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Defending the Black Sheep of the Forensic DNA Family: The Case for Implementing Familial DNA Searches in Minnesota

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**DEFENDING THE BLACK SHEEP OF THE FORENSIC DNA
FAMILY: THE CASE FOR IMPLEMENTING FAMILIAL DNA
SEARCHING IN MINNESOTA**

*Amy A. Liberty**

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I. INTRODUCTION

Since the discovery of DNA fingerprinting by British researcher Alec Jeffreys in 1985, forensic DNA identification has made an unprecedented impact on the criminal justice system.¹ The first DNA-based conviction in the United States occurred in 1987, when a Florida court convicted Tommy Lee Andrews of rape after DNA tests matched his DNA from a blood sample with that of semen found in a rape victim.² In 1989, Virginia established the first forensic DNA database in the United States, and

¹ JOHN M. BUTLER, FORENSIC DNA TYPING, 2 (Academic Press, 2d ed. 2005) [hereinafter BUTLER, *Forensic DNA Typing*].

² *Andrews v. State*, 533 So. 2d 841, 842 (Fla. Dist. Ct. App. 1988) (holding that “genetic fingerprint” evidence was admissible).

by 1998 the National DNA Index System (NDIS) was operational.³ Forensic DNA testing has emerged as a beacon of quality among other forensic science fields due to the fact that forensic DNA methods are rooted in objective scientific principles. In an otherwise scathing report of forensic science by the National Academy of Sciences (NAS) in 2009, DNA testing was heralded as the consummate form of forensic science done right.⁴

The admissibility of DNA evidence in United States courts has seen its ups and down, but increasingly courts are supportive of its admission due to its unparalleled accuracy. Indeed, the United States Supreme Court recently unequivocally endorsed the value of DNA evidence, stating that “law enforcement, the defense bar, and the courts have acknowledged DNA testing’s ‘unparalleled ability both to exonerate the wrongly convicted and to identify the guilty. It has the potential to significantly improve both the criminal justice system and police investigative practices.’”⁵ Forensic DNA testing databases are now commonplace in criminal investigations.⁶ Despite the prolific use of forensic DNA testing in criminal investigations, DNA testing remains an evolving science.⁷ Similar to other emerging technologies, novel methods and applications of DNA testing need to be evaluated for both scientific validity and legal consequences.⁸ One such novel and controversial use of DNA databases is familial DNA searching.

Familial DNA searching is defined as a “deliberate search of a DNA database conducted for the intended purpose of potentially identifying close biological relatives to the unknown forensic profile obtained from crime scene evidence.”⁹ Familial searching relies on the principle that biologically related individuals, such as siblings or parents and children, will share more genetic information than non-biologically related individuals.¹⁰ The conviction of the first individual linked to a crime through familial DNA searching occurred in 2004 in the United Kingdom when defendant Craig Harmon pleaded guilty to manslaughter after DNA from blood found at the

³ BUTLER, *Forensic DNA Typing*, *supra* note 1, at 2.

⁴ NAT’L RESEARCH COUNCIL, STRENGTHENING FORENSIC SCIENCE IN THE UNITED STATES: A PATH FORWARD 41(2009), *available at* http://www.nap.edu/openbook.php?record_id=12589&page=R1 (stating that DNA analysis has “a higher degree of reliability and relevance than any other forensic technique”).

⁵ *Maryland v. King*, 133 S. Ct. 1958, 1966 (2013) (quoting Dist. Attorney’s Office for Third Judicial Dist. v. Osborne, 557 U.S. 52, 55 (2009)).

⁶ BUTLER, *Forensic DNA Typing*, *supra* note 1, at ix (noting the numerous types of criminal cases that utilize DNA testing).

⁷ *Id.* at xi (stating that “ten new chapters have been added to accommodate the explosion of new information”).

⁸ *Id.* at 389.

⁹ FBI Laboratory Services, *Familial Searching*, FBI.GOV, <http://www.fbi.gov/about-us/lab/biometric-analysis/codis/familial-searching> (last visited Apr. 28, 2015) [hereinafter *Familial Searching*].

¹⁰ *Id.*

crime scene closely matched the DNA of Harman's relative, who was registered in a DNA database.¹¹

This article addresses both the scientific principles and legal implications of familial DNA searching, using Minnesota as a case study for state implementation. Section II outlines the basics of forensic DNA testing, DNA databases, and the intricacies of familial DNA searching.¹² Section III explores the Fourth Amendment implications of searching a DNA database for family members.¹³ Section IV discusses the two most promising strategies for implementing familial DNA searching: statutory authorization and administrative policy.¹⁴ Section V first argues that familial DNA searching is an effective and scientifically valid procedure that will withstand Fourth Amendment scrutiny.¹⁵ Finally, Section V concludes by arguing that familial DNA searching should be implemented in Minnesota through statutory authorization, whether implicitly through the already existing DNA database legislation or explicitly through new legislation specific to familial DNA, in conjunction with a rulemaking process that is transparent to both the scientific and legal community, as well as the public.¹⁶

II. BACKGROUND

A sound understanding of the basics of DNA and genetic inheritance, the underlying structure of DNA databases, and the technicalities of the familial DNA searching process is critical to a legal analysis of familial DNA searching. Knowledge of the science behind familial DNA searching will serve to remove skepticism and enable legal professionals to accept the constitutionality of this powerful technology.

A. DNA Basics

1. A Forensic DNA Profile

Forensic DNA is based on the scientific fact that, with the exception of identical twins, each individual's genome is unique.¹⁷ One-half of that genetic information comes from an individual's father, and one-half comes

¹¹ Mitch Morrissey, *Familial DNA Searching: What Every Prosecutor Should Know About This Powerful Forensic Tool*, PROSECUTOR, July/Aug./Sept. 2011, at 15 (detailing the Craig Harmon case).

¹² See *infra* Part II (describing forensic DNA analysis and DNA databases).

¹³ See *infra* Part III (discussing applicable Fourth Amendment case law).

¹⁴ See *infra* Part IV (describing two methods of familial DNA searching implementation).

¹⁵ See *intra* Part V.A–B (arguing that familial DNA searching is scientific valid and constitutional under the Fourth Amendment).

¹⁶ See *infra* Part V.C–D (arguing that familial DNA searching should be conducted at the state level through open and public policy or statute).

¹⁷ BUTLER, *Forensic DNA Typing*, *supra* note 1, at 26 (discussing the area of the genome that make individuals unique).

from an individual's mother.¹⁸ However, deciphering each individual's entire genome for forensic DNA testing is not feasible or practical.¹⁹ Therefore, forensic DNA profiling only tests a small subset of an individual's DNA in order to differentiate between individuals for identity purposes.²⁰ Forensic DNA markers, which are selected based upon their propensity to differentiate between two people and their lack of phenotypic characteristics, can be isolated in small subsets of DNA and are used for identification and matching purposes.²¹

The most common type of DNA testing performed today, and the type that is used universally in the United States is short tandem repeat (STR) testing.²² STRs are small segments of DNA that are repeated over and over in a specific area, or locus, that is being analyzed.²³ A DNA profile is developed based on the variation in the number of repeats.²⁴ The number of repeats is designated as an allele.²⁵ For instance, at one locus, an individual might have allele 15 from his or her father and allele 17 from his or her mother. At another locus, alleles 8 and 9 might be present. This series of numbers makes up an individual's forensic DNA profile, which can be compared to a DNA profile obtained using biological evidence collected from a crime scene.²⁶ Forensic testing in the United States currently requires analysis of a minimum of thirteen different areas of an individual's genome.²⁷ The frequency of each allele in the population allows a statistical estimate to be made regarding the frequency of that entire DNA profile in the population.²⁸ A random match probability between an evidence-derived DNA profile and a DNA profile from a known individual can then be calculated and reported to law enforcement.²⁹

¹⁸ *Id.* at 17.

¹⁹ *Id.* at 21 (noting that the Human Genome Project took fifteen years to complete).

²⁰ *Id.* at 26 (describing the areas of the genome that are appropriate for genetic identity purposes).

