Testimony of

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Mr. Chairman, Ranking Member Grassley and Members of the Subcommittee, thank you for inviting the Federal Bureau of Investigation (FBI) to provide an update on our efforts relating to DNA, specifically with respect to the Combined DNA Index System (CODIS) and the National DNA database.

In looking back at the first use of DNA technology on casework in England in 1985, enormous advances have been achieved in institutionalizing this technology within the criminal justice system in the United States. While there are now hundreds of stories illustrating the impact of DNA, the following demonstrates how it has been assimilated into law enforcement investigations.

A college professor was raped and murdered in Flint, Michigan in 1986. A search of the Michigan state fingerprint files was negative and no suspects were developed in the case. Five years later, a flight attendant was raped and murdered in a motel in Romulus, Michigan. Again, there were no suspects. In 2001, DNA from the 1986 offense was submitted to the Combined DNA Index System (CODIS) at the state level which matched it to the 1991 murder. The Flint Police Department's Cold Case Squad submitted latent fingerprints from the 1986 homicide to the FBI's Latent Fingerprint Unit. Three latent prints were searched using the FBI's Integrated Automated Fingerprint Identification System (IAFIS) and one of the latent prints was identified. Rather than immediately arrest the suspect, the police followed him and retrieved a napkin the suspect had used in a restaurant. DNA found on the napkin matched the DNA from both homicides and the suspect was arrested, charged with both murders and is awaiting trial.

How do these state and national databases work? The answer is DNA. DNA is a unique identifier; only identical twins have the same DNA. DNA is found in almost every cell in the human body and is exactly the same in every cell. Because it is unique to each individual, the DNA collected from a crime scene can be used to eliminate a suspect in a case or link a suspect to the evidence. Moreover, as illustrated in the case above, DNA maintains its integrity so that evidence from crimes committed many years ago may still yield sufficient DNA to conduct an analysis.

The analysis or testing of DNA obtained from a crime scene or a convicted offender's DNA sample will produce a DNA profile - a series of numbers, each of which represents the result from the analysis of a specific location on the chromosome called a locus. Generally, DNA profiles submitted for searching at the national level must contain information on 13 Short Tandem Repeat (STR) loci. The STR loci approved for use in CODIS were specifically selected as law enforcement identification markers because they were not directly linked to any genetic code or medical condition.

The Combined DNA Index System (CODIS)

The acronym "CODIS" is used to describe not only the software used to maintain and run these DNA databases but also the entire program of software support for Federal, state and local forensic laboratories as well as the various indices (Forensic, Offender and Missing Person) at all three levels - national, state and local. The acronym "NDIS" stands for the National DNA Index System, one component, albeit an integral one, of the CODIS program.

One of the underlying concepts behind the development of CODIS was to create a database of a state's convicted offender profiles and use it to solve crimes for which there are no suspects. Historically, forensic examinations were performed by laboratories if evidence was available and there was a suspect in the case. By creating a database of the DNA profiles of convicted sex offenders and other violent criminals, forensic laboratories would be able to analyze those cases without suspects and search those DNA profiles against the database of convicted offenders and other crime scenes and determine if a serial or recidivist rapist or murderer was involved. It was expected that this new tool would enable forensic laboratories to generate investigative leads or identify suspects in cases, such as stranger sexual assaults where there may not be any suspects.

The CODIS program has exceeded these expectations. CODIS began in 1990 as a pilot project with 12 state and local forensic laboratories and today has 153 participating laboratories representing 49 states and the District of Columbia. The FBI's primary method of measuring the effectiveness of the CODIS program is the number of investigations it assists by either identifying a suspected perpetrator or by linking serial crimes. As of March, 2002, CODIS has assisted in over 4,719 investigations in 32 states and two federal laboratories.

The CODIS software is used to maintain these DNA databases and search the DNA profile against the DNA profiles of convicted offenders and other crime scenes. For example, a DNA profile of a suspected perpetrator is developed from the sexual assault evidence kit. If there is no suspect in the case or if the suspect's DNA profile does not match that of the evidence, the laboratory will search the DNA profile against the Convicted Offender Index. If there is a match in the Convicted Offender Index, the laboratory will obtain the identity of the suspected perpetrator. If there is no match in the Convicted Offender Index, the DNA profile is searched against the crime scene DNA profiles contained in the Forensic Index. If there is a match in the Forensic Index, the laboratory has linked two or more crimes together and the law enforcement agencies involved in the cases are able to pool the information obtained on each of the cases. Matches made by CODIS and confirmed by the participating laboratories are often referred to as CODIS "hits."

Standards for Assuring Quality at the National DNA Index

The introduction of this new technology also brought recognition of the need for standardized quality assurance protocols. In the 1980's, the FBI Laboratory convened a group of Federal, state and local forensic scientists, known as the Technical Working Group on DNA Analysis Methods

or TWGDAM (now known as the Scientific Working Group on DNA Analysis Methods or SWGDAM). TWGDAM developed the guidelines for a quality assurance program that were adopted by virtually every laboratory performing forensic DNA analysis, becoming de facto national guidelines.

