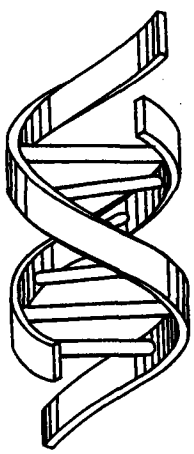
Department of Justice Canada
Ministère de la Justice Canada

Obtaining and Banking DNA Forensic Evidence



CONSULTATION PAPER

Canada

OBTAINING AND BANKING

DNA FORENSIC EVIDENCE

Consultation Paper

Criminal and Social Policy Sector

CONTENTS

FOREWORD

DNA typing is a powerful comparative identification tool. Since its forensic introduction in Canada in 1988-89, it has been instrumental in securing convictions in hundreds of violent crimes, from homicide to assault. It has also helped to eliminate suspects, sometimes in the face of damning allegations. In the United States it has even led to the exoneration and release of previously convicted individuals. Clearly, the implications for the criminal justice system deserve serious attention.

The Department of Justice has prepared this consultation paper to identify some of the main issues raised by this technology and to seek the public's views on what course the government should take. The paper looks at three areas of concern: obtaining and banking DNA evidence and regulating laboratory work. Specific questions follow each discussion. Your responses will help the federal government to develop its policy in this new and challenging territory.

Please send your comments, by November 20, 1994, to:

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Thank you for taking part in this consultation.

I. INTRODUCTION

The most prominent application of DNA typing has been in identifying perpetrators of violent crime by comparison of biological samples of suspects against biological specimens that perpetrators have directly or indirectly left at or taken from crime scenes (e.g. semen, saliva, skin, or blood).

DNA typing, however, is useful not only in cases where the victim cannot identify the perpetrator. Since most violent crime occurs between people who are acquainted or related, it can corroborate claims of, for example, sexual abuse where there is immediate disclosure (e.g. semen in victim's vagina). In cases where the victim is pregnant or has given birth, the foetus's or child's DNA profile can be compared to the mother's and the suspect's to determine paternity. Interpretations of this sort are possible because DNA is inherited both maternally and paternally. In this same way victims can be identified from only body parts, or light can be shed on the circumstances of a disappearance by analysis of trace smears and "reverse paternity" interpretation.

"DNA typing", in the forensic context, is a generic phrase which encompasses various molecular biological techniques that can be used for identification purposes by direct analysis of specific sites on the DNA molecule. The application of DNA technology to forensics has raised some important concerns. On the one hand, there has been a demand for legislation clearly authorizing, under specific circumstances, the taking of biological samples from individuals for DNA typing comparison to crime-scene specimens. For example, the Uniform Law Conference in 1991 and again in 1993 passed resolutions calling for legislation permitting the taking of bodily substances from persons for DNA typing purposes.

On the other hand, there is clearly a need to regulate and safeguard the use of the DNA evidence obtained. For example, while the 1993 *Report of the Canadian Panel on Violence Against Women* called for the collection of "DNA evidence from all those accused of sex offences" and the creation of a "DNA data bank to help identify serial offenders," the Privacy Commissioner, in his report *Genetic Testing and Privacy* (1992), has cautioned against unwarranted or unregulated incursions on privacy by genetic technology. Legislation dealing with obtaining and banking DNA forensic evidence will have to balance these various concerns.

II. BACKGROUND

1. The Science

DNA is the acronym for a molecule called Deoxyribonucleic Acid. It has been described as the basic building block of life, the blueprint of the body. Human bodies, as well as those of animals and vegetables, consist of millions upon millions of cells. Each cell contains a nucleus, a compartment within which are 46 chromosomes, divided into 23 pairs, inherited maternally and paternally. The DNA molecule is arranged in these chromosomes and is the same in each cell, no matter what part of the body it comes from.

Each person inherits DNA on conception. The fertilized egg contains DNA inherited from the father's single fertilizing sperm and the mother's single egg. The original cell thereafter continues to divide so each cell in the body replicates the DNA from that original union, and basically the DNA stays the same from conception to death.

Although the accepted theory is that no two people have the same DNA, apart from identical twins, the present technology does not allow a scientist to look at the entire DNA chain contained in the 23 pairs of chromosomes of the cell. Nonetheless, in 1985, British scientist Alec Jeffreys determined that by examining certain sections of these chemical combinations scientists could differentiate between individuals. These sections of DNA are considered highly polymorphic (i.e. they differ greatly among individuals).

Most of the chemical combinations in the DNA are common to everyone, simply because we have much in common with each other as human beings. The highly polymorphic sections are not as common between individuals. The significance for forensics is that the more of these polymorphic sites that match (between an evidence sample and the known sample), the less likely it is that a different person contributed the evidence sample. The other significant point is that a non match at any of these polymorphic sites absolutely excludes the individual whose DNA profile is being compared to the DNA profile in the evidence sample.

