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"Research is formalized curiosity.

It is poking and prying with a purpose"

~Zora Neale Hurston

ASCLD
FORENSIC RESEARCH COMMITTEE
BULLETIN

FRC *Hot Topics*

- The 10th anniversary of National Forensic Science Week was celebrated across the country September 18-24. It highlighted the contributions that forensic science makes to the criminal justice system. It was an opportunity to celebrate academic programs, forensic professionals, and scientific research in the various forensic disciplines. ASCLD promoted awareness and the FRC took the opportunity to highlight our goals and programs.

- International Forensic Strategic Alliance (IFSA) is a multilateral partnership between regional networks of operational forensic laboratories across the globe of which ASCLD is a member. The FRC is collaborating with the IFSA in its mission to promote research and innovation in areas with operational relevance that are critical to scientific service providers for the criminal justice system.

- The 2023 ASCLD FRC Awards are now open! Please consider nominating yourself or a peer for one of the three awards:
  - The LEAP Collaboration Award
  - The Innovation Award
  - The Outstanding Evaluation/Validation Award

  Submission Deadline January 20, 2023

The FRC Bulletin is designed to highlight developments within our core priorities. You are encouraged to submit comments and suggestions regarding the content to ASCLDFRC@gmail.com

LIGHTNING TALKS

Lightning Talks are monthly talks given at lunchtime to provide the community with brief snapshots of new and emerging research. In each episode two or three speakers give brief (~7 min) talks on a themed topic. To date, there have been 18 "Lighting Talks" featuring speakers from 12 countries as well as attendees from 30 countries and 47 states. Upcoming talks:

The Future of Forensic Analysis, Interpretation, and Reporting
Date: Thursday, October 13th at 1:00pm EST
Speakers: Adele Quigley-McBride – Duke Law, Alex Biedermann – University of Lausanne, Geoffrey Stewart Morrison – Aston University
Registration Link: https://bit.ly/3PeTGRW

Topic: Forensic Anthropology
Date: Thursday, November 3rd at 1:00pm EST
Speakers: Lisette Jong – University of Amsterdam, Nicholas Marquez-Grant – Cranfield University, and TBD
Registration Link: https://bit.ly/3QpPzDW

Topic: Forensic Toxicology
Date: Thursday, December 8th at 1:00pm EST
Speakers: Sherri Kacinko – NMS Laboratories, Marthe Vandeputte – University of Ghent, and TBD
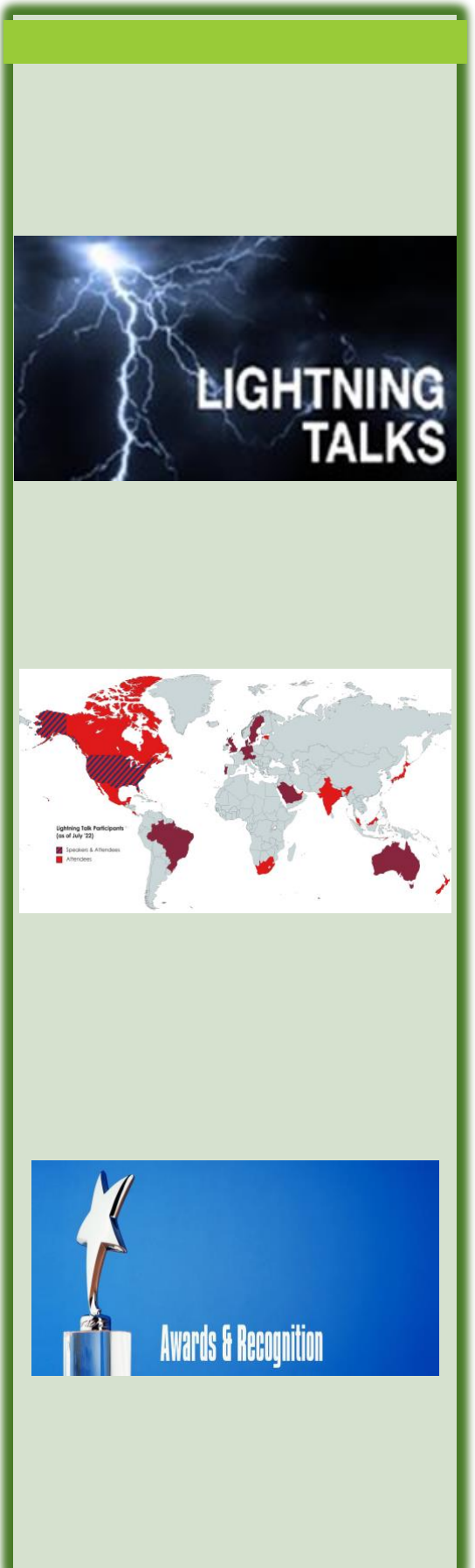Registration Link: https://bit.ly/3Aixbak

Sign up at https://www.ascld.org/forensic-research-committee/

Missed a Lightning Talk, watch the replay here.

