Presidents message

Dear Colleagues,

Approximately a month and a half ago, we reached out to the ASCLD membership for feedback on our 2017-2018 National Outreach Priorities and Agenda. The finalized version is now posted on our website at http://www.ascld.org/wp-content/uploads/2017/07/ASCLD-NOPA-July2017.pdf. We are very pleased that a number of our membership took the time to share their expertise and make comments. Each of these comments were discussed and addressed individually by our board and made our positions stronger. We benefit tremendously through consolidating the variations in opinion on such important topics impacting the future direction of forensic science.

Several lab leaders commented on the word we use to refer to the “area” of Forensic Science. It has been referred to as many things, including a field, a discipline and an industry. Our most recent discussion has settled on the term “profession”. Profession can be defined as an occupation that involves prolonged training and a formal qualification. A profession is a calling, a vocation, a career. It falls on a slightly higher plane than a trade, craft or a job.

As a profession, practicing forensic science is very demanding. Not only is the demand for perfection great and the cost of error high, there is an appropriate high level of standards posed by accreditation requirements. Much is expected and rightly so. The results of our analyses make a big impact.

Please take a moment to read our Priorities and Agenda and share it with our future lab leaders on your staff.

Ray

Be sure to stay up-to-date with our 2017-18 National Priorities and Agenda!

Our NEW mailing address: 65 Glen Road, Suite 123, Garner, NC 27529

Communications Committee

ASCLD is looking for enthusiastic volunteers to assist with the following positions on the Communications Committee:

- Communications Manager for Scientific Publications and Research News
- Crime Lab Minute Design Specialist
- Public Relations Liaison to Industry Partners and University Programs
- Social Media Coordinator

Please email Ascldpoc@qmail.com for more information or call 202-498-8105. Thank you for your interest.
Looking for a new opportunity?

- **Forensic Scientist Technical Leader (Fingerprint)**, DC Government – Department of Forensic Sciences, Washington, DC, Expires: August 7, 2017
- **Controlled Substance Analyst**, State of Wisconsin-Department of Justice, Wausau, WI, Expires: August 21, 2017
- **Forensic Serologist**, Sorenson Forensics, Salt Lake City, Expires: September 29, 2017
- **Forensic DNA Technician**, Sorenson Forensics, Salt Lake City, Expires: September 29, 2017
- **Forensic DNA Analyst I / II**, Sorenson Forensics, Salt Lake City, Expires: September 29, 2017
- **Forensic DNA Analyst – Priority DNA**, Sorenson Forensics, Salt Lake City, Expires: August 31, 2017
- **Laboratory Director**, Austin Police Department, Austin, Texas, Expires: August 1, 2017
- **Forensic Scientist – Division of Technical Services**, Virginia Dept. of Forensic Science, Richmond, VA, Expires: August 11, 2017
- **Quality Specialist**, Houston Forensic Science Center, Houston, TX, Expires: September 30, 2017
- **Forensic Analyst – Biology/DNA**, Houston Forensic Science Center, Houston, TX, Expires: September 30, 2017
- **Crime Scene Supervisor**, Houston Forensic Science Center, Houston, TX, Expires: September 30, 2017
- **Latent Print Examiner**, Houston Forensic Science Center, Houston, TX, Expires: September 30, 2017
- **Property & Evidence Manager**, NMS Labs, Grand Prairie, TX, Expires: October 18, 2017
- **Forensic Biologist III or IV Trainer**, NMS Labs, Willow Grove, PA, Expires: October 18, 2017
- **Forensic Chemist III or IV**, NMS Labs, Willow Grove/Warminster PA, Expires: October 18, 2017
- **Forensic Scientist I, II, III- Chemistry**, Kansas Bureau of Investigation, Topeka, KS, Expires: July 31, 2017
- **Forensic Scientist I, II, III- Biology**, Kansas Bureau of Investigation, Topeka, KS, Expires: July 31, 2017
- **Forensic Scientist I, II, III**, Kansas Bureau of Investigation, Topeka, KS, Expires: July 31, 2017
- **Non-Tenure Track Forensic Science Faculty Position**, Pennsylvania State University, University Park, PA, Expires: October 13, 2017
- **Forensic Science Lecturers (2)**, University at Albany, SUNY, Albany, NY, Expires: August 31, 2017
- **Staff Chemist**, ORAU (Oak Ridge Associated Universities), Charlottesville, VA and OCONUS, Expires: September 29, 2017
- **Post doctoral scholar**, The Pennsylvania State University, Forensic Science Program, Department of Biochemistry and Molecular Biology, University Park, PA, Expires: August 31, 2017
- **Latent Print Laboratory Director**, NYS Division of Criminal Justice Services, Albany, NY, Expires: September 15, 2017
- **Bilingual Accreditation Manager**, ANSI-ASQ National Accreditation Board, Cary, NC, Expires: September 14, 2017
- **Software Tester**, JusticeTrax, Inc., Mesa, Arizona, Expires: July 31, 2017
- **QA/QC Project Coordinator**, Harris County Institute of Forensic Sciences, Houston, TX, Expires: July 31, 2017
- **Audio/Video Forensic Analyst**, Houston Forensic Science Center, Houston, TX, Expires: September 30, 2017
- **Staff DNA Analyst (#01611)**, ORAU, Charlottesville, VA and OCONUS, Expires: October 2, 2017
- **Senior DNA Analyst (#01607)**, ORAU, Charlottesville, VA and OCONUS, Expires: October 2, 2017
- **Principal DNA Analyst (#01604)**, ORAU, Charlottesville, VA and OCONUS, Expires: October 2, 2017
- **Associate DNA Analyst (#01593)**, ORAU, Charlottesville, VA and OCONUS, Expires: September 29, 2017
- **Lab Manager**, Sorenson Forensics, Salt Lake City, Expires: August 2, 2017
- **DNA Analyst I & II**, Sorenson Forensics, Salt Lake City, Expires: August 2, 2017
- **DNA Technician**, Sorenson Forensics, Salt Lake City, Expires: August 2, 2017
- **Serologist**, Sorenson Forensics, Salt Lake City, Expires: August 2, 2017
New Agilent Sponsored Webinar!
Registration is Open!!

