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A Privacy Review of DNA Databases

NATALIE A. BENNETT*

ABSTRACT: Since the 1990s, DNA profiles have proved to be a useful law enforcement tool. The government currently stores and retains DNA samples in state-maintained databases that are linked together in a centralized National DNA Index System. Legislation varies widely from state to state concerning what classes of offenders are incorporated into such databases, and many states—recognizing the importance of expanding DNA databases—are increasing the number of individuals eligible for database inclusion. This trend of broadening inclusion has prompted a wide range of privacy concerns and presents potentially problematic ethical and social consequences.

This note examines a spectrum of academic and governmental commentaries focusing on the ethical, legal, and social implications of forensic DNA profiling. The article explains the technical nature of these databases as an investigative tool and weighs the pros and cons related to their use. The article then further examines current and future policy goals of DNA database programs, including: whether it is appropriate to retain samples; what types of samples are most pertinent for retention; and what is the appropriate scope of inclusion for individuals in a national system. After examining statutory frameworks already in place at the state level, the note concludes by evaluating the projected role of the courts in settling Fourth Amendment challenges arising from continued DNA database expansion.

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I. INTRODUCTION

DNA analysis has achieved much acclaim over a relatively short period of time, demonstrating itself as an extraordinary investigative and crime-solving tool that allows for definitive genetic identification.¹ Since the mid-1990s, DNA databases have exponentially expanded in terms of the number of samples they contain, and consequently, their importance to forensics has increased. While the promise of increased efficacy has some members of law enforcement and legal academia advocating for the expansion of criminal DNA databases to include DNA samples from the entire population,² civil libertarians advocate that the benefits of preventing and solving crime do not outweigh the cost of eroding liberty.³ This paper explores privacy concerns that cover a wide range of the political spectrum as the judiciary, legislators, and the American public struggle to make federal and state DNA laws compatible with the rapid advances of DNA technology.⁴

The note begins with Part I providing background on the biological nature of DNA and its use as an identification technology. The first section additionally outlines the history of DNA database creation in the United States and identifies problematic inconsistencies in state statutes regulating the inclusion of samples. Part I concludes by acknowledging the ongoing public debate considering the inevitable trade-off between law enforcement and civil liberty interests surrounding forensic DNA analysis.

Part II identifies discrete legal and policy questions arising from sample retention. This section examines these questions in light of voiced privacy concerns, system feasibility, and future directions. Notably, this section specifically considers the potential flaws of

¹ See HENRY C. LEE & FRANK TIRNADY, *BLOOD EVIDENCE: HOW DNA IS REVOLUTIONIZING THE WAY WE SOLVE CRIMES* viii (Perseus Publishing 2003) (explaining that DNA identification evidence is predicated upon the genetic uniqueness of each individual (excepting twins, triplets, or clones)).

² Mark A. Rothstein & Meghan K. Talbott, *The Expanding Use of DNA in Law Enforcement: What Role for Privacy?*, 34 J.L. MED. & ETHICS 153, 154 (2006); see Akhil Reed Amar, *A Search for Justice in Our Genes*, N.Y. TIMES, May 7, 2002, at A31, available at <http://query.nytimes.com/gst/fullpage.html?res=9E05E7DB1730F934A35756CoA9649C8B63>.

³ Rothstein & Talbott, *supra* note 2, at 162.

⁴ See Amar, *supra* note 2.

utilizing “junk DNA” as a genetic sample and chronicles U.S. proposals for a universal database with a population-wide repository.

Part III surveys the application of Fourth Amendment jurisprudence to recent challenges alleging that DNA sample collection constitutes an unreasonable search and seizure. After articulating the predominant legal theories, the section acknowledges that there is an emerging judicial proclivity to permit a wider cross-section of citizens to provide DNA samples for crime-solving efforts. Part IV concludes this review.

A. DNA TECHNOLOGY AS AN INVESTIGATIVE TOOL

Each person has a unique set of deoxyribonucleic acid (“DNA”) sequencing⁵ (contained in body cells) that dictates an individual’s physical characteristics and identity and stores hereditary information that passes from one generation to the next.⁶ The chemical identifiers in DNA are akin to the unique ridges on human fingerprints: “DNA databases provide a function similar to fingerprint indices, in that they allow investigators to compare genetic profiles recovered from crime scenes with those taken from convicted individuals.”⁷ However, DNA is far more information-rich than fingerprints because it contains the code of a person’s hereditary propensities and susceptibilities, parentage, and racial origins.⁸ Additionally, DNA is a

⁵ The fundamental structure of DNA was first identified by James Watson and Francis Crick (with the help of exquisite X-ray photographs of crystallized DNA by Rosalind Franklin) in 1953. The structure they identified is that of a double helix resembling a coiled rope ladder, the supporting sides of which consist of deoxyribose sugar and phosphate. Between the sugar-phosphate supports are four alternating organic bases: adenine (A), guanine (G), cytosine (C), and thymine (T). A chemically bonds with T, and C chemically bonds with G. LEE & TIRNADY, *supra* note 1, at 3.

⁶ LAURI R. HARDING, *Introduction*, in *AT ISSUE: DNA DATABASES 7* (Lauri H. Harding ed., Greenhaven Press 2007). DNA is the blueprint of life. The entire DNA molecule is coiled tightly in little bundles that make up the chromosomes. Every normal human being has 46 chromosomes, 1 pair of sex chromosomes (two X chromosomes for females; an X and a Y for males), and 22 pairs of autosomes (any chromosome that is not a sex chromosome). All humans receive 22 autosomes plus one X chromosome from their mothers and 22 autosomes and one X or Y chromosome from their fathers. LEE & TIRNADY, *supra* note 1, at 3.

⁷ Jonathan Kimmelman, *The Promise and Perils of Criminal DNA Databanking*, 18 NATURE BIOTECH. 695, 695 (2000).

⁸ *Id.*

more dependable informant,⁹ and genetic information, unlike fingerprints, is shared among biological relatives.¹⁰ Collectively, these differences between genetic information and traditional fingerprinting are beneficial identifiers, but these differences also raise concerns with respect to criminal DNA databases' expanding scope and varying storage policies.¹¹

The most widely used technology for DNA identification¹² is generating a "genetic fingerprint" through the polymerase chain reaction technique ("PCR").¹³ This technique facilitates DNA identification from a tiny biological sample by amplifying small amounts of DNA through polymerase chain reactions.¹⁴ The process makes DNA typing possible by producing large amounts of identical DNA, and the PCR allows investigators to obtain a DNA profile from postage stamps, coffee cups, and even single hairs.¹⁵ Within the DNA copy produced by PCR, short tandem repeat ("STR") technology¹⁶ is

⁹ The ability to identify a person by his or her DNA carries a certainty greater than 99.9% (depending on quality of sample and type of test done), and stored DNA samples do not degrade or degenerate over time like most hair, skin, or tissue samples. HARDING, *supra* note 6, at 7.

¹⁰ Kimmelman, *supra* note 7, at 695. Genetic fingerprinting has also been instrumental in determining paternity and inheritance rights and for identifying remains in mass casualty situations. HARDING, *supra* note 6, at 7.

¹¹ Kimmelman, *supra* note 7, at 695.

¹² In January 1999, the FBI mandated that state laboratories switch from the RFLP system to the new STR system. LEE & TIRNADY, *supra* note 1, at 172.

¹³ Tracey Maclin, *Is Obtaining an Arrestee's DNA a Valid Special Needs Search Under the Fourth Amendment? What Should (and Will) the Supreme Court Do?*, 34 J.L. MED. & ETHICS 165, 166 (2006).

¹⁴ Garrett E. Land, *Judicial Assessment or Judicial Notice? An Evaluation of the Admissibility Standards for DNA Evidence and Proposed Solutions to Repress the Current Efforts to Expand Forensic DNA Capabilities*, 9 J. MED. & L. 95, 106 (2005) ("PCR testing has been praised for its ability to obtain results with very small sample amounts.").

¹⁵ See LEE & TIRNADY, *supra* note 1, at ix. For a general explanation of DNA typing, see Land, *supra* note 14, at 105–107.