2. The Forensic Application

Forensic labs worldwide began developing programs to adapt Alec Jeffreys' discovery for forensic use in their respective countries. In North America, several private labs began to offer the service to the police. The two federal police forces, the RCMP in Canada and the FBI in the United States, worked cooperatively to ready DNA typing for forensic use. The FBI began casework in 1988 and the RCMP, from their Central Forensic Laboratory in Ottawa, began routine casework analysis early in the fall of 1989. Shortly thereafter, the Centre for Forensic Science in Toronto began accepting cases, followed by the Laboratoire de police scientifique in Montreal (now Direction des expertises judiciares).

The principal DNA identification technique used in North America is called Restriction Fragment Length Polymorphism (RFLP) typing. Additional techniques are beginning to be used in casework or are being validated by forensic laboratories, principally based on an amplification procedure called Polymerase Chain Reaction (PCR).

Police forces have embraced DNA typing for the following reasons:

(a) Except for red blood cells, all cellular material in the human body can theoretically be typed: e.g. semen, blood (i.e. white blood cells), hair roots, saliva (i.e. the epithelial cells), skin, bone marrow, and bone, including mixed samples (such as different bloods).

(b) Since DNA is essentially the same from cell to cell any part of the body can be compared to another of the same body (e.g. blood to semen to hair to skin).

(c) Only minute amounts of these kinds of bodily substances are needed for the purpose of typing.

(d) The techniques can exclude suspects and, as a corollary, have the power to identify. The power to exclude is absolute. The power to include depends on the inference to be drawn from matching profiles.

The police investigator can therefore put the science to a variety of tasks:

(a) to identify a victim, e.g. where only a body part is found;

(b) to identify a victim and point to a suspect, e.g. where the DNA in a body part matches the DNA pattern in blood traces found in or on an item in the suspect's possession;

(c) to identify a suspect by substances that the perpetrator left at a crime scene. An obvious example would be semen found in the vagina of a rape victim. Less obvious would be saliva swabbed from a bite mark inflicted on a victim or skin of a suspect found under a victim's fingernails;

(d) to identify a suspect by substances the perpetrator took from the crime scene, e.g. where the DNA profile of a murder victim matches that found in blood on a suspect's clothing; and

(e) to identify serial crimes and to distinguish between serial and copycat crimes.

Courts in this country have accepted DNA typing as significant identification evidence in cases of violent crime, supported by extensive studies conducted by the United States Office of Technology Assessment (OTA, the analytical arm of the U.S. Congress) and, more recently, by the National Research Council of the United States National Academy of Sciences.

III. ISSUE - OBTAINING DNA EVIDENCE

When it is necessary to compare crime-scene specimens to a suspect, the difficult legal question of obtaining a "known bodily standard" from that person is raised.

The biological specimens realistically available from suspects for DNA comparison purposes to crime scene specimens would be (a) hair, (b) saliva (and mouth swabs), and (c) blood.

Hair

DNA technology requires the cellular material comprising the hair root, the root sheath which is obtained when hairs are plucked from the body. Hairs that have naturally fallen out may also be a source, but not a consistent one, since it depends on the amount of root sheath if any, still attached to the hairs.

Saliva and Mouth Swabs

What is of interest are the epithelial cells, the cells sloughed from the mouth, either by spitting or, preferably, by swabbing the lips, tongue and inside cheeks. This is not an entirely consistent source of typeable DNA since, for saliva, it depends on the number of cells sloughed off and, for mouth swabs, the skill of the collector.

Blood

Blood is considered to be particularly useful for DNA typing and a very limited amount is required, such as could be obtained by a finger lancet.

1. Taking a Bodily Substance as a "Known Standard" in a Criminal Investigation

Police investigators have tried various avenues to obtain a "known standard" in order to make use of DNA evidence. "Known standard" is used in this context to denote a bodily substance that is suitable for DNA typing and can be proven to have come from the suspect, against which the crime-scene specimen can be compared.

Police investigators have sought the consent of the suspect and/or have gathered substances from a suspect in circumstances where that person would no longer have "an expectation of privacy." For example, a tissue used by a suspect to wipe his nose and mouth was discarded into a waste bin and retrieved by the police and used as a "known" DNA standard. In some cases, they have plucked hair or taken buccal swabs as part of a lawful arrest, arguing the common law authority to do so.

More recently they have turned to an amendment of the *Criminal Code* (section 487.01) to attempt to obtain a warrant to seize biological specimens. This provision permits judges to issue a warrant allowing officers to use techniques that would ordinarily be considered "an unreasonable search or seizure in respect of a person or a person's property." It cautions,

though, that such a warrant does not permit "interference with the bodily integrity of any person."

