

DNA's Link to Corrections

By National Institute of Justice Staff

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During the past decade, DNA has emerged as a remarkable crime-fighting tool. While fingerprints revolutionized 20th century law enforcement, DNA has the potential to be the best crime-solving tool of the 21st century. As popular television captures public imagination through fictional crime drama, the media routinely describe actual serious crimes solved or innocent inmates exonerated with this technology. Often unseen is the significant role corrections professionals play in this process.

DNA has been critical in solving some of the nation's most serious crimes. For example, in 1990 in Goldsboro, N.C., a series of brutal attacks on elderly victims occurred. The unknown assailant was dubbed the "Night Stalker." During one attack in March of that year, an elderly woman was brutally raped and would likely have been murdered if it were not for her daughter's early arrival home. The suspect fled, leaving behind materials intended to burn the residence and the victim in an attempt to conceal the crime. Later that year, another elderly woman was brutally raped and murdered. Three months later, a third elderly woman was raped and killed, along with her husband. Their house was burned in an attempt to cover up the crime, but emergency personnel pulled the bodies from the house before it was engulfed in flames.

DNA analysis of rape evidence from each victim showed that the same perpetrator had committed all three crimes. However, there was no suspect. The crime lab entered the DNA

profiles into North Carolina's DNA database. More than 10 years after these crimes, the DNA database made a "cold hit." The perpetrator had been convicted of shooting into an occupied dwelling, an offense that requires inclusion in the North Carolina DNA database. When confronted with the DNA evidence, the suspect confessed to all three crimes.¹ Because of the great promise of DNA, President Bush launched his more than \$1 billion DNA Initiative last year. (A description of the initiative follows later in this article.)

The Long and Short Of DNA

DNA analysis is a powerful tool because each person's nuclear DNA is unique (with the exception of identical twins). Therefore, DNA evidence collected from a crime scene can implicate or eliminate a suspect, similar to the use of fingerprints. It also can analyze unidentified remains through comparisons with DNA from relatives. DNA can be found on decades-old evidence. Previously unsolvable cases, often homicides and sexual assaults, can contain critical DNA evidence that will help identify the perpetrator even when the victim cannot. Additionally, when evidence from one crime scene is compared through the federal DNA database with evidence from another crime scene, those crime scenes can be linked to the same perpetrator locally, statewide and nationally.

Plant and animal DNA also hold investigatory potential. It is almost impossible to enter a house where a domestic animal lives without being contaminated by the animal's hair. Animal hairs collected from a crime scene, therefore, can be indicative of a perpetrator's presence at the scene or provide evidence of a connection between a victim and a perpetrator. Various types of plant material may also be collected as evidence. In some cases, materials such as leaf fragments and twigs are found on the clothing of a victim or suspect. In the

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case of a large scale marijuana operation, DNA analysis of marijuana plants seized from different locations can establish that they originated from the same source.

DNA Technology Advancements

Recent advancements in DNA technology have improved law enforcement's ability to use DNA to solve old cases. Old analysis methods required large biological samples (often the size of a quarter). In addition, these old methods often failed to yield results when samples were degraded or contaminated.

Newer DNA analysis techniques can yield results from biological evidence invisible to the naked eye. Today, police departments throughout the country are re-examining unsolved rape and homicide cases and looking for usual and unusual sources of DNA. Recently, a \$111,000 Department of Justice grant for investigator and forensic analyst overtime led to the solving of nine rapes and 22 homicides in Kansas City.

New DNA analysis methods also can help identify missing persons. For families whose loved ones have been missing for years, DNA advances can help identify hair, bones and teeth, and provide much needed closure for grieving families. Because of scientific advances in DNA technology that were used to identify victims of the World Trade Center attacks, DNA results can now be obtained from severely degraded samples.

How DNA Databases Aid Investigations

DNA databases have greatly enhanced law enforcement's ability to solve old and new cases with DNA. These databases allow law enforcement officials to match crimes with suspects and develop critical investigative information.

Prisons and jails throughout the country are a critical component of the nation's DNA database system. Every state has a statute that requires the collection of DNA samples from some convicted offenders. Some states have expanded collection statutes that require DNA collections from arrestees or juveniles adjudicated delinquent for certain offenses. The vast majority of the DNA sample collections are managed by corrections departments, jails and juvenile facilities.

States and the FBI store hundreds of thousands of potential suspect DNA profiles in what are called convicted offender databases. A computer software system known as CODIS operates local, state and national databases of DNA profiles from convicted offenders, unsolved crime scene evidence and missing persons.

CODIS constantly compares crime scene DNA evidence with other crime scene DNA evidence, seeking to link what otherwise might appear to be unrelated crimes. At the same time, crime scene DNA profiles are constantly matched against existing and newly entered convicted offender profiles. Given the recidivistic nature of many crimes, especially sexual assault and burglary, these convicted offender profile databases are solving many serious and otherwise unsolvable crimes like the Goldsboro Night Stalker murders.

