

No. 09-10303

**UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT**

UNITED STATES OF AMERICA,

Plaintiff-Appellee,

v.

JERRY ARBERT POOL,

Defendant-Appellant.

Appeal from the United States District Court
for the Eastern District of California
in Case No. 2:09-cr-00015-EJG (Hon. Edward J. Garcia)

**BRIEF OF *AMICUS CURIAE* ELECTRONIC PRIVACY
INFORMATION CENTER (EPIC) IN SUPPORT OF APPELLANT
AND URGING REVERSAL**

Marc Rotenberg
Counsel of Record
John Verdi
Sharon Goott Nissim
Electronic Privacy
Information Center (EPIC)
1718 Connecticut Ave. NW,
Suite 200
Washington, DC 20009
(202) 483-1140
Attorneys for Amicus Curiae

July 25, 2011

CORPORATE DISCLOSURE STATEMENT

Pursuant to Fed. R. App. P. 26.1 and 29(c), *Amicus Curiae* Electronic Privacy Information Center ("EPIC") is a District of Columbia corporation with no parent corporation. No publicly held company owns 10% or more of EPIC stock.

TABLE OF CONTENTS

CORPORATE DISCLOSURE STATEMENT	i
TABLE OF CONTENTS	ii
TABLE OF AUTHORITIES	iv
INTEREST OF AMICUS CURIAE.....	1
ARGUMENT.....	5
I. The CODIS Database Contains Detailed Personal Information About Individuals; the Database has Expanded and Become More Widely Used Over Time.....	5
II. DNA Identification is not the Functional Equivalent of Fingerprint Identification	9
A. The Thirteen Noncoding CODIS Loci Contain Substantially More Information than Fingerprints.....	10
1. Noncoding DNA is Not "Junk DNA"	10
2. The Thirteen CODIS Loci Can Identify an Individual's Race, Ethnicity, and Heritage	14
3. Government DNA Profiles Enable Familial Searches and Result in the Identification of Family Members	17
B. The Government Collects and Retains Full DNA Sequences, which Contain Substantially More Information than Fingerprints	24
III. DNA Samples can be Reanalyzed for Non-Law Enforcement Purposes.....	28
A. Federal Entities Use DNA for Non-Law Enforcement Purposes	29

B. State Entities Use DNA for Non-Law Enforcement Purposes	33
CONCLUSION.....	35
CERTIFICATE OF COMPLIANCE.....	36
CERTIFICATE OF SERVICE	37

TABLE OF AUTHORITIES

Cases

S. v. United Kingdom, App. No. 30562/04 (Eur. Ct. H.R. Dec. 4, 2008) 16

Statutes

42 U.S.C. § 14135a (2011)	8, 26
44 Pa. Cons. Stat. § 2319 (2010)	34
73 Fed. Reg. 74,932, 74,935 (Dec. 10, 2008)	8
Ala. Code 975 § 36-18-20 (2009)	34
Ark. Code. Ann. § 12-12-1018 (2010)	34
H.R. Rep. 106-900(I) at 52 (Sept. 26, 2001)	27
Iowa Code § 81.3 (2009)	34
La. Rev. Stat. Ann. § 15:612 (2009)	34
Mass. Gen Laws. ch. 22E. § 10 (2009)	34
Md. Code Ann., Pub. Safety § 2-505 (2010)	34
Me. Rev. Stat. Ann. tit., 25 § 1577 (2009)	34
Mich. Comp. Laws § 28.176 (2010)	34
Mo. Rev. Stat. § 650.052 (2009)	34
Mont. Code Ann. § 44-6-102 (2009)	34
N.C. Gen. Stat. § 15A-266.8 (2009)	34
N.J. Stat. Ann. § 53:1-20.24 (2009)	34

N.M. Stat. § 29-16-8 (2009) 34
 Neb. Rev. Stat. § 29-4105 (2009)..... 34
 S.C. Code Ann. § 23-3-640 (2010) 34
 Wyo. Stat. Ann. § 7-19-402 (2010) 34

Other Authorities

Dep't of Homeland Sec., *DNA Testing for Immigration Benefits* (Sept. 28, 2009) 31
 Anita LaFrance Allen, *Genetic Testing, Nature, and Trust*, 27 Seton Hall L. Rev. 887 (1997)..... 10
 B. A. Malyarchuk, M. Wozniak, et al., *Variation of 15 Autosomal Microsatellite DNA Loci in the Russian Population*, 41 Molecular Biology 1 (2007)..... 15
 Christopher G. Beevers, et al., *Association of the Serotonin Transporter Gene Promoter Region (5-HTTLPR) Polymorphism with Biased Attention for Emotional Stimuli*, 118 J. Abnormal Psychol. 431 (2009) 26
Citizenship and Immigration Services Ombudsman Annual Report 2009, Department of Homeland Security (June 30, 2009) 30
 Comm. on DNA Tech. in Forensic Science of the Nat'l Acad. of Science, *DNA Technology in Forensic Science* 122 (Nat'l Acad. Press 1992).... 29
 Ctrs. for Disease Control and Prevention, *Genetic Testing* (May 17, 2011) 25
 Dante Cicchetti, et. al., *Interaction of Child Maltreatment and 5-HTT Polymorphisms: Suicidal Ideation among Children from low-SES Backgrounds*, 35 J. Pediatr. Psychol. 536 (2010) 26
 Dep't of Homeland Sec., *TSA Testing DNA? No Way!*, (Feb. 2, 2011) ... 31

Department of Homeland Security, *Human Factors/Behavior Science Projects* 31

Donald E. Shelton, *Forensic Science in Court* (2011) 19

Elisa Piere & Mairi Levitt, *Risky Individuals and the Politics of Genetic Research Into Aggressiveness and Violence*, 22 *Bioethics* 457 (2008) . 27

Elizabeth E. Joh, *Reclaiming ‘Abandoned’ DNA: The Fourth Amendment and Genetic Privacy*, 100 *NW. U. L. Rev.* 857 (2006) 25, 27

Emily C. Barbour, *DNA Databanking: Selected Fourth Amendment Issues and Analysis*, CRS Report R41847, Congressional Research Service (June 6, 2011)..... 19

Erin E. Murphy, *Relative Doubt: Familial Searches of DNA Databases*, 109 *Mich. L. Rev.* 291 (2010)..... 19, 21, 22, 23

Essentially Yours: The Protection of Human Genetic Information in Australia (2003) 17

FBI Laboratory Services, *Familial Searching*..... 18

FBI, U.S. Dep’t of Justice, *The FBI’s Combined DNA Index System Program Brochure* (July 2010)..... 7

Federal Bureau of Investigation, "Quality Assurance Standards for DNA Databasing Laboratories" 24

Federal Bureau of Investigation, *CODIS—The Future*..... 9, 14

Frequently Asked Questions (FAQs) on the CODIS Program and the National DNA Index System 5, 6, 8, 20, 21

