U.S. Department of Justice
Office of Justice Programs
National Institute of Justice

Forensic Science Technology Working Group Operational Requirements
June 2023

The Forensic Science Technology Working Group (TWG) is a committee of approximately 50 experienced forensic science practitioners from local, state, and federal agencies and laboratories.

Through the Forensic Science TWG, NIJ reaches out to the forensic science practitioner community to identify, discuss, and prioritize operational needs and requirements. These needs and requirements help inform NIJ's planned and ongoing research and development activities, and ensure that future research and development investments meet practitioners' needs. TWG meetings are the first phase in NIJ's research and development process.

Disciplines represented by the Forensic Science TWG include:

- Crime Scene Examination
- Forensic Anthropology and Odontology
- Forensic Biology/DNA
- Forensic Pathology
- Impression and Pattern Evidence
- Medicolegal Death Investigation
- Seized Drugs
- Toxicology
- Trace Evidence

NIJ's Research and Development Process

NIJ's research and development process helps ensure that projects are relevant to the field and produce valid, actionable results. The process typically includes:

1 IDENTIFYING NEEDS

In addition to working group meetings, NIJ sponsors workshops and other events to guide future research.

2 DEVELOPING A RESEARCH AGENDA

Our long-term research agenda is guided by our strategic goals.

3 IMPLEMENTING RESEARCH

NIJ funds research at external organizations, supplemented by the in-house research of our science staff.

4 POST-AWARD ACTIVITIES

NIJ scientists and grants managers monitor research projects and conduct site visits.

5 EVALUATING RESEARCH RESULTS

Results from awards inform future funding opportunities and become part of the process of developing NIJ's research agenda.

6 DISSEMINATING TO THE FIELD

NIJ spreads knowledge to policymakers, practitioners, and other researchers to advance science and practice.

For more information go to NIJ.ojp.gov, keyword: TWG.

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Technology Working Group Operational Requirements (Updated June 2023)	**Forensic Discipline(s)**	**Scientific Research**	**Technology Development**	**Policy or Protocol Development**	**Assessment & Evaluation**	**Dissemination or Training**	**Databases or Reference Collections**
Scientific foundations for expert conclusions of forensic evidence	Impression & Pattern Evidence; Trace Evidence	✓					
Development and validation of standardized forensic methods and conclusions	Impression & Pattern Evidence; Trace Evidence	✓	✓	✓			
Determination of accuracy and reliability of forensic analyses and conclusions, including potential sources of error	Impression & Pattern Evidence; Trace Evidence	✓	✓				
Practical statistical approaches for the interpretation of forensic evidence	Impression & Pattern Evidence; Trace Evidence	✓	✓		✓		✓
Evaluation of the effectiveness of varied types of review and/or verification of casework, testimony, and investigative leads	Impression & Pattern Evidence; Trace Evidence	✓		✓	✓		✓
Evaluation of qualified language of association along the continuum from investigative leads to definitive conclusions	Impression & Pattern Evidence; Trace Evidence	✓		✓			
Novel and/or improved evidence recognition, collection, and visualization tools and analytical instrumentation for field and lab use	Impression & Pattern Evidence; Trace Evidence	✓	✓		✓		
Evaluation of the effects of inter- and intra-disciplinary sequential evidence processing and analytical methods	Impression & Pattern Evidence; Trace Evidence	✓	✓	✓	✓		
Determination of the optimal content and frequency of proficiency tests to evaluate performance and mitigate risk	Impression & Pattern Evidence; Trace Evidence	✓		✓			
Understanding of the cognitive processes involved in pattern recognition as applied to forensic comparative analysis	Impression & Pattern Evidence; Trace Evidence	✓					
Quantitative methods to augment visual trace evidence screening and examinations	Trace Evidence	✓	✓		✓		
Comprehensive evaluation of the detection and utility of organic gunshot residues	Trace Evidence	✓	✓		✓		
Fundamental understanding of how environmental factors can affect trace evidence	Trace Evidence	✓					
Evaluation of non-DNA approaches for human hair screening or comparison	Trace Evidence	✓					
Determination of the causes of textile physical damage (e.g., tear, cut, stab, shot, burn) and evaluation of the persistence of damage characteristics	Trace Evidence	✓					
Understanding the interference of or chemical interaction between sexual lubricants, personal care products, and the human body	Trace Evidence	✓	✓				
Development of a comprehensive extraction method to allow for both DNA and sexual lubricant analysis from a single sample	Trace Evidence	✓	✓		✓		
Construction of new and updating of existing databases with properties of manufactured materials	Trace Evidence						✓
Identification and characterization of nanomaterials in evidentiary materials	Trace Evidence	✓					✓
Objective and validated methods to classify spatter patterns by the mechanism of formation	Bloodstain Pattern Analysis	✓	✓		✓		
Fundamental understanding of droplet formation, droplet trajectory, and the resultant formation of bloodstain patterns	Bloodstain Pattern Analysis	✓	✓				
Understanding of the interaction of blood with fabrics and textiles	Bloodstain Pattern Analysis	✓					