With the increasing availability of DNA technology for criminal investigations, there has been a growing demand from the courts, police officers, lawyers, interest groups, and the press for clear procedures for obtaining biological samples from suspects and rules delineating the circumstances under which they may be taken.

- Should Parliament legislate a separate and specific procedure to permit the seizure of biological samples during the course of a criminal investigation?
- If so, what biological samples should be covered?
- What justification should be required?
- What other conditions should apply?

2. Taking a Bodily Substance as a "Known Standard" on Conviction

Another aspect of this issue involves the taking of a biological sample from a specified class or classes of convicted offenders for subsequent DNA identification purposes. Such a procedure would involve the concept of banking DNA evidence for forensic application and will be discussed in that context.

IV. ISSUE - BANKING DNA EVIDENCE

The phrase "DNA evidence banking" is used here to denote both DNA banking and DNA data banking. DNA banking refers to the storage and use of the bodily substances obtained, while DNA data banking refers to the storage and dissemination of the information derived from these bodily substances.

1. The Framework

The idea of banking information for future criminal investigations is not new - for instance, it has been done with fingerprinting under the *Identification of Criminals Act*. Even for DNA typing there are precedents. In the United States, as of December 31, 1993, 21 states had enacted legislation, of varying breadth (see Appendix A), and 7 more have introduced bills. As well, the FBI has created a national DNA data banking system known as CODIS (Combined DNA Index System). This system is operating at the pilot stage, with 14 state laboratories involved (see Appendix B). The British Royal Commission on Criminal Justice has recommended, as part of a broad list of sweeping changes, the creation of DNA data banks, and Australia is studying the concept.

The American National Academy of Science, noting the analogy to the latent fingerprint system, commented that the present forensic use of DNA typing is "only the tip of the iceberg":

> If DNA profiles of samples from a population were stored in computer databanks (databases), DNA typing could be applied in crimes without suspects. Investigators could compare DNA profiles of biological evidence samples with a databank to search for suspects.

Likewise, the British Royal Commission pointed out that a databank

> would also enable unsolved earlier offences where DNA evidence had been found but not linked with the offender to be cleared up if DNA samples taken from a suspect in connection with a later offence matched the evidence found at the scene of the earlier crime.

The identification of the perpetrator/suspect is not the only benefit, however. Previously unidentified bodies might also be identified using such a system, since a data bank could contain DNA profiles of unidentified bodies and body parts.

The CODIS program is divided into three main indices, which provide useful classifications for considering the issue.

(a) Forensic Index

This would relate to the DNA evidence obtained from the scene of an unsolved crime (e.g. semen, hair, blood, saliva, skin). It could also temporarily include the DNA evidence derived from sampling a known suspect of that crime. It would then be possible to determine whether that person had been involved in any unsolved crimes that are indexed.

(b) Convicted Offender Index

This would include the DNA identification profiles derived from bodily substances taken from persons convicted of certain kinds of offences, whether or not DNA evidence was relevant to the particular offence for which that person was convicted. Subsequently, should a crime-scene specimen DNA profile match a profile in the forensic index , the police could then apply for a warrant to obtain a "known standard" from that person for direct comparison and use in any judicial proceedings.

What kind of offences should trigger such authority upon conviction? Two considerations should be kept in mind. First, the types of crimes most relevant to DNA typing are those where bodily substances tend to be left at the crime scene and where the identification of the perpetrator is in question. Secondly, the banking of DNA evidence is based on the likelihood that certain kinds of offenders tend to re-offend.

The consistent element in the various U.S. State Legislative classifications is that they target sexual offenders. Consensus ends there, however. One U.S. jurisdiction has included all felony offenders, whether or not the person was convicted of a crime of violence. The recent British Royal Commission Report on Criminal Justice recommended taking bodily substances "without consent from all those arrested for serious criminal offences, whether or not DNA evidence is relevant to the particular offence" and that "the relevant DNA data or samples would be retained for subsequent use if the person is convicted." Reasons given to justify widening the net of convicted offenders range from administrative convenience (Virginia) to propensity to commit other crimes (British Royal Commission).

(c) Missing Persons Index

This index would contain genetic profiles of unidentified bodies or body parts. It could be searched against profiles of parents, siblings or relatives in the hope of making an identification.

2. Privacy

Any legislative scheme would have to take into account concerns over privacy.

According to former Chief Justice Dickson (in *Hunter* v. *Southam Inc.*), the right to a reasonable expectation of privacy

> indicates that an assessment must be made as to whether in a particular situation the public's interest in being left alone by government must give way to the government's interest in intruding on the individual's privacy in order to advance its goals, notably those of law enforcement.