The importance of quality standards was more formally addressed by the DNA Identification Act of 1994 (42 U.S.C. §14131 - enacted as part of the Violent Crime Control and Law Enforcement Act of 1994 §210304(b)) which required the FBI Director to empanel a representative body to recommend quality assurance standards for forensic DNA testing laboratories. The DNA Identification Act specifically provided that in the interim, until such standards were developed and issued by the FBI Director, the TWGDAM Guidelines were to be considered the national quality standards. This body, known as the DNA Advisory Board, recommended two sets of quality assurance standards to the FBI Director, Quality Assurance Standards for Forensic DNA Testing Laboratories and Quality Assurance Standards for Convicted Offender DNA Databasing Laboratories. Both standards were approved by the FBI Director and were effective October 1, 1998 and April 1, 1999, respectively (see Attachment A).
The FBI's efforts to ensure accountability to the DNA Identification Act have been met with cooperation and compliance by the state and local forensic laboratories seeking to participate in the National DNA Index. Once a forensic laboratory agrees to abide by these quality standards and enters into an agreement with the FBI governing these federal requirements as well as NDIS operating procedures, the laboratory will be authorized to upload their DNA convicted offender, casework and missing person data to the National DNA Index. Compliance with the Quality Assurance Standards and NDIS Procedures is monitored by audits of the participating laboratories

The DNA Identification Act also authorized the FBI Director to establish and maintain a national DNA identification index (42 U.S.C. §14132). The National DNA Index System was implemented in October, 1998. Today, there are a total of 127 laboratories representing 41 States and three federal laboratories participating in the National DNA Index. There are currently over 900,000 convicted offender DNA profiles in NDIS and 33,000 forensic profiles contributed by participating federal, state and local laboratories. The DNA Identification Act limits the type of DNA data that may be maintained in the national database as well as who may access this data and for what purpose. All DNA records in NDIS are protected from unauthorized access through administrative, physical and technical safeguards.

Adherence to the Quality Assurance Standards was required for the Federal DNA grant programs authorized by the DNA Identification Act of 1994 (42 U.S.C. §3796kk-2(1)) and more recently, the grant programs authorized by the DNA Analysis Backlog Elimination Act of 2000 (42 U.S.C. §14135(d)(2)). It is important to note that private laboratories under contract to the public forensic laboratories for analyses of DNA samples must also satisfy the national Quality Assurance Standards. Continuation of these and similar requirements to comply with national Quality Assurance Standards to receive Federal grant funding and to participate in the National DNA Index promotes the commitment to quality DNA data.

Success of CODIS Creates New Demands

An identification tool that was initially thought to benefit the investigation of sexual assault cases has proven to have much wider application in the investigation and prosecution of crimes. States have observed this first hand with their CODIS hits and sought to expand coverage of their databases beyond sexual offenses - first to more serious violent felonies and then all felony offenses. The states are learning quickly that, the larger the size of the database, the more crimes that are solved. Virginia, for example, has long authorized the collection of DNA samples from all felons, and has achieved remarkable results in solving rapes, murders, and other crimes with CODIS. A study of the Virginia system has shown that a large proportion of its matches in sex offense cases would not have been obtained if the state had only collected DNA samples from violent offenders. Rather, the DNA sample which results in the solution of a rape is often collected on the basis of the offender's conviction for a nonviolent offense, such as a burglary, a drug offense, or a theft.

Consistent with the DNA Identification Act of 1994 (42 U.S.C. §14132; authorizing the inclusion of DNA records for persons convicted of a crime), the FBI supports the inclusion of all felony offenders in the National DNA Index. Similar benefits could be expected from expanding DNA sample collection from federal offenders to include all felons. This approach has previously received substantial support in Congress. For example, the DNA legislation sponsored by Senators Kohl and DeWine that the Senate passed in 1999 - title XV of S. 254 - would have allowed the collection of DNA samples from all federal offenders convicted of felonies.

Legislative activity on DNA database laws has not shown signs of slowing down since passage of the last state DNA database law in 1998. Well over half of the states have expanded the offenses included in their DNA databases. Over the last few years, hundreds of bills have been introduced in state legislatures across the country to expand coverage of state DNA databases. Many of these proposals have been successful and there are now 19 states with laws authorizing the collection of DNA samples from all felony offenders (see Attachment B). These legislative efforts to include all felons are commendable. But we know from our annual survey of CODIS laboratories that the majority of states are unable to keep pace with the collection of these convicted offender samples. Federal funding provided under the DNA Analysis Backlog Elimination Act of 2000 has had significant positive impact on these backlogs, but the reality is that new backlogs will continue to be created as states expand their database laws.
The DNA legislation goes beyond expanding the qualifying offenses to other areas intended to ensure the prosecution of crimes solved using DNA analysis and CODIS. For example, dozens of proposals have been introduced to extend or eliminate the Statute of Limitation for sexual assaults or permitting the issuance of a warrant or indictment listing the DNA profile of an unknown person.