FRC AWARDS

The award cycle for the 2023 ASCLD FRC Awards is now open! The submission deadline is **January 20, 2023**.

The awards are open to scientists from all disciplines (bio/DNA, drug chemistry, toxicology, fingerprints, questioned documents, trace/microscopy, firearms/toolmarks, and digital/multimedia sciences) in operational forensic labs, academic or research laboratories.

The LEAP Collaboration Award recognizes an outstanding partnership between LEAP participating academic and operational forensic laboratories.

The Outstanding Evaluation/Validation Award recognizes an outstanding evaluation/validation study that has been submitted to the FRC repository.

The Innovation Award recognizes activities highlighting new technologies, protocols, or tools that impact the operational forensic science laboratory.

The applications can be found on the ASCLD FRC page https://www.ascld.org/forensic-research-committee/.

LABORATORIES & EDUCATORS ALLIANCE PROGRAM (LEAP)

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.

Research partnerships are critical for advancing the field of forensic science. Through research partnerships, laboratories and universities are able to collaborate on mutually beneficial research projects. By partnering together, each organization may leverage the partner organization's facilities, equipment, expertise, experience, knowledge, and skills.

Is your laboratory interested in hosting an intern or partnering with a university? Are you interested in conducting research, assisting with evaluations/validations, or interested in internship opportunities for your students at a forensic science laboratory? Sign up for the LEAP program today!

Crime Lab Sign Up / University Sign Up

Check out this short video to learn more about LEAP.

Current World
LEAP Partners:

USA, Canada, Australia,
Saudi Arabia

FRC COLLABORATION HUB

The FRC collaboration hub hosts the Researcher-Practitioner Collaboration Directory. 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, search the Researcher/Practitioner Collaboration Directory for projects in need of participants.

Recent collaborations include:

o *Blind Proficiency Testing from Robin Mejia of Carnegie MellonUnversity Mobile App Evidence Analysis from Dr. Yong Guan of Iowa State University*

o *Forensic Processing at Crime Labs from Dr. Brett Gardner of University of Virginia*

o *Characterization of Footwear in Local Populations from Dr. Susan Vanderplas of University of Nebraska, Lincoln*

o *Handwriting Evaluation from Dr. Alicia Carriquiry of Iowa State University*

o *Forensic Processing at Crime Labs from Dr. Brett Gardner of University of Virginia*

o *Characterization of Footwear in Local Populations from Dr. Susan Vanderplas of University of Nebraska, Lincoln*

CSAFE (Center for Statistics and Applications in Forensic Science) also has collaboration opportunities.

CSAFE is committed to applying proven statistical and scientific methods to improve the accuracy of the analysis and interpretation of forensic evidence. CSAFE is currently seeking statisticians, scientists, forensic practitioners to collaborate with in the following research areas: Firearms and Toolmarks, Footwear Impressions, Latent Print Analysis, Bloodstain Pattern Analysis, Handwriting Analysis, and Digital Evidence. CSAFE: forensicstats.org

EVALUATION AND VALIDATION REPOSITORY

Recent additions highlight new tools, technologies, and methods that have been implemented and transitioned into forensic laboratory operations.