DNA typing technology, by its very nature, creates privacy concerns not relevant in other forms of forensic identification, such as fingerprinting. The Privacy Commissioner of Canada discussed the question in his 1992 report, *Genetic Testing and Privacy*:

> There may be proper uses for personal genetic databases where crimes of serious violence are involved. Databases, however, should continue to be used only for identification. RFLP analysis should continue to be structured to avoid disclosing genetic characteristics beyond those needed for identification. Future techniques for identification through genetic analysis should similarly avoid collecting information other than that needed for identification. Furthermore, not every form of criminal activity would warrant including a criminal's DNA profile in a genetic database. Databases should be considered only for persons who have been convicted of crimes involving serious violence.

Noting that further study is needed, the Privacy Commissioner recommended that:

> Genetic databases containing identification information about persons convicted of crimes involving serious violence should not be assembled for criminal investigations or prosecutions without
>
> (a) further study of the privacy and other human rights implications and
>
> (b) specific authorizing legislation, if the study finds the database to be acceptable.
>
> If genetic databases are to be found acceptable, they should be used only for identification. The information contained in a genetic database and any genetic samples related to the crime should not be used to try to identify other characteristics that may have a genetic link, such as personality.

The *sine qua non* of forensic DNA typing is that the techniques are designed and used for identification only. Privacy concerns in this area generally are less about using the technology for identification purposes in crime detection, than about using this information for more than crime detection or using the technology for purposes other than identification.

It would be appropriate, then, to discuss these concerns in the context of the two components of DNA evidence banking - DNA Banking and DNA Data Banking.

As mentioned earlier, DNA Banking refers to the use and retention of the bodily specimens taken for DNA typing from suspects in the course of a criminal investigation or from convicted offenders under any future legislation. Two basic issues arise in this context:

(a) What measures can be taken to ensure that only identification information is derived from the sample? and

(b) Is there a need to retain the actual samples after the identification information is recorded?

We know that DNA technology can identify genetic traits and trace inheritable diseases. One suggested legislative scheme for preventing the unauthorized use of the technology (i.e. for purposes other than forensic identification) would identify the purpose behind the tests in the enabling legislation. An FBI study proposed that legislation should

> specify that tests to be performed on the ... samples are: (1) to analyze and type the genetic markers contained in or derived from DNA; (2) for law enforcement identification purposes; (3) for research or administrative purposes, including: (a) development of a population statistics data base, when personal identifying information is removed; (b) to support identification research and protocol development of forensic DNA analysis methods; (c) for quality control purposes; and, (4) to assist in the recovery or identification of human remains from mass-disasters or for other humanitarian purposes, including identification of living persons.

On the question of retaining a biological sample once it has been typed for banking purposes, the present state of the science and resulting technology would appear to impose special needs. It is true that retaining a sample could lead to misuse. However, as the U.S. National Research Council pointed out:

> there is a practical reason to retain DNA samples for short periods. Because DNA technology is changing so rapidly, we expect the profiles produced with today's methods to be incompatible with tomorrow's methods. Accordingly, today's profiles will need to be discarded and replaced with profiles based on the successor methods. It would be extremely expensive and inefficient to have to redraw blood samples for retyping.... As databanks become established and technology stabilizes somewhat, samples should be destroyed promptly after typing.

On the other hand, the Privacy Commissioner has stressed that

> a strict time limit should be placed on retaining personal genetic information (including samples).... If information is allowed to be kept for extended periods under exceptional circumstances, extraordinary care must be taken to ensure that it is used only for purposes for which it was collected or for a consistent purpose.

The second aspect of DNA evidence banking is DNA Data Banking, that is, the storage and dissemination of the DNA typing identification information derived from testing the samples. The obvious privacy concern here is to ensure that this information is only released to and used by those it was originally gathered for.

Although the *Privacy Act* does have general provisions addressing the question of disclosure of personal information, the Privacy Commissioner has expressed strong reservations about its effectiveness in dealing with new biotechnologies. One legislative approach in the U.S. has been, as it would pertain to forensic DNA typing and data banking, to provide penalties for wilful violation, in addition to identifying the purpose in the enabling legislation.

Linked to these privacy concerns is the concern that samples must be destroyed and the data expunged should the person from whom it was taken not be convicted or should the conviction be overturned.

3. Economic, Scientific and Technological Considerations

The development of any national DNA evidence banking scheme would obviously involve more than legal issues. The scientific and technological capabilities of forensic DNA typing would play a part in shaping any legislation, as would cost.

Consideration needs to be given to the following issues in particular.

(a) The ability of the forensic labs to bank DNA evidence on a national level.

(b) The abilities of such a national system to share DNA identification information with foreign jurisdictions (e.g. United States and Britain), since the systems must be compatible.

(c) Sample handling and storage requirements.

(d) The type of identifying information to be stored and linked. For example, would a link between the collection of fingerprints and DNA samples from convicted offenders be necessary for identification, control and information storage purposes.

(e) The computer hardware and software requirements including the ability to protect data and to expunge data.

(f) The capital and operating costs.