Power of High Res Mass Spec to Detect Fentanyl Analogues
When: July 27th, 2017 at 11:00am EST

This webinar summarizes the pharmacology of Non-Pharmaceutical Fentanyls (NPFs), trends of abuse, and explore novel techniques for the analysis of NPFs in forensic toxicology casework using Q-TOF mass spectrometry applications.

The number of opioid overdoses in the United States has dramatically increased over the past few years. The abuse of heroin and synthetic opioids such as fentanyl and its analogues are major contributors to this epidemic. Non-pharmaceutical fentanyls (NPFs) such as carfentanil, furanyl fentanyl, acetyl fentanyl, fluoroisobutyryl fentanyl, and other novel opioids such as U-47700 and 4-ANPP are being routinely encountered in forensic toxicology and drug chemistry casework. Furthermore, we will highlight prevalence statistics from Alabama, Palm Beach County, and other laboratories...

Click HERE to find out more and Register!

NIJ Forensic Technology Center of Excellence
Attendee Enrollment Open!
Rapid DNA Technology Forum
When: August 15th - 17th, 2017 from 8am - 5:30pm EST
Where: The Alexandrian in Old Town, Alexandria, VA

The FTCoE will host the Rapid DNA Technology Forum on August 15-17, 2017 in Alexandria, VA. Rapid DNA technology has quickly advanced over the past several years with two commercially available systems being adapted to analyze the CODIS panel, and the introduction of the Rapid DNA Act of 2017 which may soon become law. This forum will provide the forensic DNA community an opportunity to be updated on commercially available Rapid DNA technologies, and hear lessons learned from several early adopters spanning local law enforcement and federal agencies. The evolution of Rapid DNA will be discussed along with technologies currently in development which have the potential to impact the future of forensic DNA analysis.

Episode 9 Podcast!!
Just Blood Spatter

In episode nine of Just Science, funded by the National Institute of Justice’s Forensic Technology Center of Excellence [Award 2016-MU-BX-K110], we spoke with Dr. Marc Smith, from the Georgia Institute of Technology. Dr. Smith’s NIJ funded research in blood spatter has connected computational fluid dynamics with empirical studies to improve the understanding of blood spatter onto solid, slanted surfaces. His work looks at many variables, including droplet size, speed, surface roughness and wettability. Listen and Subscribe HERE.