¹⁶ Short tandem repeats are short stretches of highly repetitive DNA, typically 2–7 base pairs in length, which are present in all humans and which vary widely between individuals. Phil Reilly, *Legal and Public Policy Issues in DNA Forensics*, 2 NATURE REVIEWS GENETICS 313, 314 (2001). For a full explanation and extensive history of STR technology, see John M. Butler, *Genetics and Genomics of Core Short Tandem Repeat Loci Used in Human Identity Testing*, 51 J. FORENSIC SCI. 253 (2006).

used to identify genetic loci.¹⁷ Genetic loci are used to distinguish DNA profiles by examining the gene sequence on a specific location on a chromosome and comparing its length with the gene sequence on the same chromosome from a different person.¹⁸ Most of the typing done at or on behalf of the various state crime labs uses a standard battery of thirteen STR loci.¹⁹ Population geneticists calculated that the probability of a complete match between profiles of two unrelated persons in a randomly mating population of Caucasian Americans is 1.74×10^{-15} , or 1 in 575 trillion.²⁰ The FBI declared in July of 2000 that, with STR markers, it was 99% certain that no other individual in the country could have contributed the DNA in any given evidence sample.²¹

The viability of DNA as an investigative tool was first realized in the 1990s. Since that time, individual states have implemented measures that provide for circumstances in which DNA samples can be collected and retained.²² Virginia created the first DNA database in 1989, and currently, all fifty states have criminal DNA databases²³ that are linked together in the National DNA Index System ("NDIS").²⁴

¹⁷ Reilly, *supra* note 16.

¹⁸ *Id.*

¹⁹ The position a gene or other DNA fragment occupies on the DNA ladder is called its "locus." Land, *supra* note 14, at 105. "The forensic testing community in the United States uses a standardized set of thirteen core short tandem repeat (STR) loci." Rothstein & Talbott, *supra* note 2, at 156; *see also* JOHN M. BUTLER, *FORENSIC TYPING: BIOLOGY AND TECHNOLOGY BEHIND STR MARKERS* 323 (Elsevier Academic Press 2001).

²⁰ Reilly, *supra* note 16, at 313–14.

²¹ LEE & TIRNADY, *supra* note 1, at 169 (citing B. Budowle, R. Chakaborty, G. Carmody & K.L. Monson, *Source Attribution of a Forensic DNA profile*, 2 *FORENSIC SCI. COMM.* 3 (July 2000), available at <http://www.fbi.gov/hq/lab/fsc/backissu/july2000/source.htm>).

²² Rosemary Walsh, *The United States and the Development of DNA Data Banks*, *PRIVACY INT'L*, Feb. 20, 2006, <http://www.privacyinternational.org/article.shtml?cmd%5B347%5D=x-347-528471>.

²³ *See* Davina Dana Bressler, Note, *Criminal DNA Databank Statutes and Medical Research*, 43 *JURIMETRICS J.* 51, 51 (2002); *see, e.g.*, H.R. Rep. No. 106-900, at 8 (2000) as reprinted in 2002 U.S.C.C.A.N. 2323, 2324.

²⁴ David Lazer & Viktor Mayer-Schönberger, *Statutory Frameworks for Regulating Information Flows: Drawing Lessons for the DNA Data Banks from Other Government Systems*, 34 *J.L. MED. & ETHICS* 366, 371 (2006); Seth Axelrad, *Survey of State DNA Database Statutes 2005*, *AM. SOC. OF LAW, MED. & ETHICS*, http://www.aslme.org/dna_04/grid/index.php (click on "statutes grid– html format")

Maintained by the FBI,²⁵ the federal Combined DNA Index System ("CODIS") allows for interstate comparison of DNA profiles.²⁶

Although all fifty states currently have legislation requiring that DNA profiles of certain categories of individuals be included in at least two levels of CODIS,²⁷ the legislation varies widely from state to state concerning which classes of offenders are incorporated into the national database.²⁸ Congress attempted to combat problematic inconsistencies by passing the DNA Analysis Backlog Elimination Act of 2000.²⁹ This statute authorized the U.S. Attorney General to issue grants to the states in order to expand the CODIS database to include analysis of samples taken from individuals convicted of a qualifying

(last visited Feb. 22, 2009). Additionally, all fifty states have statutes providing for obligatory DNA banking of blood and saliva samples for those convicted of certain felony crimes. Similar federal legislation is in force covering those convicted of specified offenses in the District of Columbia and other U.S. federal territories and property and members of the U.S. military while on active duty. Frank R. Bieber, *Science and Technology of Forensic DNA Profiling: Current Use and Future Directions*, in DNA AND THE CRIMINAL JUSTICE SYSTEM: THE TECHNOLOGY OF JUSTICE 45 (David Lazer ed., The MIT Press 2004); see also 10 U.S.C. § 1565 (2000) (covering military offenses); 42 U.S.C. § 14135(a) (2000) (covering collection and use of DNA identification information from certain federal offenders); 42 U.S.C. § 14135(b) (covering collection and use of DNA identification information from certain District of Columbia offenders).

²⁵ Statutory authority to create the national database was provided by the federal DNA Act, contained within the Violent Crime and Law Enforcement Act of 1994, and led to the creation of the National DNA Index System ("NDIS"). In September 2005, a further initiative to expand the collection practice was added by the Senate Judiciary Committee to the Violence Against Women Act, and the amendment known as the DNA Fingerprint Act of 2005, 42 U.S.C. § 14132(a) (2005). Title X of Pub. Law 109-162 (2006) passed with the effect of removing barriers to maintaining data from criminal arrestees and making it easier to include their DNA samples in the NDIS; see Walsh, *supra* note 22, at 2.

²⁶ Bieber, *supra* note 24, at 45-46. Rather than a single centralized source, CODIS is a three-tiered structure of information sharing; all profiles originate from local laboratories. The states then collect this information for their state-wide databases. At the highest level of this hierarchy, CODIS, is the NDIS, which permits states participating in the CODIS program to compare samples at a national level. To aid in criminal investigation, CODIS has two indices: one containing DNA profiles of individuals, and the other containing unidentified DNA from crime scenes. Elizabeth E. Joh, Commentary, *Reclaiming "Abandoned" DNA: The Fourth Amendment and Genetic Privacy*, 100 NW. U. L. REV. 857, 876 n.97 (2006).

²⁷ Maclin, *supra* note 13, at 166.

²⁸ *Id.*

²⁹ 42 U.S.C. § 14135(a)(1).

offense as determined by that state.³⁰ Recognizing the importance of expanding DNA databases, many states have increased the number of individuals eligible for inclusion in the CODIS system.³¹ As states broaden the category of offenders, they will increase their eligibility for federal funding to reduce their backlogs and solve more crimes.³²

1. BENEFITS OF DNA TECHNOLOGY

Policymakers, criminal investigators, and legal professionals have identified a series of benefits—already derived or potentially derivable—from the increasingly routine and inexpensive use of DNA technology and its expanding applications.³³ As identified by British scholars Robin Williams and Paul Johnson, these benefits include the potential to make speedy and robust suspected offender identifications through automated profile comparisons in centralized databases; the ability to confidently eliminate innocent suspects from investigations; the increased likelihood of generating reliable and persuasive evidence for use in court; a reduction in the cost of many investigations; the likely deterrent effect of DNA databasing on potential criminal offenders; and a possible increase in public confidence in policing and in the judicial process as a whole.³⁴

2. CONCERNS OVER DNA TECHNOLOGY

Despite the tangible benefits of expanded DNA databases, the increased application of this technology has prompted a wide range of concerns and problems. Civil libertarians, especially, denounce the storage of tissue samples (particularly those taken from individuals without consent) and the proliferation of genetic information used by the police.³⁵ Williams and Johnson note that, “[a]s a result, in

³⁰ See *id.*

³¹ Tania Simoncelli & Barry Steinhardt, *California’s Proposition 69: A Dangerous Precedent for Criminal DNA Databases*, 33 J.L. MED. & ETHICS 279, 282 (2005).

³² Maclin, *supra* note 13, at 166.

³³ Robin Williams & Paul Johnson, *Inclusiveness, Effectiveness, and Intrusiveness: Issues in the Developing Uses of DNA Profiling in Support of Criminal Investigations*, 33 J.L. MED. & ETHICS 545, 546 (2005).

³⁴ *Id.*

³⁵ Williams & Johnson, *supra* note 33, at 546.

jurisdictions where forensic DNA databases have been introduced, a range of critical commentaries have emerged which have sought to counter claims for the effectiveness of DNA-aided investigations with assertions of potentially problematic ethical and social consequences of their uses.”³⁶ In a reciprocal analysis to the potential benefits, Williams and Johnson have also identified the potential pitfalls of the databases: the threat to the bodily integrity of citizens who are subject to the non-consensual sampling of their genetic material; the intrusion and denigration of privacy rights caused by the storage and use of tissue samples; the potential for the future misuse of such samples held in state and privately owned laboratories; the prospect of long term bio-surveillance occasioned by the storage of genetic information in police databases and forensic laboratories; and the possibility for the deceptive use of DNA forensic evidence in police investigations and criminal prosecutions.³⁷

B. DNA DATABASES AS A PUBLIC DEBATE

The discourse over the ethical, legal, and social implications of forensic DNA profiling has engaged the public interest, and full public engagement is critical to protect a system of justice that strikes an appropriate balance between public safety and civil liberties.³⁸ Generally speaking, the debate over DNA databases often polarizes libertarian groups—such as the American Civil Liberties Union (“ACLU”) and criminal defense lawyers (opposing universal sample collection³⁹ and sample retention⁴⁰)—against prosecutors and police

³⁶ *Id.*

³⁷ *Id.* (noting that the literature on these matters is extensive); see also DNA ON TRIAL: GENETIC IDENTIFICATION AND CRIMINAL JUSTICE (P.R. Billings ed., Cold Spring Harbor Lab. Press 1992); DNA AND THE CRIMINAL JUSTICE SYSTEM: THE TECHNOLOGY OF JUSTICE 45–46 (David Lazer ed., The MIT Press 2004); GRAEME T. LAURIE, GENETIC PRIVACY: A CHALLENGE TO MEDICO-LEGAL NORMS (Cambridge University Press 2002).