Check the website to search for a validation or evaluation study or provide study information to be included. Here are some of the latest validation and evaluation submissions:

NYC OCME Internal Validation of STRmixTM v2.7 for Fusion 5C/3500xL Data – STRmixTM Parameters
Keywords: STRmix, Fusion 5C/3500XL
Laboratory: New York City Office of the Chief Medical Examiner
Discipline: Biology/Serology
Contact Name: Timothy D. Kupferschmid
Email: tkupferschmid@ocme.nyc.gov
Web link**:** https://www1.nyc.gov/assets/ocme/downloads/pdf/strmix_v2_7_parameters.pdf

Estimation of STRmix parameters for OCME New York Laboratory
Keywords: STRmix
Laboratory: New York City Office of the Chief Medical Examiner
Discipline: Biology/Serology
Contact Name: Timothy D. Kupferschmid
Email: tkupferschmid@ocme.nyc.gov
Web link: https://www1.nyc.gov/assets/ocme/downloads/pdf/strmix_parameters.pdf

Internal Validation of STRmix V2.4 for Fusion
Keywords: STRmix
Laboratory: New York City Office of the Chief Medical Examiner
Discipline: Biology/Serology
Contact Name: Timothy D. Kupferschmid
Email: tkupferschmid@ocme.nyc.gov
Web link: https://www1.nyc.gov/assets/ocme/downloads/pdf/STRmix-V2-4-Fusion-5C-Validation%20Summary.pdf

Internal Validation of GeneMarker HID software
Keywords: GeneMarker, HID
Laboratory: New York City Office of the Chief Medical Examiner
Discipline: Biology/Serology
Contact Name: Timothy D. Kupferschmid
Email: tkupferschmid@ocme.nyc.gov
Web link: https://www1.nyc.gov/assets/ocme/downloads/pdf/GeneMarker-HID-Validation-Summary.pdf

PowerPlex® Fusion System Amplification Kit on the Applied Biosystems 3130xl Genetic Analyzer using GeneMarker HID v. 2.8.2 Analysis Software Validation Report
Keywords: PowerPlex Fusion, 3130xL
Laboratory: New York City Office of the Chief Medical Examiner
Discipline: Biology/Serology
Contact Name: Timothy D. Kupferschmid
Email: tkupferschmid@ocme.nyc.gov
File link:
Web link: https://www1.nyc.gov/assets/ocme/downloads/pdf/Fusion-Validation-Summary.pdf

Internal Validation of STRmix™ v2.7 for Fusion 5C/3500xL Data
Keywords: STRmix, Fusion 5C/3500xL
Laboratory: New York City Office of the Chief Medical Examiner
Discipline: Biology/Serology
Contact Name: Timothy D. Kupferschmid
Email: tkupferschmid@ocme.nyc.gov
Web link: https://www1.nyc.gov/assets/ocme/downloads/pdf/internal_validation_strmix_2_7.pdf

Multi-drug Screen in Blood and Urine by LC/MS/MS Using SLE+ Extraction Plates
Keywords: Toxicology, Multi-Drug, LC/MS/MS
Laboratory: Idaho State Police Forensic Services
Discipline: Toxicology
Contact Name: Matthew Gamette
Email: matthew.gamette@isp.idaho.gov
File link: https://www.ascld.org/wp-content/uploads/formidable/13/Validation-Summary-MDS-APPROVED.pdf
Web link: https://isp.idaho.gov/forensics/validation/

Multi-drug and Cannabinoids Screen in Blood and Urine by LC/Q-TOF Using SLE+ Extraction Plates
Keywords: Toxicology, LC/Q-TOF, Multi-Drug, Cannabinoids
Laboratory: Idaho State Police Forensic Services
Discipline: Toxicology
Contact Name: Matthew Gamette
Email: matthew.gamette@isp.idaho.gov
File link: https://www.ascld.org/wp-content/uploads/formidable/13/Final-Validation-Summary-QTOF-MDS-APPROVED.pdf, https://www.ascld.org/wp-content/uploads/formidable/13/Final-Validation-Summary-QTOF-Cannabinoids-APPROVED.pdf
Web link: https://isp.idaho.gov/forensics/validation/

Antiepileptics / Acidic Drug Confirmation and Quantitation by LCMSMS
Keywords: antiepileptics, acidic drugs, LCMSMS
Laboratory: Montgomery County Coroner's Office / Miami Valley Regional Crime Laboratory
Discipline: Toxicology

Contact Name: Matthew Juhascik
Email: juhascikm@mcohio.org
File link: https://www.ascld.org/wp-content/uploads/formidable/13/AEA-by-LCMSMS-Summary-of-Validation-7482-1-1.pdf