Subscribe to the channel at:
- Google Play
- iTunes
- Stitcher
- SoundCloud

DNA - Bode
16th Annual DNA & Investigators Conference – Bode East. September 11-14 in Philadelphia, PA

ASCLD/RTI Backlog Series
Archival versions of the ASCLD/RTI Backlog Series can be found at the following links:
- The Paradox of Backlog Reduction – How Doing Less Can Be Doing More
- Taking the First Steps Toward Backlog Reduction
- Managing Customer Expectations and Education
- How to Increase your Staff without Increasing Budget
- Efficiency Improvements
- Developing a Statewide Approach to Backlog Management
- Case Acceptance Policies and Guidelines

ASCLD/RTI Rapid DNA Series
Archival versions of the ASCLD/RTI Rapid DNA Series can be found at the following links:
- Rapid DNA: The QAS and NDIS
- Rapid DNA: Arizona DPS and Richland County, SC
- Rapid DNA: Booking Stations and CODIS

NFSTC News
NFSTC is now offering online proficiency testing in crime scene investigation to agencies across the globe. After the Fact has been used as the competency standard since 2011 and is a cost-effective training tool. Assessments are $250 and available at www.csi-skills.com. NFSTC online training courses can be found on their website.

ANAB Training

Introduction to ISO/IEC 17025

Internal Auditing to ISO/IEC 17025

Fundamental Measurement Uncertainty
August 24-25, 2017, Memphis, TN and November 16-17, 2017, San Francisco, CA

ISO/IEC 17025 Lead Assessor Training
October 2-6, 2017, San Antonio, TX and October 8-12, 2017, Riyadh, KSA

Internal Auditing to ISO/IEC 17020 - NEW!
October 17-19, 2017, Alexandria, VA

June 2017 Newsletter

OSAC Promotes Hundreds of Forensic Science Standards, Guidelines, and Other Documents During 2017

OSAC Public Status Reports & Open Discussions

The webcasts and PowerPoint presentations are available for public viewing on the NIST OSAC website." The OSAC Registry is a trusted repository of high-quality, science-based standards and guidelines for forensic sciences.

WK58027 - Standard Practice for Preserving Ignitable Liquids and Ignitable Liquid Residue Extracts from Fire Debris Samples (link is external) is a work item revision to existing standard E2451-13

WK58028 - Standard Guide for Forensic Examination of Non-Reactive Dyes in Textile Fibers by Thin-Layer Chromatography (link is external) is a work item revision to existing standard E2227-13

New Approved Standards

ASTM E2926 - 17 Standard Test Method for Forensic Comparison of Glass Using Micro X-ray Fluorescence (µ-XRF) Spectrometry (link is external)

ASTM E1588 - 17 Standard Practice for Gunshot Residue Analysis by Scanning Electron Microscopy/Energy Dispersive X-Ray Spectrometry (link is external)

E30.12 Digital and Multimedia Evidence

The following work item is underway:
Forensic Science in the News

Looking for quicker results, South Barrington police to work with regional forensic scientists

Thomas Roman, police chief in South Barrington, said the department is joining the Northeastern Illinois Regional Crime Laboratory in hopes for a quicker turnaround on village cases, ending ties with the authorities at the Illinois State Police Forensic Science Center in Chicago.

Trump Holds Key To Secret JFK Assassination Files

The National Archives this week released several hundred of the documents, which come from CIA and FBI files, and of course, JFK researchers are scrambling to see whether they contain any new clues about the president's murder. But many more documents remain under seal, awaiting release by October, the 25-year deadline set by the 1992 Kennedy Assassination Records Collection Act.

The law gives only one person — the president — the ability to stop the release from happening. He can act only if he certifies in writing that the documents would somehow endanger national security.

NYC expands controversial DNA testing on seized guns to help charges stick

Several said such an undertaking would be extremely difficult without adding staff, lab space, and expensive equipment. The Federal Bureau of Investigation, and the Bureau of Alcohol, Tobacco, Firearms and Explosives, only deploy DNA tests for select gun cases — often shootings and murders.

