethanol, Headspace

Laboratory: Palm Beach County Sheriff's Office Crime Laboratory

Discipline: Toxicology

Contact Name: Nick Tiscione

Email: [tiscionen@pbso.org](mailto:tiscionen@pbso.org)

File link: <https://www.asclcd.org/wp-content/uploads/formidable/13/Validation-Summary-for-Alcohol-Analysis-by-Headspace-GC-FIDMS.pdf>

## **USEFUL FORENSIC RESEARCH LINKS**

- [Center for Statistics and Applications in Forensic Evidence \(CSAFE\)](#)
- [RTI Forensic Technology Center of Excellence](#)
- [National Institute of Justice Office of Forensic Sciences](#)
- [International Forensic Strategic Alliance \(IFSA\)](#)
- [IFSA Research and Innovation Position Statement](#)
- [OSAC Research and Development Needs](#)
- [NIST Forensic Data sets](#)
- [CSAFE Forensic Data sets](#)
- [FIU Research Forensic Library](#)
- [CFSRE Publications](#)

“Don’t  
reinvent the  
wheel,  
Just realign  
it.”

-Anthony J.  
D'Angelo

“You need to  
do the  
research. If  
you don’t  
know about  
something,  
then you ask  
the right  
people who  
do.”

-Spike Lee



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## Meet the FRC Committee

Henry Maynard – Chair/LEAP

Kathleen Carrado – LEAP

Tracey Dawson Green – Lightning Talks

Lisa Yoshida – Evaluation/Validation Repository

Ashley Hall, Tracey Dawson Green – Awards

Mandy Tinkey, Laura Tramontin – Outreach/Bulletin

Ed Sisco, Ashraf Mozayani, Henry Swofford, Richard Meyers

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***THE FRC BULLETIN IS  
DESIGNED TO HIGHLIGHT  
DEVELOPMENTS WITHIN OUR  
CORE PRIORITIES. YOU ARE  
ENCOURAGED TO SUBMIT  
COMMENTS AND SUGGESTIONS  
REGARDING THIS BULLETIN TO  
ASCLDFRC@GMAIL.COM***

### **FRC STRATEGIC GOALS:**

- ADVANCE FORENSIC SCIENCE RESEARCH
- SUPPORT THE DEVELOPMENT OF FUTURE FORENSIC CAPABILITIES
- FURTHER CULTIVATE FORENSIC SCIENCE RESEARCH PARTNERSHIPS
- PROMOTE INFORMATION SHARING THROUGHOUT THE FORENSIC SCIENCE RESEARCH COMMUNITY
- IDENTIFY AND PRIORITIZE THE RESEARCH, DEVELOPMENT, TECHNOLOGY, AND EVALUATION (RDT&E) NEEDS FOR THE FORENSIC COMMUNITY





# American Society of Crime Laboratory Directors

## Research Priorities 2022-2024



<b>General Forensics</b>	Development and validation of standardized forensic methods and conclusions in impressions, patterns, and trace evidence disciplines
	Development, evaluation, and validation of massively parallel sequencing techniques for whole genome sequences, partial genome sequencing, and other forensic casework applications such as proteomics
	Development, evaluation, and validation of statistical or other computational methods to augment interpretation and quantitatively assess the value and strength of forensic evidence
	Evaluation of accuracy and reliability of forensic examinations as a function of evidence quantity, quality, or complexity
	Exploring the best ways to communicate results generated through statistical or other computational methods to non-technical audiences, such as investigators, litigators, and factfinders
	Research to support the application of evaluative reporting (likelihood ratios/expanded conclusion scales) and testimony for forensic evidence other than DNA (e.g., trace materials)
	Development of local, National, and International ground truth data sets across a range of evidence types for source and activity inferences
Understanding the impact of various types of biases (beyond confirmation and contextual bias) on practical decision making across all practitioner types from the scene to the courtroom within the criminal justice system by exploring risk in decision-making and harnessing knowledge in other fields such as medicine, engineering and across the social sciences	
<b>Controlled Substances</b>	Development of a standardized drying procedure for plant material to ensure consistent quantitative analysis of THC
	Error rate studies on qualitative analysis (single tests and schemes) in controlled substances
	Differentiation between THC-rich and CBD-rich cannabis plants in the field (more sensitive tests) and in the laboratory (more specific tests)
	Alternative methods beyond GC-MS to distinguish fentanyl-related substances (e.g., positional isomers, analogs) including FTIR, derivatization, color test, or other widely used forensic techniques
	Applications for DNA analysis of marijuana to identify cultivar for sourcing and linkage applications



# American Society of Crime Laboratory Directors

## Research Priorities 2022-2024



<b>DNA/Biology</b>	The ability to detect and locate sufficient biological material (e.g., epithelial cells, extracellular DNA) associated with touched or worn objects, that is not visible to the eye or with alternate light sources, for downstream DNA analysis
	Explore the use of Rapid DNA instruments for crime scene samples (e.g., touch DNA, sexual assault kits) with comparisons to traditional STR-typing methods
<b>Questioned Documents</b>	Validation of conclusion scale in forensic document examination
<b>Pattern and Impression Evidence</b>	Assessment of examiners' toolmark categorization accuracy
	Development, evaluation, and validation of methods to quantitatively assess the aptitude of candidates in pattern evidence disciplines
<b>Trace Evidence</b>	Development of an integrated and multidisciplinary approach for the advancement of data collection, data management and data analysis to aid interpretation of trace evidence
	Comprehensive GSR persistence study
	Specific identification of shooters via GSR
	Modelling the transfer and persistence of different trace evidence materials between a range of substrates