²¹ *Id.* at 88 (explaining the desirable characteristics of STRs used in forensic DNA typing). Phenotypic characteristics are those that are physically observable, such as eye color. Current DNA testing markers do not look at genes. See JOHN M. BUTLER, *FUNDAMENTALS OF FORENSIC DNA TYPING*, 6 (Academic Press, 2009).

²² See BUTLER, *Forensic DNA Typing*, *supra* note 1, at 94. (describing how the U.S. established STRs as the method of forensic DNA testing in 1997 to ensure that all states would be "talking the same language.") Because of the universal use of the STR system, comparisons can be made between any two pieces of forensic DNA evidence recovered from any crime scene throughout the U.S. *Id.* at 90.

²³ *Id.* at 87 (describing the characteristics of STRs).

²⁴ *Id.*

²⁵ *Id.* at 23 (defining "allele").

²⁶ *Id.*

²⁷ See BUTLER, *Forensic DNA Typing*, *supra* note 1, at 95 (discussing the thirteen CODIS loci selected by the FBI sponsored STR Project).

²⁸ *Id.* at 498 (explaining DNA profile frequency estimate calculations).

²⁹ *Id.* at 497 (defining random match probability as a probability based on frequency genotype estimates).

2. YSTR Testing

A second type of forensic DNA testing—Y-chromosome STR (YSTR)—is also widely used by forensic scientists.³⁰ Traditional autosomal STR markers are shuffled around between each generation so that a father and son will not have the same genetic profile.³¹ In contrast, Y-chromosome markers, commonly called “lineage markers,” are passed down from generation to generation without changing.³² YSTR testing looks at STR markers that are only present on the Y-chromosome, and for this reason, only male individuals will have a YSTR profile.³³ A father and son will have the same YSTR profile, as will two brothers who have the same father.³⁴

Because of this method of inheritance, an obvious limitation to YSTR testing is that the YSTR profile of a male individual is not unique.³⁵ As with most scientific principles, a limitation in one application can be an advantage in another application. Familial DNA searching relies precisely on this paternal inheritance to confirm the familial relationship between two individuals who may be linked in a traditional STR familial search.³⁶ Section B, *infra*, discusses the practice of using YSTR testing in familial DNA searching.³⁷

B. An Overview of Forensic DNA Databases and Mechanics

Once a DNA profile is derived from a piece of forensic evidence collected from a crime scene, identifying the individual genetically matched to the sample often becomes the central focus of the investigation.³⁸ Sometimes, law enforcement officials may have suspects already identified. More often, however, the case is considered a non-suspect case, meaning law enforcement officials have not identified specific suspects or persons-of-interest in the case.³⁹ In non-suspect cases, DNA evidence can be used to identify potential suspects by running the evidence-derived DNA profile against profiles in an existing DNA database and getting a “cold hit.”⁴⁰ A

³⁰ JOHN M. BUTLER, ADVANCED TOPICS IN FORENSIC DNA TYPING: METHODOLOGY, 371 (Academic Press, 2012) [hereinafter BUTLER, *Advanced Topics*].

³¹ *Id.* Autosomal markers are genetic markers that are not located on the sex determining chromosomes, X and Y. *Id.*

³² *Id.* (noting the exception for mutational events).

³³ *Id.*

³⁴ *Id.* at 373.

³⁵ *Id.* (discussing the paternal inheritance of the male Y chromosome).

³⁶ BUTLER, *Advanced Topics*, *supra* note 30, at 607 (noting the use of YSTRs to increase the success rates of familial DNA searching).

³⁷ *See infra* Part II.B.4.

³⁸ *See* BUTLER, *Advanced Topics*, *supra* note 30, at 213.

³⁹ *Id.* at 214.

⁴⁰ *Best Practices for Handling “Cold Hits”*, FORENSIC DNA EDUC. FOR LAW ENFORCEMENT DECISION MAKERS (last visited Apr. 28, 2015), <http://projects.nfstc.org/fse/10/10-02.html>. A DNA cold hit refers to an instance where one or more connections

DNA database may contain DNA profiles from convicted offenders, individuals arrested for crimes, unknown DNA profiles obtained from crime scene evidence, and DNA profiles obtained from unidentified human remains.⁴¹ The vast amount of DNA profiles available in the DNA database help police efficiently and accurately identify suspects.⁴²

1. CODIS Structure

In order to effectively take advantage of the availability of DNA profiles, a national database called CODIS ensures that forensic DNA profiles from all United States jurisdictions can be cross-referenced against each other.⁴³ CODIS is an acronym for “Combined DNA Index System” and is a generic term that refers to both the Federal Bureau of Investigation’s (FBI) program for criminal justice DNA databases as well as the software used to manage these databases.⁴⁴ CODIS is comprised of local, state, and national databases.⁴⁵ In Local DNA Index Systems (LDISs), DNA profiles can be entered and searched against other profiles from local cases.⁴⁶ In addition, each participating state has a single laboratory that operates and maintains a State DNA Index System (SDIS).⁴⁷ DNA profiles and information can be searched against other DNA profiles within the same state at the SDIS level.⁴⁸ Each state also has its own statute that regulates what types of samples are required to be collected and submitted to the database.⁴⁹

The National DNA Index System (NDIS) is the top level of CODIS, and it contains DNA profiles contributed by all federal, state, and local participating forensic laboratories.⁵⁰ NDIS operates as a central hub and allows states to share DNA profiles.⁵¹ By designating and requiring the determination of thirteen core loci, or areas tested, CODIS ensures that all states use the same terminology and collect DNA profiles that are

are made between a perpetrator and a crime scene in the absence of a current investigative lead. *Id.* (citing the DNA.gov definition of “cold hit”).

⁴¹ See BUTLER, *Advanced Topics*, *supra* note 30, at 224 (discussing the different CODIS indices). The content of each state or federal database is determined by statute. *Id.*

⁴² See *id.* at 435 (stating that DNA databases have revolutionized the ability to link crime scene evidence to perpetrators).

⁴³ *Id.* at 438 (describing the structure of CODIS).

⁴⁴ FBI Laboratory Services, *CODIS Brochure*, FBI.GOV, http://www.fbi.gov/about-us/lab/biometric-analysis/codis/codis_brochure (last visited Apr. 28, 2015).

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Forensic Science Laws Database*, NAT’L CONFERENCE OF STATE LEGISLATURES, <http://www.ncsl.org/research/civil-and-criminal-justice/dna-laws-database.aspx> (last visited Apr. 7, 2015) (repository for the DNA database legislation by state).

⁵⁰ See CODIS Brochure, *supra* note 44.

⁵¹ *Id.*

comparable for matching purposes.⁵² The DNA Identification Act of 1994 authorized the creation of NDIS and specifies what types of samples may be maintained at NDIS and the requirements for participating laboratories relating to quality assurance, privacy, and expungement.⁵³ NDIS was implemented in October 1998 and currently, all 50 states, the District of Columbia, and the federal government participate in NDIS.⁵⁴ As of December 2014, NDIS contained the profiles of over 11,000,000 offenders, approximately 1,300,000 arrestees, and 602,000 forensic casework profiles.⁵⁵ These DNA databases were designed primarily to identify unknown crime scene samples by comparing evidence-derived DNA profiles to the DNA profiles in the database and discovering a “hit,” or a direct match, at all 13 loci.⁵⁶

2. Database Match Criteria

In order to evaluate the legal implications of familial DNA searching, it is important to understand the intricacies of the CODIS software and how different types of matches are identified. The CODIS software allows for searching at three different levels of stringency: high, moderate, and low.⁵⁷ A high stringency search requires an exact match of both alleles at each of the 13 loci searched.⁵⁸ Moderate stringency searches require all alleles to match, but the target and candidate profiles may contain a different number of alleles.⁵⁹ Moderate stringency matches cannot have any mismatches, unlike low stringency searches.⁶⁰ Low stringency searches produce a match when at least one allele matches at each locus, even though the casework profile has an additional allele not in the offender profile, or

⁵² BUTLER, *Forensic DNA Typing*, *supra* note 1, at 94 (noting that in order for DNA testing to be effective, standardized markers must be used).