Sheriff considers opening crime lab after state announces forensic analysis fees

The Texas Department of Public Safety's crime lab system is set to enter the fiscal year short of $11 million. According to the department, general appropriations from the Texas legislature will provide only $63 million out of the $74.5 million it costs to run the lab.

4 compelling events retired crime lab director can’t forget

"I don’t want to ever call anything routine, because it’s not," he said. “I think what brings people to work every day is there is a new challenge, a new case every single morning at the coroner’s office and at the crime laboratory where your job is to try and determine cause and manner of death."

Officials rush to secure funding after DPS announces crime lab fees

"We understand that they have costs," Phipps said of the state agency. "But at the same time, the citizens are already paying taxes that fund the DPS. It's like they are being double taxed to pay out of our tax base to have these tests done."

Tracking Einstein's stolen toothbrush at Wilton Library

The crime scene was closed after an hour and the group were allowed to discuss with one another about who they thought committed the crime. Several shared their reasoning for the person or people they believed were responsible for the stolen toothbrush.

Reno-Sparks Jan. homicides still unsolved: ‘We are his voice now’

"We’re working with the (Washoe County) crime lab to try and generate leads through our physical evidence,” Myers said. He also noted the department received several Secret Witness tips. "To date, we don’t have any new information."

COLD CASE ARREST

The case had gone cold after investigators exhausted all leads and failed to find a DNA match, Mancuso said. But it picked up again in 2015 when they employed the aid of new technology.

Cold case murder defendant asks judge to toss case, says lost evidence could clear him
The man arrested and charged last spring in the presumed 1982 murder of Stephen E. Smith seeks to have the case thrown out, saying evidence lost and leads abandoned over 35 years might have exonerated him.

NFSTC News

STEM TEC Record Attendance

Posted on June 27, 2017

For the eighth year, NFSTC hosted students from the Junior Achievement of Tampa Bay STEM TEC program. This year, 44 students were selected to attend the event – a record number. Five stations were set up covering bio-screening, alternate light source, latent prints, digital forensics, and a CSI: Rocks station. Using tools from their very … Continue reading STEM TEC Record Attendance →

Read More...

Department of State-funded training wraps up

Posted on June 19, 2017

The intense 20-week DNA analyst training for 14 Central American students has concluded and participants are safely back in their home countries. On site since January, the students tackled techniques and protocols from bio-screening to trial presentation.

Read More...

Bode Cellmark Forensics provides advanced forensic solutions offering crime labs ways to reduce their workloads and budgets.

Bode’s newest offerings include:

Sexual Assault Kit Backlog Reduction Program streamlines processes to eliminate backlogs of untested sexual assault kits.

Bode Buccal 2™ is uniquely designed to improve DNA databanking collecting and automate
Next Professional Orientation Schools Scheduled

The next Professional Orientation Schools for New Crime Laboratory Scientists have been scheduled to begin on August 14 and October 9th. Laboratory directors and supervisors with new employees are encouraged to have them enroll as soon as possible. For more information or to enroll, please visit www.jmcollinsjr.com/pos.html. To reach the instructor, John Collins, please call (517) 803-4063 or email at forensicdirector@gmail.com.

Foresight 20/20

The American Society of Crime Laboratory Directors (ASCLD) has received funding from the Laura and John Arnold Foundation to develop software that will transfer data from forensic Laboratory Information Management Systems (LIMS) to Foresight, a business quantitative process tailored to forensic laboratories.

The goal of the project, called Foresight 20/20, will be to allow laboratories to easily upload business-relevant information from their individual LIMS to the Foresight project, hosted at West Virginia University.

Software development and installations for JusticeTrax Alpha labs is progressing. The software provides a dashboard of the labs’ own stats and Foresight stats, among other information. The information, formatting, and interface may vary somewhat by vendor.

Grant Assistance for DNA

Foresight 20/20

West Virginia University Forensic Management
Technical Colloquium on the Weight of Evidence

How can we transition the reporting of forensic results from simple “match/no match” statements to statements that integrate error and uncertainty?

The first day will be about defining the weight of evidence - what it means and how to quantify it. The second day will cover collecting evidence and analyzing data with these quantification challenges in mind. The third day will focus on communicating and reporting findings of forensic examination.