³⁸ See Alice Noble, *DNA Fingerprinting and Civil Liberties*, 34 J.L. MED. & ETHICS 149, 152 (2006).

³⁹ Commentators argue against a universal database on the grounds that it would constitute a “step toward an Orwellian society” that will make “us [into] a ‘nation of suspects’ and radically[]alter the relationship between the citizen and [the] government.” DAVID H. KAYE & MICHAEL E. SMITH, *DNA Databases for Law Enforcement: The Coverage Question and the Case for a Population-Wide Database*, in DNA AND THE CRIMINAL JUSTICE SYSTEM: THE TECHNOLOGY OF JUSTICE 265 (David Lazer ed., The MIT Press 2004) (quoting Jean E. McEwen, *DNA Databanks*, in GENETIC SECRETS: PROTECTING PRIVACY AND CONFIDENTIALITY IN THE GENETIC AGE 236 (Mark A. Rothstein ed., Yale University

seeking broader authority to take biological samples from individual suspects to solve crimes.⁴¹ Somewhere in the middle are victims' rights groups and feminists who support speedy DNA testing of evidence taken from victims of rape.⁴²

There is inevitably a trade-off between law enforcement and civil liberties. The costs and benefits of DNA databases, therefore, are being closely monitored and fiercely debated. Social theorist David Garland highlights this point by observing that "surveillance technologies are an essential part of modern societies."⁴³ Garland further hypothesizes that the concept of DNA identification for an entire population may someday be as ordinary as Social Security numbers, but it is the *means* by which such surveillance is achieved and the public discourse and awareness that it generates, which necessitates widespread attention to facilitate regulation without abuse.⁴⁴

II. THE LEGAL AND POLICY IMPLICATIONS OF SAMPLE RETENTION

This section raises three discrete issues to be resolved through federal legislation, policy initiatives, and consideration by the Supreme Court concerning the scope of DNA databases. At the core of the debate is the basic inquiry as to whether individual privacy protections can tolerate retention—and hypothetical future abuses—in government laboratories. Additionally, if U.S. policy continues to opt for sample retention, the question remains as to what type of sample

Press 1997)). "Storing information on otherwise unsuspected individuals," it is said, "expresses an ethos of suspicion." Jonathan Kimmelman, *supra* note 7, at 696.

⁴⁰ Bressler, *supra* note 23, at 52 (citing Jonathan Kimmelman, Commentary, *Risking Ethical Insolvency: A Survey of Trends in Criminal Law Databanking*, 28 J.L. MED. & ETHICS 209, 212–13 (2000)).

⁴¹ See Amar, *supra* note 2.

⁴² *Id.* In January of 2008, Maryland expanded its DNA database to collect samples from people arrested for murder, rape, and assault (instead of only collecting DNA from convicted criminals). This statute was passed largely as a result of fierce lobbying by rape victim Laura Neuman. Kelli Arena & Kevin Bohn, *Rape Victim Pushes for Expanded DNA Database*, CNN.COM, May 12, 2008, <http://www.cnn.com/2008/CRIME/05/12/dna.database/index.html>.

⁴³ Joh, *supra* note 26, at 884 (quoting David Garland, *Panopticon Days: Surveillance and Society*, 20 CRIM. JUST. MATTERS 3 (1995)).

⁴⁴ See *id.*

should actually be retained. As continued biological advances threaten to reveal genetic information about individuals from samples previously assumed innocuous, current methods to maintain information in databases raise significant privacy concerns over potential misuse by the government, insurers, or employers. Finally, this section explores national and state-specific policy proposals that continue to increase the class of citizens compelled to provide DNA samples to centralized DNA databases.

A. SHOULD DNA SAMPLES BE RETAINED?

The current federal and state policies requiring the criminal justice system to retain tissue samples are a core issue in the privacy debate. The FBI quality assurance standards for laboratories participating in CODIS state: “[w]here possible, the laboratory shall retain or return a portion of the evidence sample or extract.”⁴⁵ As a result, specimens may be stored indefinitely in the event a profile is challenged or testing technology improves. Perhaps the most compelling and immediate reason for the retention of offender DNA samples is to promote quality assurance.⁴⁶ In the event that a potential “match” is identified, DNA laboratories want to be able to conduct a re-analysis of the sample before releasing any personally identifiable information.⁴⁷ This re-analysis is a routine part of the match confirmation process for laboratories participating in the CODIS program.⁴⁸ Additionally, given the use of automated batch sample-processing methods, there is a possibility, however slight, of inaccurate sample labeling; re-analysis of retained samples is designed to identify any possible sample mix-up.⁴⁹ Accordingly, “saving the samples could be useful for re-testing or for the inclusion

⁴⁵ Brief for Electronic Privacy Information Center as Amici Curiae Supporting Petitioner, *Johnson v. Quander*, 440 F.3d 489 (D.C. Cir. 2006) (No. 05-5156) [hereinafter EPIC Brief], reprinted in *AT ISSUE: DNA DATABASES* 80 (Lauri H. Harding ed., Greenhaven Press 2007).

⁴⁶ M. Dawn Herkenham, *Retention of Offender DNA Samples Necessary to Ensure and Monitor Quality of Forensic DNA Efforts: Appropriate Safeguards Exist to Protect the DNA Samples from Misuse*, 34 J.L. MED. & ETHICS 380, 381 (2006).

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.* at 381–82.

of additional genetic markers, but as long as the samples are stored, there is a possibility that they could be used by unauthorized third parties in ways that might lead to disclosure of confidential information, or for malicious, retributive, or oppressive purposes.”⁵⁰

Although the FBI policy favors retention of samples,⁵¹ currently, there is no national policy on sample retention, but in almost every state the samples are retained indefinitely.⁵² About half of the states have laws *explicitly* addressing the retention of DNA samples; the remaining state statutes are either silent or authorize a state agency to establish rules regarding storage and retention.⁵³ In most states, samples are being retained indefinitely, unless (1) the individual has a conviction overturned or case dismissed or (2) the individual is an arrestee who is never convicted.⁵⁴ Wisconsin is the only state that explicitly requires the destruction of DNA samples after analysis is completed,⁵⁵ although no samples have yet been destroyed. Arizona requires that all samples be retained for thirty-five years and then destroyed.⁵⁶ Nebraska, by contrast, is the only state that explicitly requires that all samples be permanently retained.⁵⁷

Privacy advocates call for destruction of all samples after analysis to provide assurance that samples will not be re-analyzed for an improper purpose by law enforcement.⁵⁸ They assert that the

⁵⁰ Rothstein & Talbott, *supra* note 2, at 158 (citing Seth Axelrad, *Survey of State DNA Database Statutes 2005*, AM. SOC. OF LAW, MED. & ETHICS, http://www.aslme.org/dna_04/grid/index.php (click on “statutes grid– html format”) (last visited Feb. 22, 2009)).

⁵¹ Law enforcement authorities argue that sample retention is necessary for “quality assurance purposes” such as re-testing in the event of a mix-up. Tania Simoncelli & Helen Wallace, *As DNA Databases Grow, the Potential for Abuse and Error Increases*, in AT ISSUE: DNA DATABASES 26 (Lauri H. Harding ed., Greenhaven Press 2007).

⁵² Rothstein & Talbott, *supra* note 2, at 158 (citing Axelrad, *supra* note 50).

⁵³ See Axelrad, *supra* note 50.

⁵⁴ *Id.*

⁵⁵ WIS. STAT. ANN. § 165.77 (West 2004 & Supp. 2007) (requiring destruction after analysis has been completed and the applicable court proceedings have ended).

⁵⁶ ARIZ. REV. STAT. § 13-610 (LexisNexis 2005).

⁵⁷ NEB. REV. STAT. § 29-4105 (2005).