Grimes EA, Noake PJ., Dixon L, et al., *Sequence polymorphism in the human melanocortin 1 receptor gene as an indicator of the red hair phenotype*, 122 *Forensic Sci. Int’l* 124 (2001) 13

Harrison Wein, *How Junk DNA Affects Heart Disease*, NIH Research Matters (Mar. 1 2010)..... 12, 14

Information Bulletin from Edmund G. Brown, Jr., Attorney General, DNA Partial Match (Crime Scene DNA Profile to Offender) Policy No. 2008-BFS-01 (2008) 23

James Dinkins, *Privacy Impact Assessment for the Enforcement Integrated Database*, Dep't of Homeland Sec. (Jan. 14, 2010) 32, 33

Jessica D. Gabel, *Probable Cause From Probable Bonds: A Genetic Tattle Tale Based on Familial DNA*, 21 Hastings Women's L.J. (2010) 20

Jill S. Barnholtz-Sloan, Ranajit Chakraborty, et al., *Examining Population Stratification via Individual Ancestry Estimates versus Self-Reported Race*, 14 Cancer Epidemiology Biomarkers and Prevention 1545 (2005)..... 16

John D. H. Stead, Jerome Buard, et al., *Influence of Allele Lineage on the Role of the Insulin Minisatellite in Susceptibility to Type 1 Diabetes*, 9 Hum. Molecular Genetics 2929 (2000) 13

Matthew Graydon, François Cholette, et al., *Inferring ethnicity using 15 autosomal STR loci—Comparisons Among Populations of Similar and Distinctly Different Physical Traits*, 3 Forensic Sci. Int'l: Genetics 251 (2009) 16

Maura Dolan & Jason Felch, *Tracing a Suspect Through a Relative*, L.A. Times, Nov. 25, 2008 21

Mickey McCarter, *Homeland Security Considering Portable, Instant DNA Scanners*, Fox News (March 4, 2011)..... 30, 31

Nat'l Conference of State Legislatures, *State Laws on DNA Data Banks: Qualifying Offenses, Others Who Must Provide Sample* (Feb. 2010) 8

Nat'l Human Genome Research Inst., <i>New Findings Challenge Established Views on Human Genome</i> (June 2007).....	11
Nat'l Inst. for Justice, Office of Justice Programs, U.S. Dep't of Justice, <i>NIJ Special Report: Making Sense of DNA Backlogs, 2010—Myths vs. Reality 2</i> (Feb. 2011).....	6
Nat'l Inst. of Justice, Office of Justice Programs, U.S. Dep't of Justice, <i>NIJ Special Report: Using DNA to Solve Cold Cases</i> (July 2002).....	6, 7
Nat'l Insts. of Health ENCODE Project Consortium, <i>Identification and analysis of functional elements in 1% of the human genome by the ENCODE pilot project</i> , 447 <i>Nature</i> (2007)	11
National Commission for the Future of DNA Evidence, National Institute of Justice, U.S. Dep't of Justice, <i>The Future of Forensic DNA Testing: Predictions of the Research and Development Working Group</i> , NCJ 183697 (Nov. 2000).....	29
NIH Research Matters, <i>DNA Terrain Affects Function in Human Genome</i> (Mar. 23, 2009).....	14
S.P. Myers, et al., <i>Searching for first-degree familial relationships in California's offender DNA database: Validation of a likelihood ratio-based approach</i> , <i>Forensic Sci. Int. Genet.</i> (2010).....	17
Scientific Working Group on DNA Analysis Methods Ad Hoc Committee on Partial Matches" <i>SWGDM Recommendations to the FBI Director on the "Interim Plan for the Release of Information in the Event of a 'Partial Match' at NDIS,</i> " 11 <i>Forensic Sci. Comm.</i> 4 (Oct. 2009)	23
Sheldon Krinsky & Tania Simoncelli, <i>Genetic Justice</i> (2011)....	9, 10, 11, 12, 13, 25
Tara O'Toole, <i>Under Secretary Tara O'Toole, Science and Technology Directorate, Before the House Committee on Appropriates,</i>	

Subcommittee on Homeland Security, "S&T Fiscal Year 2012 Budget Request," Dep't of Homeland Sec. (Mar. 30, 2011)..... 32

Teleconference on Biological Relationship Testing: Opportunities and Challenges, Department of Homeland Security (Oct. 30, 2008). 30

The FBI's Combined DNA Index System Program Brochure (July 2010) 5

U.S. Dep't of Energy Genome Program's Biological and Env'tl. Research Info. Sys. (BERIS), *Human Genome Project Information: DNA Forensics*..... 6, 10, 11, 17, 27

U.S. Dep't of Justice, *Federal Bureau of Investigation Interim Plan for the Release of Information In the Event of a "Partial Match" at NDIS* (July 20, 2006)..... 20, 21

Xing-bo Song, Yi Zhou, et al., *Short-tandem repeat analysis in seven Chinese regional populations*, 33 *Genetics and Molecular Biology* 605 (2010) 15

INTEREST OF AMICUS CURIAE¹

The Electronic Privacy Information Center ("EPIC") is a public interest research center in Washington, D.C.² EPIC was established in 1994 to focus public attention on emerging civil liberties issues and to protect privacy, the First Amendment, and other Constitutional values.

EPIC has participated as *amicus curiae* in several cases before the U.S. Supreme Court and other courts concerning privacy issues, new technologies, and Constitutional interests. *See, e.g., Sorrell v. IMS Health Inc.*, 131 S. Ct. 2653 (2011); *FCC v. AT&T Inc.*, 131 S. Ct. 1177 (2011); *NASA v. Nelson*, 131 S. Ct. 746 (2011), *Doe v. Reed*, 130 S. Ct. 2811 (2010); *Quon v. City of Ontario*, 130 S. Ct. 2619 (2010); *Tolentino v. New York*, 926 N.E.2d 1212 (N.Y. 2010), *cert. granted*, 131 S. Ct. 595 (2010) and *cert. dismissed as improvidently granted*, 131 S. Ct. 1387 (2011); *Flores-Figueroa v. United States*, 129 S. Ct. 1886 (2009);

¹ On June 24, 2011, the Court granted EPIC's motion for leave to proceed as *amicus* in the present case. The undersigned states that no monetary contributions were made for the preparation or submission of this brief, and this brief was not authored, in whole or in part, by counsel for a party.

² EPIC is grateful for the work of EPIC Clerks Andrew Christy, Pamela Hartka, James Kleier, and Jeramie Scott, who contributed to the preparation of this brief.