Download the article here

An opportunity to work at JusticeTrax doesn’t come around very often. We have a Software Tester position open! This one is going to go fast! Please read about the opening at https://justicetrax.com/employment/

The Software Tester basic function is to validate the quality of JusticeTrax products. The Software Tester finds weaknesses in the products in an efficient and timely manner so Software Developers can resolve them before customers experience a problem. Experience with JusticeTrax applications, especially LIMS-plus, may be substituted for experience as a software tester.

Following a number of requests from recipients for a direct link to the digest, I am in the process of creating a web-page on the ChemCentre web-site (www.chemcentre.wa.gov.au) for you to directly link to. I am hopeful that this will be active when the next issue of the digest is published and I will notify you accordingly. Please also continue providing me with feedback that enhances the value of this publication.

DR JOHN COUMBAROS
MANAGER – STRATEGY, RESEARCH & DEVELOPMENT
Forensic Science Laboratory
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Location: Corner Manning Road and Townsing Drive, Bentley WA 6102
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jcoumbaros@chemcentre.wa.gov.au

National Victimization Statistical Support

The chemistry behind the opioid epidemic
Andy Brunning
C&EN; 95(24); p. 24; June 6, 2017

As new and lethal opioids flood U.S. streets, crime labs race to identify them
Max Blau
STAT; July 5, 2017Photos by Raymond McCrea Jones for STAT

https://www.statnews.com/2017/07/05/opioid-identification-analogs/
Forensic Science Assessments: A Quality and Gap Analysis - Fire Investigation
José Almirall, Hal Arkes et al
AAAS; 89 pages; July 11, 2017

NIJ Forensic Science R&D Reports for ASCLD
Crime Lab Minute Vol 10

These research reports have been submitted by the National Institute of Justice (NIJ) especially for their relevance to crime laboratory activities. ASCLD has not reviewed nor does it necessarily endorse the findings of this research.

Report: NIJ's DNA Analysis, Capacity Enhancement and Other Forensic Activities
This report summarizes NIJ's approach to improving forensic science includes long term strategic advances and necessary immediate relief to address the challenges of satisfying increasing demand for DNA analysis. From 2008 to 2014, the turnaround time for analysis has remained nearly constant, while testing capacity increased by over 60 percent. Average cost per case has decreased from $1,279 in 2007 to $607 in 2014. And since 2009, uploads of DNA profiles to the Combined DNA Index System (CODIS) have increased 143 percent. The need for this assistance has never been greater, through capacity building, technical assistance, research, development, evaluation and dissemination, NIJ is working to address the challenges experienced by forensic laboratories.

Tune in to the FTCOE Just Science Podcast!
NIJ's Forensic Technology Center of Excellence has launched Just Science, a podcast for forensic science professional and others interested in learning how crime laboratories are working to produce more accurate results, become more efficient and solve more crimes. The podcast covers every forensic science discipline. Recent episodes discussed lab management, human factors, 3D optical topography, subjective probability, DNA mixture interpretations and economics and crime labs.

The Evidence for Very Small Particles
NIJ recently published an article in Forensics discussing the work of Stoney Forensic in developing an investigatory technique called “very small particle analysis.” This approach involves the careful examination of dust on an object to trace it back to its original location, or the comparison of two or more objects for their dust profiles. The technique is particularly useful in cases where the amount of dust available is limited.

Dear colleagues,
Please find a vacancy announcement below:
The School of Natural Sciences at Griffith University is currently advertising for an Associate Professor / Senior Lecturer in Forensic Science.

For further information, see: https://www.griffith.edu.au/future-staff (Job Search - ID 105777). The closing date for the position is the 25th August 2017.

Australia New Zealand Policing Advisory Agency (ANZPAA)
email: Secretariat.NIFS@anzpaa.org.au | web address: www.anzpaa.org.au | phone: +61 3 9628 7211 | fax: +61 3 9628 7253 | address: Level 6 Tower 3, World Trade Centre, 637 Flinders Street, DOCKLANDS VIC 3008 |
objects to determine if they have, at some point, been in the same place. The researchers have successfully used this analysis to support U.S. government agencies and local and international law enforcement investigations, for example to trace the origins of illegal shipments of elephant tusks.