The Extent Of DNA Backlogs

The recent influx of DNA evidence and related technologies into forensic science has led to an unprecedented use of physical evidence in the adjudication of crime. But the demand for DNA evidence analysis has put a strain on crime laboratories as they struggle to analyze samples from convicted offenders from correctional facilities and casework evidence from law enforcement agencies.

While popular press refers to a DNA evidence backlog, there actually are two components of the backlog:

- Convicted Offender Backlog — Unanalyzed samples from offenders convicted of crimes

requiring that their DNA be submitted to a database.

- Forensic Casework Backlog — Unanalyzed evidence at crime labs and evidence from cases with possible biological evidence that law enforcement agencies have not submitted to those labs.

Preliminary estimates place the number of collected, untested convicted offender samples at between 200,000 and 300,000. It is also estimated that there are between 500,000 and 1,000,000 convicted offender samples that remain uncollected, according to the 2003 White House report, *Advancing Justice Through DNA Technology*.² Any concerted attempt to collect owed samples is a responsibility that could be placed on corrections, jails, and probation and parole agencies.

In an NIJ-funded report, *National Forensic DNA Study Report*,³ researchers have also estimated that the forensic casework sample backlog is over one-half million. Of that number, evidence from approximately 52,000 homicide cases, 169,000 sexual assault cases and 264,000 property crime cases is still in the hands of law enforcement agencies. The remainders are unanalyzed DNA cases reported by local crime labs (approximately 34,700 at state labs and 22,600 at local labs).

Why the Backlog Exists

In an effort to discover why the backlog exists, researchers surveyed local and state forensic laboratories, law enforcement agencies and prosecutors. Here is what they found:

Success Breeds Demand: Broad-er Offender Collection Statutes. Crime labs have made enormous progress in reducing the number of unanalyzed convicted offender samples. However, they are deluged with new requests as more states require collection of samples from more categories of nonviolent crimes. Based on responses from crime labs in states without statutes requiring DNA collection from all convicted felons, the expansion to all convicted felons in the databases would add 2,281,000 offender profiles in the first year,

with 504,484 profiles added in future years. (The first year number assumes retroactive statutes that would include offenders still serving sentences.)

The answer, however, is not to slow down convicted offender collections. Evidence has shown that states with broad collection statutes are solving far more crimes than those with narrow collection statutes. Having nonviolent offenders in the database clearly can lead to the arrest of violent offenders. For many years, the Virginia Division of Forensic Science has reported that more than 80 percent of the hits on the state's DNA database would have been missed if only violent offenders were in the database. The Department of Justice strongly recommends that states collect DNA profiles from all convicted felons to ensure an effective DNA system.

Forensic Casework Backlogs. Processing delays at crime laboratories, due to insufficient resources, lack of trained staff and insufficient infrastructure, contribute substantially to the forensic casework backlog. DNA casework analysis is also time consuming and expensive when compared with equally important crime lab work such as latent fingerprints, firearms and bullet analysis, trace evidence and drug analysis.

Notably, most of the forensic casework samples awaiting DNA analysis are not found at the crime labs. The vast majority of these samples remain in law enforcement agencies. These agencies are often reluctant to submit evidence to the lab. The most cited reason by these agencies is that they see DNA as a tool for prosecution, not for investigation — more than 30 percent of responding agencies indicated that they do not submit DNA evidence for cases in which a suspect has not been identified. More than 10 percent fail to submit samples when a suspect has been identified but not yet charged, and 14 percent do not submit DNA evidence when a guilty plea is expected. Unfortunately, this approach fails to maximize the stunningly effective crime-fighting potential of the DNA databases.

The Future of DNA With The President's Initiative

President Bush has called upon Congress to support a five-year, more than \$1 billion DNA initiative to eliminate casework and convicted offender backlogs, improve crime lab capacity (through automated systems, robotics and laboratory management systems), train stakeholders in the criminal justice system (including forensic scientists, police, corrections, probation and parole, lawyers, judges and crime victims), provide post-conviction DNA testing grants (for appropriate testing in cases where the inmate may be actually innocent and through a system that discourages frivolous testing and

provides victims services) and ensure that DNA forensic technology is used to its full potential to identify missing persons.

The president's DNA initiative encourages all types of forensic analysis (not just DNA) to help solve crimes. In addition, the federal government will continue to research ways to improve DNA analyses so that they are faster, cheaper and better.

Timely and appropriate DNA testing means greater justice and safety. But it is going to take the efforts of everyone in the criminal justice system to realize the DNA database's full power — from correctional staff collecting samples from convicted offenders, to the lab technicians who

will analyze those samples, to the law enforcement investigators who may link that offender to an unsolved crime. The promise of DNA is worth the effort.

ENDNOTES

¹ National Institute of Justice. 2002. *Using DNA to solve cold cases*, Special Report, Washington, D.C.: U.S. Department of Justice.

² To access the full text, visit www.whitehouse.gov/infocus/justice/dna_initiative-toc.html.

³ Asplen, C.H., M.J. Gaffney, L.H. Hurst, C.L. Johnson, N.P. Lovrich, T.C. Pratt and T.M. Schellberg. 2003. *National forensic DNA study report*. Washington, D.C.: National Institute of Justice.

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