⁵³ DNA Identification Act of 1994, 42 U.S.C. §14132 (1994) For example, the statute allows the maintenance of DNA samples of convicted offenders, casework samples, and missing persons.

⁵⁴ *FAQs on the CODIS Program and the National DNA Index System*, FBI.GOV, <http://www.fbi.gov/about-us/lab/biometric-analysis/codis/codis-and-ndis-fact-sheet> [hereinafter *CODIS FAQs*] (last visited Apr. 28, 2015).

⁵⁵ *CODIS—NDIS Statistics*, FBI.GOV, <http://www.fbi.gov/about-us/lab/biometric-analysis/codis/ndis-statistics> (last visited Apr. 28, 2015). Interestingly, state DNA databases were established prior to the implementation of NDIS. *See also* BUTLER, *Forensic DNA Typing supra* note 1, at 2 (noting that in 1989 Virginia required felons convicted of a serious crime to submit samples for DNA testing); *Supra* note 54 and accompanying text (stating that the national DNA database was implemented in 1998).

⁵⁶ *Id.*

⁵⁷ *See* FBI LABORATORY SERVICES, NATIONAL DNA INDEX SYSTEM (NDIS) OPERATIONAL PROCEDURES MANUAL, VERSION 3, at 31 (Jan. 1, 2015) (Table 1) [hereinafter *NDIS Procedures Manual*], available at <http://www.fbi.gov/about-us/lab/biometric-analysis/codis/ndis-procedures-manual>.

⁵⁸ *CODIS FAQs, supra* note 54.

⁵⁹ *Id.*

⁶⁰ *Id.*

vice versa.⁶¹ While low-stringency matches are conducted at the SDIS and LDIS levels, they are not conducted at the NDIS level.⁶²

*Table 1. Examples of different match stringencies possible in the CODIS software.*⁶³

Locus	Casework Profile	Offender Profile	Match Stringency
A	13	13, 14	Moderate
B	28, 31.2	28, 31.2	High
C	10, 12	10	Moderate
D	17	15, 17	Moderate
E	24, 25	24, 25	High
F	8, 9	8, 10	Low

NDIS conducts moderate stringency searches.⁶⁴ Moderate stringency CODIS searches were implemented because forensic science laboratories realized that crime scene profiles are often partially degraded and/or contain DNA from more than one contributor.⁶⁵ DNA degradation occurs when the DNA source is subject to environmental conditions, such as heat and humidity, or it may simply occur due to the age of the sample.⁶⁶ A degraded DNA profile might not contain all of the genetic information in the profile.⁶⁷ This moderate stringency search enables the scientist conducting the search to “stumble upon” a possible familial association due to the number of alleles shared between the forensic casework profile and the convicted offender profile.⁶⁸ These fortuitous matches have important implications in developing familial DNA searching policies.⁶⁹

⁶¹ *Id.*

⁶² LDIS and SDIS databases contain fewer DNA profiles and therefore, lower stringency searches are possible, but not often conducted. Each state maintains its own procedures for searching DNA profiles at the state and local levels. A DNA profile may be searched at low-stringency if the scientist believes that not all of the genetic information is present in the DNA profile. This can sometimes occur with aged bones, for example.

⁶³ Table amended from *CODIS FAQs*, *supra* note 54.

⁶⁴ *NDIS Procedures Manual*, *supra* note 57.

⁶⁵ *CODIS FAQs*, *supra* note 54. A DNA mixture is the presence of DNA from more than one individual in a crime scene sample. More than two alleles present at a locus is indicative of a forensic DNA mixture.

⁶⁶ BUTLER, *Advanced Topics*, *supra* note 30, at 31.

⁶⁷ *Id.* (discussing the appearance of degraded DNA).

⁶⁸ Natalie Ram, *Fortuity and Forensic Familial Identification*, 63 STAN. L. REV. 751, 769 (2011).

⁶⁹ *See infra* Part IV (describing the considerations for developing familial DNA searching policies).

3. *Fortuitous vs. Intended Partial Matches*

Familial searching is a *deliberate* search of a DNA database conducted for the intended purpose of identifying a close biological relative of the unknown forensic profile.⁷⁰ Familial DNA searching is often used synonymously with “partial match;” however, it is better understood as a *type* of partial match.⁷¹ Partial matches are discovered either fortuitously or deliberately.⁷² Deliberate partial matches are the product of an intentional familial search.⁷³ Fortuitous partial matches are not intended, but nevertheless may implicate the same constitutional concerns.⁷⁴ Fortuitous partial matches are the product of a lower-stringency search in the CODIS database.⁷⁵ Although the result is the same—potentially identifying a relative of an offender in the database—the distinction of whether the search was intended seems to factor into state policy due to the reluctance of states to officially announce that they are conducting familial DNA searching.⁷⁶

The myriad of confusing, incomplete, and varying policies regarding the use of familial DNA searches is an unfortunate effect of this unwillingness of states to fully confront the issue of familial DNA testing. A comprehensive 2010 survey of state partial matching policies uncovered startling statistics relating to laboratory procedures and protocols.⁷⁷ Of the 47 states surveyed, 19 have approved or reported fortuitous partial matches of familial DNA, while 14 of these states will not conduct deliberate familial searches.⁷⁸ Ten states have policies that expressly preclude a deliberate search, but permit reporting on a fortuitous partial match.⁷⁹ Significantly,

⁷⁰ *Recommendations from the SWGDAM Ad Hoc Working Group on Familial Searching*, SWGAM, 1 (2013), <http://swgdam.org/SWGDAM%20Recs%20on%20Familial%20Searching%20APPROVED%2010072013.pdf> [hereinafter *Recommendations*]. The Scientific Working Group on DNA Analysis Methods, known as SWGDAM, serves as a forum to discuss, share, and evaluate forensic biology methods, protocols, training, and research to enhance forensic biology services as well as provide recommendations to the FBI Director on quality assurance standards for forensic DNA analysis. See *infra* text accompanying note 124 (describing the formation of the SWGDAM Adhoc Working Group on Familial DNA Searching).

⁷¹ A partial match is a match that has some, but not all alleles matching between the evidence-derived DNA profile and a profile in the database.

⁷² Ram, *supra* note 68 at 753.

⁷³ *Id.*

⁷⁴ *Id.* (noting that the information uncovered by both fortuitous and deliberate searches is functionally similar).

⁷⁵ See *Familial Searching*, *supra* note 9 (explaining that a partial match is identified by the number of alleles shared between the two profiles when conducting a search).

⁷⁶ See Tom Olsen, *Duluth police crack 1981 cold case, credit DNA technology*, TWINCITIES.COM—PIONEER PRESS (Feb. 3, 2015), http://www.twincities.com/localnews/ci_27447861/duluth-police-crack-1981-cold-case-credit-dna. Notably, this article does not mention the words familial DNA searching, even though it was used to identify the suspect in this case. *Id.*

⁷⁷ Ram, *supra* note 68.

⁷⁸ *Id.* at 768–69.

⁷⁹ *Id.* at 769.

what is done and what is expressly permitted or prohibited are two separate inquiries. Furthermore, laboratories make the distinction between deliberate and fortuitous matches to “game the system.”⁸⁰ Laboratories take advantage of the crime-solving potential of partial match searching without dealing with the political fallout by expressly stating that they are conducting “familial DNA searching.”⁸¹

Unfortunately, the FBI supports this contradiction. Familial searching is not being done at the National DNA Index System (NDIS), yet the FBI facilitates sharing of information between states that develop an association through fortuitous partial matches at NDIS.⁸² “Familial searching is often confused with what occurs when a partial match results from the routine search of the DNA database. A partial match is the *spontaneous product* of a regular database search.”⁸³ Every time a scientist conducts a moderate or low stringency search, there is a risk of developing a partial match, whether or not the intention was present.⁸⁴

4. Evaluating the Results of Familial DNA Searches: Refining the Investigative Lead

Opponents of familial DNA searching, perhaps skeptical about the accuracy of familial DNA searching and the procedures used to implement it, argue that it is not effective and will lead to unwarranted investigations of innocent individuals.⁸⁵ In fact, the effectiveness of a familial searching method can be evaluated by its ability to distinguish true first-degree relatives from individuals exhibiting similar genetic profiles by chance alone.⁸⁶ For example, full siblings may not share any alleles at a given locus, yet two unrelated individuals might share the same alleles by chance alone.⁸⁷

Two primary methods have been utilized to evaluate the familial associations between two profiles that do not match but have a number of

⁸⁰ See *Id.* at 808 (noting that laboratories may use this distinction in order to avoid public controversy while benefitting from the rewards of partial matching)

⁸¹ Olsen, *supra* note 76.