**Developing Reliable Methods for Microbial Fingerprinting of Soils**

Soil evidence has the potential of being a valuable tool for linking a suspect, victim, or item to a crime scene. Currently, however, only class characteristics of soil are considered in traditional analysis. This NIJ-supported research project examined the utility of soil bacterial profiling via next-generation sequencing of the 16S rRNA gene to identify a soil’s origin. The researchers successfully differentiated soil samples from diverse and similar habitats back to their location of origin 100 percent of the time in multidimensional space and 87.5 percent of the time through supervised classification. Time and space within a habitat did not affect bacterial profiles enough to hinder location-of-origin assignment. Soil collected from evidentiary items remained clustered nearest its location of origin with 100 percent accuracy, even after a full year or long-term storage. The success in tracing soils back to a location of origin demonstrates the potential of next-generation sequencing of bacteria, in conjunction with a combination of robust statistical techniques, for the individualization of forensic soil samples.

**Quantitative Algorithm for the Digital Comparison of Torn Duct Tape**

Researchers from University of California, Davis sought to minimize human contextual bias in decisions about whether torn duct tape found at a crime scene matches a duct-tape roll found in a suspect’s possession by combining digital image analysis and an objective, quantitative algorithm in assessing the likelihood of a match. These NIJ-supported researchers performed edge detection and morphological smoothing operations on high-resolution images of torn duct tape edges to extract the torn-edge coordinates. In 97 percent of examined tears, the true match had the lowest observed sum of square residuals, with false positive rates ranging from 0.5 percent for some types of hand-torn duct tape to 62 percent for scissors-cut duct tape. This work provides a starting point for quantitative assessment of the likelihood of physical end matching of duct tape without human contextual bias.

**Non-Medical Use of Prescription Drugs: Policy, Law Enforcement, and Diversion Tactics**

The goal of this University of Central Florida study was to determine whether Florida law HB 7095 and related legislation reduced the number of pain clinics abusively dispensing opioid prescriptions in the State, as well as to assess the logistics of administering the law. The findings presented in this NIJ-supported report indicate that the Florida effort against rampant “pill mills” was largely successful, which is consistent with research that has documented reductions in opioid-related deaths in Florida. Further, the findings show the key role of interagency cooperation in the success of the legislation, which in conjunction with Florida’s legislation, should be considered a model for future efforts in reducing easy access to prescription opioids.

**Differential Sampling of Footwear to Separate**

https://us6.campaign-archive.com/?u=ce3907946f07b89fcd62a4425&id=c403622ab2[10/26/2018 3:02:55 PM]
Evidentiary Particles from Background Noise

This NIJ-supported project by Stoney Forensic tested the ability to separate particle signals on the footwear soles using differential analysis of loosely held, moderately held, and strongly held particle fractions. Prior research has used a generalized sampling of particles on footwear soles from both contact and recessed areas showing the retention of particles from earlier contacts. The current study determined that although particles on the contact surfaces of footwear were removed and replaced, particles on the more recessed areas of the sole were not. Three environmental exposure sites were chosen to have different characteristic particle types (soil minerals) and shoes of two types (work boots and tennis shoes) were tested. Some shoes were exposed to only one environment, and others were exposed to all three in one of six sequences. Sampling methods were developed to separate particles from the contact surface of the shoe based on how tightly they were held to the sole.

Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) and Laser Induced Breakdown Spectroscopy (LIBS) Analyses of Paper, Inks, and Soils

Florida International University researchers sought to demonstrate the utility of an analytical chemistry tool that is relatively new to forensic laboratories, Laser Induced Breakdown Spectroscopy (LIBS), in conducting elemental analysis of ink, paper, and soil evidence quickly and with little or no sample preparation. The commercial LIBS instrumental results were compared to previously optimized in-house LIBS systems and also to the alternative forensic tools, which offer good analytical performance but suffer from either very high costs and significant complexity (in the case of LS-ICP-MS) or analytical limitations in the form of sample requirement and relatively high detection limits (in the case of mXRF and SEM-EDS). Although less mature than LA-ICP-MS, LIBS also shares the benefits associated with laser ablation methods, with the added advantage of improved speed, versatility, ease of operation, affordability, and portability. This NIJ-supported project shows that both LA-ICP-MS and LIBS are useful analytical tools for the analysis of paper, inks, soil, and cotton.