Herring v. United States, 129 S. Ct. 695 (2009); *Crawford v. Marion County Election Board*, 128 S. Ct. 1610 (2008); *Hibel v. Sixth Judicial Circuit of Nevada*, 542 U.S. 177 (2004); *Doe v. Chao*, 540 U.S. 614 (2003); *Smith v. Doe*, 538 U.S. 84 (2003); *Department of Justice v. City of Chicago*, 537 U.S. 1229 (2003); *Watchtower Bible and Tract Society of N.Y., Inc. v. Village of Stratton*, 536 U.S. 150 (2002); *Reno v. Condon*, 528 U.S. 141 (2000); *Chicago Tribune Company v. University of Illinois Board of Trustees*, 2011 WL 982531 (N.D. Ill. 2011), *appeal docketed*, No. 11-2066 (7th Cir. May 10, 2011); *S.E.C. v. Rajaratnam*, 622 F.3d 159 (2d Cir. 2010); *IMS Health v. Ayotte*, 550 F.3d 42 (1st Cir. 2008) *cert. denied*, 129 S. Ct. 2864 (2009); *National Cable and Telecommunications Association v. Federal Communications Commission*, 555 F.3d 996 (D.C. Cir. 2009); *Bunnell v. Motion Picture Association of America*, No. 07-56640 (9th Cir. filed Nov. 12, 2007); *Kohler v. Englade*, 470 F.3d 1104 (5th Cir. 2006); *United States v. Kincade*, 379 F.3d 813 (9th Cir. 2004), *cert. denied* 544 U.S. 924 (2005); and *State v. Raines*, 857 A.2d 19 (Md. 2003).

EPIC has a longstanding interest in personal privacy, limiting the government's collection of personal information, and restricting the

collection of genetic material. EPIC maintains a web page on the topic,³ and has filed several amicus briefs challenging DNA collection practices.⁴ In *Kincade*, 379 F.3d 813, EPIC filed an *amicus* brief urging the Ninth Circuit to rule that a section of the DNA Analysis Backlog Elimination Act of 2000, 42 U.S.C. § 14135a (2009), violates the Fourth Amendment by requiring the compulsory collection of DNA samples from parolees.

In this case, the DNA collection regime at issue in *Kincade* is being challenged as it applies as a condition of pretrial release per the Bail Reform Act, 18 U.S.C. §§ 3142(b) and (c)(1)(A). EPIC is particularly concerned about the continued expansion of DNA collection from increasingly larger populations; the CODIS database, which once contained only DNA profiles of sex offenders, has now been expanded to apply to mere arrestees. Furthermore, access to CODIS is not strictly limited, as all law enforcement agencies in the country, at the federal, state, and local levels, have access to CODIS for purposes of DNA

³ See *EPIC Genetic Privacy*, <http://epic.org/privacy/genetic/>.

⁴ See *Kohler v. Englade*, 470 F.3d 1104 (5th Cir. 2006); *United States v. Kincade*, 379 F.3d 813 (9th Cir. 2004), *cert. denied* 544 U.S. 924 (2005); *Maryland v. Raines*, 857 A.2d 19 (Md. 2004); *Herring v. United States*, 555 U.S. 135 (2009).

matching. As CODIS expands, individual privacy rights are implicated, and not just for the individual whose DNA is added to the database; the ability to search for partial matches also implicates the privacy rights of family members whose DNA is a close enough match that the person is flagged in a CODIS DNA search.

EPIC is acutely concerned with evolving scientific knowledge and the way new scientific discoveries can further implicate privacy rights. Today's science shows that DNA reveals vastly more personal information than a fingerprint. The DNA markers utilized by CODIS are not "junk;" instead, these non-coding DNA segments can identify an individual's race, ethnicity, and heritage. Given that there is no statutory requirement for the government to discard the full DNA sample from which the DNA profile is obtained, the government indefinitely remains in possession of a person's full genetic makeup. As science reveals new ways in which DNA may be used, the potential for misuse by government entities increases the risk to individual privacy. Already, state governments have authorized law enforcement DNA samples to be used for non-law enforcement purposes, and EPIC has a vested interest in preventing such invasive uses.

ARGUMENT

I. The CODIS Database Contains Detailed Personal Information About Individuals; the Database has Expanded and Become More Widely Used Over Time

The FBI maintains a national DNA database known as the Combined DNA Indexing System ("CODIS"). The pilot program for what became CODIS started with fourteen state and local laboratories. *The FBI's Combined DNA Index System Program Brochure* (July 2010).⁵ Today, there are over 180 public law enforcement laboratories. *Id.* Additionally, all fifty states, Puerto Rico, the District of Columbia, the federal government, and the U.S. Army Criminal Investigation Laboratory participate in the CODIS program. *Frequently Asked Questions (FAQs) on the CODIS Program and the National DNA Index System* [hereinafter *FBI CODIS FAQ*].⁶

The FBI Laboratory's CODIS program allows federal, state, and local crime laboratories to store, search, and share DNA profiles electronically. Nat'l Inst. for Justice, Office of Justice Programs, U.S. Dep't of Justice, *NIJ Special Report: Making Sense of DNA Backlogs*,

⁵ Available at http://www.fbi.gov/about-us/lab/codis/codis_brochure.

⁶ Available at <http://www.fbi.gov/about-us/lab/codis/codis-and-ndis-fact-sheet>.

2010—*Myths vs. Reality 2* (Feb. 2011).⁷ The FBI has selected short tandem repeat ("STR") technology to generate profiles for CODIS. *FBI CODIS FAQ*. STR technology is used to evaluate thirteen specific regions, known as loci or markers, within DNA located in a cell's nucleus. U.S. Dep't of Energy Genome Program's Biological and Env'tl. Research Info. Sys. (BERIS), *Human Genome Project Information: DNA Forensics* [hereinafter *DOE DNA Forensics*].⁸

CODIS consists of three hierarchical tiers—local, state, and national—which operate in tandem as a nationally distributed database. Nat'l Inst. of Justice, Office of Justice Programs, U.S. Dep't of Justice, *NIJ Special Report: Using DNA to Solve Cold Cases* (July 2002).⁹ The National DNA Index System ("NDIS") is the highest tier and makes it possible for all laboratories participating in CODIS to access and compare DNA profiles from across the country. *Id.* The second tier is the State DNA Index System ("SDIS"). *Id.* The third tier is the Local DNA Index System ("LDIS"), where DNA profiles are

⁷ Available at <https://www.ncjrs.gov/pdffiles1/nij/232197.pdf>.

⁸ Available at

http://www.ornl.gov/sci/techresources/Human_Genome/elsi/forensics.shtml (last modified June 16, 2009).