⁵⁸ Mark A. Rothstein & Sandra Carnahan, *Legal and Policy Issues in Expanding the Scope of Law Enforcement DNA Data Banks*, 67 BROOK. L. REV. 127, 164 (2002).

destruction of DNA from which the digitized profile is constructed would greatly diminish public fears about government threats to genetic privacy.⁵⁹ Furthermore, destruction of DNA samples after analysis limits the use of those genetic fingerprints to their core purpose: a one-time verification without inviting re-purposing at a later stage.⁶⁰

From a practical standpoint, it would be possible to operate the system without retaining DNA samples indefinitely, but there would be strong resistance to the destruction of samples in some law enforcement circles.⁶¹ The paucity of uniform privacy protections compounds the problem from a policy perspective. Essentially, more and more DNA is being collected—with the advances in genetic research making this data more and more valuable—yet there is no legislation in place to comprehensively prohibit and sanction the potential for misuse. Legislators approaching this issue and wishing to ensure adequate privacy protections face a crossroads: either place federal statutory restrictions on the storage of all DNA samples or protect privacy more permanently by destroying the samples themselves.⁶²

B. WHAT TYPE OF SAMPLE SHOULD BE RETAINED?

In addition to the issue as to whether samples should be retained, there is the technical issue of *what type of sample* should actually be retained. Since the inception of DNA databanking, law enforcement proponents have analogized DNA samples to traditional fingerprints.⁶³ However, opponents maintain that this analogy is

⁵⁹ Reilly, *supra* note 16, at 315.

⁶⁰ Lazer & Mayer-Schönberger, *supra* note 24, at 372.

⁶¹ Reilly, *supra* note 16, at 317.

⁶² Barry Steinhardt, *Privacy and Forensic DNA Data Banks*, in *DNA AND THE CRIMINAL JUSTICE SYSTEM: THE TECHNOLOGY OF JUSTICE* 190 (David Lazer ed., The MIT Press 2004); see also Lazer & Mayer-Schönberger, *supra* note 24, at 372 (arguing in favor of destroying samples once they have been typed in order to ensure that a change in political regime cannot result in an immediate change in the regulation of information or the possibility of improperly sharing such information with a rogue third party).

⁶³ Commentators have commonly drawn an analogy between DNA and fingerprints; genetic analysis is often described as “DNA fingerprinting.” Joh, *supra* note 26, at 869; David H. Kaye, *Two Fallacies About DNA Data Banks for Law Enforcement*, 67 BROOK. L. REV. 179, 188 (2001).

flawed, because like DNA a fingerprint identifies a person, but unlike a fingerprint, DNA stores and reveals massive amounts of personal, private data about that individual. The advance of science promises to make stored DNA only more revealing in time.⁶⁴ Genetic data contains information about an individual that can provide insights into personal family relationships, disease predisposition, physical attributes, and ancestry.⁶⁵

Early in the debate over DNA typing, the loci used in law enforcement DNA testing were popularly characterized as “lacking any particular biological function”—they were commonly labeled “junk DNA.”⁶⁶ Among biologists, however, the term “junk” was quickly replaced by “non-coding” but, unfortunately, the colloquialism stuck. The term “junk DNA” is now considered misleading because much of the so-called “junk” is believed to have a function, and DNA markers have the potential to be significant even if they are not within a coding region.⁶⁷

Thirteen specific loci—better known as STRs—are used to create the DNA profiles used in law enforcement databases.⁶⁸ Recent suggestions⁶⁹ that these standard DNA fingerprints, used by police around the world, contain a subtle signature that can be linked with

⁶⁴ United States v. Kincade, 379 F.3d 813, 842 (9th Cir. 2004) (Gould, J., concurring); see also Rothstein & Carnahan, *supra* note 58, at 156–57 (distinguishing DNA samples from fingerprinting).

⁶⁵ Tania Simoncelli, *Dangerous Excursions: The Case Against Expanding Forensic DNA Databases to Innocent Persons*, 34 J.L. MED. & ETHICS 390, 392 (2006).

⁶⁶ Colloquy, *Is the “JUNK” DNA Designation Bunk?*, 102 NW. U. L. REV. 54, 56 (2007).

⁶⁷ *Id.* (citing Colin Nickerson, *DNA Study Challenges Basic Ideas in Genetics: Genome ‘Junk’ Appears Essential*, BOSTON GLOBE, June 14, 2007, at A1).

⁶⁸ *Is the “JUNK” DNA Designation Bunk?*, *supra* note 66, at 56. For definition and discussion of “loci,” see Land, *supra* note 14 and *supra* note 19, at 105; see also Rothstein & Talbott, *supra* note 2, at 156 (discussing loci as markers).

⁶⁹ See W. Wayt Gibbs, *The Unseen Genome: Gems Among the Junk*, SCI. AM., Nov. 2003, at 46, 49–50. Gibbs quotes the Director of the Institute for Molecular Bioscience at the University of Queensland as saying: “I think [junk DNA] will come to be a classic story of orthodoxy derailing objective analysis of the facts . . . [It] may well go down as one of the biggest mistakes in the history of molecular biology.” See also Justin Gillis, *Genetic Code of Mouse Published: Comparison with Human Genome Indicates “Junk DNA” May be Vital*, WASH. POST, Dec. 5, 2002, at A1 (reporting that “new discoveries were likely to force scientists to abandon the term ‘junk DNA’ and send them back to the drawing board”).

genetic predispositions⁷⁰ and raise serious privacy concerns as to what type of sample should be stored in the future. At the very least, Professor Simon Cole suggests that it would be misleading to claim that the forensic STRs (used in the CODIS databases) have no medical significance, are devoid of information, or are completely innocuous from a privacy standpoint.⁷¹ Nonetheless, despite discoveries about the role “junk DNA” may play in a larger biological scheme, CODIS proponents ardently maintain that information coded in the databases will be used solely for identification purposes.⁷² Even if STR profiles could reveal private information—both today and in the future—the CODIS STRs are of “negligible value” to scientists for ascertaining information about an individual’s health.⁷³ Another well-known scholar, Professor David H. Kaye, directly challenges the cautions raised by Professor Cole: “[t]he scenarios for the misuse by the government, insurers, or employers of the STR-identification profiles in NDIS and other law enforcement databases border on science fiction.”⁷⁴

Furthermore, regardless of “junk DNA’s” theoretical potential to reveal genetic information about an individual, the federal legislature has already taken steps to ensure the integrity of law enforcement practices when accessing these databases. The Privacy Act Notice on the NDIS demonstrates a commitment to safeguard DNA samples and DNA records from unauthorized disclosure and use.⁷⁵ Specifically, no

⁷⁰ “A massive international study of the human genome has caused scientists to rethink some of the most basic concepts of cellular function. . . . Among critical findings: A huge amount of DNA long regarded as useless—and dismissively labeled “junk DNA”—now appears to be essential to the regulatory processes that control cells. Also, the regions of DNA lying between genes may be powerful triggers for diseases— and may hold the key for potential cures.” Nickerson, *supra* note 67, at A1.

⁷¹ *Is the “JUNK” DNA Designation Bunk?*, *supra* note 66, at 59; but see Colloquy, *Please, Let’s Bury the Junk: The CODIS Loci and the Revelation of Private Information*, 102 NW. U. L. REV. 70, 71 (2007) (clarifying why STR profiles are useless as a genetic test to screen for any particular disease and are useful only for identification purposes).

⁷² *Please, Let’s Bury the Junk: The CODIS Loci and the Revelation of Private Information*, *supra* note 71, at 71, 80–81.

⁷³ *Id.* at 80–81 (conceding that DNA profiles are potentially more revealing than fingerprints or social security numbers, but the information content is no more threatening than that of a blood group or tissue type).

⁷⁴ *Id.* at 81.

⁷⁵ Herkenham, *supra* note 46, at 382.

personal identifying information (other than the specimen identification number) is stored on NDIS,⁷⁶ and the Federal DNA Identification Act requires very limited disclosure and use of the DNA samples and records.⁷⁷ Forty-six states similarly limit access to and disclosure of DNA samples and records in their databases, and a majority of state DNA database statutes include specific provisions governing the confidentiality of the DNA records and/or DNA samples.⁷⁸

As a final precautionary measure, the unauthorized acquisition or disclosure of DNA information is subject to prosecution.⁷⁹ At the federal level, the penalty is a fine not to exceed \$250,000 or imprisonment for a period not to exceed one year.⁸⁰ Thirty-eight states also have criminal penalties for the unauthorized use or disclosure of DNA records, and eighteen states expressly penalize tampering with or unlawfully obtaining a DNA sample as a felony offense.⁸¹

Despite proffered safeguards, questions remain for citizens concerned about potential privacy risks posed by calling the current thirteen loci sample (forensic STRs) “junk,” or “not socially or medically significant.”⁸² Legal scholar Mark Rothstein maintains that if public policy must balance a range of options, then it is incumbent upon those advocating an expansion of police powers to demonstrate how substantial public interests in deterrence and justice are fostered.⁸³ For example, an increasing intrusion of individual rights should not be tolerated unless the law enforcement benefits are tangible and readily apparent. Additionally, concurring skeptics worry about the ad hoc protections afforded by state laws to prevent

⁷⁶ Privacy Act of 1974, 5 U.S.C. §552a (1996); New System of Records, 61 Fed. Reg. 139,37495 (1996).