- Should Parliament legislate the creation of a forensic DNA evidence bank?
- If so, what biological samples should be included?
- From what class of convicted offenders should samples be taken (i.e. for what kinds of offences)?
- What safeguards should be provided?

V. ISSUE - LABORATORY REGULATION

The discussion of obtaining and retaining biological samples for present or future criminal investigations leads to the issue of laboratory regulation. The U.S. National Research Council observed that "it is not uncommon for an emerging technology to go without regulation until its importance and applicability are established" and that this was the case for DNA typing technology. The Council noted the special circumstances of forensic laboratories:

> forensic scientists have little or no control over the nature, condition, form, or amount of sample with which they must work. But it is now clear that DNA analytic methods are a most powerful adjunct to forensic science for personal identification and have immense benefit to the public -- so powerful, so complex, and so important that some degree of standardization of laboratory procedures is necessary to assure the courts of high-quality results.

Unlike the United States, which has many public and private laboratories operating in the forensic DNA field, Canada has only a few public labs - RCMP, Centre of Forensic Science and Directions des expertises judiciares - and even fewer private labs. Nonetheless, the question of regulation might best be addressed while the situation is still relatively simple.

- Should Parliament legislate accreditation or licensing requirements for laboratories involved in forensic DNA typing?
- If so, what approach should be taken?

APPENDIX A

SUMMARIES OF U.S. DNA DATABANKING STATUTES*

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STATE STATUTES CONCERNING DNA DATABANKS

(as of November 11, 1993)

ARIZONA *[Arizona Revised Statutes Annotated § 31-281 (effective 1990)]*

Requires a person convicted of specified sexual offences [i.e. sexual abuse (felony); sexual conduct with a minor (felony); sexual assault (felony); molestation of a child (felony); crime against nature (misdemeanor); lewd and lascivious acts (misdemeanor); incest (felony)] to submit to DNA testing for purposes of law enforcement identification. The Department of Public Safety is responsible for maintaining files of the test results in its databank.

CALIFORNIA *[California Penal Code § 290.2 (effective 1990)]*

Requires any person convicted of committing or attempting to commit a specified felony offence (i.e. rape; rape or penetration with a foreign object; incest; sodomy; lewd or lascivious acts with a child under 14 years of age; oral copulation), felony murder, specified felony assault and battery offence (i.e. assault on public figures; sexual battery; battery; battery against transportation personnel or passengers; battery against jurors; assault with caustic chemicals; assault with deadly weapon or force likely to produce great bodily injury), or any person committed as a mentally disordered sex offender to provide blood and saliva samples for DNA analysis as a condition of probation, parole or other release. The Department of Justice DNA Laboratory is to provide equipment and instructions for the collection of samples, analysis of samples and maintain records of the results in its databank. DNA test results are discoverable by defence counsel. Unauthorized dissemination of test results constitutes a misdemeanor.

COLORADO *[Colorado Revised Statutes § 17-2-201 (effective 1990)]*

Mandates, as a condition of parole, DNA typing of any person convicted of an offence for which the factual basis involved a specific criminal sexual assault (i.e. patterns of sexual abuse; sexual contact; sexual intrusion; sexual penetration). The results of the typing are retained in a databank maintained by the Colorado Bureau of Investigation to be furnished to any state law enforcement agency upon request.

FLORIDA *[Florida Statutes Annotated § 943.325 (effective 1990)]*

Provides that all individuals convicted of any offence or attempt of an offence relating to sexual battery or lewd and lascivious behaviour must submit a blood sample for DNA typing to be included in the state databank. The Florida Department of Law Enforcement is responsible for administering the program and the databank. Records associated with DNA analysis are exempt from public records laws.

GEORGIA *[Code of Georgia § 24-4-60 (effective 1992)]*

Authorizes the collection of blood samples from persons convicted of certain sex offences (i.e. rape; sodomy; statutory rape; enticing a child for indecent purposes; incest; bestiality; necrophilia; sexual assault against persons in custody or those detained in a hospital or other institution) for DNA analysis and entry into a state DNA databank. The Georgia Bureau of Investigation is responsible for the testing program and databank, but may contract with individuals or organizations for services to perform the sample analysis. The results of the analysis and access to the databank shall be made available to law enforcement officials, upon request, for purposes of a criminal investigation. The Bureau of Investigation must develop procedures governing access to the databank.

HAWAII *[Hawaii Revised Statutes Annotated § 706-603 (effective 1992)]*

Mandates that persons convicted of certain offences, including attempts (i.e. first and second degree murder; promoting child abuse in the first degree; incest; sexual assault) must provide a sample of saliva and two samples of blood for DNA analysis. Directs the Hawaii Criminal Justice Data Center to establish a DNA databank to be used for law enforcement purposes.

