MAR. 03

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

NIJ

Special **REPORT**

Report to the Attorney General on Delays in Forensic DNA Analysis

To the Attorney General:

It is my honor to transmit this Report to the Attorney General on Delays in Forensic DNA Analysis. As directed, the National Institute of Justice convened a task force of criminal justice and forensic experts to examine the reasons for the backlogs of crime scene evidence awaiting DNA analysis. Based on the views and opinions of the members of the task force, I am submitting the following recommendations for your consideration in developing a comprehensive national effort to eliminate DNA analysis delays.

Respectfully submitted,

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Washington, D.C.

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Report to the Attorney General on Delays in Forensic DNA Analysis

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Introduction

On August 21, 2001, Attorney General John Ashcroft directed the National Institute of Justice (NIJ) to assess the existing analysis delays of crime scene DNA evidence and develop recommendations to eliminate those delays. Specifically, the Attorney General requested that the assessment and recommendations address, among other matters: (1) resource requirements for laboratory equipment; (2) resource, training, and education requirements for laboratory personnel; and (3) the use of innovative technologies that could permit speedier analysis with smaller equipment. He also directed NIJ to make recommendations for a national, comprehensive effort to eliminate the unacceptable delays currently occurring with the analysis of crime scene DNA evidence.

In response to this direction, NIJ convened a task force comprising a broad cross-section of criminal justice and forensic science experts. The DNA task force met on March 4, 2002, and October 21–22, 2002. At these meetings, the task force and NIJ staff discussed extensively the nature of DNA backlogs, the causes of those backlogs, and possible strategies for reducing the backlogs.[1] The DNA task force had the benefit of hearing from a number of invited speakers, including representatives of the South African Police Service, scientific experts who have developed new technologies that may be used to streamline DNA analysis and address backlog reduction, and representatives from the Forensic Resource Network.[2] In addition, NIJ has undertaken an assessment of the backlog of cases that have not been DNA tested in crime laboratories and law enforcement agencies. Although the assessment will not be finalized for several more months, preliminary figures have been provided to NIJ.

Assessment of Delays in the Analysis of DNA Casework

Forensic DNA evidence has tremendous potential to solve some of our Nation's most serious crimes. It has solved rape and homicide cases that could not have been solved with traditional law enforcement techniques. DNA has also exonerated persons charged with or convicted of crimes they did not commit. However, DNA currently is not used to its full potential in the criminal justice system.

[1] Transcripts of the task force meetings are available to the public on NIJ's Web site (*http://www.ojp.usdoj.gov/nij/dnainitiative*).

[2] Representatives from the Forensic Resource Network (FRN) were invited to speak before the DNA task force about how their resources might be used to solve issues and problems currently facing the forensic DNA community. FRN, a collaboration among NIJ grantees, provides innovative solutions to challenges facing the forensic science community. FRN assists State and local crime laboratories with such issues as quality assurance, validation and evaluation, new technologies, and surplus property distribution. The grantees are the National Forensic Science Technology Center (NFSTC), Marshall University, West Virginia University, and the University of Central Florida's National Center for Forensic Science (NCFS).

Ideally, forensic DNA evidence would be collected from rape kits and crime scenes, properly stored, transmitted to a crime lab, analyzed, and compared against a suspect's DNA sample or a DNA database (populated with offender and crime scene DNA profiles). The results, then, would be used in a criminal prosecution. However, any weakness in one part of the system will delay or prevent the use of DNA evidence as a crime-fighting tool.

There is a significant backlog of casework samples that has been caused by a massive demand for DNA analyses without a corresponding growth in forensic laboratory capacity. These delays pose substantial barriers to using forensic DNA evidence to its full potential. Although the full extent of the problem may not be measurable (the Nation has more than 17,000 separate law enforcement agencies that potentially could be retaining untested forensic DNA evidence), the problem of unanalyzed DNA is a serious impediment to effective law enforcement and denies justice to crime victims and the public.[3] Based on NIJ staff analysis of preliminary figures relating to the backlog assessment, NIJ estimates that approximately 350,000 rape and homicide cases await DNA testing. Notably, only about 10 percent of these samples are in crime labs; approximately 90 percent of the samples awaiting DNA testing are in the control of law enforcement agencies.

