

## **FUNDING UPDATE FROM THE NATIONAL INSTITUTE OF JUSTICE**

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The National Institute of Justice (NIJ) is the research arm of the United States Department of Justice. The research performed by and for NIJ focuses on strengthening the criminal justice system by developing new technologies to prevent or reduce crime, evaluating the effectiveness of criminal justice programs, researching criminal behavior, and recommending actions that can be taken by public or private agencies to improve criminal justice. The Investigative and Forensic Sciences Division (IFSD) is a section of NIJ's Office of Science and Technology. The mission of IFSD is to identify, research, and evaluate new technologies and methods to improve investigative and forensic sciences at the State and local level. To accomplish this mission, IFSD provides grants and other funding to support the investigative and forensic communities in the areas of research and development, implementation of standard and innovative methodologies, enhancement of forensic laboratory facilities, and tools for use in training. Funding is available to State and local agencies, as well as universities and private sector organizations performing research that will benefit the investigative and forensic sciences and their application at the State and local level. Requests for funding are made by submitting a written proposal in response to periodic solicitations issued by NIJ.

Three of the programs administered by the Investigative and Forensic Sciences Division of NIJ include the Crime Laboratory Improvement Program (CLIP) (formerly the Forensic DNA Laboratory Improvement Program), the Convicted Offender DNA Backlog Reduction Program, and the Five Year Forensic DNA Research and Development Program.

### **CRIME LABORATORY IMPROVEMENT PROGRAM (CLIP)**

NIJ's first program dedicated to the forensic laboratory community, the Forensic DNA Laboratory Improvement Program, was established by the DNA Identification Act of 1994. As mandated by the Act, the Attorney General (through NIJ) made funds available to State and local governments to carry out projects intended to develop or improve the capability to analyze DNA evidence. The goal of the Forensic DNA Laboratory Improvement Program was to increase the capabilities and capacities of public forensic laboratories to conduct state-of-the-art DNA testing in support of the investigation and adjudication of violent crime. This program commenced in fiscal year (FY) 1996 and ended in FY 2000. During this five-year period, over \$37 million was awarded to more than 140 State and local laboratories, resulting in the procurement of upgraded laboratory equipment, training of personnel in new DNA testing methods, implementation of advanced testing methods, analysis of convicted offender samples and participation in the Combined DNA Index System (CODIS) national database, evaluation of external blind proficiency testing, and an overall improvement in laboratory efficiency and analytical capacity. As a result of funds awarded under this program, State and local crime labs were able to validate and implement PCR-based STR analysis methods and, in combination with the increased interest and participation in the CODIS database, move toward a standardized testing methodology that

will ensure compatibility of data for effective sharing of criminal information across State and local jurisdictions.

Starting concurrently in FY 2000, the Forensic DNA Laboratory Improvement Program was expanded to encompass a broader area of forensic laboratory testing. Now known as the Crime Laboratory Improvement Program (CLIP), this expanded program is intended to provide funding to *all* forensic disciplines for upgrading equipment and supplies, training and education expenses, and contractor-provided services during periods of in-house validation of new methods. To address the changing focus of this program, a CLIP summit was held in July of 2000 in Washington, D.C. During this summit, criminal justice practitioners and researchers discussed FY 2001 CLIP plans and priorities in the areas of: 1) training and education, 2) information and technology transfer, 3) research and development, 4) testing, evaluation, and validation, and 5) operational support and analytical services. There was consensus within the community that each of these areas needs greater resources to assure high quality forensic results to the criminal justice system. For FY 2001, approximately \$30 million has been appropriated in the President's budget to include both CLIP and the Convicted Offender DNA Backlog Reduction Program (see below), although at the time of this publication the finalized budget was not yet available. However, a series of congressional earmarks, totaling approximately \$21 million to 17 agencies, are likely to preclude the solicitation of proposals for competitive awards under the CLIP program in FY 2001.

## **CONVICTED OFFENDER DNA BACKLOG REDUCTION PROGRAM**

In October of 1998, the FBI's National DNA Index System (NDIS) became operational allowing State crime laboratories to exchange and compare DNA profiles electronically, thereby linking crimes to each other and to convicted offenders across the nation through the Combined DNA Index System (CODIS). A consequence of the implementation of NDIS and CODIS has been an increasingly large number of convicted offender DNA samples awaiting testing for the 13 core CODIS STR loci and uploading into the national DNA database. To address this situation, NIJ provides funds to State crime laboratories for the purpose of outsourcing the analysis of backlogged, convicted offender DNA samples to private laboratories. During FY 2000, the first year of the Convicted Offender DNA Backlog Reduction Program, \$15 million were allocated for this purpose. All private vendor laboratories selected to participate in this program were required to be accredited by the American Society of Crime Laboratory Directors (ASCLD), or certified by the National Forensic Science Technology Center (NFSTC). Additionally, in order to qualify for the FY 2000 program, a State crime laboratory must have had a minimum of 1000 backlogged samples, and was additionally required to perform analysis of "unknown suspect" cases totaling 1% of the number of DNA samples for which funding was awarded.