⁷⁷ For a full list of the requirements for limited disclosure, see 42 U.S.C. § 14132(b)(3) (2004).

⁷⁸ See Herkenham, *supra* note 46, at 383 (citing individual state statutes).

⁷⁹ *Id.*

⁸⁰ See 42 U.S.C. §§ 14133(c), 14135(e); 42 U.S.C. § 14132(c).

⁸¹ See Herkenham, *supra* note 46, at 383 (citing individual state statutes).

⁸² *Is the “JUNK” DNA Designation Bunk?*, *supra* note 66, at 62.

⁸³ Rothstein & Carnahan, *supra* note 58, at 158.

abuse: as long as millions of biological samples are held in the absence of uniform regulations, there will remain a temptation to use them for purposes that go beyond law enforcement identification.⁸⁴ Given the strong public concern about the privacy risks associated with DNA databases, there appear cogent reasons to pass legislation standardizing the types of samples collected; the analytical method used to generate a DNA profile; the limitations on sample access; the appropriate forensic purposes for which the data can be used; and federal sanctions for unauthorized access to, or use of, database information.⁸⁵

C. FROM WHOM SHOULD SAMPLES BE RETAINED?

The promise of increased efficacy has some members of law enforcement and legal academia advocating for the expansion of criminal DNA databases to include samples from the entire population.⁸⁶ A variety of practical and policy issues shape the debate over whose DNA should be included in government DNA databases, but the recent trend is toward a system where the government has access to an increasing number of DNA samples. Currently, all fifty states and federal law compel the collection of DNA from at least some categories of criminal offenders,⁸⁷ but states independently continue to add to the list of individuals forced to provide a DNA sample for analysis.⁸⁸

1. FUTURE PROPOSALS FOR A UNIVERSAL DATABASE

As states have realized the success of a centralized DNA database, they have subsequently realized that its utility is based on the number

⁸⁴ Steinhardt, *supra* note 62, at 174.

⁸⁵ See Rothstein & Carnahan, *supra* note 58, at 161–66.

⁸⁶ Rothstein & Talbott, *supra* note 2, at 154 (citing Amar, *supra* note 2).

⁸⁷ Paul M. Monteleoni, *DNA Databases, Universality, and the Fourth Amendment*, 82 N.Y.U. L. REV. 247, 252 (2007).

⁸⁸ Ashley J. McCarron, Comment, *Do the Crime, Serve the Time, Then Leave Your DNA Behind: United States v. Weikert*, 3 J. HEALTH & BIOMEDICAL L. 379, 387 (2007) (citing U.S. DEP'T OF JUSTICE, USING DNA TO SOLVE COLD CASES 9 (2002), <http://www.ojp.usdoj.gov/nij/pubs-sum/194197.htm> (commenting on states' expansion of categories of individuals required to submit DNA)).

of profiles contained within the database.⁸⁹ At first, only convicted murderers and sex offenders were required to provide a DNA sample for profiling, but recent success with the database has led to the inclusion of less violent offenders, even those merely suspected of a crime.⁹⁰ Each state remains sovereign in its mandatory requirements for sample collection, but the resulting discrepancies by jurisdiction have led some commentators to perceive an urgent need to legislate strong safeguards implementing a universal, federal database.⁹¹ Such proposals advocate for a federal DNA statute that would limit access to appropriate government officials and issue severe penalties for misuse of DNA.⁹² With protections in place, the government would then take a biological sample from as many citizens as possible (such as when adults renew driver's licenses), including every newborn, and the federal government would subsequently generate a DNA profile for each person.⁹³ This data would be stored in a database and could be checked against any genetic material found at crime scenes across the country.⁹⁴

The campaign for the national universal database is largely due to the success of criminal DNA databases. In 1999, the proposal gained widespread media coverage and increased public discourse when New York City Mayor Rudolph Giuliani proposed collection of DNA samples from all newborns for both medical and law enforcement purposes.⁹⁵ In practical terms, it is not far-fetched to imagine such a protocol being adopted. Currently, all states have laws that mandate screening newborns for genetic diseases, as well as laws that ensure the confidentiality of those test results.⁹⁶ Furthermore, in 2001, three

⁸⁹ *Id.*

⁹⁰ *Id.*

⁹¹ See generally David H. Kaye & Michael E. Smith, *DNA Identification Databases: Legality, Legitimacy, and the Case for Population-Wide Coverage*, 2003 WIS. L. REV. 413, 421 (2003); Amar, *supra* note 2.

⁹² See Amar, *supra* note 2.

⁹³ For a discussion of a possible path to a population-wide database, see Kaye & Smith, *supra* note 91, at 437.

⁹⁴ Amar, *supra* note 2.

⁹⁵ Simoncelli & Steinhart, *supra* note 31, at 283.

⁹⁶ For example, states require testing of newborns for phenylketonuria ("PKU"), a rare condition that results in profound mental retardation that can only be diagnosed and

highly influential legal scholars⁹⁷ (all serving as members of the National Commission on the Future of DNA Evidence)⁹⁸ began publicly advocating, “a single, population-wide DNA database for the United States.”⁹⁹ Because “cold hits”¹⁰⁰ from DNA registries are now a routine matter, they argue that a universal database would eliminate the specter of a racially skewed national DNA database.¹⁰¹

Such proposals are not without comparative precedents. Both Estonia and the United Kingdom have proposed population-based DNA collections and research projects, and the most internationally discussed DNA-based project—deCODE in Iceland—is a commercial project to generate a computerized database collecting medical records and DNA samples from the entire population for population-

treated by blood testing before any symptoms appear. Teresa K. Baumann, Note, *Proxy Consent and a National DNA Databank: An Unethical and Discriminatory Combination*, 86 IOWA L. REV. 667, 677 (2001) (citing Paul A. Lombardo, *Genetic Confidentiality: What's the Big Secret?*, 3 U. CHI. L. SCH. ROUNDTABLE 589, 598 (1996)).

⁹⁷ Michael E. Smith is a professor of law at the University of Wisconsin; David H. Kaye is a professor of law at Arizona State University; Edward J. Imwinkelried is a professor of law at the University of California-Davis. LEE & TIRNADY, *supra* note 1, at 175.

⁹⁸ In 1997, Attorney General Janet Reno, as a result of her interest in the value of DNA evidence to exonerate wrongfully convicted persons, created the National Commission on the Future of DNA Evidence to advise the United States Department of Justice on unresolved policy questions. Reilly, *supra* note 16, at 315.

⁹⁹ LEE & TIRNADY, *supra* note 1, at 175.

¹⁰⁰ “Cold hits” within the national DNA database links someone in the database (often a convicted offender) to an unsolved or “cold case.” See Liza Porteus, *Supporters, Critics Debate DNA Database Expansion*, FOX NEWS.COM, May 9, 2003, <http://www.foxnews.com/story/0,2933,86390,00.html>. “While a suspect may not leave any other physical evidence behind, investigators can use DNA to place the suspect at the scene of a crime, especially where there are no eyewitnesses. DNA is helpful in solving crimes because it can link one crime scene to another, a suspect to a victim, a victim to a suspect, and a victim to a crime scene.” Laura A. Matejik, *DNA Sampling: Privacy and Police Investigation in a Suspect Society*, 61 ARK. L. REV. 53, 58 (2008); but cf. Rothstein & Talbott, *supra* note 2, at 154 (equating “cold hits” to mean something equivalent to “investigations aided,” but concluding that there is no clear definition of the term).

¹⁰¹ According to Smith, Kaye, and Imwinkelried: “The Bureau of Justice Statistics report that a black man is six times more likely to be imprisoned during his life than a white man,” and given this data, the construction of huge convict or arrestee DNA databases could exacerbate racial divisions. LEE & TIRNADY, *supra* note 1, at 175; see also Michael E. Smith, David H. Kaye, & Edward J. Imwinkelried, *DNA Data from Everyone Would Combat Crime, Racism*, USA TODAY, July 26, 2001, at 15A.

based genetic research.¹⁰² The deCODE database project has raised important concerns about ethical protection, the principle of informed consent,¹⁰³ and the power to regulate genetic information.¹⁰⁴

Considered as a whole, foreign DNA databanking practices offer contrasts that highlight the strengths and weaknesses of U.S. policies. Perhaps the main difference between the application of DNA databanking in the United States and Europe is that European nations generally permit ‘sweeps’—the collection of large numbers (sometimes thousands) of “elimination samples” to help focus investigations.¹⁰⁵ The United Kingdom¹⁰⁶ recently caught the attention of critics at home and abroad when a senior judge suggested that every man, woman, and child in the country—and those who come to visit—should have their DNA taken and held on a national police database.¹⁰⁷

In sum, in a short time, the United States has witnessed rapid-fire proposals to expand the size and function of DNA databases, including calls for a population-wide repository. A universal standard for sample collection remains highly controversial and will not come to

¹⁰² George J. Annas, *Genetic Privacy*, in *DNA AND THE CRIMINAL JUSTICE SYSTEM: THE TECHNOLOGY OF JUSTICE* 141 (David Lazer ed., The MIT Press 2004).