⁹ Available at <https://www.ncjrs.gov/pdffiles1/nij/194197.pdf>.

entered into the system by participating forensic labs throughout the country. *Id.* The tiered nature of the system enables each state and local agency to operate its DNA database in compliance with state and local laws. *Id.*

DNA profiles in CODIS are organized in several indices: the Convicted Offender Index, Arrestees Index, Forensic Index, Missing Persons Index, Biological Relatives of Missing Persons Index, and the Unidentified Humans (Remains) Index. FBI, U.S. Dep't of Justice, *The FBI's Combined DNA Index System Program Brochure* (July 2010).¹⁰

As the number of laboratories and participating districts has expanded, so have the categories of individuals from whom law enforcement may require DNA samples. CODIS began as an effort to collect DNA from crime scenes and from felons convicted of only a small number of federal crimes, specifically sex offenses and crimes against children. But law enforcement has continually expanded its collection of DNA. As of February 2010, the federal government and most states authorized the collection of DNA from all persons convicted of a felony.

¹⁰ Available at <http://www.fbi.gov/hq/lab/codis/brochures.htm>.

Nat'l Conference of State Legislatures, *State Laws on DNA Data Banks: Qualifying Offenses, Others Who Must Provide Sample* (Feb. 2010).¹¹

The categories have also expanded from those convicted of crimes to mere arrestees. The DNA Analysis Backlog Elimination Act of 2000 authorizes compulsory collection of DNA samples from individuals in federal custody and from individuals on release, parole, or probation. 42 U.S.C. § 14135a (2011). The U.S. Department of Justice authorized a final rule that took effect on January 9, 2009 which requires U.S. agencies to collect DNA samples from "individuals who are arrested, facing charges, or convicted, and from non-United States persons who are detained under authority of the United States." 73 Fed. Reg. 74,932, 74,935 (Dec. 10, 2008).

As of May 2011, the NDIS of CODIS contained 9,748,870 offender DNA profiles and 375,375 forensic DNA profiles. *FBI CODIS FAQ*. The number of profiles has grown rapidly from the roughly 485,000 total profiles in 2000. *Id.* The number of profiles is only expected to increase going forward. *See* Federal Bureau of Investigation, *CODIS*—

¹¹ Available at <http://www.ncsl.org/default.aspx?tabid=12737>.

The Future.¹² As CODIS expands, the FBI is working to increase its capabilities with enhanced kinship analysis. *Id.*

II. DNA Identification is not the Functional Equivalent of Fingerprint Identification

DNA identification is not analogous to fingerprint identification because unlike a fingerprint, a DNA sample contains personal information beyond the mere identity of an individual. The government collects and stores this personal information. When the government takes a DNA sample for CODIS, it uses the sample to create a DNA profile of thirteen, noncoding loci, and it stores that profile alongside the person's entire genetic sample. Sheldon Krinsky & Tania Simoncelli, *Genetic Justice* 234-35 (2011). For the reasons explained below, neither (A) the CODIS profile nor (B) the full DNA sample is comparable to a fingerprint because CODIS profiles and DNA contain substantially more information than is necessary for identification purposes. Unlike fingerprints, DNA is useful for more than identification because it can provide insights into a person's family, "susceptibility to particular diseases, legitimacy of birth, and perhaps predispositions to certain behaviors and sexual orientation." *DOE DNA*

¹² Available at http://www.fbi.gov/about-us/lab/codis/codis_future.

Forensics. Experts have noted that DNA testing can result in "the potential for social stigma, discrimination in employment, barriers to health insurance, and other problems." Anita LaFrance Allen, *Genetic Testing, Nature, and Trust*, 27 Seton Hall L. Rev. 887 (1997).

A. The Thirteen Noncoding CODIS Loci Contain Substantially More Information than Fingerprints

The thirteen noncoding loci the government stores in CODIS contain more information than fingerprints do. The government frequently refers to the noncoding loci stored in CODIS as "junk DNA." However, "no serious scientist refers to noncoding regions of DNA any longer as 'junk.'" Krimsky at 236. Noncoding DNA is genetically significant – that is, it plays an active role in DNA replication and cell division. Noncoding DNA can be used to determine traits such as race and gender. Noncoding DNA can also be used to identify people other than the person from whom it was collected, like their family members.

1. Noncoding DNA is Not "Junk DNA"

Noncoding DNA performs significant genetic functions – it aids in DNA replication and cell division. Nat'l Insts. of Health ENCODE Project Consortium, *Identification and analysis of functional elements in 1% of the human genome by the ENCODE pilot project*, 447 *Nature*

799 (2007).¹³ The finding challenged the "long-standing view that the human genome consists of . . . a vast amount of so-called junk DNA that is not biologically active." Nat'l Human Genome Research Inst., *New Findings Challenge Established Views on Human Genome* (June 2007).¹⁴ Furthermore, according to the Human Genome Project, "there is a chance that a person's entire genome may be available—regardless of whether they were convicted or not. Although the DNA used is considered 'junk DNA' . . . in the future this information may be found to reveal personal information such as susceptibilities to disease and certain behaviors." *DOE DNA Forensics*.

Scientists and legal scholars recognize that the analogy between fingerprints and DNA profiles is fundamentally flawed because fingerprints are "two-dimensional representations of the physical attributes of our fingertips" that are "useful only for identification," while DNA contains much more personal information. Krimsky at 235; *DOE DNA Forensics*. Unlike DNA profiles, "[f]ingerprints cannot be analyzed to determine whether two individuals are related. They cannot

¹³ *Available at*

<http://www.genome.gov/Pages/Research/ENCODE/nature05874.pdf>.

¹⁴ *Available at* <http://www.genome.gov/25521554>.

tell you your likelihood of developing Alzheimer's disease or breast cancer or whether you are a carrier for cystic fibrosis There is no exponentially growing list of conditions that can be read from a fingerprint, or even significant research in this area." Krinsky at 235.

By definition, noncoding DNA does not direct the creation of proteins like coding DNA does, but it is active in directing biological functions and influences genetic markers. For example, noncoding DNA affects the proper functioning of organs like the heart, and variations in non-coding DNA can indicate an increased risk of heart disease. A study funded by the National Institutes of Health found that a noncoding DNA sequence reveals the risk of heart disease because "when something goes awry in variants of this interval, [it causes] vascular cells to divide and multiply more quickly than usual." Harrison Wein, *How Junk DNA Affects Heart Disease*, NIH Research Matters (Mar. 1 2010).¹⁵ There is also evidence that noncoding DNA contains biological markers for particular traits, such as hair color and diabetes. For example, researchers identified a marker for red hair in a locus that, like the thirteen used in CODIS, was thought to be non-

¹⁵ *Available at*
<http://www.nih.gov/researchmatters/march2010/03012010heart.htm>.

coding. Grimes EA, Noake PJ., Dixon L, et al., *Sequence polymorphism in the human melanocortin 1 receptor gene as an indicator of the red hair phenotype*, 122 *Forensic Sci. Int'l* 124 (2001).