Task force members discussed various reasons why the majority of these unanalyzed samples are in the custody of police departments and not crime labs. Most crime labs lack sufficient evidence storage facilities that provide appropriate conditions to prevent degradation of evidence. The retention of casework samples by police is usually due to the belief that the crime lab will not accept the sample or, even if it accepts the sample, will be unable to analyze it.

The DNA task force identified a number of factors that contribute to the inability of labs to accept and process casework samples in a timely manner. The DNA task force members repeatedly stressed that most State and local crime labs lack sufficient numbers of trained forensic scientists and identified a variety of causes for this personnel shortage. State and local governments with shrinking budgets lack adequate resources to hire trained scientists. Even when funds are available, there is an insufficient pool of qualified forensic scientists to hire. This is due in part to the fact that some colleges that offer degrees in forensic science do not have curriculums that include the basic science courses necessary for this occupation.

Even when a State or local crime lab can afford to hire a qualified college graduate, the newly hired scientist still requires extensive training before he or she is permitted to conduct DNA analyses. This training includes, for example, evidence handling protocols, how to determine whether a particular item may contain probative DNA evidence, and the proper use of scientific equipment. This on-the-job training is usually handled one-on-one, with a more experienced analyst responsible for training the newly hired analyst. This is a very labor-intensive form of training that places substantial demands on the time of experienced analysts. However, even when all of these obstacles are addressed, public crime labs report that they face substantial staff retention problems. Public crime lab salaries are often below the salaries paid by the private sector.

[3] For example, because of years of delays in DNA analysis in Los Angeles, many rape kits and other evidence were thrown away because investigators believed that the statutes of limitations had passed.

In addition, existing forensic staff often must devote time to clerical and repetitive functions that do not make the most of their analytical skills. Although some crime labs lack basic analysis equipment, most public crime labs lack a sufficient infrastructure that would speed DNA analyses and maximize staff resources. Many State and local crime labs lack basic information management systems, automated equipment, high throughput analyzers, and quality assurance software. Some of this equipment is commercially available, but State and local crime labs lack the funds to purchase it.[4] In addition, many public crime labs have insufficient space to accommodate additional equipment.

Because DNA casework analysis often requires comparisons with offender DNA profiles contained in local, State, and national DNA databases, the effectiveness of a DNA casework backlog reduction strategy is dependent upon well-populated offender databases. Currently, however, there are impediments to offender database collections. In addition to casework analysis backlogs, backlogs exist in analyzing convicted offender samples. While many States have statutes authorizing the collection of DNA evidence from a variety of convicted offenders, substantial numbers of authorized samples have not been collected.[5]

Task force members also noted that forensic DNA evidence analysis ultimately is intended to produce evidence that is admissible in a judicial proceeding to determine guilt or innocence. They noted that training for prosecutors, defense attorneys, and judges is insufficient and urged that training materials and programs be developed for these key players in the judicial process.

Recommendations of the National Institute of Justice

To address the problems identified by the task force, NIJ recommends the creation of a comprehensive, national DNA strategy that addresses DNA casework analysis backlogs. NIJ's recommendations have two primary goals: (1) build our Nation's capacity to use DNA evidence as a routine forensic tool and (2) enhance public safety until long-term capacity can be built. NIJ's specific recommendations are as follows:

Recommendation 1: Improve the DNA Analysis Capacity of Public Crime Laboratories

Our Nation's crime labs do not have the capacity to take full advantage of DNA forensic technology because of an insufficient number of trained personnel, inadequate equipment,

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[4] The task force reviewed the crime lab automation efforts undertaken by South African forensic laboratories. That country faces an unprecedented problem with sexual assaults on children (sparked by a prevalent myth that HIV can be cured by sexual intercourse with a child). Because these rape cases often cannot be solved without DNA evidence, South African authorities have undertaken extensive efforts to increase DNA forensic analysis capacity with the limited funds available. They have sought to automate every stage of the DNA process involving repetitive tasks, and thus have developed their own automation tools. They have even included DNA evidence containers (that fit into the automated analysis equipment) as part of standard rape collection kits.