⁸² See *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., Oct. 2009, at no. 4, available at http://www.fbi.gov/about-us/lab/forensic-science-communications/fsc/oct2009/standard_guidelines/swgdam.html (outlining procedures for states to conduct lower stringency searches to develop partial matches).

⁸³ Familial Searching, *supra* note 9 (emphasis added) (making the distinction between partial matches that happen accidentally and deliberate familial searching).

⁸⁴ *CODIS FAQs*, *supra* note 54.

⁸⁵ See, e.g., Erin Murphy, *Relative Doubt: Familial Searches of DNA Databases*, 109 MICH. L. REV. 291 (2010) (arguing against the practice of familial searching due to claims related to equality, accuracy, and discrimination).

⁸⁶ See *Recommendations*, *supra* note 70, at 2 (Recommendation 1.1).

⁸⁷ Bruce S. Weir et al., *Genetic relatedness analysis: modern data and new challenges*, 7 NATURE REV. GENETICS 771 (2006).

shared alleles: counting shared alleles and a kinship likelihood ratio.⁸⁸ The simpler, but less effective method is to determine the degree of relatedness by counting the number of shared alleles between the two profiles.⁸⁹ This method is less predictive of true familial associations because it fails to take into account the population frequency of those alleles.⁹⁰ For instance, if two profiles share an 8 allele at a locus, the association is certainly more significant if that 8 allele only occurs in 1% of the population versus if it occurs in 99% of the population.⁹¹ Therefore, even though related individuals share more DNA than unrelated individuals, partial matches exist between unrelated individuals, especially if the DNA profile from the crime scene includes alleles that are highly prevalent in the population.⁹²

The kinship likelihood ratio is more effective than counting shared alleles because it considers not only the number of alleles common to both profiles, but also the population frequencies of those alleles.⁹³ Kinship likelihood ratio is the comparison of the “joint probabilities of the forensic and offender profiles given that the donors are related . . . versus [that] they are unrelated.”⁹⁴ Kinship likelihood ratios are represented as a continuum. The likelihood ratio determines whether it is very likely that the two individuals are related or whether there is very little probability that the two individuals are related.⁹⁵ The numerical associations developed between the crime scene sample and the database profiles establish a “ranking” of potential relatives.⁹⁶ Because an unrelated individual might, by chance, share more alleles than a related individual, this ranking list is only the first step in assessing the familial relationship between the crime scene sample and the identified samples in the database.⁹⁷ For example, in a simulated database of 2,130,000 profiles, there was only a 1 in 5 chance that a first-degree relative was ranked number one.⁹⁸

⁸⁸ *Recommendations, supra* note 70, at 8 (discussing the two different statistical models for conducting familial DNA searching).

⁸⁹ *See BUTLER, Advanced Topics, supra* note 30, at 605 (noting that the likelihood calculation is more informative than counting alleles because it incorporates the frequencies of those alleles).

⁹⁰ *Id.*

⁹¹ *Id.* (explaining how common alleles will have a greater chance of being shared by chance alone rather than due to inheritance).

⁹² *Id.*

⁹³ *See Recommendations, supra* note 70, at 2 (Recommendation 1.1).

⁹⁴ Jianye Ge & Bruce Budowle, *Kinship Index Variations among Populations and Thresholds for Familial Searching*, 7 PLOS ONE e37474, available at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3353921/>.

⁹⁵ Frederick R. Bieber et al., *Finding Criminals Through DNA of Their Relatives*, 312 SCIENCE 1315, 1315 (2006) (describing the use of the likelihood ratio in familial DNA searching).

⁹⁶ *See Recommendations, supra* note 70, at 9 (explaining the rankings that are developed after a familial DNA search in a simulated study).

⁹⁷ *Id.* at 11 (describing the process through which the ranking list is refined).

⁹⁸ *Id.*

This ranking list can be further refined to reduce the number of false positives.⁹⁹ Y-chromosome testing is the most common method employed at this stage in the process.¹⁰⁰ Because first-degree male relatives (fathers and sons or brothers) share the same YSTR profile, testing of the crime scene sample and the profiles in the ranked list allows the laboratory to confirm or refute the purported association developed during the autosomal DNA search.¹⁰¹ YSTR testing eliminates 99% of those not related by male lineage.¹⁰² The United Kingdom uses the geographic location of the crime and the offender, as well as the age and ethnicity of the offender, to further distill the ranking list.¹⁰³ Regardless of the analysis and refinement methods, initial matching results of familial DNA searches always require some additional aspect of scrutiny and evaluation to maximize accuracy.

C. Putting Familial DNA Testing Into Practice

Despite its limited formal use in the United States, familial DNA searching has already seen some high profile successes. The most infamous successful use of familial DNA to date in the United States, the “Grim Sleeper” case, occurred in California.¹⁰⁴ A serial killer whose killings spanned two decades was finally identified through familial DNA searching in 2009.¹⁰⁵ His son had recently been entered into the California convicted offender database and subsequent testing showed that the two individuals shared the same YSTR profile.¹⁰⁶ Familial DNA searching solved another California case involving criminal sexual conduct of a woman outside a Santa Cruz coffee shop in 2008.¹⁰⁷ The perpetrator’s DNA profile did not match anyone in the DNA database directly, but a familial DNA search led to a partial match with a man later identified as the perpetrator’s father.¹⁰⁸ In 2015, a successful familial DNA search solved a Minnesota cold-case homicide from 1981.¹⁰⁹ A partial match was made between the DNA profile

⁹⁹ *Id.*

¹⁰⁰ See Bieber, *supra* note 95, at 1315 (explaining YSTR analysis as a way to narrow the familial DNA ranking list).

¹⁰¹ See *Recommendations*, *supra* note 70, at 7 (stating that YSTR analysis can limit the number of false positives in a familial DNA search).

¹⁰² *Id.*

¹⁰³ C.N. Maguire et al., *Familial Searching: A Specialist Forensic DNA Profiling Service Utilizing the National DNA Database® to Identify Unknown Offenders via Their Relatives—The UK Experience*, 8 FORENSIC SCI. INT’L: GENETICS 1, 8 (2014) (describing the multi-step process in familial DNA searching conducted in the United Kingdom).

¹⁰⁴ Michael Chamberlain, *Familial DNA Searching*, 27-SPG CRIM. JUST. 18, 28 (2012) (describing the details of the “Grim Sleeper” case).

¹⁰⁵ *Id.* at 29.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ Olsen, *supra* note 76.

from the crime scene and the perpetrator's son, who years later entered the Minnesota database.¹¹⁰

Because familial DNA searching is still relatively underused in the United States, the potential benefits of this type of searching strategy might be more appropriately gauged by examining its successful use outside the United States. The United Kingdom has the most prolific familial DNA searching program of any country.¹¹¹ From 2002 to 2011 the United Kingdom utilized familial DNA searching in 188 cases.¹¹² In the United Kingdom, familial DNA searching is used in serious crime cases or in 'cold case' reviews when there are few or no investigative leads, and has led to the identification of 41 perpetrators or suspects.¹¹³ The United Kingdom program is based on five basic principles:

- (1) the DNA profiles of relatives exhibit a greater degree of similarity than unrelated individuals;
- (2) family members of an offender are more likely to be involved in offending behavior;
- (3) family members tend to reside within a certain geographic area;
- (4) family dispersion is positively correlated with higher income and higher education; and
- (5) offenders tend to commit crimes where they live.¹¹⁴

These principles bring to light the sociologic implications of familial DNA searching that have caused some to voice strong opposition to the process, but they are rooted in fact.¹¹⁵ For example, statistics indicate that individuals who commit crime are likely to have a relative who has committed crimes.¹¹⁶ According to the Bureau of Justice Statistics' report on inmates, "an estimated 46% of jail inmates in 2002 had a family member who had been incarcerated in a prison or jail.¹¹⁷ About 31% had a brother; 19% a father; 9% a sister; and 7% a mother who had been incarcerated."¹¹⁸ If these statistics are representative of the current databases, there will be a close relative in

¹¹⁰ *Id.*

¹¹¹ BUTLER, *Advanced Topics*, *supra* note 30, at 606 (stating that the United Kingdom has had the most experience so far with familial DNA searching).