The CODIS loci are presently capable of revealing personal medical information, and such noncoding DNA is predicted to reveal more information as analytic methods steadily progress. CODIS loci can convey medical information "where one or more short tandem repeats (STRs) are found to correlate with another genetic marker whose function is known, . . . the presence of the seemingly innocuous STR serves as a 'flag' for that genetic predisposition or trait." Krimsky at 235. In fact, researchers found that one of the CODIS loci is closely related to the gene that codes for insulin, which is connected to diabetes. John D. H. Stead, Jerome Buard, et al., *Influence of Allele Lineage on the Role of the Insulin Minisatellite in Susceptibility to Type 1 Diabetes*, 9 *Hum. Molecular Genetics* 2929 (2000).

The extent of correlations between noncoding DNA and biological or medical indicia is predicted to increase in the future. Ninety-eight percent of DNA is considered noncoding and is actively being explored because it could have "huge dividends for understanding and treating

disease." Harrison Wein, *How Junk DNA Affects Heart Disease*, NIH Research Matters (Mar. 1 2010). A recently developed technique for examining the three dimensional structure of DNA is advancing the understanding of non-coding DNA's impact on human biological functions, and it has detected cross-species similarities that "will speed researchers' efforts to identify functional elements in the human genome and understand how they affect human health." NIH Research Matters, *DNA Terrain Affects Function in Human Genome* (Mar. 23, 2009). The FBI also intends to extract more information from CODIS profiles in the future; it will exploit scientific advances in DNA analysis by adopting techniques to allow it to expand the amount of data it can extract from CODIS profiles. *CODIS – The Future*.

2. The Thirteen CODIS Loci Can Identify an Individual's Race, Ethnicity, and Heritage

It is also possible for researchers to use the thirteen CODIS loci to identify an individual's race, ethnicity, and heritage because different ethnic groups have distinct genetic patterns in these loci. For example, some Chinese populations have enough variation in their thirteen CODIS loci to differentiate the groups consistently by their "geographic location, languages and eating habits." Xing-bo Song, Yi Zhou, et al.,

Short-tandem repeat analysis in seven Chinese regional populations, 33 *Genetics and Molecular Biology* 605 (2010).¹⁶ A Russian population can also be distinguished from Poles, Slovans, Serbs, and Bosnians because of their higher or lower frequencies of certain CODIS alleles. B. A. Malyarchuk, M. Wozniak, et al., *Variation of 15 Autosomal Microsatellite DNA Loci in the Russian Population*, 41 *Molecular Biology* 1 (2007).¹⁷

There are similar studies for virtually every ethnic and geographic population in the world. One study used much of this data as a base to predict ethnicity using STRs. The study "performed best for ethnic groups with distinctly different physical traits." The researchers concluded that this result could "be taken as an indication that STRs, commonly referred to as 'junk' DNA, may have an effect on phenotype." Matthew Graydon, François Cholette, et al., *Inferring ethnicity using 15 autosomal STR loci—Comparisons Among Populations of Similar and Distinctly Different Physical Traits*, 3 *Forensic Sci. Int'l: Genetics* 251

¹⁶ Available at <http://www.scielo.br/pdf/gmb/v33n4/02.pdf>.

¹⁷ Available at http://malyarchuk-bor.narod.ru/MolBiol_1_07.pdf.

(2009).¹⁸ Another study used the thirteen CODIS loci to determine individual ancestry for each member in its sample and found that the method provided "a better measure of ancestral background than self-reported race." Jill S. Barnholtz-Sloan, Ranajit Chakraborty, et al., *Examining Population Stratification via Individual Ancestry Estimates versus Self-Reported Race*, 14 *Cancer Epidemiology Biomarkers and Prevention* 1545 (2005).¹⁹ They chose to use the CODIS loci to measure ancestry because those "markers show considerable allele frequency variation among racial and ancestral groups from around the world." *Id.* The European Court of Human Rights found that the DNA profiles created by the United Kingdom could be used to distinguish ethnicity, as well as determine family members, and the government did not dispute either finding. *S. v. United Kingdom*, App. No. 30562/04, paras. 75, 76 (Eur. Ct. H.R. Dec. 4, 2008).²⁰

¹⁸ Available at [http://www.fsigenetics.com/article/S1872-4973\(09\)00048-9/abstract](http://www.fsigenetics.com/article/S1872-4973(09)00048-9/abstract).

¹⁹ Available at <http://cebp.aacrjournals.org/content/14/6/1545>.

²⁰ Available at <http://www.echr.coe.int/echr/en/hudoc> (follow "HUDOC database" hyperlink; search Application Number for "30562/04").

3. Government DNA Profiles Enable Familial Searches and Result in the Identification of Family Members

While fingerprints can only be used to identify the individual from whom they are taken, a CODIS DNA profile may be used to identify the individual's family members and to implicate the individual's family members in investigations in which they would not otherwise be involved. The CODIS loci are frequently used for paternity tests, and "with 13 STR loci it is quite likely that a search of a database will identify a person who is a relative of the person contributing the evidence sample." *DOE DNA Forensics; accord Essentially Yours: The Protection of Human Genetic Information in Australia* (2003).²¹

Familial searching using the thirteen CODIS loci has proven extremely effective. A study of California's familial searching protocol found that 93% of fathers and 61% of full siblings were identified by using the thirteen CODIS loci in California's database of approximately one million DNA profiles. S.P. Myers, et al., *Searching for first-degree familial relationships in California's offender DNA database: Validation of a likelihood ratio-based approach*, *Forensic Sci. Int. Genet.* (2010).

²¹ Available at <http://www.austlii.edu.au/au/other/alrc/publications/reports/96/>.

Though the FBI states that familial DNA searching is not performed through CODIS in NDIS, this is based on a selective definition of familial searching, and familial matching does in fact occur. FBI Laboratory Services, *Familial Searching*.²² The FBI defines familial searching as a "deliberate search of a DNA database conducted for the intended purpose of potentially identifying close biological relatives." *Id.* However, the FBI will allow disclosure of partial DNA matches that may indicate familial relationships. *Id.*

Forensic laboratories conduct DNA database searches with varying degrees of stringency: high stringency searches are discriminating searches intended to produce only direct matches, requiring exact matches at all thirteen loci; crime laboratories also conduct low and moderate stringency searches in which search standards are less discriminating and can generate partial matches. Partial matches contain insufficient common DNA alleles to indicate a definite match, or may indicate that the sample definitely does not match, but may be sufficient to indicate a familial link. Erin E. Murphy, *Relative Doubt: Familial Searches of DNA Databases*, 109

²² Available at <http://www.fbi.gov/about-us/lab/codis/familial-searching>.

Mich. L. Rev. 291 (2010). A single search in forensic DNA software can return both direct matches as well as partial matches that indicate potential familial relationships. *Id.*; see also Emily C. Barbour, *DNA Databanking: Selected Fourth Amendment Issues and Analysis*, CRS Report R41847, Congressional Research Service (June 6, 2011).²³

Crime laboratories conduct these lower stringency searches that produce partial matches in several circumstances, including when processing degraded DNA samples. DNA samples are easily degraded both before reaching a lab and once in a lab because DNA is very sensitive to environmental conditions and can "start to degrade depending on the sample's exposure to extreme temperatures, oxygen, water, sweat and breath." Donald E. Shelton, *Forensic Science in Court* 29 (2011).