[5] The authorized but uncollected samples are often referred to as "owed samples."

cramped laboratory space, outdated information systems, and growing casework demands. To build public crime lab capacity, the following specific elements should be considered as part of a long-term strategy:

A. Ensure that crime labs have the basic equipment and materials to conduct DNA analyses

Crime laboratories face rapidly increasing workloads and lack the funds to purchase and maintain new equipment. All crime laboratories should have access to the latest technology for conducting standard DNA analysis. NIJ recommends that assistance be provided to those crime labs that are without basic equipment and materials to conduct the fundamental processes of DNA analysis—extraction, quantitation, amplification, and analysis.

B. Equip public crime labs with laboratory information management systems

Certain portions of the DNA testing procedure are labor-intensive and time-consuming. A significant amount of staff time is devoted to tracking and managing evidence samples. Often, evidence tracking is accomplished through hand-written entries on forms.

Laboratory information management systems (LIMS) are designed to automate evidence handling and casework management. They can improve the integrity and speed of evidence handling and help to demonstrate a proper chain of custody. These systems can provide the additional benefit of aiding public crime labs with the management of all casework, not simply DNA samples.

LIMS are especially critical to efforts to maximize staff resources. They can increase efficiency by freeing up analysts' time. Increased staff time can then be devoted to testing procedures not amenable to automation.

LIMS also can be part of a comprehensive laboratory strategy to improve communication with other criminal justice agencies. The DNA task force identified inadequate communication among law enforcement, crime laboratories, and the courts as one of the largest problems plaguing existing resources. Duplicate collections, case dispositions, suspect exclusions, incomplete data submission, and evidence location are all issues that contribute to wastes of time and expense.[6]

Most public DNA laboratories do not have a LIMS. Significant start-up costs are involved in implementing these systems, requiring some labs to first upgrade their existing computer hardware and networks. LIMS involve initial capital expenditures for computer systems, software, and supporting hardware, as well as continuing costs for maintenance and support. NIJ recommends that the national DNA strategy support the implementation of a LIMS in all public crime labs.

[6] The task force recommended that a small, expert focus group be formed to specifically address the issue of integrating existing systems to maximize communication within the criminal justice system. As this is a system-wide issue that requires input from many different criminal justice professionals, NIJ suggests that this issue be referred for longer term study, perhaps to a national forensic science commission.

C. Provide automation tools to public DNA laboratories

To streamline aspects of the DNA analysis procedure that are labor- and time-intensive, crime laboratories seek to use automated systems, such as robots, to perform DNA extraction. These systems increase analyst productivity, limit human error, and reduce contamination.

In the United States, few examples of forensic DNA laboratory automation exist to serve as models. However, the South African experience may be instructive. Robotics play a significant role in the South African database process: removal of human capital performing repetitive processes enables reassignment of that capital to the post-analysis phase of interpretation, evaluation, and court testimony. Automation within the system involves coordinating robotic actions with minimal or no human intervention to obtain reproducible results. Important characteristics of the South African system include large capacity; walk-away capability; and tracking, recording, and verification at every step (a quality assurance measure), largely assisted by a LIMS. DNA task force members discussed how the South African Police Service's experiences demonstrate the utility (i.e., cost- and time-saving measures) of automation.

Additionally, the DNA task force supported NIJ's plan that the Forensic Resource Network collaborate with the American Society of Crime Laboratory Directors (ASCLD) to develop a resource guide and innovative practices for automating a forensic science laboratory. The task force recommended that the final product be developed as a Web-based document so that it can be updated on a continuing basis. It was further recommended that the product include automation solutions for convicted offender and casework laboratories and that evidence control (i.e., tracking and storage) be addressed.