ILLINOIS *[Illinois Revised Statutes Chapter § 38-1005-4-3 (effective 1990)]*

Requires the persons listed below to provide blood and saliva specimens to the Illinois Department of State Police for DNA analysis and entry into a DNA databank.

- any person convicted of or receiving court supervision for a specified offence on or after the effective date (i.e. sexual relations within families; sexual abuse; criminal sexual assault; aggravated sexual abuse sex);
- any person ordered institutionalized as a sexually dangerous person;
- any person convicted of a sexual offence before the effective date and presently incarcerated in any state correctional facility or county jail, or presently on probation or conditional discharge for a specified offence (as noted above); or
- any person presently institutionalized as a sexually dangerous person found guilty of committing or attempting to commit a sexual offence but determined to be mentally ill.

IOWA *[Iowa Code Annotated § 13.10 (effective 1990)]*

Directs the attorney general, in consultation with the Division of Criminal Investigation, to specify felonies and misdemeanors which shall require the offender to submit a specimen for DNA profiling as a condition of probation, parole, or work release.

Upon appropriation or receipt of sufficient funds, the Division of Criminal Investigation shall carry out DNA profiling of submitted specimens. The Division may contract with private entities for DNA profiling.

KANSAS *[1991 Kansas Laws Chapter 92 (Senate Bill Number 329)]*

Requires those persons listed below to submit specimens of blood and saliva for DNA analysis.

- any felon convicted of a specified sex offence or attempt of such act (i.e. forcible sexual intercourse; sodomy; unlawful sexual act);
- any felon convicted of a specified violation (i.e. first degree murder; voluntary manslaughter; child abuse);
- any person ordered institutionalized as a result of being convicted of a specified sex offence, as noted above;
- any felon convicted of a specified violation before the effective date and presently incarcerated in any states correctional facility or country jail.

Provides that the Kansas Bureau of Investigation shall be the central repository for the DNA information and shall establish a databank to be used for law enforcement purposes.

KENTUCKY *[Kentucky Revised Statutes § 17:170 and 17:175 (effective 1992)]*

Directs that any person convicted of felon murder or specified felony sex offences (i.e. rape; sodomy; sexual abuse; incest; indecent exposure) may have a sample of blood taken by the Department of Correction for DNA law enforcement identification purposes and inclusion in a law enforcement identification databank. Requires any person in the custody of the corrections department as a result of commission of one of the specified offences on the effective date to submit a DNA sample.

A centralized databank of DNA identification records for convicted criminals, crime scene specimens, missing persons and close biological relative of missing persons shall be established by the Department of State Police. The established system shall be compatible with the procedures set forth in a national DNA identification index to ensure data exchange on a national level. Provides for the expungement of records upon a reversal and dismissal of a conviction. Any persons who disseminates, receives or otherwise uses or attempts to use information in the databank is guilty of a Class A misdemeanor.

MICHIGAN *[Michigan Compiled Laws Annotated § 750.520m (effective 1991)]*

Provides that persons convicted of a specified violation or an attempted specified violation (i.e. first degree criminal sexual conduct; second degree criminal sexual conduct; second or subsequent offences of criminal sexual conduct; assault with a threat to commit criminal sexual conduct) must submit blood samples for DNA identification profiling and samples of saliva for a determination of secretor status, unless the investigation law enforcement agency or the state police already have a sample on file for that person.

The investigating law enforcement agency has agency has responsibility for collecting samples and the State Police for analysis and preservation of profiles. The State Police will promulgate rules regarding the collection of samples, distribution of equipment and instructions, storage and transmission of samples, computerization of files and protection of privacy interests. The State Police will also work with the FBI to develop DNA identification capabilities at the State Police Crime Laboratories. The Governor is also to appoint a DNA Advisory Committee.

MINNESOTA *[Minnesota Statutes Annotated § 609.3461 and 299C.155 (effective 1990)]*

Requires the following persons to submit to DNA analysis testing:

- any person convicted of actual or attempted criminal sexual conduct in the first, second, third, or fourth degree;

- any person sentenced as a patterned sex offender, which is defined as one whose criminal sexual behaviour is so ingrained that the risk of reoffending is great without psychotherapeutic intervention or other long-term controls;

- any person adjudicated by the juvenile court for actual or attempted criminal sexual conduct in the first, second, third or fourth degree;

- any person presently in custody and convicted of actual or attempted criminal sexual conduct in the first, second, third, or fourth degree or sentenced as a patterned sex offender, and who has not previously provided a sample, must do so before release from the custody of the Commissioner of Corrections.

The Commissioner of Corrections or local correction authority may order persons to provide specimens for analysis before completion of the term of imprisonment. Section 609.3461 authorizes the State Bureau of Criminal Apprehension to adopt uniform procedures and protocols to maintain, preserve, and analyze human biological specimens for DNA and to develop a centralized system to cross-reference data obtained from DNA analysis.