Method Validation for a Statistically Based Comparison of Tool Marks using GelSight-Based Three Dimensional Imaging and Novel Comparison Algorithms for Firearm Forensics

TopMatch technology for structural 3D imaging and comparison of cartridge casings shows excellent and continually improving match accuracy; however, in order to fully establish the base credibility of the platform, it was necessary to establish best-scanning practices and to demonstrate that the method meets the quality-control criteria of other forensic instruments. This NIJ-supported project by Cadre Research Labs aimed to enhance TopMatch by establishing best practices and conducting a set of methodology studies. The project complements the previous studies on accuracy and evidence stability by addressing the remaining issues of precision, repeatability, reproducibility, contamination risk, and performance checks. In addition, researchers studied the effects of cleaning protocols, focus variation, and ambient lighting variation.

Measuring the Frequency Occurrence of Handwriting and Hand-Printing Characteristics

One of the basic axioms of handwriting comparison is that no two writers use the exact same set of handwriting characteristics. The database created by NIJ-supported researchers and the resulting frequency occurrence proportions provide the forensic and judicial communities with some empirical data with which to assess this axiom. The specific approach in collecting samples that match the U.S. demographics provides unique insight and substantive data on the quantitative relationship between the presence/absence of readily identifiable features and key demographic factors as noted by Huber and Headrick (age, gender, ethnicity, education, location of second/third grade schooling, and handedness) while controlling for other factors,
such as temporal state and geographic locations. The original set of specimens collected from a wide spectrum of participants provided an initial large collection that was eventually pared down to achieve what is considered a representative sample from the entire target population.

**Gunshot Residue in a Non-Firearm Detainee Population**

Studies have shown varying amounts of gunshot residue (GSR) in the police environment, with most being on surfaces within facilities occupied and operated by law enforcement. This NIJ-supported study by researchers at the Harris County Institute of Forensic Sciences examined whether GSR contamination could be found on the hands of detainees at the Harris County Jail (Texas) who were not charged with any offenses related to the discharge of a weapon. Of the 175 samples obtained and tested, not one characteristic GSR particle was found. Coupling the results of this study with one in which no GSR particles were on 100 persons answering bench warrants in Bexar County (Texas) gives an average of less than one GSR particle in 275 hand samples. Considering that a different study of random surfaces within the Chicago Police Department (n=201) found a total of 56 GSR particles, the current study concludes that GSR particles are not readily transferred to surfaces not in close proximity to a recently fired gun.

**Comparison of Microspectrophotometry and Fluorescence Excitation-Emission Matrix (EEM) Spectroscopy for Non-Destructive Fiber Examination.**

When spectral information is used in the study of fiber evidence, variations within a fiber source lead to the recommendation that multiple spectra be collected from each fiber to properly characterize the sample. Although this methodology is sufficient for comparison of profiles with obvious differences, the chemometric methods used in this NIJ-supported study from researchers at the University of Central Florida show higher accuracies than the visual method commonly used in forensic laboratories. Current practices in forensic labs that involve fluorescence microscopy do not take advantage of the information content that exists in the spectral signature of textile fibers. The coupling of a microscope to a spectrofluorimeter allows for the acquisition of a complete training set of EEMs for fiber dye identification from an individual fiber. Accounting for the variance of the EEM spectra at different regions along the length of the fiber provides a useful training set that can be used as the basis for principal component cluster analysis.

**Development of a Mobile, Automated Tool Mark Characterization/Comparison System**

This NIJ-supported project developed a portable prototype instrument that provides forensic examiners with the ability to characterize a tool-marked surface, compare the data from that surface to data files obtained from any other surface, and assess the likelihood that the marks on the two surfaces were made by the same tool. To date, the system has been successfully tested on data sets consisting of fully striated marks created from 50 sequentially manufactured screwdrivers, quasi-striated markings produced by 50 sequentially manufactured shear-cut pliers, and impression marks produced by 50 sequentially manufactured cold chisels.