D. Maximize the use of technology in quality assurance and data analysis processes

Forensic DNA analysis requires two data reviews for quality assurance purposes. To meet this labor-intensive requirement, some labs designate individuals to do nothing but review this data. Expert data-reading systems can rapidly assess the quality of DNA profile data and greatly reduce staff time. They provide accurate and reliable quality assurance measures and assist human reviewers who may become fatigued from repetitive and exhaustive data reviews. Technology is currently being field tested to perform the initial "data read," while having the laboratory analyst conduct the required second read. It is likely that a commercial product will be available soon for the forensic community. Once properly integrated and accepted by the forensic community, expert systems will have a significant impact on streamlining quality assurance procedures.

In addition, quality assurance and data analysis can be greatly enhanced and accelerated by providing secure communications connectivity for consultants. These consultants can be hired on a contract basis to review and interpret data and provide reports directly to the laboratory. This flexibility is often essential given limited resources and fluctuating demands. A long-term national strategy should consider supporting the ability of crime laboratories to contract with outside experts for "virtual" assistance with case analysis, interpretation, and laboratory management.

E. Continue to assist crime labs in meeting accreditation requirements

Federal law requires that all laboratories submitting DNA forensic and convicted offender sample profiles for inclusion in the National DNA Index System (NDIS) demonstrate annual compliance with the FBI Director's National Quality Assurance Standards for Forensic DNA and Convicted Offender Laboratories. Laboratories can demonstrate compliance through accreditation by the ASCLD's Laboratory Accreditation Board (ASCLD/LAB), certification by the NFSTC, or a combination of internal and external audits.

To ensure compliance with quality standards, NIJ intends to continue to provide pre-accreditation services through the FRN so that all States and localities can take advantage of the power of DNA forensics.

F. Support efforts to ensure appropriate retention and storage of forensic evidence

Forensic evidence must be stored in a manner that ensures its integrity and maintains its availability while criminal investigations and judicial proceedings continue. Appropriate evidence storage conditions require costly equipment such as security systems, environmental control systems, ambient temperature monitors, and dehumidifiers. Evidence storage problems further complicate casework backlogs. Evidence might be stored at a courthouse, police agency, or evidence warehouse rather than in appropriate lab storage facilities.

To encourage appropriate retention and storage of forensic evidence, NIJ recommends the collection and dissemination of best-practice information about evidence retention and storage. Such information should identify cost-effective practices and facilitate the exchange of information among the law enforcement and forensic community about the value of particular equipment. A long-term capacity building strategy could also provide support for the development of appropriate storage.

G. Continue the exchange of technological assistance among Federal, State, and local crime labs

NIJ recommends that the national DNA strategy also support the exchange of technological assistance among DNA analysts. The National Institute of Justice, the Federal Bureau of Investigation, and the Forensic Resource Network all have this capacity, as do some State and local laboratories and agencies. Training and educational programs (as recommended below) can make crime labs more aware of these existing resources.

H. Support mitochondrial DNA testing

Nuclear DNA analysis is the preferred means of DNA analysis. However, sometimes attempts to develop a nuclear DNA profile fail. The only other option, then, may be mitochondrial DNA testing.[7] This most often occurs when the biological sample is old, degraded, or otherwise compromised.

[7] A description of mitochondrial DNA testing can be found in NIJ's publication *Using DNA to Solve Cold Cases*, which can be found on the Web at *http://www.ojp.usdoj.gov/nij/pubs-sum/194197.htm.*

State and local laboratory representatives indicated that most of their labs lack the capacity to conduct mitochondrial DNA analysis. Therefore, these cases often need to be outsourced by labs without this capability. Outsourcing mitochondrial DNA analyses on a routine basis is cost-prohibitive. To address the problem, task force members recommended that States expand their capabilities in this area. If mitochondrial DNA testing services were available at a lower cost, the kinds of cases using this technology might increase.

Recognizing the disparity throughout the country regarding the need for and awareness of mitochondrial DNA testing, NIJ recommends that (1) the FBI's current mitochondrial unit be supplemented and (2) a collaborative effort be developed among State and local labs conducting mitochondrial DNA analyses to serve other State and local jurisdictions without this capability.

I. Encourage the use of DNA technology to identify human remains

The FBI's Missing Persons DNA Database Program is available to assist in the identification of human remains. It comprises two indexes: (1) DNA profiles of unidentified human remains and (2) DNA profiles of relatives of missing persons. For this program to achieve its intended purpose, however, DNA profiles must be entered into both indexes to the greatest extent possible.