Some forensic experts characterize searches generating partial matches as a type of familial searching, but the FBI does not. By limiting its definition of a familial search to only *deliberate* searches for potential relatives, the FBI excludes moderate stringency searches that happen to result in familial matches from its definition of familial

²³ Available at <http://www.fas.org/sgp/crs/misc/R41847.pdf>.

searches for FBI purposes. *FBI CODIS FAQ*. This allows the FBI to claim that CODIS and NDIS are not used for familial searches, though they still produce familial DNA matches and allow investigation of potential family members from the national and state databases. Jessica D. Gabel, *Probable Cause From Probable Bonds: A Genetic Tattle Tale Based on Familial DNA*, 21 *Hastings Women's L.J.* 3, 17-18, 2010.

The FBI has procedures for authorizing the release of partial match information to law enforcement. "For situations in which there is no other available investigative information," NDIS will release the personally identifiable information of partial match results upon written request from a Casework Laboratory, with concurrence of the prosecutor. U.S. Dep't of Justice, *Federal Bureau of Investigation Interim Plan for the Release of Information In the Event of a "Partial Match" at NDIS* (July 20, 2006).²⁴ The written request should "include the statistical analysis used to conclude that there may be a potential familial relationship." *Id.*

²⁴ *Available at* http://www.bioforensics.com/conference08/Familial_Searches/CODIS_Bulletin.pdf.

The request will be reviewed by the FBI Office of General Counsel and the NDIS Custodian for approval. *Id.* The FBI deems its partial match procedures "interim" though it has had its procedures in place for five years. *See id.; FBI CODIS FAQ.*

Though the FBI claims its partial match search and release procedures do not constitute familial searching, the partial match policy was instituted in response to a request for interstate familial matches. In 2006, the Denver District Attorney performed a CODIS search of NDIS which identified partial matches which he believed to be relatives of an unknown offender. Murphy at 292-93. The District Attorney lobbied FBI laboratory and national DNA database administrators and FBI Director Robert Mueller to change the policy, and shortly thereafter, Director Mueller instituted the national partial match release policy. *Id.*; Maura Dolan & Jason Felch, *Tracing a Suspect Through a Relative*, L.A. Times, Nov. 25, 2008, at 2-3.²⁵ Three states subsequently released the names and information of partially matched individuals; none of them turned out to indicate a relative of the unknown offender. Dolan at 2-3.

²⁵ Available at <http://articles.latimes.com/2008/nov/25/local/me-familial25>, 2-3.

The origin of the FBI's partial match release policy illustrates how states are able to conduct nationwide searches that produce familial matches not only from NDIS, but also from state databases which provide DNA profiles to CODIS: Laboratories and state agencies identify partial matches through CODIS, and when those partially matched profiles were entered into CODIS by other state and local laboratories, the matches are then released according to state and individual laboratory regulations. Murphy at 292-93. The FBI's policy on releasing partial matches from NDIS applies only to the DNA samples collected by federal agencies from federal offenders that constitute NDIS; the procedures by which partial matches and familial matches are produced and released from state and local databases vary from state to state, and laboratory to laboratory.²⁶ *E.g.* Md. Code Ann., Pub. Safety § 2-505 (2010); 44 Pa. Cons. Stat. § 2319 (2010); Wyo. Stat. Ann. § 7-19-402 (2010); Colorado Bureau of Investigation, *DNA Familial Search Policy* (Oct. 22, 2009).²⁷ Defendant Pool's DNA will be

²⁶ State and local laboratory partial match release practices must meet the minimum requirements of state and federal mandated guidelines.

²⁷ *Available at*

http://www.denverda.org/DNA_Documents/Familial_DNA/CBI%20DNA%20Familial%20Search%20Policy%20Oct%202009%20-%20Signed.pdf.

available for national partial match requests. Information Bulletin from Edmund G. Brown, Jr., Attorney General, DNA Partial Match (Crime Scene DNA Profile to Offender) Policy No. 2008-BFS-01 (2008);²⁸ Murphy at 292-93.

The FBI has suggested guidelines for laboratories releasing partial matches, but they are not binding or official regulations. In 2009, the FBI convened a working group to assess the CODIS partial match procedures; the working group recommended minimum standards of reliability for labs to use when assessing partial matches, but emphasized that decisions to release personal information in response to partial match requests from other labs and law enforcement agencies are made by individual laboratories. Scientific Working Group on DNA Analysis Methods Ad Hoc Committee on Partial Matches, *SWGDM Recommendations to the FBI Director on the "Interim Plan for the Release of Information in the Event of a 'Partial Match' at NDIS,"* 11 Forensic Sci. Comm. 4, Oct. (2009).²⁹ The Committee's recommendations were to be used "to guide a laboratory's decision-

²⁸ Available at http://ag.ca.gov/cms_attachments/press/pdfs/n1548_08-bfs-01.pdf.

²⁹ Available at http://www.fbi.gov/about-us/lab/forensic-science-communications/fsc/archive/oct2009/standard_guidlines/swgdam.html.

making process regarding whether to release the name of the offender whose relative may be the source of the DNA profile." *Id.*

B. The Government Collects and Retains Full DNA Sequences, which Contain Substantially More Information than Fingerprints

To make DNA profiles, the government collects and retains an individual's full DNA sequence that, unlike a fingerprint, contains personal genetic information unnecessary for identification. The government retains the full DNA samples it collects and laboratories store them indefinitely, in addition to the derivative CODIS profiles. Federal Bureau of Investigation, "Quality Assurance Standards for DNA Databasing Laboratories," Standard 7.2 ("Where possible, the laboratory shall retain the database sample for retesting for quality assurance and sample confirmation purposes.").³⁰ Federal statutes do not set forth clear guidelines for how the samples are handled after they are profiled: "[F]ederal law remains silent as to what must be done with the biological samples themselves." Elizabeth E. Joh, *Reclaiming 'Abandoned' DNA: The Fourth Amendment and Genetic Privacy*, 100

³⁰ Available at http://www.fbi.gov/about-us/lab/codis/qas_databaselabs.

NW. U. L. Rev. 857, 871 (2006).³¹ Some bioethics experts consider the "indefinite" retention of DNA samples to be "the most significant privacy concern associated with DNA data banking" because they "have the potential to reveal almost unlimited information about ourselves." Krinsky at 235-36.