¹¹² Maguire, *supra* note 103, at 1 (summarizing the use of familial DNA searching in the United Kingdom).

¹¹³ *Id.*

¹¹⁴ *Id.* at 2 (describing the familial DNA approach in the United Kingdom).

¹¹⁵ *Id.*

¹¹⁶ DORIS J. JAMES, U.S BUREAU OF JUSTICE STATISTICS, SPECIAL REPORT: PROFILE OF JAIL INMATES 2002, at 10 (July 2004), available at <http://www.bjs.gov/content/pub/pdf/pji02.pdf>.

¹¹⁷ *Id.*

¹¹⁸ *Id.*

the database approximately half of the time.¹¹⁹ Familial DNA searching is not itself a racially or socioeconomically disparate endeavor.¹²⁰ While familial searching results may yield a disproportionate selection from individual families, the disproportion already exists in DNA databases and is not due to the science of familial DNA searching.¹²¹

Leading scientific groups have evaluated the effectiveness of familial DNA searching at both the national and state level. During the 112th Congressional Session, Congressman Schiff introduced a bill entitled “Utilizing DNA Technology to Solve Cold Cases Act of 2011” that would have required the United States Attorney General to implement policies and procedures for the FBI to conduct familial searches.¹²² While this bill was not enacted, the Conference Report for the 2012 Federal Fiscal Year Appropriations Bill contained the following statements: “[t]he conferees encourage the FBI to undertake activities to facilitate familial DNA searches of the Combined DNA Index System . . . [t]he procedures should provide appropriate protections for the privacy rights of those in the NDIS database.”¹²³ In response to this recommendation, the Scientific Working Group on DNA Analysis Methods (SWGDM) formed the Familial Searching Ad Hoc Working Group (hereinafter, Working Group) to address the feasibility of familial DNA searching at the national level.¹²⁴

In 2013, the Working Group published its findings and recommendations, concluding that performing routine familial searching at the national level is not advisable at this time for four main reasons.¹²⁵ First, the inordinate number of profiles that reside in the national database makes familial DNA searches labor intensive and adequate refinement of results impracticable.¹²⁶ As the size of a database increases, the more likely it will be that false positive associations are developed in lower stringency searches, such as those involving mixtures and familial associations.¹²⁷ Second, the

¹¹⁹ *Recommendations, supra* note 70, at 9.

¹²⁰ U.S. DEP’T OF JUSTICE, AN INTRODUCTION TO FAMILIAL DNA SEARCHING FOR STATE, LOCAL AND TRIBAL JUSTICE AGENCIES: ISSUES FOR CONSIDERATION (2012), *available at* http://www.denverda.org/DNA_Documents/Familial_DNA/An%20Introduction%20to%20Familial%20DNA%20Searching%20Issues%20for%20Consideration_compliant0.pdf (noting that because the search is only based on genetic markers it actually “reduces the risk of racial profiling, as the search cannot detect race, only possible family members”).

¹²¹ *Id.*

¹²² Utilizing DNA Technology to Solve Cold Cases Act, H.R. 3361, 112th Cong. (2011).

¹²³ Conference Report to Accompany H.R. 2112, 112th Cong., 1st Session, November 14, 2011, H. Rept. 112–284, 238 (2011). *See also infra* note 236 (discussing the details of the Utilizing DNA Technology to Solve Cold Cases Act of 2011).

¹²⁴ *See Recommendations, supra* note 70 (describing the goals and authority of SWGDAM).

¹²⁵ *Id.* at 3.

¹²⁶ *Id.* at 2–3 (noting that the national DNA database contains over 10 million offender profiles).

¹²⁷ *Id.* at 11.

additional filters of metadata, such as age, population group, and geography are not available at the national level because this information is not stored at NDIS.¹²⁸ Only the following information is stored at the national level: (1) the DNA profile; (2) the agency identifier; (3) the specimen identification number; and (4) the DNA laboratory personnel associated with a DNA profile analysis.¹²⁹ No names or other personal identifiers of the offenders are stored.¹³⁰ Third, the availability of YSTR testing varies from state to state, resulting in a disparate treatment of the ranking lists depending on state.¹³¹ Finally, not every state has the legal authority to conduct familial DNA searching.¹³²

The Working Group also conducted data simulations to evaluate the effectiveness of different size databases in ranking familial associations.¹³³ In the smallest database size that was tested, the Wyoming state database that contained 19,300 profiles, a full sibling was identified in the number one ranked position 56.8% of the time.¹³⁴ By contrast, California's database, with 1,780,000 profiles, identified a full sibling in the number one ranked position approximately 22.8% of the time.¹³⁵ Experience has shown that the vast majority of traditional DNA hits occur during state level searches rather than at the national level.¹³⁶

The national DNA database has been in use for only 15 years, and experts expect that familial DNA searching will become more effective as DNA databases age.¹³⁷ As time passes, the number of relatives in the database will increase as children of previous offenders are included.¹³⁸ Currently, the largest demographic of individuals in prison are 20 to 45 years of age.¹³⁹ Since this range spans approximately a generation, it is more likely that a sibling relationship exists among current DNA profiles in the database, as opposed to a parent-child relationship.¹⁴⁰ However, siblings share fewer alleles than a parent-child pair, and are therefore harder to identify accurately

¹²⁸ *Id.* at 3.

¹²⁹ *CODIS FAQs*, *supra* note 54 (listing the information that is associated with a DNA profile in the national database).

¹³⁰ *Id.*

¹³¹ *Recommendations*, *supra* note 70, at 3.

¹³² *Id.* at 12 (noting the jurisdictional issues relating to the legal authority to perform familial searching and the impact on the scientific implementation of familial searching at the national level).

¹³³ *Id.*

¹³⁴ *Id.* at 10 (data obtained from Table 1 in *Recommendations*).

¹³⁵ *Id.*

¹³⁶ BUTLER, *Advanced Topics*, *supra* note 30, at 232 (noting that 87% of DNA database hits occur within a state).

¹³⁷ *Id.* at 608 (discussing the implications of the age of DNA databases on familial DNA searching).

¹³⁸ *Id.* Of note, in the Grim Sleeper case, the newly added profile of the son into the database helped identify his father's crimes from years earlier. *See supra* note 104.

¹³⁹ BUTLER, *Advanced Topics*, *supra* note 30, at 608.

¹⁴⁰ *Id.*

via a familial search.¹⁴¹ However, as DNA databases age, familial DNA searching will become more effective at identifying the individual who left the crime scene sample because more parent-child relationships will be included in the database.¹⁴² Despite the fact that familial DNA searches have already proven useful in criminal investigations and have the potential to become even more useful in the future, national and state governments are hesitant to implement schemes mandating use of familial DNA.¹⁴³

III. FOURTH AMENDMENT CONSIDERATIONS IN FAMILIAL DNA SEARCHING

The concerns of the national and state legislatures, with regard to allowing familial DNA searching, stem from potential constitutional implications. The Fourth Amendment to the United States Constitution provides a right “of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures.”¹⁴⁴ A Fourth Amendment challenge to familial DNA searching is comprised of three discrete issues: (1) whether the confronted action constitutes a search or seizure; (2) whether the individual challenging the Fourth Amendment violation has standing to do so; and, if so, (3) whether the search or seizure is “reasonable.”¹⁴⁵ Familial DNA searching undoubtedly possesses intricacies not yet encountered in Fourth Amendment legal precedent.¹⁴⁶ However, a Fourth Amendment analysis requires a deep understanding of the technical process involved in the searching procedure, in addition to an understanding of existing Fourth Amendment jurisprudence and an ability to accurately define the numerous interests at stake when a familial search is conducted.