To date, very few DNA profiles have been placed into this database. Many unidentified remains continue to be disposed without the collection of DNA samples. Task force members noted that for many remains, an oral or blood sample could be easily obtained and would likely lead to a DNA profile that could be entered into the database.

Even when DNA samples are collected, many crime labs lack the capacity to conduct timely analysis. This problem is magnified when the biological sample is old or degraded. The U.S. Department of Justice's efforts to aid in World Trade Center victim identification has resulted in substantial improvements in the DNA analysis of degraded remains. These technological advancements can support efforts to identify missing persons whose remains are found years after death or where the manner of death has made traditional identification methods difficult.

NIJ recommends that the national DNA strategy include programs that would encourage use of the FBI's database. Specifically, medical examiners and coroners should be encouraged to collect DNA samples before disposition of any unidentified human remains. The strategy should also support access to mitochondrial DNA analysis for State and local jurisdictions that lack this capacity. Finally, the strategy should support further research and development to improve DNA analysis of degraded remains and outreach and educational efforts to the public and law enforcement.

Recommendation 2: Help State and Local Crime Labs Eliminate Casework Backlogs

NIJ recommends that financial assistance be provided to State and local crime laboratories to address the current substantial casework backlog while lab capacity is being built. At the present time, State and local crime laboratory capacity is limited, especially in smaller jurisdictions. Because clearing casework backlogs requires more capacity than may be needed

for the long-term, State and local crime laboratories need continued financial support that gives them the flexibility to contract with private laboratories or consultants.

The DNA Analysis Backlog Elimination Act of 2000 currently does not permit local crime labs to apply for funds. Several local government agencies have casework backlogs that exceed those of many States. As a result, evidence in a large number of unsolved murder and rape cases is backlogged in these local crime labs. NIJ recommends that local jurisdictions also be authorized to apply for DNA funding grants that are now available to States.

Recommendation 3: Eliminate Existing Convicted Offender DNA Backlogs

Although crime laboratories have made enormous progress in reducing the number of unanalyzed convicted offender samples for DNA databases, they continue to be deluged with analysis requests. This backlog will only increase as more States enact statutes authorizing the collection of samples from more categories of offenders and arrestees. An aggressive program to ensure the timely analysis and entry of offender DNA samples into DNA databases is essential to maximize the crime-solving potential of DNA casework analysis. The following recommendations would help eliminate these backlogs:

A. Develop funding strategies to address growing convicted offender backlogs

As States continue to expand the categories of offenders required to provide DNA samples, crime laboratory personnel lack the resources to analyze all convicted offender DNA samples in a timely manner. The national DNA strategy should accommodate the growing trend of States to require the collection of more DNA samples from offenders. Specifically, NIJ recommends financial support to Federal, State, and local crime labs to enable them to meet demands created by these expanded DNA collection statutes. As DNA databases expand, the services of private laboratories (and some State and local laboratories) with high throughput capacity must be readily accessible to other crime laboratories to assist them with their casework. Such laboratories would be particularly adept at analyzing routine samples, such as convicted offender profiles, while permitting other crime laboratories to focus on the analysis of casework.

B. Encourage aggressive programs to collect DNA samples "owed" by convicted offenders

In many jurisdictions, inmates, parolees, and probationers are required under law to provide DNA database samples but have not yet provided those samples. For example, samples from persons being released on probation or community supervision (usually offenders convicted of less violent felonies) are not being collected because those persons never go through a jail or prison intake system where offender DNA samples are usually collected. The DNA task force identified this aspect of sample collection compliance as a problem to be addressed.

To assist State and local agencies in collecting "owed" DNA samples, NIJ recommends that a national DNA strategy support innovative and cost-effective collection programs, such as mobile collection units. In addition, the proposed research and development program could provide State and local policymakers with additional information about the cost effectiveness, efficiency, and usability of collection methods.