¹⁰³ Since the project’s inception, 20,000 people have opted out of deCode, saying their DNA is being exploited. Gisli Pálsson & Paul Rabinow, *Iceland: The Case of a National Human Genome Project*, *ANTHROPOLOGY TODAY*, Oct. 1999, at 14–15.

¹⁰⁴ DeCode has been the focus of controversy since its inception. Legally a United States corporation, deCode operates entirely in Iceland and strengthened its financial position through a business arrangement with pharmaceutical giant Hoffmann La Roche. While proponents of the database argue that the project was democratically approved by the Icelandic Parliament and will lead to scientific advances and economic opportunities for the Icelandic community, privacy opponents characterize the fact that a private company proposes to construct a genomic map of the Icelandic people (as part of a State-owned and operated database) and to commercialize information contained in it constitutes “selling Icelandic DNA.” *Id.* at 14–15.

¹⁰⁵ See Reilly, *supra* note 16, at 313.

¹⁰⁶ The United Kingdom currently has the largest DNA database of any country (four million samples with nearly a quarter of those from children). Five percent of the population is already in the national database and 30,000 additional samples are being added every month. Larry Miller, *The U.K.’s ‘Big Brother’ DNA Database*, *CBSNEWS.COM*, Sept. 8, 2007, <http://www.cbsnews.com/stories/2007/09/07/london/main3242563.shtml>.

¹⁰⁷ Lord Justice Sir Stephen Sedley is a liberal judge who is angered that minorities disproportionately have their DNA taken. Forty percent on the database are black. The Lord Justice argues this is an “indefensible” method of ethnic profiling. *Id.*

fruition without an in-depth analysis of the constitutional repercussions of collecting DNA samples from all citizens.¹⁰⁸ The debate over the appropriate scope of inclusion in a national DNA database system continues to require additional discussion. For the time being, the immediate policy discussions might focus on a consistent and more uniform approach by individual states.¹⁰⁹

2. CURRENT STATE-SPECIFIC STATUTORY FRAMEWORKS FOR SAMPLE COLLECTION

Every state has a convicted offender DNA database, but each state varies according to which offenses trigger databasing upon conviction.¹¹⁰ Convicted offender databases rest on the premise (for which there is quite a bit of evidence) that violent criminals tend to re-offend.¹¹¹ Every state permits DNA databanking of samples from adults convicted of serious sexual and other violent offenses.¹¹² As of approximately July 2005, forty-three states had “all felony” provisions, and thirty-eight states included some qualifying misdemeanors.¹¹³ Twenty-eight states permit DNA samples from juveniles adjudicated “delinquent,” to be banked.¹¹⁴ As a general principle, DNA collection on arrest (collection from “arrestees”) remains the least used method, and only four states authorize it for

¹⁰⁸ See Land, *supra* note 14, at 116–17; Paul E. Tracy & Vincent Morgan, *Big Brother and His Science Kit: DNA Databases for 21st Century Crime Control?*, 90 J. CRIM. L. & CRIMINOLOGY 635, 636–37 (2000) (“[J]ust because it may serve some law enforcement purpose does not mean the Constitution falls by the wayside.”).

¹⁰⁹ Land, *supra* note 14, at 117.

¹¹⁰ For specific provisions, see Axelrad, *supra* note 50; R.E. Gaensslen, *Should Biological Evidence or DNA be Retained by Forensic Science Laboratories After Profiling? No, Except Under Narrow Legislatively-Stipulated Conditions*, 34 J. L. MED. & ETHICS 375, 377 (2006).

¹¹¹ Gaensslen, *supra* note 110, at 377. For philosophical justifications regarding the collection of samples from recidivists, see Michelle Hibbert, *DNA Databanks: Law Enforcement's Greatest Surveillance Tool?* 34 WAKE FOREST L. REV. 767, 784 (1999); Rothstein & Talbott, *supra* note 2, at 155; Rothstein & Carnahan, *supra* note 58, at 128.

¹¹² Robert Berlet, *A Step Too Far: Due Process and DNA Collection in California After Proposition 69*, 40 U.C. DAVIS L. REV. 1481, 1487 (2007).

¹¹³ Gaensslen, *supra* note 110, at 377.

¹¹⁴ *Id.*

some or all felony offenses: Louisiana, Virginia, Texas, and California.¹¹⁵

The State of California, in particular, offers a collection model that radically diverges from traditional DNA database programs. On November 2, 2004, California voters approved Proposition 69 (The DNA Fingerprint, Unsolved Crime, and Innocence Protection Act),¹¹⁶ which allows for sampling of DNA on arrest rather than on conviction. Additionally, the Proposition vests greater discretion in the judge and limits appeals of the sample collection in a way that hinders requests for expungement of DNA information.¹¹⁷ Currently, this law is the most inclusive and costly state criminal DNA database in the country, and the state's large geographic area and population render this expansion in database size and function particularly significant. With thirty-four million people residing in California (13% of the entire U.S. population), California's laws carry a unique propensity to establish national legal precedents.¹¹⁸ According to the estimates of legal commentators, well over 600,000 people (including more than 50,000 juveniles) will qualify for testing under Proposition 69 in the first year of enactment.¹¹⁹ This figure represents more than ten times the number of samples the California Department of Justice has ever processed in a given year.¹²⁰

¹¹⁵ Berlet, *supra* note 112, at 1487; see Axelrad, *supra* note 50. Of the four states for which arrestee DNA is databanked, only two, Louisiana and California, refuse to overturn a conviction based on DNA obtained by mistake. Compare LA. REV. STAT. ANN. § 15:609 (2004) (preventing invalidation of "detention, arrest, or conviction" based on database information obtained or placed in database by mistake), with CAL. PENAL CODE § 297 (West 2004) (preventing invalidation of "detention . . . or conviction" based on database information obtained, placed, or retained by mistake).

¹¹⁶ Simoncelli & Steinhardt, *supra* note 31, at 279; see also Walsh, *supra* note 22, at 4.

¹¹⁷ Simoncelli & Steinhardt, *supra* note 31, at 289. Proposition 69 grants the judge complete discretion in deciding to grant an expungement request. The statute does not require a judge to expunge the DNA samples even if the petitioner meets all the requirements for DNA removal. A person cannot appeal the denial of a removal request, nor can he challenge it by a petition of writ. Berlet, *supra* note 112, at 1496.

¹¹⁸ California's air quality standards and tax reduction laws have been widely copied throughout the United States. See, e.g., Simoncelli & Steinhardt, *supra* note 31, at 280.

¹¹⁹ *Id.* at 281.

¹²⁰ *Id.*

In California, at least, this Proposition voices the preference of the public for an investment of public resources¹²¹ to expand efforts to identify potential suspects, regardless of whether it includes people on the “suspect” list who have never been charged or convicted.¹²² So far, no court in California has considered the constitutional implications of Proposition 69, but the dramatic changes wrought by the law raise privacy concerns under the Fourth Amendment.¹²³ Legally speaking, it remains to be seen whether sampling of DNA on arrest is fundamentally different from sampling after a conviction,¹²⁴ but thus far, federal and state courts have repeatedly upheld state efforts to expand mandatory DNA sampling.

III. APPLYING FOURTH AMENDMENT SCRUTINY TO DNA DATABANKING CHALLENGES

The most recent wave of Fourth Amendment jurisprudence epitomizes permissive governmental searches and reflects the significant weight courts are willing to afford to crime-solving needs. Ultimately, the rationale for permitting DNA sampling of criminals differs based on jurisdiction, but there have been no successful Fourth Amendment challenges at the appellate court level to DNA fingerprinting. Thus far, regardless of the test or rationale applied, challenges to state and federal DNA indexing statutes have been unsuccessful.¹²⁵

¹²¹ To pay for the new system, California increased costs of all death certificates by two dollars. Additionally, the state now requires police to ask for and collect DNA information if relatives volunteer it, and coroners also must collect DNA samples from unidentified corpses. Lewis Kamb, *Lack of a DNA Database Hampers the Police*, SEATTLE POST-INTELLIGENCE REP., Feb. 27, 2003, http://seattlepi.nwsourc.com/local/110246_missingdna27.shtml.