MISSOURI *[Missouri Statutes Annotated § 650.050 et.seq. (effective 1991)]*

Requires any person convicted of a violent felon offence (i.e. murder; voluntary manslaughter, involuntary manslaughter) or a felony sex offence (i.e. rape; sexual abuse; sodomy) to provide a blood sample for DNA analysis. The results of such test must be forwarded to the State Police for storage in a databank.

NEVADA *[Nevada Revised Statutes § 176.111 (effective 1990)]*

Authorizes courts to order persons convicted of sexual offences (i.e. sexual assault defined as sexual penetration against a person's will or when the victim is incapable of resisting; statutory sexual assault; promotion of a sexual performance of a minor; incest; lewdness with a child) to submit to DNA testing of blood and saliva. Test results are submitted to the Central Repository for Nevada Records of Criminal History. DNA test results are admissible in evidence to prove parentage or to prove the identify of a person involved in a criminal or civil action. Expert opinion may be weighed against evidence of statistical probabilities of identification or relationship.

NORTH CAROLINA *[Chapter 401, House Bill 1050 (Effective December 1, 1993)]*

Mandates that persons convicted on or July 1, 1994, of certain serious crimes (murder; rape, sexual offence; malicious castration, castration or other maiming; malicious maiming, malicious throwing of corrosive acid or alkali; malicious assault in a secret manner; felonious assault with deadly weapon with intent to kill; assaults on handicapped persons; discharging weapon into occupied property; assault with firearm or other deadly weapon upon law enforcement officer, firearm, or EMS personnel; kidnapping for the purpose of doing serious bodily harm to persons; malicious use of explosive of incendiary; burning of mobile home, manufactured-type house or recreational trail home; taking indecent liberties with children; robbery with a dangerous weapon; stalking; common law robbery; and first degree arson) provide a DNA sample for inclusion in a DNA databank for law enforcement purposes.

OKLAHOMA *[Oklahoma Statutes Annotated § 57.584 (effective 1991)]*

Requires persons convicted of incest, sodomy, indecent exposure, child pornography, consent of parent or guardian to child pornography, lewd acts towards children, child prostitution, inducing children to prostitution, first and second degree rape, lewd proposals towards children, to submit blood for DNA analysis for inclusion in a central registry.

OREGON *[Oregon Revised Statutes § 181.085 and 137.076 (effective 1991)]*

Mandates any person convicted of certain sex offences (i.e. rape; sodomy; unlawful sexual penetration, sexual abuse; public indecency; incest; using a child in a display sexually

explicit conduct); burglary with intent to commit a sex offence; promoting or compelling prostitution, or convicted of a conspiracy or attempt of those offences or any person convicted of murder or aggravated murder to submit a blood sample for DNA analysis. Also requires any juvenile who commits aggravated murder, murder or any felony sex offences to submit blood for DNA analysis. Directs that the samples be forwarded to the Oregon State Police for entry into a databank.

SOUTH DAKOTA *[South Dakota Codified Law Annotated § 23-5-14 et. seq. (effective 1990)]*

Makes the attorney general responsible for processing and filing genetic marker grouping analysis information for persons arrested and convicted of sex offences. Law enforcement officials, upon arresting a person for a specified sex offence (i.e. rape; sexual contact with a child; incest; sexual exploitation of children; possession of child pornography), are required to arrange for the collection of blood and saliva specimens for testing. Persons convicted of sex offences before July 1, 1990, are required to produce specimens for testing prior to release from judicial supervision. The Division of Criminal Investigation is responsible for providing equipment and instructions necessary for collection of specimens. The attorney general is responsible for promulgating rules for the form and the manner of collecting specimens. Testimony results are confidential information. Costs of collection are initially borne by the collecting county, but will be reimbursed by the office of the attorney general. Such costs are to be repaid by a convicted defendant.

TENNESSEE *[Tennessee Code Annotated § 38-6-113 and 40-35-321 (effective 1991)]*

Authorizes the collection of human biological specimens for DNA analysis from persons convicted of committing or attempting to commit a specified sexual offence (i.e. incest; rape; unlawful sexual penetration; aggravated sexual battery).

Directs the Tennessee Bureau of Investigation to develop uniform procedures for the collection and preservation of such specimens and authorizes it to create a DNA databank for law enforcement purposes. Provides the law enforcement officials may have access to the DNA data in connection with criminal investigations and the district attorney may have access to the DNA data for any subsequent criminal prosecution of the subject.

VIRGINIA *[Code of Virginia § 19.2-310.2 et seq. (effective 1990)]*

Authorizes the collection of blood samples, for forensic DNA analysis, from every person convicted of a felony on or after the effective date, and any person convicted of a specified felony offence (i.e. rape; criminal sexual assault; attempt to commit rape) prior to the effective date and presently incarcerated.