Moving from blood sampling to oral swab collection can improve compliance rates. Collectors must ensure that complete information is documented for each offender. Additionally, as States move to require samples from all felons and arrestees, information sharing and information technology infrastructure building will become more important to reduce duplication of effort in sample collection.

Recommendation 4: Support Training and Education for Forensic Scientists

Crime laboratory capacity is directly related to the number and quality of highly trained forensic DNA examiners and technicians. DNA task force members emphasized that the criminal justice system needs to ensure that enough qualified DNA analysts are available to conduct DNA analysis. The DNA task force members agreed that there is currently a growing need for more uniformly educated and trained analysts who can begin supervised casework once hired. NIJ recommends that the following specific proposals be considered as part of a long-term comprehensive strategy:

A. Ensure that newly hired forensic scientists have the necessary training and education

Currently, NIJ supports a technical working group comprising forensic science experts and educators to develop model curriculums for degrees in forensic science. Colleges and universities should be encouraged to use such models as a resource, if they choose to develop specialized areas of study. Encouraging focused curriculums and ongoing coordination between the academic and forensic communities will help produce highly trained forensic DNA analysts who understand protocols and quality assurance standards. The national DNA strategy should support the dissemination of such information.

Task force members identified the need for intensive, “on-the-job” training to prepare new forensic analysts for casework. To meet this need, NIJ will continue to work with the members of the Forensic Resource Network and other forensic science professionals to explore ways to assist public crime laboratories in training forensic scientists.

B. Develop strategies for increasing the pool of qualified forensic scientists who work in public crime laboratories

The task force identified a critical need to encourage students to become trained in forensic sciences and to seek careers in public crime laboratories. While the task force discussed such ideas as student loan forgiveness programs, student internships in public crime laboratories, and scholarship programs, there was no consensus as to how to implement a federally supported strategy that would ensure that students entered public service rather than the private sector. Because of the need to consider additional suggestions from the educational community and develop a refined strategy, NIJ recommends that this matter be further studied. If NIJ’s recommendation for a national forensic science commission is adopted, this issue could be referred to this commission for further review and development of a detailed strategy.

C. Provide forensic DNA analysts with up-to-date training and continuing education

Several agencies and organizations provide training opportunities for DNA analysts, including components of the U.S. Department of Justice, the American Academy of Forensic Sciences, the National Center for Forensic Sciences, the National Forensic Science Technology Center, and some State and local training organizations. Private corporations also sponsor training programs. These programs enable the valuable exchange of ideas on such issues as emerging technologies and efficient laboratory operation. NIJ recommends a comprehensive national strategy to continue the professional development of experienced analysts.

Recommendation 5: Provide Training and Education to Police Officers, Prosecutors, Defense Attorneys, Judges, Victim Service Providers, Medical Personnel, and Other Criminal Justice Personnel

Key players in the criminal justice system should be trained in the proper collection, preservation, and use of forensic DNA evidence. Fundamental knowledge of the capabilities of DNA technology is essential for police officers to collect and store evidence properly, prosecutors to introduce it successfully in court, and judges to rule correctly on its admissibility. Victim service providers should be trained to inform victims about DNA evidence and its potential impact on a case. Defense attorneys and others in the court system also should be provided with information about the capacities and limitations of DNA technology.

A. Train law enforcement officers in crime scene evidence collection and in emerging applications of DNA evidence

As first responders to crime scenes, law enforcement officers must be able to identify, preserve, and collect probative biological evidence. Improper collection can mean that valuable evidence is ignored or untestable. NIJ recommends that the national DNA strategy provide funding for training of law enforcement officers on the basic technical concepts of DNA evidence and basic “awareness training” on identifying and collecting DNA evidence at crime scenes. In addition, NIJ recommends that the national strategy support training for evidence technicians, investigators, and others processing crime scenes. This specialized training would relate to DNA evidence collection protocols and strategies for determining which items are likely to lead to probative (and not duplicative) evidence. Additionally, investigators and responding officers should learn about DNA databases and their potential to provide leads in current and “cold” cases. Likewise, training and information aimed at law enforcement leadership and policymakers will help ensure the national strategy is implemented and that line staff will support increasing the use of forensic science in routine criminal justice practice. The national DNA strategy should include support for law enforcement training agencies and organizations for the development of training curriculums and materials.