¹⁴¹ *Id.* at 609 (noting that as DNA databases age, they will begin to include the offspring of former offenders).

¹⁴² *Id.*

¹⁴³ *See infra* Part IV (discussing the lack of federal or state familial DNA policies and statutes).

¹⁴⁴ U.S. Const. amend. IV, § 2.

¹⁴⁵ *Rakas v. Illinois*, 439 U.S. 128 (1978) (holding that an individual who asserted neither a property nor a possessory interest in the automobile searched nor an interest in the property seized, and who failed to show that they had any legitimate expectation of privacy, was not entitled to challenge the search of those areas).

¹⁴⁶ *See Murphy, supra* note 85 at 332 (noting that analyzing familial DNA searching under the Fourth Amendment presents “difficult doctrinal challenges”).

A. Is a Familial DNA Search a Search?

1. Reasonable Expectation of Privacy

A Fourth Amendment right depends on whether the claim challenges conduct that constitutes a search or a seizure.¹⁴⁷ In the landmark search and seizure case of *Katz v. United States*, the Court redefined a search in terms of a person's "reasonable expectation of privacy."¹⁴⁸ In *Katz*, the scope of Fourth Amendment protections shifted from protecting places to protecting people.¹⁴⁹ *Katz* opened an array of protections not contemplated before. No longer was a Fourth Amendment search based on trespassory elements, but rather, the Constitution protected the types of things the individual seeks to protect as private.¹⁵⁰ In order to implicate the Fourth Amendment, the person must have a subjective expectation of privacy in the place or thing to be searched and society must be ready to accept this expectation as reasonable.¹⁵¹

In *Kyllo v. United States*, a case with parallels to familial DNA searching, the Supreme Court held that an actual physical intrusion was not necessary to constitute a search, specifically when using technology that "is not in general public use."¹⁵² The majority in *Kyllo* stated that "[i]t would be foolish to contend that the degree of privacy secured to citizens by the Fourth Amendment has been entirely unaffected by the advance of technology."¹⁵³ The Court attempted to essentially "update" *Katz* to align with modern technology by stating, "[t]he question we confront today is what limits there are upon this power of technology to shrink the realm of guaranteed privacy."¹⁵⁴ This acknowledgement of the interplay of technology and privacy rights has made *Kyllo* an applicable Supreme Court precedent to familial DNA searching.

In addressing the application of Fourth Amendment jurisprudence to some 21st Century technological issues, the Supreme Court has revived the trespass doctrine and emphasized the purpose of law enforcement when conducting the "search."¹⁵⁵ When *Katz*'s reasonable expectation of privacy

¹⁴⁷ *Horton v. California*, 496 U.S. 128, 133 (1990) ("A search compromises the individual interest in privacy; a seizure deprives the individual of dominion over his or her person or property.")

¹⁴⁸ *Katz v. United States*, 389 U.S. 347 (1967).

¹⁴⁹ *Id.* at 351.

¹⁵⁰ *Id.*

¹⁵¹ *Katz*, 389 U.S. at 361 (Harlan, J., concurring).

¹⁵² *Kyllo v. United States*, 533 U.S. 27, 40 (2001). The police used a thermal-imaging device from a public street to obtain details about the inside of a private residence. *Id.* at 29–30.

¹⁵³ *Id.* at 33–34.

¹⁵⁴ *Id.* at 34.

¹⁵⁵ *See United States v. Jones*, 132 S. Ct. 945, 949, (2012) (holding that attachment of Global-Positioning-System (GPS) tracking device to vehicle, and subsequent use of that device to monitor vehicle's movements on public streets, was a search within meaning of the

doctrine was formulated, the concept of DNA was in its infancy, having just been discovered by Watson and Crick in 1953.¹⁵⁶ DNA's use in criminal cases was still three decades away.¹⁵⁷ However, the Supreme Court's decisions in *United States v. Jones* and *Florida v. Jardines* provide clues as to how the Court may decide a familial DNA search case in the context of defining whether it constitutes a search under the Fourth Amendment.¹⁵⁸

In *Jones*, the Court held that attachment of a Global-Positioning-System (GPS) tracking device to a vehicle and subsequent use of that device to monitor the vehicle's movements on public streets constituted a search within the meaning of the Fourth Amendment.¹⁵⁹ In Justice Scalia's majority opinion, the Court stated that "the *Katz* reasonable-expectation-of-privacy test has been added to, not substituted for, the common-law trespassory test."¹⁶⁰ The majority did not answer the reasonable expectation of privacy question and instead relied solely on the trespass nature of the police action.¹⁶¹ This focus was the cause for much consternation among the concurring justices, and the concurring opinions in *Jones* are worthy of close examination.¹⁶²

The concurring opinion by Justice Sotomayor suggests that the trespass/*Katz* distinction that the Court proposed would raise conflicts in cases where the same information may be obtained through either electronic or visual surveillance.¹⁶³ The visual surveillance would be deemed constitutional, whereas the electronic surveillance (GPS tracking) would be deemed unconstitutional.¹⁶⁴ Scalia responded by indicating that "[i]t may be that achieving the same result through electronic means, without an accompanying trespass, is an unconstitutional invasion of privacy"¹⁶⁵ In her concurring opinion, Justice Sotomayor, quoting *Illinois v. Lidster*, pointed to what could arguably be the heart of the issue in *Jones*: "because

Fourth Amendment); *Florida v. Jardines*, 133 S. Ct. 1409, 1417–18(2013) (holding that law enforcement officers' use of drug-sniffing dog on the front porch of home to investigate an unverified tip that marijuana was being grown in the home, was a trespassory invasion of the curtilage which constituted a "search" for Fourth Amendment purposes, and that officers did not have an implied license for the physical invasion of the curtilage).

¹⁵⁶ BUTLER, *Forensic DNA Typing*, *supra* note 1, at 20.

¹⁵⁷ See *supra* note 2 (noting that the first DNA-based conviction in the United States occurred in 1987).

¹⁵⁸ See David H. Kaye, *The Genealogy Detectives: A Constitutional Analysis of "Familial Searching"*, 50 AM. CRIM. L. REV. 109, 133 (2013) (discussing how *Jones* and *Jardines* may be applicable to familial DNA searching).

¹⁵⁹ *Jones*, 132 S. Ct. at 946.

¹⁶⁰ *Id.* at 952.

¹⁶¹ *Id.* at 946 (stating that the Government's physical intrusion on an "effect" for the purpose of obtaining information constitutes a "search" in this case).

¹⁶² *Jones*, 132 S. Ct. at 954–63 (Sotomayor, J. & Alito, J., concurring).

¹⁶³ *Jones*, 132 S. Ct. at 956 (Sotomayor, J., concurring) (noting that the majority opinion may provide little guidance in cases of electronic or novel modes of surveillance without a physical invasion on property).

¹⁶⁴ *Id.*

¹⁶⁵ *Jones*, 132 S. Ct. at 954 (emphasis added).

GPS monitoring is cheap in comparison to conventional surveillance techniques and, by design, *proceeds surreptitiously*, it evades the ordinary checks that constrain abusive law enforcement practices: ‘limited police resources and community hostility.’”¹⁶⁶ Perhaps foreshadowing her approach in a future case considering a type of procedure like familial DNA searching, Sotomayor also stated that she would “consider the appropriateness of entrusting to the Executive, *in the absence of any oversight from a coordinate branch*, a tool so amenable to misuse, especially in light of the Fourth Amendment’s goal to curb arbitrary exercises of police power.”¹⁶⁷ Justice Sotomayor was concerned with the use of new and discrete law enforcement methodologies that might escape the legislative process.¹⁶⁸

Justice Alito, joined by Justices Ginsberg, Breyer, and Kagan, echoed the concerns of Justice Sotomayor, suggesting that *Katz*’s reasonable expectation of privacy test is subject to complications in the ever-advancing technological society.¹⁶⁹ In ascertaining the “subjective” element of *Katz*, he noted that “the *Katz* test rests on the assumption that this hypothetical reasonable person has a well-developed and stable set of privacy expectations.”¹⁷⁰ Justice Alito contends that new technology may change those privacy expectations and society’s attitudes to what they are willing to give up in exchange for increased security and convenience.¹⁷¹ Alito’s concern for the changing expectations of privacy in an increasingly technological society seems to indicate that when assessing the constitutionality of familial DNA searching, courts should balance the privacy expectation in an individual’s DNA profile with the desire for increased security brought by solving crimes.