Hand in hand with the need for comprehensive coverage of all felony offenders in these DNA databases is the importance of analyzing the biological evidence collected from crime scenes, regardless of whether a suspect has been identified in that case. A large national database containing the DNA profiles of all felons by itself cannot solve crimes. We know that. We also know that state and local laboratories do not currently have the capacity to analyze all the cases with biological evidence that are submitted to them. Because of limited capacities, laboratories are forced to prioritize their cases based upon court dates and whether or not a suspect has been

identified. Unfortunately, those cases for which there are no suspects - and the cases for which CODIS was specifically designed to help solve - remain unanalyzed in laboratory storage or police department evidence rooms. Nowhere is this more evident than the examples we hear of sexual assault or rape kits by the hundreds, or even thousands, gathering dust in storage - awaiting analysis. The difficulties inherent in determining the precise number of these unanalyzed rape kits nationwide should not deter us from addressing this issue. Until the laboratories have the capacity to analyze every case with biological evidence, CODIS will continue to be underutilized.

To better serve the criminal justice system, once the backlog of rape kits and other crime scene evidence is analyzed, laboratories will want to reduce the turn-around time for analyzing their casework. An obvious goal of this policy would be to assure that suspects in custody would not be detained indefinitely awaiting DNA testing results. By making DNA testing available for all cases involving biological evidence and providing reasonable turn-around times, quicker results eliminating suspects would allow law enforcement to quickly refocus their efforts earlier the investigation.

Because of the success of these DNA databases and their remarkable expansion, they are quickly approaching the capacity originally designed for CODIS. The expansion of state DNA database laws to all felony offenders and analysis of increasing numbers of casework samples translates into an increased number of profiles entered into and searched in CODIS. Moreover, as the number of CODIS laboratories has steadily increased over the years, the tiered architecture has not changed, necessitating maintenance of and user support for multiple versions of software. The FBI has been monitoring the legislative activity and planning for this eventuality. With the approval and support of the Attorney General, the FBI is undertaking the redesign of the CODIS system to enhance the system's storage and searching capacities and provide more immediate access to national searches.

Efforts undertaken several years ago to design a new matching algorithm capable of searching millions of profiles in seconds, or even microseconds, are coming to fruition and we will now turn our attention to integration of this new search engine into CODIS. Completion of these upgrades is dependent upon funding requested in the Fiscal Year 2003 budget. The CODIS redesign includes an increased capacity to accommodate 50 million DNA profiles. Other plans include increasing the frequency with which searches of the National DNA Index are performed so that as soon as new DNA data is uploaded, it would be searched and available for appropriate follow-up by the laboratory and law enforcement agency. Central management of the software applications and databases will be included in order to reduce the hardware and software maintenance costs for the participating laboratories and the FBI. And lastly, as all public DNA laboratories seek participation in the national system, the telecommunication circuits and routers must be upgraded and network maintenance provided to the participating state and local laboratories.

Finally, as forensic laboratories increase their capacities and begin to eliminate their convicted offender and casework backlogs, we must publicize the benefits of this technology for eliminating and incriminating suspects. Building upon educational efforts begun with the our publication on "Guidelines for the Collection and Preservation of DNA Evidence," and the more

recent brochure and training CD entitled "What Every Law Enforcement Officer Should Know About DNA," developed by the Commission on the Future of DNA Evidence, the importance of DNA evidence should be common knowledge among law enforcement and criminal justice personnel. Training curricula for every law enforcement recruit should include, as a matter of routine, procedures for the proper collection and storage of DNA evidence. Cold case squads, similar to the one described in the Michigan case, exist in many jurisdictions to review old unsolved cases for any biological evidence and if available, submission to the forensic laboratory for analysis and entry into CODIS. Solving these old cases brings a measure of closure for victims and their families, such as the Scovilles. David and Ann Scoville, whose daughter Patricia was raped and murdered in Vermont, have championed the cause of DNA databases and are recipients of the Attorney General's Crime Victim Service Award for 2002. The DNA evidence in Patricia's case is searched in the National DNA Index, but the case remains unsolved.

The foundation for the use of CODIS as an investigative tool has been established. The FBI Laboratory is committed to the support of the CODIS program. Considering how much has been accomplished in such a relatively short period with the cooperation and collaboration of legislative bodies and all components of the criminal justice community - law enforcement, crime laboratories, victims, prosecutors and the judiciary - the future of DNA and CODIS holds even greater promise, and hopefully closure for the Scovilles.

We appreciate the opportunity to appear before this Subcommittee and provide this update on CODIS and DNA databases. Thank you.