The information contained in a DNA sample is far more extensive than that contained in fingerprints. It trivializes DNA data to compare it to a genetic fingerprint. Unlike a fingerprint, DNA samples can provide insights into the most personal family relationships and the most intimate workings of the human body, including the likelihood of the occurrence of thousands of genetic conditions and diseases. In fact, "genetic testing is currently available for over 1,700 diseases and abnormalities, with about 1,400 available in clinical settings, and this number continues to increase every year." Ctrs. for Disease Control and Prevention, *Genetic Testing* (May 17, 2011).³² By testing for one variation in a single region of a particular gene, researchers were able to determine which abused or maltreated children were prone to

³¹ *Available at*

<http://www.law.northwestern.edu/lawreview/v100/n2/857/LR100n2Joh.pdf>.

³² *Available at* <http://www.cdc.gov/genomics/gtesting/>.

elevated rates of suicidal ideation. Dante Cicchetti, et. al., *Interaction of Child Maltreatment and 5-HTT Polymorphisms: Suicidal Ideation among Children from low-SES Backgrounds*, 35 J. Pediatr. Psychol. 536, 543 (2010). An allele variation in this same gene creates a predisposition for susceptibility to affective disorders like depression in adults. Christopher G. Beevers, et al., *Association of the Serotonin Transporter Gene Promoter Region (5-HTTLPR) Polymorphism with Biased Attention for Emotional Stimuli*, 118 J. Abnormal Psychol. 431 (2009).

The extensive information DNA can reveal about an individual carries significant social and political implications that do not accompany fingerprints. The extent of these implications was recognized in the legislative history of the DNA Analysis Backlog Elimination Act, 42 U.S.C. § 14135a, emphasizing that the scope of information that can be obtained from a DNA sample is uniquely broad and invasive:

The information obtainable from DNA testing surpasses any previous types of testing available. The amount of personal and private data contained in a DNA specimen provides insights into the most personal family relationships and the most intimate workings of the human body, including the likelihood of the occurrence of over 4,000 types of genetic

conditions and diseases. Genetic information pertains not only to the individual whose DNA is sampled, but also to anyone who shares that bloodline.

H.R. Rep. 106-900(I) at 52 (Sept. 26, 2001).

Studies of the relationship between certain genes and aggressiveness, mental illness, and anti-social behavior have revealed the potential for differential treatment based on genetic predispositions, with or without overt political action. Elisa Piere & Mairi Levitt, *Risky Individuals and the Politics of Genetic Research Into Aggressiveness and Violence*, 22 *Bioethics* 457, 509 (2008).

DNA samples are retained after their profiles have been created, though the creation of the profile exhausts their identification purposes. Though a federal arrestee or defendant who is acquitted or otherwise not convicted of a crime can request to have his DNA sample destroyed, if the defendant does not undergo the request process or is convicted of an offense, the sample is retained even though a DNA profile has already been created. Samples collected by state law enforcement officers are stored according to state guidelines, and "many state laws do not require the destruction of a DNA record or sample after a conviction has been overturned." *DOE DNA Forensics*; Joh at 871.

DNA samples are unlike fingerprints because they reveal personal information and are used for purposes beyond simply identifying an individual. Instead, DNA samples contain genetic information that can reveal personal traits such as race, ethnicity and gender, as well as medical risk for conditions such as diabetes. And these samples are retained even after their identification utility has been exhausted by the creation of a CODIS profile. Further, the CODIS DNA profiles that are created from the samples also convey more personal information than a fingerprint. The noncoding loci included in those profiles serve genetically significant biological functions and have been found to reflect personal traits like ethnicity, physical traits, medical conditions and psychological susceptibilities. Because both DNA samples and the CODIS profiles contain information about genetic functions and reveal personal information unnecessary for identification, they are unlike fingerprints, which can be used for only identification.

III. DNA Samples can be Reanalyzed for Non-Law Enforcement Purposes

Almost two decades ago, the National Academy of Sciences recommended that DNA samples be destroyed "promptly" after analysis. Comm. on DNA Tech. in Forensic Science of the Nat'l Acad. of

Science, *DNA Technology in Forensic Science* 122 (Nat'l Acad. Press 1992). The Academy reasoned, "In principle, retention of DNA samples creates an opportunity for misuses—i.e., for later testing to determine personal information." *Id.*

The National Institute of Justice foresaw this situation:

As [CODIS] enlarges and if it is broadened to include persons convicted of a larger variety of crimes, it might be possible that statistical studies of the databases could reveal useful information. Inventive researchers may glean useful information of a statistical sort. At the same time, there would need to be protection against misuse or use by unauthorized persons.

National Commission for the Future of DNA Evidence, National Institute of Justice, U.S. Dep't of Justice, *The Future of Forensic DNA Testing: Predictions of the Research and Development Working Group*, NCJ 183697, 36 (November 2000). DNA initially collected as part of criminal investigations for law enforcement purposes can now be used for purposes that fall outside the scope of law enforcement.

A. Federal Entities Use DNA for Non-Law Enforcement Purposes

On the federal level, the Department of Homeland Security ("DHS") has begun using CODIS DNA data to verify familial relationships for immigration purposes. *Teleconference on Biological*

Relationship Testing: Opportunities and Challenges, Department of Homeland Security (Oct. 30, 2008).³³ United States Citizenship and Immigration Services ("USCIS") has sometimes had difficulty ascertaining whether individuals seeking to immigrate are in fact related to current United States citizens, and a DNA analysis can easily answer this question. Due to the expense and time associated with collecting DNA samples and generating DNA profiles, DNA screening is currently voluntary. *Id.*

However, DHS is planning on expanding the use of DNA to verify familial relationships. Mickey McCarter, *Homeland Security Considering Portable, Instant DNA Scanners*, Fox News (March 4, 2011).³⁴ Some USCIS service centers have required DNA testing to establish a familial relationship. *Citizenship and Immigration Services Ombudsman Annual Report 2009*, 46, Department of Homeland Security (June 30, 2009).³⁵ A DHS component, the Science and Technology Directorate, is working to develop a system of fast and

³³ Available at http://www.dhs.gov/xfoia/gc_1227730679187.shtm.

³⁴ Available at <http://www.foxnews.com/scitech/2011/03/04/homeland-security-considering-portable-instant-dna-scanners/>.

³⁵ Available at www.dhs.gov/xlibrary/assets/cisomb_annual_report_2009.pdf.

inexpensive DNA analysis that would allow a DNA profile to be created for under \$100. Department of Homeland Security, *Human Factors/Behavior Science Projects*.³⁶ It has contracted with Network Biosystems to design a portable DNA analysis device that will allow USCIS agents, who are not trained in either DNA collection or analysis, to collect DNA with buccal swabs and create the DNA profile within an hour. Mickey McCarter, *Homeland Security Considering Portable, Instant DNA Scanners*, Fox News (March 4, 2011).³⁷ The Science and Technology Directorate expects to have a working prototype in 2011. Dep't of Homeland Sec., *TSA Testing DNA? No Way!*, (Feb. 2, 2011).³⁸ There has also been at least one proposal to perform DNA screening on all immigration requests. Dep't of Homeland Sec., *DNA Testing for Immigration Benefits* (Sept. 28, 2009).³⁹

The use of DNA analysis at the border is not used exclusively for confirming familial relationships, though. DHS Under Secretary for the

³⁶ Available at

http://www.dhs.gov/files/programs/gc_1218480185439.shtm#17.