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Understanding of the creation and obscuration of fire patterns due to ventilation effects	Fire & Arson Investigation	✓					
Evaluation of methods for origin and cause determination	Fire & Arson Investigation				✓		
Standardized procedures for collecting, preserving, and analyzing building system electronic data	Fire & Arson Investigation		✓		✓		
Understanding of the effect of materials properties on the development and interpretation of fire patterns	Fire & Arson Investigation	✓	✓				✓
Field and laboratory techniques for the quantitative measurement of fire patterns	Fire & Arson Investigation	✓	✓		✓		
Tools for fire investigators to evaluate the effects of fuel characteristics on the growth and spread of fires	Fire & Arson Investigation		✓				✓
Characterization of electrical system response as a means to study fire progression	Fire & Arson Investigation	✓					
Adequate materials property data inputs for accurate computer fire models	Fire & Arson Investigation	✓					✓
Evaluation of incident heat flux profiles to walls and neighboring items in support of fire model validation	Fire & Arson Investigation	✓					
Repeatability and reproducibility of test measurements of large-scale structure fires	Fire & Arson Investigation	✓					
Evaluation of the probative value of general wear on outsoles during footwear examinations	Footwear	✓					
Determination of relevant populations for the interpretation of class associations in footwear/tire impression evidence	Footwear; Tire Tread	✓					✓
Evaluation of Schallamach features on footwear outsoles and their utility for source determination	Footwear	✓					✓
Algorithms for automated searching of make and model of crime scene footwear or tire impressions within a database of known footwear outsole or tire tread patterns	Footwear; Tire Tread		✓		✓		✓
Understanding of the relationship between manufacturing techniques and the resultant features used for outsole comparisons	Footwear	✓			✓		✓
Understanding of the morphological variability of the shape of the foot and the resulting shoeless impression [barefoot and socked]	Footwear	✓					
Understanding of the variability of dimensional characteristics that occur during the replication of impressions	Footwear	✓	✓				
Characterization of footwear and tire impressions made from geologically based materials for selecting appropriate chemical enhancement techniques	Footwear; Tire Tread	✓	✓		✓		
Reference collection databases of handwriting samples, copybook curricula, and typewriter and computer font styles	Forensic Document Examination						✓
Quantitative assessment of intra- and inter-person handwriting and handprinting variation	Forensic Document Examination	✓	✓		✓		✓
Assessment of the comparability of different forms of writing from individuals (e.g., initials, signatures, handwriting, handprinting, foreign writing)	Forensic Document Examination	✓					