¹²² See Simoncelli & Wallace, *supra* note 51, at 28.

¹²³ Berlet, *supra* note 112, at 1498–99.

¹²⁴ See *id.* at 1509.

¹²⁵ Bryant J. Isom, Case Comment, *Determining the Proper Test for Analyzing Statutes Allowing the Taking of DNA Samples from Felons in Nicholas v. Goord: Special Needs Test or General Balancing Test?* 30 AM. J. TRIAL. ADVOC. 383, 395 (2006) (citing *Nicholas v. Goord*, 430 F.3d 652, 658–59 (2d. Cir. 2005)).

A. LEGAL RATIONALES IN CONTEXT

The Fourth Amendment protects against unreasonable searches and seizures.¹²⁶ Thus, in the context of mandates that specified felons and arrestees provide the state with samples of their DNA to be kept on file in a state database, courts are asked to evaluate the degree of intrusion this has on an individual's privacy, and how much the search promotes legitimate government interests.¹²⁷ Statutes authorizing DNA database expansion have consistently been met with Fourth Amendment challenges addressing the constitutionality of the lack of consistent privacy protections for criminal databases and their samples. Although the Supreme Court has not explicitly conducted its own balancing of privacy invasions against law enforcement needs in the context of DNA databases, courts have consistently justified a growing list of circumstances for DNA testing through an increasingly expansive judicial rationale.¹²⁸ In short, despite emphatic dissents, every court of appeals that has considered the DNA Analysis Backlog Elimination Act of 2000 ("DNA Act"),¹²⁹ and the subsequent implementation of state statutes has upheld the statute in question,¹³⁰ and has concluded that extraction and retention of DNA samples does not violate the Fourth Amendment.¹³¹

Under the Fourth Amendment, to determine whether a particular governmental intrusion constitutes a search, a court must ask whether the target of the intrusion has a subjective expectation of privacy in the information obtained by the government and whether "society is prepared to accept that expectation as objectively reasonable."¹³² Any

¹²⁶ See U.S. CONST. amend. IV, § 2.

¹²⁷ Matejik, *supra* note 100, at 70.

¹²⁸ *Recent Cases*, 118 HARV. L. REV. 818, 818 (2004).

¹²⁹ 42 U.S.C. §§ 14135–14135e. This Act allows the FBI to collect DNA from all individuals who are convicted of any of a broad list of federal crimes and sentenced to prison, parole, probation, or supervised release.

¹³⁰ Monteleoni, *supra* note 87, at 248.

¹³¹ See Noah Ehrenpreis, Case Comment, *Constitutional Law—Diminished Expectations of Privacy and the Human Genome: Circuits Align on Mandatory DNA Profiling of Convicted Felons*—United States v. Weikert, 41 SUFFOLK U. L. REV. 337 (2008) (citing United States v. Weikert, 504 F.3d 1 (1st Cir. 2007)).

¹³² Maclin, *supra* note 13, at 168 (quoting California v. Greenwood, 486 U.S. 35, 40 (1988)).

physical intrusion to the body, such as using a needle to withdraw blood, constitutes a search for Fourth Amendment purposes.¹³³ Because DNA has the potential to reveal a host of private facts about an arrestee or convicted felon, courts have found that forcibly taking and testing DNA is a search.¹³⁴

In determining the constitutionality of a governmental search, the focus of the inquiry has always been the reasonableness of the search in light of all circumstances surrounding the search in question.¹³⁵ The Supreme Court has described reasonableness as the “central requirement” of the Fourth Amendment.¹³⁶ All circuit courts have upheld the reasonableness of the DNA Act or its state analogues; however, the circuit courts differ in their method of analysis in DNA cases.¹³⁷

In *Samson v. California*, the Supreme Court recently provided further guidance as to the legal standard that should govern search and seizure jurisprudence in the context of warrantless and suspicionless searches.¹³⁸ The *Samson* Court announced a “totality of the circumstances” analysis that would be directly in line with the precedent followed by the First, Third, Fourth, Fifth, Ninth, Eleventh,

¹³³ See, e.g., *Schmerber v. California*, 384 U.S. 757 (1966); see also *Skinner v. Railway Labor Executives' Ass'n*, 489 U.S. 602 (1989) (extending this principle to include the taking of breath samples because a breathalyzer test was held analogous to the blood-alcohol test in *Schmerber*).

¹³⁴ E.g., *Rise v. Oregon*, 59 F.3d 1556, 1559–60 (9th Cir. 1995) (holding that a state may “interfere with” Fourth Amendment rights to obtain DNA without a warrant or probable cause); *United States v. Kincade*, 379 F.3d 813 (9th Cir. 2004) (en banc) (upholding compulsory DNA testing of certain conditionally-released federal offenders in the absence of individualized suspicion that the offenders have committed additional offenses); *Maryland v. Raines*, 857 A.2d 19 (Md. 2004) (upholding state DNA collection statute for certain convicted offenders).

¹³⁵ *Terry v. Ohio*, 392 U.S. 1, 19 (1968) (upholding search based on police officer's reasonable suspicion of petitioner); see *Bd. of Educ. v. Earls*, 536 U.S. 822, 837 (2002).

¹³⁶ *Matejik*, *supra* note 100, at 70 (citing *Illinois v. McArthur*, 531 U.S. 326, 330 (2001)).

¹³⁷ *Weikert*, 504 F.3d at 8–9 (highlighting other circuits' binding case law).

¹³⁸ *Samson v. California*, 547 U.S. 843, 857–58 (2006). The Court reiterated that reasonableness, not individualized suspicion, is the focus of the constitutional inquiry. The Court considered a parolee's diminished expectation of privacy and the state's substantial interests in reducing recidivism and promoting reintegration of parolees and concluded that requiring suspicion for a search inhibits the state's ability to effectively supervise parolees and protect the public from re-offenders.

and D.C. Circuits in analyzing the DNA Act.¹³⁹ Because *Samson* was not directly addressing a DNA case, however, the Second, Seventh, and Tenth Circuits have applied a “special needs” analysis, and the Sixth Circuit has declared either method sufficient to uphold the constitutionality of the DNA Act.¹⁴⁰

1. THE SPECIAL NEEDS TEST

The term “special needs” entered the legal lexicon in Justice Blackmun’s 1985 concurrence in *New Jersey v. T.L.O.*, upholding a warrantless search of a high school student when school officials had a reasonable suspicion that the student possessed contraband.¹⁴¹ Justice Blackmun advocated for a more stringent version of the traditional Fourth Amendment balancing test: “only in those exceptional circumstances in which ‘special needs,’ *beyond the normal need for law enforcement*, make the warrant and probable cause requirement impracticable, is a court entitled to substitute its balancing of interests for that of the Framers.”¹⁴² Nonetheless, far from maturing into a coherent doctrine, subsequent rulings have produced a tradition of ad hoc reasoning that makes it difficult to draw the line between “law enforcement” and “special needs.”¹⁴³

¹³⁹ *Weikert*, 504 F.3d at 18 (considering the DNA Act’s constitutionality *de novo*); *United States v. Sczubelek*, 402 F.3d 175, 184 (3rd Cir. 2005) (analyzing federal DNA Act); *Jones v. Murray*, 962 F.2d 302, 306–307 (4th Cir. 1992) (analyzing state DNA statute); *Groceman v. U.S. Dep’t of Justice*, 354 F.3d 411, 413–14 (5th Cir. 2004) (analyzing federal DNA Act); *United States v. Kraklio*, 451 F.3d 922, 924 (8th Cir. 2006) (analyzing federal DNA Act); *United States v. Kincade*, 379 F.3d 813, 832 (9th Cir. 2004) (en banc) (analyzing federal DNA Act); *Padgett v. Donald*, 401 F.3d 1273, 1280 (11th Cir. 2005) (analyzing state DNA statute); *Johnson v. Quander*, 440 F.3d 489, 496 (D.C. Cir. 2006) (analyzing federal DNA Act).

¹⁴⁰ *United States v. Amerson*, 483 F.3d 73, 79 (2d Cir. 2007) (analyzing federal DNA Act); *United States v. Hook*, 471 F.3d 766, 773 (7th Cir. 2006) (analyzing federal DNA Act); *United States v. Kimler*, 335 F.3d 1132, 1146 (10th Cir. 2003) (analyzing federal DNA Act); *United States v. Conley*, 453 F.3d 674, 679–81 (6th Cir. 2006) (analyzing federal DNA Act).

¹⁴¹ *Isom*, *supra* note 125, at 386 (citing *New Jersey v. T.L.O.*, 469 U.S. 325, 351 (1985) (Blackmun, J., concurring)).

¹⁴² *T.L.O.*, 469 U.S. at 351 (emphasis added).