**The Interpretation of Patterned Injuries in Medicolegal Death Investigation**

In this report, NIJ-supported researchers describe the results of their survey evaluating the effect of image processing and image quality on the ability of forensic pathologists to accurately interpret images of patterned injury of the skin. The study consisted of three surveys: the first, a collection of “classic” images that most pathologists would diagnose with high consensus (baseline survey); the second, degraded images with lesser resolution poorer composition to determine how degradation affected diagnostic consensus; and the third, images treated with various enhancement techniques to determine whether any benefit was gained. Surprisingly, the first survey produced a median of only 74 percent consensus. An analysis of the second and third surveys
demonstrated the importance of context and history in forensic pathologic diagnosis. When provided with history, consensus rose to approximately 98 percent per question (median value) for the matching subset of the first survey.

Prediction of Drug Interactions with Methadone, Buprenorphine and Oxycodone
The impact of drug interactions spreads beyond the field of forensic toxicology to encompass general medicine, pharmacy and other areas involved in drug use and dispensing. These can all directly and indirectly impact the criminal justice systems, as many in these professions are called upon as consultants and expert witnesses for cases. Information on potential drug interactions with methadone, buprenorphine, and oxycodone can benefit these fields. A NIJ-supported project by researchers at the University of Utah hypothesized that the inhibition of the metabolism of opioids may contribute to their toxic effects and set out to measure the in vitro inhibition of metabolism of three opioids: methadone, buprenorphine, and oxycodone. This report outlines the progress made optimizing incubation conditions, establishing positive controls and screening inhibitory potential of the three drug classes.

Evaluation of a Novel Fluorescent Dye to Detect Anogenital Injury in Women of Color
NIJ-supported researchers at the University of Virginia tested fluorescent dyes to detect sexual assault injuries on different skin colors and tones. Trials were conducted to identify non-toxic suitable dyes that can be easily visualized using equipment already in common use among forensic examiners and will not interfere with subsequent forensic DNA testing. Findings suggest that fluorescein is both safe and feasible to use in detecting genital injury across all skin tones. However, additional research on alternative dyes across all skin tones is recommended.

Development of an Analytical System for Comparison and Identification of Fiber Dyes
In order to overcome challenges to generalized fiber dye characterizations, this NIJ-supported research explored a significant range of dyestuffs that span numerous major dye application classes, chemistries, chromophores, and fiber types, using techniques and methodologies currently available in most forensic laboratories. Numerous aspects of dye analysis, from extraction through micro analytical characterization, classification, and identification were examined for a set of 300 commercially prevalent dyestuffs. The results show that dye identification can be conducted using techniques available in many labs. It is anticipated that this research will provide a basis from which laboratories can expand their approach from a generalized comparison of color between questioned and known materials to a specific identification of the colorants present in a sample. This has the potential to increase the significance of results in the prosecution or defense of a case and improve the value of investigative leads in cases for which a comparison sample does not exist by constraining or identifying specific dyes.

Trace Metal Analysis by Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry and X-Ray K-Edge Densitometry
This NIJ-supported dissertation by an Iowa State University researcher describes studies on determining trace elements in samples with forensic importance, including trace analysis in lipstick, copper wire, fly larvae and porcine skin tissue for gunshot residue and bullet residue in bones, as well as, soil from decomposed pig carcasses.

Pre-Feedback Eyewitness Statements: Proposed Safeguard against Feedback Effects on Evaluations of Eyewitness Testimony
This NIJ-supported study from an Iowa State University researcher tested pre-feedback statements as a safeguard for protecting against, and correcting for, the effects of confirming feedback on evaluations of eyewitness testimony. Results suggest that confirming feedback did not appear to have any influence on witnesses in the no pre-feedback
Statements condition. Additionally, confirming feedback did not impair evaluators’ abilities to discriminate between accurate and mistaken eyewitnesses in the conditions in which witnesses provided pre-feedback statements. Witnesses’ pre-feedback statements to evaluators did not improve evaluators’ abilities to discriminate between accurate and mistaken eyewitnesses who received feedback. Finally, evaluators tended to judge witnesses who gave no pre-feedback statements more favorably than they judged witnesses who gave pre-feedback statements.