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Understanding of the kinematics of handwriting and digitally captured signatures	Forensic Document Examination	✓					
Comparative evaluation of automated handwriting identification systems	Forensic Document Examination				✓		
Optimal methods and materials for the preservation, visualization, recovery, and comparison of tool marks in cartilage and bone	Tool Marks; Forensic Pathology; Forensic Anthropology	✓	✓		✓		
Source attribution of drug tablets using manufacturing tool marks	Tool Marks; Seized Drugs	✓	✓		✓		✓
Enhanced, and cost-effective, development/improvement of technologies and capabilities for visualizing and imaging evidence at the scene	Crime Scene Examination			✓		✓	
Development of novel, improved, or enhanced presumptive tests (rapid, accurate, and nondestructive) for evidence analysis and interpretation at the scene and in the morgue/lab; although presumptive tests exist, there is always an opportunity for improved, enhanced, or novel tests	Crime Scene Examination; Medicolegal Death Investigations; Toxicology	✓	✓		✓		
A number of tools and calculators for forensic anthropology (e.g., ancestry and sex estimation) and crime scene investigation (e.g., blood stain pattern analysis) exist in disparate locations or non-user-friendly formats	Forensic Anthropology; Crime Scene Examination		✓				
Development of a multidisciplinary statistical model, for example, likelihood ratio, for use in personal identification, based on population frequencies of traits (anthropological, friction ridge, radiological, odontological, pathological, biological, etc.) to reduce subjectivity in decedent identifications	Forensic Anthropology	✓					
Further research on bone healing rates, at the macro- and micro-levels, and the quantification of healing rate differences by age and by bone element	Forensic Anthropology; Forensic Pathology	✓					
Obtaining records for human identification through dental comparison; MDIs cannot locate dentist to obtain ante-mortem records for identification purposes	Forensic Anthropology; Forensic Pathology		✓	✓			✓
Difficulty in locating clandestine graves; inability to use current technology effectively	Forensic Anthropology; Medicolegal Death Investigations	✓	✓		✓	✓	
Enhancement of unidentified decedent system(s) with weighting capability for ante-mortem and post-mortem comparisons with the goal of providing a ranked list of "best matches" to effectively and efficiently identify potential candidates or hits; current human identification systems could be improved to more efficiently and effectively identify potential candidates or hits	Forensic Anthropology; Medicolegal Death Investigations		✓		✓		✓
Difficulty in identifying geographical origin of remains; development of novel and innovative methods and/or systems for identifying geographic region or country of origin of unidentified remains	Forensic Anthropology; Forensic Pathology; Medicolegal Death Investigations	✓					

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Training opportunities for practitioners, resources, and employee retention to meet caseload demand within the MDI community	Forensic Anthropology; Forensic Pathology; Medicolegal Death Investigations					✓	
Innovation and collaboration with other science disciplines outside of the medicolegal death investigation arena	Forensic Anthropology; Forensic Pathology; Medicolegal Death Investigations	✓	✓	✓	✓	✓	✓
More studies to improve accuracy and reliability of isotope analyses for geolocation and human remains identification, to overcome challenges in identification of human remains	Forensic Anthropology; Forensic Pathology; Medicolegal Death Investigations	✓					✓
Ability to determine the cause and manner of death of infants and children (distinguishing between natural, accidental, and nonaccidental) in sudden fatal events to include traumatic injury versus sudden nontraumatic causes of death, e.g., channelopathies, genetic disease, metabolic disorders, etc.	Forensic Pathology	✓					
Further research studies on force measurement, fracture mechanics, and modeling of injuries (to include hard tissue and soft tissue) to improve accuracy of trauma analysis and quantify error rates associated with trauma interpretation	Forensic Pathology	✓					
Difficulty in detecting subtle injuries (to include deep tissue bruising, tattoos, and other soft tissue modifications) on bodies, both living and deceased	Forensic Pathology			✓		✓	
Further research into the utility of advanced imaging technologies in post-mortem examination, assessing the cost-benefit of the imaging results with the financial burden of purchasing such technologies and hiring the expertise required, and development of standardized protocols; advanced imaging technologies in post-mortem examination are expensive, inaccessible for most agencies, difficult to interpret, and require specialized expertise	Forensic Pathology		✓	✓	✓	✓	
What are the consequences of differing levels of post-mortem investigation? Is there an unknown error rate in diagnosis of cause and manner of death due to the necessity of deciding on field investigation vs. no field investigation, autopsy vs. no autopsy, external exam vs. autopsy, impact of full-body imaging, and the roles of ancillary tests (toxicology, histology, microbiology, genetic and metabolic)?	Forensic Pathology	✓		✓	✓	✓	
Ability to read through hypoxic artifacts and identify traumatic brain injury in pediatric patients who have been hypoxic for any period of time	Forensic Pathology	✓					
Ability to collect reliable, appropriate, well-documented toxicology samples; improved collaboration and education between sample collectors (e.g., pathologists, autopsy technicians, medicolegal death investigators, hospital phlebotomists, and organ and tissue procurement staff) and toxicologists, including training on sample taking and recording	Forensic Pathology; Toxicology; Medicolegal Death Investigations	✓		✓		✓	