B. Train prosecutors, defense attorneys, and judges

NIJ intends to continue developing educational materials relating to DNA evidence. The DNA task force expressed its support for the DNA for Officers of the Court project, which NIJ is currently developing through its Forensic Resource Network.

NIJ recommends that support be provided to prosecutors' organizations to provide training and technical assistance opportunities for prosecutors. Prosecutors should be provided more information about solving "cold cases" with DNA evidence, post-conviction DNA testing requests, and developing innovative legal strategies to optimize the power of DNA databases.

NIJ also recommends that training be made available for defense counsel in order to promote public confidence in the integrity of the criminal justice system. Defense counsel who handle cases involving biological evidence should have access to training and resources on the applications and limitations of DNA evidence, especially in the post-conviction context. NIJ recommends that the comprehensive national strategy support legal education programs to provide training and resources on forensic DNA technology.

Judges also must be equipped with technical and scientific knowledge to make rulings in cases involving forensic DNA evidence. They should be aware of capacity issues facing public crime laboratories in their jurisdictions. NIJ recommends that support be provided to judicial training conferences and professional organizations for the development of DNA training and educational resources for judges.

C. Provide ongoing DNA education and support to crime victims, victim service providers, and medical personnel who collect evidence for sexual assault investigations

Victims and those who advocate on their behalf must have access to information about the investigative and courtroom uses of forensic DNA evidence. The DNA task force reached a clear consensus that Sexual Assault Nurse Examiner (SANE)/Sexual Assault Response Team (SART) programs have exponentially increased the quality and quantity of forensic evidence collected from sexual assault victims. However, given the high turnover rates in this profession, efforts to standardize evidence collection kits or processing techniques would be one way of ensuring uniformity across the country. In addition to supporting specialized evidence collection programs for sexual assault victims, NIJ also recommends the development of educational materials for medical providers, especially those in rural or under-served areas that cannot support specialized programs.

To address the concerns of victims, the U.S. Department of Justice has developed educational materials. NIJ recommends developing additional materials and training programs to disseminate information about best practices that respect victim privacy while also encouraging effective evidence collection.

D. Train probation and parole officers and corrections personnel

NIJ recommends that the national DNA strategy supports efforts by States and local governments to augment the capacity of their probation, parole, and corrections staff to collect DNA samples from convicted offenders. Such support could include education and training for probation, parole, jail, and prison staff on the collection of these samples.

Recommendation 6: Support DNA Research and Development

Forensic DNA analysis, like other areas of biotechnology, is rapidly evolving. Research and development promises to open up new ways to assist crime labs. Smaller, faster, and cheaper analysis tools will reduce capital investments for crime laboratories while increasing their capacity. These tools also will facilitate the application of forensic DNA technology to more categories of evidence and enable investigative uses of DNA as close to the crime scene as possible. NIJ recommends that the comprehensive national DNA strategy include the following:

A. Fund research and development of new and emerging DNA technologies

NIJ's DNA research and development portfolio includes technologies that may decrease the time and expense of conducting DNA analysis in the laboratory and augment the portability of DNA analysis devices. Advances in DNA analysis technologies will reduce the personnel hours normally required for more repetitive tasks, thus decreasing overall turn-around time of casework analysis. The national strategy should support DNA research efforts. Research and development of new capabilities in automated short tandem repeats (STRs), single nucleotide polymorphisms (SNPs), mitochondrial DNA analysis (mtDNA), and Y-chromosome DNA analysis methods can significantly reduce turn-around times and permit examiners to focus on the customized aspects of DNA testing. Research into the forensic uses of animal and plant DNA will also yield additional crime-solving tools.

B. Accelerate the development of DNA chip technology

NIJ recommends that the national strategy accelerate support for development of chip-based DNA technologies that will decrease analysis time and enable the use of faster DNA-based test methods. For example, "DNA-on-a-chip" technology can reduce analysis time from several hours to less than 20 minutes. Ultimately, DNA chip technology may facilitate access to immediate DNA analysis at crime scenes by trained forensic personnel.