¹⁴³ *Maclin*, *supra* note 13, at 170; *see, e.g.*, S.A. SALTZBURG & D.J. CAPRA, *AMERICAN CRIMINAL PROCEDURE: CASES AND COMMENTARY* 431 (7th ed. 2004) (after discussing many special needs cases, asking “[w]here is the line, then, between crime enforcement and special needs”). David H. Kaye, *The Constitutionality of DNA Sampling on Arrest*, 10 CORNELL J. L. & POL’Y 455, 491 (2001) (noting that lower court judges “have disagreed as to

Despite purported inconsistencies, the application of the special needs test gained widespread acceptance in many contexts as a means to authorize government searches despite the absence of individualized suspicion.¹⁴⁴ Applying this test to instances of DNA collection and beyond, the Supreme Court affirmed a special needs exception to the traditionally “closely guarded”¹⁴⁵ Fourth Amendment protections, but only “[i]n limited circumstances where the privacy interests implicated by the search are minimal, and where an important governmental interest furthered by the intrusion would be placed in jeopardy by a requirement of individualized suspicion.”¹⁴⁶

2. THE TOTALITY OF THE CIRCUMSTANCES TEST

An alternative legal theory—which departs from special needs altogether—has been prominent in the most recent Fourth Amendment DNA database decisions: the “totality of the circumstances” analysis. Under DNA statutes, courts “evaluat[e] the totality of the circumstances” by “balanc[ing] the degree to which DNA profiling interferes with the privacy interests of qualified federal offenders against the significance of the public interests served by such profiling.”¹⁴⁷ This general balancing approach is a less rigorous examination under the Fourth Amendment because it does not require that a special need be identified and it solely considers the reasonableness of governmental action in relation to the intrusion against private interests.¹⁴⁸

In most criminal cases, courts strike a balance in favor of satisfying the reasonability requirement. In an early DNA database decision, the Ninth Circuit justified an even broader interpretation of

the applicability of the “special needs” exception to convicted-offender DNA databanking) (listing cases).

¹⁴⁴ See, e.g., *Skinner*, 489 U.S. at 624; *Nicholas*, 430 F.3d at 660 (“The evolution of the Court’s Fourth Amendment jurisprudence suggests that the [special needs] doctrine has increasingly become the test employed by the Court in suspicionless search cases.”).

¹⁴⁵ See *Chandler v. Miller*, 520 U.S. 305, 309 (1997).

¹⁴⁶ *Skinner*, 489 U.S. at 624.

¹⁴⁷ *Isom*, *supra* note 125, at 386 (citing *Kincade*, 379 F.3d at 836).

¹⁴⁸ *Id.* (citing *Nicholas*, 430 F.3d at 664 n.22); but cf. *Sczubelek*, 402 F.3d at 184 (concluding that the totality of the circumstances test is “more rigorous” than the special needs doctrine).

“reasonableness,” holding that drawing blood for DNA analysis was analogous to taking a fingerprint (a minimal intrusion).¹⁴⁹ Under this theory, constitutionality would be determined by balancing the degree to which the database would advance the public interest against the severity of the resulting interference with individual liberty.¹⁵⁰ Relying on the initial *Rise v. Oregon* decision, an eleven-judge panel in the Ninth Circuit recently announced a holding in *Kincade* that noticeably broadens the population subjected to DNA testing.¹⁵¹ Furthermore, *Kincade* increases the circumstances in which DNA testing may be used, and in the case of a federal parolee, the *Kincade* Court concluded that despite the alarmist tone of outraged opponents,¹⁵² the interests furthered by the federal DNA Act are undeniably compelling:

In light of conditional releasees’ substantially diminished expectations of privacy, the minimal intrusion occasion by blood sampling, and the overwhelming societal interests so clearly furthered by the collection of DNA information from convicted offenders, we must conclude that compulsory DNA profiling of qualified federal offenders is reasonable under the totality of the circumstances.¹⁵³

Although the split among appellate courts is over methodology, not ultimate conclusions, it is the totality of the circumstances analysis that seems to be emerging as the controlling precedent in evaluating suspicionless searches under DNA indexing statutes. This

¹⁴⁹ Commentators have commonly drawn an analogy between DNA and fingerprints; genetic analysis is often described as “DNA fingerprinting.” Joh, *supra* note 26, at 869.

¹⁵⁰ *Rise*, 59 F.3d at 1562.

¹⁵¹ *Kincade*, 379 F.3d at 831, 837, 839.

¹⁵² *Id.* at 838 (“In our system of government, courts base decisions not on dramatic Hollywood fantasies, but on concretely particularized facts developed in the cauldron of the adversary process and reduced to an assessable record. If, as *Kincade*’s aligned amici and Judge Reinhardt’s dissent insist, and when, some future program permits the parade of horrors the DNA Act’s opponents fear-unregulated disclosure of CODIS profiles to private parties, genetic discrimination, state-sponsored eugenics, and (whatever it means) the use of CODIS to somehow ‘quite literally, to eliminate political opposition,’ we have every confidence that courts will respond appropriately.”).

¹⁵³ *Id.* at 839.

trend finds its strongest support in the recent *United States v. Weikert* holding,¹⁵⁴ in which the First Circuit relied heavily upon the additional guidance provided by the Supreme Court in *California v. Samson*¹⁵⁵ to conclude that governmental interests outweigh a parolee's privacy expectation.¹⁵⁶ Citing the permissive governmental searches affirmed in *Samson*, critics of the majority opinion in *Weikert* suggest that recent decisions manifest a growing judicial proclivity to apply less-exacting standards.¹⁵⁷ It has been suggested that increased deference for crime-solving agendas signal an erosion of Fourth Amendment principles.¹⁵⁸

B. FOURTH AMENDMENT JURISPRUDENCE GOING FORWARD

On first (and perhaps even second) glance, the distinction between the two rationales may seem meaningless because they reach essentially the same result. However, the test applied by the courts will make a great deal of difference as there will undoubtedly be future pressure to expand DNA databases to include DNA profiles of individuals who wish to obtain drivers licenses or federal passports; applicants for federal jobs or admission to public universities; all newborns or potentially the entire population.¹⁵⁹ Without an explicit indication of the preferred doctrinal rationale to be applied, it makes ensuing discussion of such hypothetical databases unnecessarily

¹⁵⁴ *Weikert*, 504 F.3d at 8–11 (determining “special needs” test inapplicable).

¹⁵⁵ The *Samson* Court upheld a parole scheme allowing random searches of parolees at any time without individualized suspicion because the government has a “substantial” interest in monitoring, rehabilitating, and preventing recidivism of parolees. *Samson*, 547 U.S. 843.

¹⁵⁶ *Weikert*, 504 F.3d at 14 (determining forced DNA extraction reasonable for supervised releases during the defendant's term).

¹⁵⁷ Robert Cacace, *Samson v. California: Tearing Down a Pillar of Fourth Amendment Protections*, 42 HARV. C.R.-C.L. L. REV. 223, 237 (2007) (noting “[a]s the DNA cases make clear, courts are eager to extend *Samson*'s logic along the continuum toward law-abiding citizens”).

¹⁵⁸ *Weikert*, 504 F.3d at 18–20 (Stahl, J., dissenting) (warning that the substantial weight afforded to general crime-solving needs, coupled with the negligible weight afforded to individual privacy interests, signals cause for concern that “ordinary citizens who, because of their employment, activity, or position in society” may be subjected to unwarranted and suspicionless searches); see also Cacace, *supra* note 157.

¹⁵⁹ See *Recent Cases*, *supra* note 128, at 821–23.

complicated and politically perilous. It is difficult to predict how these questions ultimately will be resolved, but it seems sensible for the Supreme Court to clarify its position amidst the rapid growth of genetic technologies that make expanded uses of DNA profiles a likely forthcoming legislative proposal.

IV. CONCLUSION

Without a doubt, bio-politics in the twenty-first century has generated hopes and fears, expectation and trepidation, celebration and condemnation. If public policy must balance a range of increasingly intrusive options to individual rights against the benefits of law enforcement, then it is incumbent upon the expanding police powers to demonstrate benefits to the public good. Experience tells us that DNA identification databases can be structured to respect most individual privacy interests and can be administered fairly, but uniform federal regulations would undoubtedly allay fears of database misuse by third parties and government abuse of such data. An even more modest, but still desirable, regulatory improvement would be to explicitly mandate that all states ensure adequate privacy protections for their respective legislative schemes. New expansions of DNA technology should be adopted only if they would be consistent with fundamental privacy and civil liberty interests. Furthermore, if the crime-solving and prevention benefits of DNA databases warrant greater establishment, continuation, and funding, policy justifications should be provided in the legislatures and in the courts to maintain a critical and consistent balance.