The solicitation for FY 2000 closed May 15, 2000. A total of 21 states applied for funding. All 21 states received the full amount requested. This will result in over 280,000 convicted offender samples being tested for the 13 STR loci and entered into the national database, as well as analysis of almost 3000 "unknown suspect" cases, due to the 1% state match (Figure 1). Several states were able to begin outsourcing with federal funds by September, 2000. As of this writing (November 27, 2000) more than 10 database "hits" have already occurred.

The Convicted Offender DNA Backlog Reduction Program will continue in FY 2001. The requirements for this program are expected to be more flexible this year, and states with fewer than 1000 backlogged samples will be eligible to apply for funding. At the time of this publication, the exact funding range of this program could not be identified, since the Department of Justice budget has not yet been finalized.

### **FIVE-YEAR FORENSIC DNA RESEARCH AND DEVELOPMENT PROGRAM (1999-2003)**

The use of DNA genotyping for forensic identity determination has markedly evolved since it was first used for this purpose in the late 1980's. Although the early restriction fragment length polymorphism (RFLP) technology provided a powerful discriminatory tool, its use was limited to biological evidentiary samples containing relatively large amounts of high molecular weight DNA. The advent of the polymerase chain reaction (PCR) and its subsequent incorporation into forensic DNA testing has substantially increased the successful analysis of degraded or small DNA samples. The short tandem repeat (STR) loci are currently the markers of choice for this purpose, due to their ability to robustly amplify, be processed rapidly through multiplexing, and yield powerful statistics. However, other genetic polymorphisms, such as those found in the mitochondrial DNA (mtDNA) hypervariable regions and in the non-recombining portion of the Y chromosome, recently have been shown to provide effective alternatives to STRs. MtDNA analysis is especially useful for cases involving extremely degraded or limited biological residues, such as skeletal remains or shed hairs. Y chromosome markers can be very beneficial in resolving sexual assault cases, particularly those with multiple male contributors. Other markers, such as single nucleotide polymorphisms (SNPs) and Alu sequences, may become important tools for the forensic scientist in the future (1).

Through appropriations to the National Institute of Justice, the Department of Justice has been a strong supporter of new technologies and tools for criminal justice applications, especially in the area of DNA testing. The goal of the Five-Year Forensic DNA Research and Development Program is to maximize the value of DNA evidence to the criminal justice system by encouraging research that builds or improves upon existing technologies, methods, or approaches, as well as research based on new or novel technologies, methods, or approaches. Approximately \$5 million have been allocated for each of the five years (1999-2003), typically with \$3 million for funding ongoing research and \$2 million for funding new projects.

NIJ accepts proposals for forensic DNA research and development in response to yearly solicitations distributed by NIJ in late winter to early spring. The selection process for funding is highly competitive and is based on recommendations by an external peer review panel. This panel is comprised of both laboratory researchers and practitioners with expertise in forensic DNA technology. Each proposal is evaluated by the panel on the basis of: 1) the quality and technical merit of the proposed research, 2) the impact of the research on the criminal justice system, 3) the applicant capabilities and experience, 4) the cost of the project relative to the benefit, and 5) the overall potential of the project for advancing forensic DNA technology.

Proposals receiving a highly favorable rating by the review panel receive further consideration for funding by NIJ. The review panel may also suggest that a proposal be modified and resubmitted, either for immediate consideration for funding, or under a future NIJ solicitation.

Types of research currently receiving NIJ funding include a microdevice for high-speed STR analysis (Whitehead Institute), a hybridization chip (Nanogen), a MALDI-TOF assay for examining mtDNA and Y chromosome polymorphisms (NIST), new analytical buffer systems for capillary electrophoresis (Ohio University), improved methodologies for separating sperm and epithelial cell fractions in sexual assault evidence (University of Virginia), and increasing the understanding of the genetic properties of Y chromosome polymorphic markers (University of Arizona). Additional information regarding these and all other NIJ funded research can be found on our web site ([www.ojp.usdoj.gov/nij](http://www.ojp.usdoj.gov/nij)).

## CONCLUSION

The National Institute of Justice is committed to advancing research and providing resources that will be of value to the forensic DNA community, and encourages responses to funding solicitations. Information regarding funding opportunities can be found on the NIJ web site ([www.ojp.usdoj.gov/nij/funding\\_fore.htm](http://www.ojp.usdoj.gov/nij/funding_fore.htm)).

## REFERENCES

1. The Future of Forensic DNA Testing: Predictions of the Research and Development Working Group. A Report From the National Commission on the Future of DNA Evidence, 2000.

Figure 1: Participating states in the Convicted Offender DNA Backlog Reduction Program for FY 2000. Each of the 21 states that applied for funding (yellow) received the full amount requested. As a result, over 280,000 samples will be tested for the 13 core CODIS loci and entered into the national database. The number of backlog samples to be tested from each state are shown.