Provides for DNA analysis procedures and maintenance of samples at a data bank with the Bureau of Forensic Science. The statute also provides for criminal penalties for

unauthorized data bank use and dissemination, and expungement for data records when a conviction has been overturned and case dismissed [See Code of Virginia 19.2-310.2 et. seq.].

WASHINGTON *[Revised Code of Washington § 43.43.752 and 43.43754 (effective 1990)]*

Provides that, after the effective date, any person convicted of a felony defined as a sex offence (i.e. rape; rape of a child; child molestation; indecent liberties; sexual misconduct with a minor) or a violent offence (i.e. first and second degree manslaughter; first and second degree kidnapping, first and second degree arson; first and second degree assault; first and second degree robbery; vehicular manslaughter while under the influence of drugs or alcohol) or any criminal attempts, solicitation, or conspiracy to commit such offences, must submit to DNA identification analysis.

The state patrol office maintains the state databank. No local law enforcement agency could establish or operate a DNA identification system before July 1, 1990, unless: the equipment of the local system is compatible with the state system; the local system is equipped to receive and answer inquiries from the Washington state patrol DNA identification system; and the procedures and rules for the collection, analysis, storage, expungement and use of DNA identification data do not conflict with procedures and rules applicable to the state patrol DNA identification system.

WISCONSIN *[Wisconsin Act 16 § 3855 and 973.047 (effective 1993)]*

Requires all defendants, including juveniles, convicted of sexual assault to submit a DNA sample to the state crime laboratory for forensic DNA analysis. Further, provides that persons convicted of specified crimes [i.e. sex crimes without consent, crimes against children, crime against bodily life and security (homicide, battery), burglary] may, at the judge's discretion, but ordered to submit a sample. Provides that any person incarcerated or on probation or parole as of the effective date of the statute, for first degree or second degree sexual assault or sexual assault of a child will be added to the databank by July 1, 1998.

APPENDIX B

LEADS GENERATED BY U.S. DNA DATABANKS*

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LEADS GENERATED BY U.S. DNA DATABANKS

The first case solved in the United States by searching convicted offender DNA records through a DNA databank was a rape/murder that occurred in Minnesota in 1991. The DNA sample from the semen found at the crime scene was searched against the nearly 1,200 convicted offender DNA records on file at the Minnesota Bureau of Criminal Apprehension. A match was made which led to the identification of a possible suspect. That suspect was later arrested and subsequently convicted of rape and homicide. The second case, also in Minnesota, involved a rape case without any suspects. A search of the convicted offenders' DNA records at the Minnesota Bureau of Criminal Apprehension resulted in a match and the identification of a possible suspect. The suspect has since been arrested for sexual assault and is now awaiting trial.

A third case involved the rape of a woman and the murder of her husband. In this case, DNA testing eliminated two suspects initially identified by the police. And in April 1993, the Illinois State Police, using CODIS software, discovered a DNA match from among its 500 convicted offender DNA records with the DNA evidence left at the crime scene. This DNA match led to the eventual arrest and indictment of the suspect.

The state of Virginia recently made its first DNA database match in a case in which a 63-year-old woman had been raped by a man who broke into her home in January 1993. The DNA samples taken from the crime scene were matched with a DNA sample in Virginia's three-year-old DNA databank. In August 1993, the Virginia Division of Forensic Science informed police that it had a match between the crime scene samples and a sample in the DNA databank. Police were unable to locate the suspect until October 15, 1993, when police arrested him on unrelated drug charges. The suspect has been charged with rape, burglary with intent to rape and attempted sodomy. The suspect's DNA sample had been taken while he was serving an 18-year sentence for a 1979 rape.

The capabilities provided by the DNA databanks now in existence have both solved and linked cases. For example, the Metro-Dade County Police Department (Miami, Florida) solved an unknown suspect rape case by linking the DNA crime scene evidence from their case to the DNA evidence from another rape already solved by police. The suspect pled guilty to both crimes.

In Reno, Nevada, the Washoe County Sheriff's Department linked three rape cases to the same individual, two of which were cases where no suspect had been identified. And the Minnesota Bureau of Criminal Apprehension, through routine analysis of crime scene evidence, linked 18 unknown suspect serial rape cases together. Two suspects initially arrested were eliminated by DNA testing. Subsequently, two other suspects were apprehended by police and their DNA was found to match the crime scene DNA specimens. These two suspects are currently awaiting trial on rape charges.

At the Florida Department of Law Enforcement, a DNA profile from a south Florida case with no suspect was searched against the convicted offender DNA index and no matches were found. However, this DNA profile was compared against the DNA records from other unknown suspect cases in Florida and matched another south Florida case. This information was forwarded to investigators who are now pursuing these leads.

APPENDIX C

SELECTED REFERENCES

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I INTRODUCTION

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