However, in 2013 Justice Scalia and a majority of the court again relied on the common-law trespass rule to decide *Florida v. Jardines*.¹⁷² The majority opinion held that law enforcement officers’ use of a drug-sniffing dog on the front porch of a home was a trespassory invasion of the curtilage which constituted a “search” for Fourth Amendment purposes.¹⁷³ The Court also held that the officers did not have an implied license for the specific physical invasion of the curtilage.¹⁷⁴ In determining whether or not a search

¹⁶⁶ *Jones*, 132 S. Ct. at 956 (Sotomayor, J., concurring) (quoting *Illinois v. Lidster*, 540 U.S. 419, 426 (2004)) (emphasis added).

¹⁶⁷ *Id.* (emphasis added).

¹⁶⁸ *See id.*

¹⁶⁹ *Jones*, 132 S. Ct. at 962 (Alito, J., concurring) (noting that the “*Katz* expectation-of-privacy test avoids the problems and complications” similar to those in this case).

¹⁷⁰ *Id.*

¹⁷¹ *Id.* (stating new technology may provide increased convenience or security at the expense of privacy).

¹⁷² *Jardines*, 133 S. Ct. 1409.

¹⁷³ *Id.* at 1415.

¹⁷⁴ *Id.* The Court drew a distinction between going up to the front door and knocking and bringing a trained police dog to explore the area around the home in hopes of discovering incriminating evidence. *Id.* at 1416.

occurred, the Court emphasized the intention of the officers when applying the reasonable expectation of privacy analysis: “the scope of a license—express or implied—is limited not only to a particular area but also to a *specific purpose*.”¹⁷⁵ For a second time in a year, the Court skirted the issue of defining a reasonable expectation of privacy in something abstract, leaving the door open for an opinion holding that familial DNA searches do not infringe upon a reasonable expectation of privacy.

2. A Search Defined in a Multi-step Process: When is the “Constitutional Moment” in Familial DNA Searching?

In most Fourth Amendment cases, defining the “search” is not a complicated issue; rather, courts focus on the reasonableness of the search in the case context. In the context of familial DNA searching, however, a court must determine the “constitutional moment” from among many possibilities, due its multi-step, technical, and scientific process.¹⁷⁶ For example, the moment of the search could be when the offender sample is collected, when DNA testing is conducted, when the sample is uploaded to the database, when the database search is conducted, or when the sample of the target individual is retested.¹⁷⁷ The rights of multiple individuals in the process also complicate the search issue.¹⁷⁸ The search of one person through the DNA collection process may potentially affect the constitutional rights of another if familial DNA searching is used.¹⁷⁹ This intermingling of individuals involved in the process requires a careful analysis of each step in the process and a study of what case sets precedent at each one of these steps.

Unquestionably, using a buccal swab on the inside of an individual’s cheek to collect a sample for DNA testing is a search.¹⁸⁰ The more critical question regarding familial DNA searching, however, is what subsequent steps in the process also constitute searches under the Fourth Amendment. A 2012 case from the Fourth Circuit, *United States v. Davis*, attempted to apply the Fourth Amendment to the downstream DNA testing and its database derivatives.¹⁸¹ Relying on a combination of *Skinner v. Railway Labor Executives* and *United States v. Mitchell*,¹⁸² the Fourth Circuit held that the “extraction of DNA and the creation of a DNA profile result in a sufficiently

¹⁷⁵ *Id.* at 1416 (emphasis added).

¹⁷⁶ Murphy, *supra* note 85, at 332 (discussing the difficulty in identifying which step involves constitutional scrutiny).

¹⁷⁷ *Id.*

¹⁷⁸ *Id.* at 334.

¹⁷⁹ *Id.*

¹⁸⁰ *Maryland v. King*, 133 S. Ct. 1958, 1969 (2013) (holding that using a buccal swab on the inner tissue of a person’s cheek is a search).

¹⁸¹ *United States v. Davis*, 690 F.3d 226 (4th Cir. 2012).

¹⁸² *Skinner v. Ry. Labor Executives’ Ass’n*, 489 U.S. 602, 617 (1989); *United States v. Mitchell*, 652 F.3d 387, 407 (3d Cir. 2011) (stating that the processing of the DNA sample and creation of the DNA profile is a search).

separate invasion of privacy that such acts must be considered a separate search under the Fourth Amendment even when there is no issue concerning the collection of the DNA sample.”¹⁸³ While *Skinner* did not involve DNA testing, the Court determined that because the collection and subsequent testing of urine from railroad employees intruded upon the expectations of privacy that our society has long regarded as reasonable, the intrusions were searches under the Fourth Amendment.¹⁸⁴ Citing *Arizona v. Hicks*,¹⁸⁵ the United States Court of Appeals District of Columbia Circuit concluded in *Johnson v. Quander* that “accessing the records stored in the CODIS database is not a ‘search’ for Fourth Amendment purposes.”¹⁸⁶ Under the sparse case precedent regarding the steps in DNA testing, the creation of a DNA profile may constitute a search under the Fourth Amendment; however, the search of a database would not.¹⁸⁷

Despite the complex issues surrounding the collection, testing, and retention of DNA profiles, most courts have not taken a comprehensive step-by-step approach to the constitutionality of DNA databases and their uses.¹⁸⁸ Instead, focusing on the collection of the DNA sample as the critical step, federal and state statutes authorizing the collection of DNA samples from persons convicted of qualifying offenses have been universally upheld.¹⁸⁹ The courts have not sufficiently addressed the issue of what can be done with the samples once in the database and, specifically, whether retrospective searches of DNA profiles are lawful.¹⁹⁰

¹⁸³ *Davis*, 690 F.3d at 246.

¹⁸⁴ *Skinner*, 489 U.S. at 617. Critical to the Court’s analysis were two factors: (1) that the testing of the urine could reveal “a host of private medical facts”; and (2) that the intimate nature of the collection of the urine implicated privacy interests.

¹⁸⁵ *Arizona v. Hicks*, 480 U.S. 321 (1987).

¹⁸⁶ *Johnson v. Quander*, 440 F.3d 489, 498 (D.C. Cir. 2006). In *Hicks*, while entering and searching an apartment based on exigent circumstances, the officer found an expensive piece of stereo equipment in plain view. *Hicks*, 480 U.S. at 323–24. The Supreme Court concluded that moving the piece of equipment in order to record the serial number from its underside constituted a search, but matching the serial numbers to those of stolen equipment did not independently involve a Fourth Amendment analysis. *Id.* at 324–25.

¹⁸⁷ *See Davis*, 690 F.3d at 246 (holding that the creation of a DNA profile is a search); *Johnson*, 440 F.3d at 498 (determining that accessing records in CODIS is not a search).

¹⁸⁸ *Murphy*, *supra* note 85 at 333 (noting that courts have not analyzed the moments in DNA testing separately).

¹⁸⁹ *See, e.g., Banks v. United States*, 490 F.3d 1178 (10th Cir. 2007); *United States v. Weikert*, 504 F.3d 1 (1st Cir. 2007); *United States v. Amerson*, 483 F.3d 73 (2d Cir. 2007); *United States v. Hook*, 471 F.3d 766 (7th Cir. 2006); *Johnson v. Quander*, 440 F.3d 489 (D.C. Cir. 2006); *United States v. Conley*, 453 F.3d 674 (6th Cir. 2006); *United States v. Kraklio*, 451 F.3d 922 (8th Cir. 2006); *United States v. Sczubelek*, 402 F.3d 175 (3d Cir. 2005); *Groceman v. U.S. Dept. of Justice*, 354 F.3d 411 (5th Cir. 2004); *United States v. Kincade*, 379 F.3d 813 (9th Cir. 2004); *State v. Bartylla*, 755 N.W.2d 8 (Minn. 2008).