C. Research the use of DNA through demonstration projects

DNA task force members stressed the necessity of an integrated approach to reducing DNA backlogs and urged more training for law enforcement and more cooperation among the key members of the criminal justice system. To demonstrate the public safety and financial benefits of increased use of DNA and other forensic evidence, NIJ recommends a research project using demonstration sites to test, for example, whether increased forensic evidence collection and prompt testing solves more crimes. Law enforcement agencies of comparable size and jurisdiction or comparable police districts in a large metropolitan area could be selected for a comparative evaluation. This research will help inform State and local criminal justice entities about the most cost-effective ways to use DNA and forensic evidence to protect the public.

D. Create a national forensic science commission

The DNA task force has been an extremely helpful advisory group in identifying the DNA needs of State and local crime labs and has highlighted the relationship of DNA evidence to other forensic sciences. Although this advisory group has completed its mission, its work emphasizes the importance of having a body to guide the future of technology, policy, and program development. Accordingly, NIJ recommends the establishment of a national forensic science commission to keep abreast of rapidly evolving scientific advances in all

areas of forensics and to make recommendations on technology investments to improve public safety.

Such a commission could also serve as an ongoing forum for discussing strategy and policy to help ensure that existing forensic technologies are maximized to aid the criminal justice system. It could also serve as a clearinghouse for the thorough and thoughtful exchange of information and ideas. The DNA task force members stressed that the success and productivity of such of a commission would be dependent on those appointed to it. For these reasons, NIJ recommends that commission members be drawn from professional forensic science organizations, accreditation bodies, and key components of the criminal justice community.

Conclusion

NIJ recommends the development of a national, comprehensive strategy to maximize the use of DNA evidence throughout the criminal justice system. NIJ recommends that the aforementioned proposals be incorporated into that strategy.

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Chicago Police Department

About the National Institute of Justice

NIJ is the research, development, and evaluation agency of the U.S. Department of Justice. The Institute provides objective, independent, nonpartisan, evidence-based knowledge and tools to enhance the administration of justice and public safety. NIJ's principal authorities are derived from the Omnibus Crime Control and Safe Streets Act of 1968, as amended (see 42 U.S.C. §§ 3721–3723).

The NIJ Director is appointed by the President and confirmed by the Senate. The Director establishes the Institute's objectives, guided by the priorities of the Office of Justice Programs, the U.S. Department of Justice, and the needs of the field. The Institute actively solicits the views of criminal justice and other professionals and researchers to inform its search for the knowledge and tools to guide policy and practice.

Strategic Goals

NIJ has seven strategic goals grouped into three categories:

Creating relevant knowledge and tools

1. Partner with State and local practitioners and policymakers to identify social science research and technology needs.
2. Create scientific, relevant, and reliable knowledge—with a particular emphasis on terrorism, violent crime, drugs and crime, cost-effectiveness, and community-based efforts—to enhance the administration of justice and public safety.
3. Develop affordable and effective tools and technologies to enhance the administration of justice and public safety.

Dissemination

4. Disseminate relevant knowledge and information to practitioners and policymakers in an understandable, timely, and concise manner.
5. Act as an honest broker to identify the information, tools, and technologies that respond to the needs of stakeholders.

Agency management

6. Practice fairness and openness in the research and development process.
7. Ensure professionalism, excellence, accountability, cost-effectiveness, and integrity in the management and conduct of NIJ activities and programs.

Program Areas

In addressing these strategic challenges, the Institute is involved in the following program areas: crime control and prevention, including policing; drugs and crime; justice systems and offender behavior, including corrections; violence and victimization; communications and information technologies; critical incident response; investigative and forensic sciences, including DNA; less-than-lethal technologies; officer protection; education and training technologies; testing and standards; technology assistance to law enforcement and corrections agencies; field testing of promising programs; and international crime control.

In addition to sponsoring research and development and technology assistance, NIJ evaluates programs, policies, and technologies. NIJ communicates its research and evaluation findings through conferences and print and electronic media.

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