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Effective biometric capture techniques and devices for the digital acquisition of decedent data; effective technologies do exist for biometric capture for living persons, but not decedents, including decedents exhibiting various post-mortem artifacts	Medicolegal Death Investigations	✓	✓		✓	✓	
Ability to determine precise time since death; studies of innovative methods or technologies to determine precise time since death	Medicolegal Death Investigations	✓	✓		✓		
Greater understanding of potential loss of forensic evidence due to decedent recovery, transport, and handling from scene to morgue; what evidence is lost by not performing evidence recovery prior to removal from the scene?	Medicolegal Death Investigations	✓		✓	✓		
Biological evidence screening tools that can address any or all of the following: identifying areas on evidence with DNA, time since sample deposition, detection of single source vs. mixed samples, proportions of contributors, or sex of contributors	Forensic Biology	✓	✓	✓			
Methods by which to identify areas on a swab with DNA to determine how much is needed for testing prior to beginning extraction	Forensic Biology	✓		✓			
The ability to differentiate, physically separate, and selectively analyze DNA and/or cells from multiple donors or multiple tissue/cell types contributing to mixtures, with little to no sample loss; for example, alternative methods of differential extraction with limited sample manipulation (no centrifugation step) and/or automatable sperm capture that can be used on existing lab equipment (EZ2, Hamilton, etc.)	Forensic Biology	✓	✓				
Improved DNA collection devices or methods for recovery and release of DNA, especially collection from metallic items (e.g., fired cartridge casings)	Forensic Biology	✓	✓	✓			
Research that documents the various impacts of methods, reagents, and materials on the recovery, repair, and/or preservation of low-quantity and/or low-quality DNA from various cell types	Forensic Biology	✓	✓	✓			
Approaches where the elimination of steps from typical DNA processing workflows (e.g., extraction, quantitation, amplification) improves efficiency, workflow, and sample conservation	Forensic Biology	✓	✓	✓			
Research to understand the limitations and/or variability of Rapid DNA on crime scene samples in order to inform best-practice recommendations development	Forensic Biology	✓		✓	✓		
Alternative ways to enrich or target genomic areas of forensic DNA interest vs. a traditional PCR-based approach	Forensic Biology	✓	✓	✓			
The ability to associate cell type and/or fluid with a DNA profile, primarily for mixed DNA profiles, enabling profiles to be reported at source level within existing laboratory instrumentation	Forensic Biology	✓	✓	✓			
Mixture interpretation algorithms for all markers, including lineage markers (e.g., STRs, sequence-based STRs, X-STRs, Y-STRs, mitochondrial, microhaplotypes, SNPs)	Forensic Biology	✓		✓	✓		
Improved methods for identifying the number of contributors for all marker types (e.g., STRs, sequence-based STRs, X-STRs, Y-STRs, mitochondrial, microhaplotypes, SNPs)	Forensic Biology	✓		✓	✓		

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Kinship software solutions using multiple marker systems (e.g., STRs, sequence-based STRs, X-STRs, Y-STRs, mitochondrial, microhaplotypes, SNPs)	Forensic Biology	✓	✓				
Statistical tools/methods for combining marker types for weight-of-evidence estimations	Forensic Biology	✓		✓	✓		
Additional characterization of existing databases and further development of population data of forensically relevant genetic markers (e.g., sequence-based STRs, X-STRs, Y-STRs, mitochondrial, microhaplotypes, SNPs) to include populations that are currently underrepresented in existing databases	Forensic Biology	✓			✓		
Research to understand the limitations and/or variability of probabilistic genotyping software implementation that informs best-practice development	Forensic Biology				✓		
Methods for database entry, search, and match resolution that use probabilistic genotyping results	Forensic Biology		✓	✓	✓		
Guidelines for effective communication of likelihood ratios or other probabilistic results in court	Forensic Biology				✓	✓	
Guidelines for the formation of likelihood ratio propositions to inform best-practice development	Forensic Biology			✓	✓	✓	
Ground truth data sets across a range of evidence types for source- and activity-level inferences, and implementation guidance	Forensic Biology	✓		✓			
Foundational research related to the discriminatory power and sensitivity of alternate biological analyses (e.g., proteomics, microbiome, plants, animals) to associate individuals with crime scene evidence	Forensic Biology	✓					
Research that supports forensic investigative genetic genealogy testing procedures, policies, and practices by criminal justice organizations	Forensic Biology		✓	✓	✓	✓	
Comprehensive, systematic, well-controlled studies that provide both foundational knowledge and practical data about DNA transfer (e.g., primary, secondary) and persistence in the real world, as well as best practices for interpretation	Forensic Biology	✓		✓	✓	✓	
Development of infrastructure to compile and share resources (e.g., lab-created mixtures, raw data files, training plans, protocols, validation summaries) for training and tool development with appropriate human subjects and privacy oversight	Forensic Biology		✓			✓	✓
Error rate studies on qualitative analysis (single tests and schemes), recognizing different contributions of analytical sufficiency, data interpretation, and considering effects of sample suitability; the conclusion of such a study should also explain its limitations	Seized Drugs and Toxicology	✓			✓		
Research into scientifically based acceptance criteria of analytical data generated in case samples; the effectiveness of this study could be improved if performed in conjunction with the study for error rate on qualitative analysis (single tests and schemes)	Seized Drugs and Toxicology	✓			✓		
Robust, flexible, configurable, cost-effective laboratory information (data) management systems and/or add-on components/modules that allow for data migration from legacy systems	Seized Drugs and Toxicology		✓	✓			✓

