

THE DNA FORENSICS TECHNICAL WORKING GROUP (TWG): HOW CRIME LABORATORY PRACTITIONERS ARE STRENGTHENING THE RESEARCH AND DEVELOPMENT PROGRAMS OF THE NATIONAL INSTITUTE OF JUSTICE

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The Office of Justice Programs' National Institute of Justice (NIJ) is the research, development, and evaluation agency of the U.S. Department of Justice and is dedicated to researching crime control and justice issues. NIJ provides objective, independent, evidence-based knowledge and tools to meet the challenges of crime and justice, particularly at the State and local levels. NIJ has two operating offices: the Office of Research and Evaluation and the Office of Science and Technology. The Office of Research and Evaluation develops, conducts, directs, and supervises research and evaluation activities across a wide variety of issues. The Office of Science and Technology manages technology research and development, development of technical standards, forensic sciences capacity building, and technology assistance to State and local law enforcement and corrections agencies.

The Investigative and Forensic Sciences Division of NIJ's Office of Science and Technology supports a variety of research efforts focused on a diverse group of topics related to forensic science. For example, the goal of NIJ's Forensic DNA Research and Development Program is to direct advances in human genetics, molecular biology, and biotechnology toward the development of novel tools and technologies for use in examining biological evidence. Projects under this program focus on tools to increase the success rate of the analysis of biological evidence that is degraded, damaged, limited in quantity, or otherwise compromised; tools for better separation of the male and female fractions of sexual assault evidence; identification and characterization of genetic markers that can reveal additional or more discriminatory information about the source of the DNA evidence; and development of miniaturized, high throughput DNA testing devices. For information on specific projects, see the research page of DNA.gov (<http://www.dna.gov/research/>).

The General Forensics Research and Development Program encompasses several "non-DNA" forensic disciplines, including Trace Evidence, Controlled Substances, Toxicology, Anthropology, and Impression Evidence (including friction ridge, firearms, tool marks, tire marks, and questioned documents). The projects supported under this program, while diverse in nature, focus on the development of tools/technologies for the identification, collection, preservation, and/or analysis of forensic evidence that are faster, more reliable, widely applicable, rugged, less costly, and/or less labor-intensive; tools that provide a quantitative measure/statistical evaluation of forensic comparisons; and the identification or characterization of new analytes of forensic importance.

The ultimate goal under both forensic R&D programs is to provide crime laboratories with innovative tools and technologies that can maximize the value of crime scene evidence. To meet this goal, it is essential that NIJ properly focuses its R&D efforts so that the products developed are of the highest value to the practitioner community. Through the formation of Technical Working Groups (TWGs), NIJ reaches out to the

practitioner community to identify, discuss, and prioritize operational needs and requirements. These needs and requirements will help validate NIJ's planned and ongoing research and development activities, and will help ensure that future technologies meet practitioner-driven needs.

The DNA Forensics TWG meets semi-annually (Fall and Spring) and is comprised of crime laboratory practitioners from various Federal, State, and local agencies as well as the private sector. It is coordinated jointly by NIJ's Investigative and Forensic Sciences Division and the National Institute of Standards and Technology's (NIST's) Office of Law Enforcement Standards. The first meeting was held in April 2005. In addition to addressing crime laboratory needs and requirements, the DNA Forensics TWG provides the practitioner perspective to researchers funded under NIJ's Forensic DNA R&D Program. This "reality check" is essential to ensure that NIJ-funded research remains appropriately focused and is of maximum benefit to the forensic practitioner community.

The technology needs identified by the DNA Forensics Technical Working Group include the following:

High Priority:

- Y-STR database coordination and management
- Automated sperm searches
- Body fluid/ cell type identification
- Preliminary genetic differentiation
- Enhancement of information to assist in DNA evidence collection
- Physical separation of cells
- DNA repair
- Method to remove contaminants from items such as tips, tubes, etc.

Medium Priority:

- Physical characteristics
- Species determination
- Non-destructive method for DNA isolation
- Understanding and overcoming PCR inhibition
- Novel methods for DNA profiling

Low priority:

- Macro screening of biological samples found at crime scenes

- Age determination of stains
- Twin differentiation
- Fingerprint powder brush contamination
- Coordination and management of autosomal SNP population database

Overall, the DNA Forensics TWG strengthens NIJ's Forensic DNA Research and Development Program by providing the practitioner perspective that is essential for identifying operational needs and requirements, for helping to ensure that R&D projects are appropriately focused, and for helping to define and facilitate the tasks needed to move R&D deliverables into operation crime laboratories.