Hemp analysis by LCMSMS
Keywords: hemp, marijuana, total THC, LCMSMS
Laboratory: Montgomery County Coroner's Office / Miami Valley Regional Crime Laboratory
Discipline: Seized Drugs
Contact Name: Matthew Juhascik
Email: juhascikm@mcohio.org
File link: https://www.ascld.org/wp-content/uploads/formidable/13/Hemp-THC-and-THCA-by-LCMSMS-Summary-of-Validation-7489-1.pdf

Antiepileptics / Acidic Drug Confirmation and Quantitation by LCMSMS
Keywords: antiepileptics, acidic drugs, LCMSMS
Laboratory: Montgomery County Coroner's Office / Miami Valley Regional Crime Laboratory
Discipline: Toxicology
Contact Name: Matthew Juhascik
Email: juhascikm@mcohio.org
File link: https://www.ascld.org/wp-content/uploads/formidable/13/AEA-by-LCMSMS-Summary-of-Validation-7482-1.pdf

Drug-Facilitated Crime Analysis by LCMSMS
Keywords: drug-facilitated, sexual assault, LCMSMS, solid-phase extraction
Laboratory: Montgomery County Coroner's Office / Miami Valley Regional Crime Laboratory
Discipline: Toxicology
Contact Name: Matthew Juhascik
Email: juhascikm@mcohio.org
File link: https://www.ascld.org/wp-content/uploads/formidable/13/DFC-Validation-Summary-7487-1.pdf

THC related compounds by LCMSMS
Keywords: THC, delta 8, LCMSMS, solid-phase extraction
Laboratory: Montgomery County Coroner's Office / Miami Valley Regional Crime Laboratory
Discipline: Toxicology
Contact Name: Matthew Juhascik
Email: juhascikm@mcohio.org
File link: https://www.ascld.org/wp-content/uploads/formidable/13/THCPlus-by-LCMSMS-Summary-of-Validation-7494-1.pdf

Benzodiazepines by LCMSMS
Keywords: Benzodiazepines, LCMSMS, solid-phase extraction
Laboratory: Montgomery County Coroner's Office / Miami Valley Regional Crime Laboratory

Discipline: Toxicology
Contact Name: Matthew Juhascik
Email: juhascikm@mcohio.org
File link: https://www.ascld.org/wp-content/uploads/formidable/13/Benzo-by-LCMSMS-Summary-of-Validation-7486-1.pdf

ProFlex Thermalcycler Validation with GlobalFiler
Keywords: ProFlex, PCR, Thermalcycler, Globalfiler, Yfiler
Laboratory: Colorado Bureau of Investigation
Discipline: Biology/Serology
Contact Name: Jennifer Malone, DNA Technical Leader
Email: jennifer.malone@state.co.us
File link: https://www.ascld.org/wp-content/uploads/formidable/13/2021-Casework-ProFlex-Thermal-Cycler-Validation-59019-1.pdf

ArmedXpert Validation
Keywords: RMP, Random Match Probability
Laboratory: Ohio Bureau of Criminal Investigation
Discipline: Biology/Serology
Contact Name: Steven Wiechman
Email: Steven.Wiechman@ohioattorneygeneral.gov
File link: https://www.ascld.org/wp-content/uploads/formidable/13/Ohio-BCI-ArmedXpert-Validation-12222020-signed.pdf

Please consider submitting information about your lab's validations and evaluations to the repository. Submissions can include basic information such as validation/evaluation title, lab name, and point of contact information (which enables other forensic scientists to contact you with questions) or additional information such as a short validation/evaluation summary or even a full validation/evaluation report.

By sharing this information, you are supporting other laboratories that wish to expand their forensic capabilities!

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

FRC Committee Members

Henry Maynard – Chair/LEAP
Kathleen Carrado – LEAP
Ed Sisco – Lightning Talks
Lisa Yoshida, Brooke Ehlers – Evaluation/Validation Repository
Ashley Hall, Tracey Dawson Green – Awards
Mandy Tinkey, Laura Tramontin – Outreach/Bulletin
Ashraf Mozayani, Henry Swofford, David Love

American Society of Crime Laboratory Directors
Research Priorities 2022-2024

General Forensics	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
Controlled Substances	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

DNA/Biology	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
Questioned Documents	Validation of conclusion scale in forensic document examination
Pattern and Impression Evidence	Assessment of examiners' toolmark categorization accuracy
	Development, evaluation, and validation of methods to quantitatively assess the aptitude of candidates in pattern evidence disciplines
Trace Evidence	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

Updated November 2021