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Evaluation of and development of strategies to address the root causes of occupational stress and their effect on forensic lab work quality, employee well-being and longevity, and organizational health	Seized Drugs and Toxicology				✓		
Tools for effective communication between forensic laboratories and policy makers related to resource allocation, public safety, public health, etc.	Seized Drugs and Toxicology			✓	✓	✓	
Selection criteria (e.g., minimum requirements) and test processes for forensic science professionals (including managers), to include evaluation of critical thinking abilities and data analysis skills, in order to attract and retain quality candidates	Seized Drugs and Toxicology			✓		✓	
Increased and improved communication between FEPAC and practitioners to better equip graduates for casework and testimony readiness; better define requirements for forensic science programs to emphasize realistic expectations, practical, hands-on laboratory experience, and critical thinking skills	Seized Drugs and Toxicology			✓		✓	
Forensic laboratory process optimization, which may include evidence recognition, collection, and packaging on scene, submission acceptance criteria, analysis, data management, and/or reporting, with consideration of future flexibility; for example, automation of sample preparation for toxicology	Seized Drugs and Toxicology	✓	✓	✓	✓		
Improved, broader, and more representative proficiency testing, to include some blind testing	Seized Drugs and Toxicology				✓	✓	
Access to field-wide corrective action documentation for all lab operations (e.g., language and resolution of accreditation nonconformities, proficiency testing, quality control failures, personnel issues, etc.)	Seized Drugs and Toxicology				✓	✓	
Continued advancement of practical forensic application/development of emerging or current instrumentation and software (e.g., microspectrophotometer, using the second derivative in IR spectroscopy, thermal analysis coupled with FTIR or GC-MS, TOF/QTOF); a clear case should be made for how new technology either may do something that current technology cannot, or may be an improvement over current technology (more sensitive, faster, more cost-effective, etc.)	Seized Drugs and Toxicology	✓	✓		✓		
Access to other forensic laboratories' methods, SOPs, validation plans, automation workflows, and macros	Seized Drugs and Toxicology					✓	
Research to establish validated methods for quantitation of delta-9-THC, delta-9-THC-A, or combination thereof, in plant materials, edibles, extracts, and other cannabis-based products	Seized Drugs	✓					
Research to establish validated methods for quantitation of cannabinoids (naturally occurring and semi-synthetic, such as delta-8-THC, THC-O, and exo-THC) in plant materials, edibles, extracts, and other cannabis-based products	Seized Drugs	✓					
Stability studies for THC/marijuana material (plants, edibles, extracts, vape liquid, etc.), to include recommendations for storage conditions; at minimum, such studies should be conducted at a range of temperatures, humidity levels, and time periods	Seized Drugs	✓					