³⁷ Available at <http://www.foxnews.com/scitech/2011/03/04/homeland-security-considering-portable-instant-dna-scanners/>.

³⁸ Available at <http://blog.tsa.gov/2011/02/tsa-testing-dna-no-way.html>.

³⁹ Available at

<http://www.homelandsecuritydialogue.org/dialogue3/immigration/ideas/dna-testing-for-immigration-benefits>.

Science and Technology Directorate, Tara O'Toole, has stated that DNA will also be used to "determine identity" of individuals seeking to immigrate. Tara O'Toole, *Under Secretary Tara O'Toole, Science and Technology Directorate, Before the House Committee on Appropriates, Subcommittee on Homeland Security, "S&T Fiscal Year 2012 Budget Request,"* Dep't of Homeland Sec. (Mar. 30, 2011).⁴⁰ It is unclear which DNA database these samples would be compared to, but CODIS would be the logical choice.

DHS also operates an information sharing environment that uses information from CODIS called the Enforcement Integrated Database ("EID"). James Dinkins, *Privacy Impact Assessment for the Enforcement Integrated Database*, Dep't of Homeland Sec. (Jan. 14, 2010).⁴¹ The EID is not limited to law enforcement purposes, as it is "a shared common database repository for several DHS law enforcement and homeland security applications." *Id.* According to a January 2010 Privacy Impact Assessment, EID is limited to use by United States Immigration and Customs Enforcement and United States Customs

⁴⁰ Available at

http://www.dhs.gov/ynews/testimony/testimony_1301519363336.shtm.

⁴¹ Available at

http://www.dhs.gov/xlibrary/assets/privacy/privacy_pia_ice_eid.pdf.

and Border Protection. *Id.* At this time, the EID contains only "DNA collection information, limited to the date and time of a successful DNA sample collection and information from the FBI that the DNA sample is valid"; it does not contain "any actual DNA samples or sequences." *Id.*

B. State Entities Use DNA for Non-Law Enforcement Purposes

Many states have broad statutes that explicitly permit DNA databases to be used for purposes other than law enforcement, even though the DNA is collected by state law enforcement with the purpose of adding it to CODIS. While current federal law does not mirror such propositions, it does suggest a direction in which the federal government may head in the future. At least seventeen states have DNA database laws that allow for some use of the DNA aside from a mere law enforcement purpose.

These laws vary in their breadth, although all do require that personal identification information be removed from the DNA samples before they are used for the non-law enforcement purposes. Some only deviate from law enforcement purposes to create population databases, where others explicitly allow the DNA database to be used for research purposes. None of these state statutes explicitly authorize using DNA

stored in CODIS for these purposes. However, the DNA that is being used for non-law enforcement purposes is DNA that is collected by state and local law enforcement in order to be included in CODIS.

Seventeen states allow the use of DNA for non-law enforcement purposes including population statistical databases.⁴² Seven states allow the use of DNA for non-law enforcement purposes beyond population statistical databases, including research purposes.⁴³

⁴² Alabama, Ala. Code 975 § 36-18-20 (2009); Arkansas, Ark. Code. Ann. § 12-12-1018 (2010); Iowa, Iowa Code § 81.3 (2009); Louisiana, La. Rev. Stat. Ann. § 15:612 (2009); Maine, Me. Rev. Stat. Ann. tit., 25 § 1577 (2009); Maryland, Md. Code Ann., Pub. Safety § 2-505 (2010); Massachusetts, Mass. Gen Laws. ch. 22E. § 10 (2009); Michigan, Mich. Comp. Laws § 28.176 (2010); Missouri, Mo. Rev. Stat. § 650.052 (2009); Montana, Mont. Code Ann. § 44-6-102 (2009); Nebraska, Neb. Rev. Stat. § 29-4105 (2009); New Jersey, N.J. Stat. Ann. § 53:1-20.24 (2009); New Mexico, N.M. Stat. § 29-16-8 (2009); North Carolina, N.C. Gen. Stat. § 15A-266.8 (2009); Pennsylvania, 44 Pa. Cons. Stat. § 2319 (2010); South Carolina, S.C. Code Ann. § 23-3-640 (2010); Wyoming, Wyo. Stat. Ann. § 7-19-402 (2010).

⁴³ Alabama, Ala. Code 975 § 36-18-20 (2009); Maryland, Md. Code Ann., Pub. Safety § 2-505 (2010); Massachusetts, Mass. Gen Laws. ch. 22E. § 10 (2009); Michigan, Mich. Comp. Laws § 28.176 (2010); Nebraska, Neb. Rev. Stat. § 29-4105 (2009); South Carolina, S.C. Code Ann. § 23-3-640 (2010); Wyoming, Wyo. Stat. Ann. § 7-19-402 (2010).

CONCLUSION

Amicus Curiae respectfully requests this Court to grant Appellant's motion to reverse the decision of the lower court.

Respectfully submitted,

/s/ Marc Rotenberg
MARC ROTENBERG
Counsel of Record
JOHN A. VERDI
SHARON GOOTT NISSIM
ELECTRONIC PRIVACY INFORMATION
CENTER (EPIC)
1718 Connecticut Ave. NW
Suite 200
Washington, DC 20009
(202) 483-1140

July 25, 2011

CERTIFICATE OF COMPLIANCE

This brief complies with the type-volume limitation of 7,000 words of Fed. R. App. P. 29(d) and Fed. R. App. P. 32(B)(i). This brief contains 5,459 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii). This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32(a)(6) because this brief has been prepared in a proportionally spaced typeface using Microsoft Office Word in 14 point Century style.

Dated: July 25, 2011

/s/ John Verdi
MARC ROTENBERG
JOHN A. VERDI
SHARON GOOTT NISSIM
ELECTRONIC PRIVACY INFORMATION
CENTER (EPIC)
1718 Connecticut Ave. NW
Suite 200
Washington, DC 20009
(202) 483-1140

CERTIFICATE OF SERVICE

I hereby certify that on this 25th day of July, 2011, the foregoing Brief of *Amicus Curiae* was electronically filed with the Clerk of the Court, and thereby electronically serve upon counsel for the parties *via* electronic delivery. Also, EPIC sent 2 copies to each party via U.S. Mail, postage prepaid, on July 26, 2011.

Dated: July 25, 2011

/s/ John Verdi
MARC ROTENBERG
JOHN A. VERDI
SHARON GOOTT NISSIM
ELECTRONIC PRIVACY INFORMATION
CENTER (EPIC)
1718 Connecticut Ave. NW
Suite 200
Washington, DC 20009
(202) 483-1140