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Field test for discrimination of hemp versus marijuana that meets acceptability criteria for evidentiary purposes	Seized Drugs	✓			✓		
Research into the identification of by-products formed during CBD conversion	Seized Drugs	✓					
Creation and inclusion of scientific definition of derivatives as associated with the Farm Bill of 2018	Seized Drugs			✓			
Nationwide compilation of state legislation regarding hemp-related definitions (e.g., hemp, hemp products, hemp derivatives, semi-synthetic, etc.) with the intention to develop best practices for lawmakers' consideration	Seized Drugs				✓		✓
Prioritization of agencies for adequate externally sourced training and continuing development of drug chemists	Seized Drugs			✓		✓	
Expanded auto-sampling capabilities for DART-TOF for increased workflow efficiency	Seized Drugs	✓	✓				
Qualitative HPLC-diode array screening method for all cannabis-related compounds	Seized Drugs	✓	✓				
Assessment of the operational independence of laboratories managed by law enforcement or prosecutors' offices and associated effects on public perception, judicial outcomes, impartiality, and freedom from conflicts of interest resulting from financial or other pressures	Seized Drugs				✓		
Solutions to challenges identifying NPS, such as novel benzodiazepines and opioids, with limited resources (instruments, software, financial, personnel, knowledge of/access to external resources)	Seized Drugs			✓			✓
Evaluation of efficient methods of triaging cases and successful case management agreements among labs and customer stakeholders	Seized Drugs	✓			✓		
Tools to address expectations on practitioners to definitively render legal opinion regarding scheduling of novel psychoactive substances that are not specifically scheduled by name/class but may meet the criteria	Seized Drugs			✓		✓	
Additional screening capacity to allow for screening of more items per case for intelligence gathering and submission triage purposes, with understanding of associated limitations	Seized Drugs	✓	✓				
Suggested standardized language for reports, based on data gathered from diverse agencies, to include a glossary of terms to clarify commonly misunderstood words and phrases (e.g., identification uncertainty versus misidentification) to improve written communication with stakeholders	Seized Drugs				✓	✓	✓
Research to determine limitations of GC/MS-only schemes to correctly identify controlled substances and other compounds of interest, to include analogs, as well as suggestions for reporting those limitations	Seized Drugs	✓	✓		✓		
Study of interpretation of scientific report language by non-scientist stakeholders, including juries/the public	Seized Drugs	✓			✓		

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Research on the correlation of blood and oral fluid values, particularly with regard to DUID interpretation and postmortem, with an emphasis on studies pertaining to pharmacokinetics and pharmacodynamics of drug partitioning into oral fluid; ensure dissemination includes policymakers	Toxicology	✓					
Solutions to interpretation challenges affected by inconsistent and unreliable toxicology results or consolidated toxicology data due to widely variable collection techniques, inappropriate matrix selection, and inaccurate descriptions of specimen collection sites by pathologists, autopsy technicians, hospital phlebotomists, and law enforcement	Toxicology			✓		✓	
Solutions to challenges in drawing appropriate conclusions from composite toxicology data (e.g., NFLIS, medical examiner/coroner survey) with unstated limitations (e.g., differences in testing regime, scope of analytes, reporting limits) due to unrestricted self-reporting and non-standardized testing	Toxicology			✓		✓	
Solutions to challenges of implementation and integration of high resolution mass spectrometry in the toxicology workflow (e.g., data storage, interpretation of non-traditional data, appropriate validation parameters, efficiencies in workflow, determination and application of acceptance criteria)	Toxicology					✓	
Access to new pharmaceutical and emerging illicit substance analytical standards (to include certified reference materials and isotopically labeled internal standards) for use in forensic and research laboratories (to include parent drugs and metabolites)	Toxicology						✓
Research into prevalence, concentrations, impairment, toxicity, etc. on new non-delta-9-THC compounds, isomers, derivatives, and metabolites	Toxicology	✓					
Increased research and data collection to gain a better understanding of the relevance of novel psychoactive substances, such as (but not limited to) synthetic opioids, cannabinoids, benzodiazepines, and substituted cathinones, and related isomers	Toxicology	✓					
Basic pharmacology training for forensic toxicologists	Toxicology					✓	
Basic statistics and data analysis training for forensic toxicologists	Toxicology					✓	
Increased understanding of the impact of vaping substances (licit and illicit) and need for vaping paraphernalia collection and testing	Toxicology	✓		✓	✓	✓	
Research to determine drug stability, in years, at different temperatures (refrigerated, frozen, deep freeze) in different solvents, blood, and other matrices	Toxicology	✓					
Research on THC concentrations and toxicity, to include cardiac effects, in living subjects, with current THC street potency levels	Toxicology	✓					
Proof of concept to support portable, reliable, and robust roadside devices to test for marijuana use and/or measure impairment, including scientific foundation for new or existing devices	Toxicology	✓	✓		✓		

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Nationwide assessment of reasons for non-adoption (to include root cause analysis) and impact of implementation of ASB standards for forensic toxicology testing	Toxicology			✓	✓		
Determination of drug prevalence and relevance in DFC casework	Toxicology	✓					
Research to determine electrolyte stability in postmortem vitreous fluid for up to a year	Toxicology	✓					