¹⁹⁰ *Murphy*, *supra* note 85 at 335 (discussing what can be done with a sample once collected).

B. Standing: Multiple Interests at Stake

Standing is a central component to Fourth Amendment jurisprudence. Even though the Fourth Amendment does not specifically speak of standing, a number of Supreme Court cases have articulated a standing requirement for a valid Fourth Amendment claim.¹⁹¹ “Fourth Amendment rights ... may not be vicariously asserted.”¹⁹² Typically, the issue of standing is coalesced in the *Katz* expectation of privacy inquiry; essentially, for a defendant to challenge the admission of evidence under a Fourth Amendment claim, he or she must demonstrate that his or her legitimate expectation of privacy was violated.¹⁹³ The usually relatively straightforward determination of whether a person has standing under the Fourth Amendment is complicated in the setting of familial DNA searches.

The vacated Ninth Circuit case of *United States v. Pool* alludes to the complexities inherent in familial DNA searching: “[i]t is not clear that familial comparisons raise a constitutional privacy issue or, if they do, whose interests are violated.”¹⁹⁴ Despite not dealing with familial DNA searching directly, the court analogizes familial DNA searching with a photograph lineup:

It is questionable whether the rights of the perpetrator (if ultimately identified through the use of familial comparisons) are violated. This seems somewhat analogous to a witness looking at a photograph of one person and stating that the perpetrator has a similar appearance which leads the police to show the witness photos of similar looking individuals, one of whom the witness identifies as the perpetrator. It is questionable whether the person whose photograph helped focus the inquiry, or whose familial comparison helped focus the inquiry, has suffered any invasion of his or her constitutional right to privacy.¹⁹⁵

¹⁹¹ See e.g., *Katz v. United States*, 389 U.S. 347 (1967); *Minnesota v. Olson*, 495 U.S. 91 (1990) (holding that an overnight guest in a home has standing to challenge a search in that home); *Rakas v. Illinois*, 439 U.S. 128 (1978) (ruling that an individual who has neither a property nor a possessory interest in the automobile searched nor an interest in the property seized does not have standing to challenge the search).

¹⁹² *Alderman v. United States*, 394 U.S. 165, 174 (1969).

¹⁹³ *Rakas*, 439 U.S. at 148 (stating that the individuals in the automobile did not show that they had any legitimate expectation of privacy in the glove compartment). “To mount a successful motion to suppress, an accused must first establish that he personally has a legitimate expectation of privacy in the object that was searched.” *United States v. Stringer*, 739 F.3d 391, 396 (8th Cir. 2014).

¹⁹⁴ *United States v. Pool*, 621 F.3d 1213, 1221 (9th Cir. 2010), *vacated*, 659 F.3d 761 (9th Cir. 2011).

¹⁹⁵ *Id.*

Therefore, even if a familial DNA search implicates a Fourth Amendment search, it is unclear if the individual whose rights were theoretically violated would have standing to assert a Fourth Amendment claim.¹⁹⁶

C. *Is the Search Reasonable?*

Assuming a familial DNA search challenge can successfully navigate its way through being categorized as an actual “search” with an infringement on the reasonable expectation of privacy of the relative implicated, the court would then have to address the reasonableness of that search.¹⁹⁷ Ordinarily, for a search to be reasonable, the government must first obtain a search warrant from a neutral magistrate.¹⁹⁸ However, warrantless searches may be constitutional as long as they are reasonable.¹⁹⁹ In some cases, “[w]hen faced with special law enforcement needs, diminished expectations of privacy, minimal intrusions, or the like, the Court has found that certain general, or individual, circumstances may render a warrantless search or seizure reasonable.”²⁰⁰ Furthermore, in *Maryland v. King*, the Court stated that “[t]he need for a warrant is perhaps least when the search involves no discretion that could properly be limited by the ‘interpo[lation of] a neutral magistrate between the citizen and the law enforcement officer.’”²⁰¹ In *Maryland v. King*, the Court implied that a search of an individual who has not been suspected of any wrong-doing would be analyzed under the special needs test and not the totality of the circumstances test.²⁰²

In DNA collection statute cases, the courts are split as to how to determine reasonableness: the special needs test²⁰³ or the totality of the

¹⁹⁶ See Murphy, *supra* note 85, at 333 (discussing standing issues associated with familial DNA searching).

¹⁹⁷ See *supra* Part III.A (discussing whether a familial DNA search would be considered a search for Fourth Amendment purposes).

¹⁹⁸ *Terry v. Ohio*, 392 U.S. 1, 20 (1968). The Warrant Clause of the Fourth Amendment dictates that law enforcement officers must demonstrate that they have probable cause to believe that the search will reveal particular evidence of a crime. This determination must be made by a neutral magistrate. *Id.* at 21.

¹⁹⁹ *Id.* at 9 (holding that the Constitution only forbids unreasonable searches and seizures).

²⁰⁰ *Illinois v. McArthur*, 531 U.S. 326, 330 (2001).

²⁰¹ *King*, 133 S. Ct. at 1969 (citing *Treasury Employees v. Von Raab*, 489 U.S. 656, 667 (1989)).

²⁰² *King*, 133 S. Ct. at 1978.

²⁰³ See, e.g., *United States v. Conley*, 453 F.3d 674, 680 (6th Cir. 2006) (finding that the special need was to procure reliable identifying information, reduce recidivism, and protect communities); *Nicholas v. Goord*, 430 F.3d 652, 668–69 (2d Cir. 2005) (finding that the special need was to create a DNA-indexing database to assist in solving crimes); *Green v. Berge*, 354 F.3d 675, 677 (7th Cir. 2004) (finding that the special need was to create a reliable identification for storing in the database to solve past and future crimes); *United States v. Kimler*, 335 F.3d 1132, 1146 (10th Cir. 2003) (holding that the special need was to create a DNA-indexing database); *Roe v. Marcotte*, 193 F.3d 72, 79 (2d Cir. 1999) (determining that the special need was to reduce and prevent the recidivism rate).

circumstances test.²⁰⁴ Regardless of the approach taken or justification given, the United States Supreme Court has concluded that DNA collection statutes are constitutional.²⁰⁵ Notably, however, none of these cases have addressed the derivative privacy concern of a potential third party, the relative of the individual in the database.²⁰⁶ In addressing the constitutionality of familial DNA searches in the future, courts may take either the special needs approach or the totality of the circumstances approach.²⁰⁷

D. Maryland v. King and Familial DNA Searching

In *Maryland v. King*, the Court for the first time ruled on a DNA Fourth Amendment case in what Justice Alito referred to as “perhaps the most important criminal procedure case that this Court has heard in decades.”²⁰⁸ While *King* did not specifically consider familial DNA searching, it may illuminate how the Court will treat DNA testing and searching in future cases. *King* addressed the constitutionality of the most liberal type of DNA collection statutes—those involving the requirement of arrestees to submit a DNA sample to the database.²⁰⁹ Twenty-eight states and the federal government have adopted laws authorizing the collection of DNA from some or all arrestees for inclusion into the database.²¹⁰ Minnesota passed a statute in 2006 that authorized the collection of DNA samples from arrestees.²¹¹ However, the Minnesota Court of Appeals held that the statute violated state and federal constitutional prohibitions against unreasonable searches and seizure.²¹²

²⁰⁴ See, e.g., *United States v. Kincade*, 379 F.3d 813, 836 (9th Cir. 2004); *United States v. Weikert*, 504 F.3d 1, 11 (1st Cir. 2007); *Green v. Berge*, 354 F.3d 675, 680–81 (7th Cir. 2004) (Easterbrook, J., concurring); *Groceman v. U.S. Dep’t of Justice*, 354 F.3d 411, 413–14 (5th Cir. 2004); *Velasquez v. Woods*, 329 F.3d 420, 421 (5th Cir. 2003); *Jones v. Murray*, 962 F.2d 302, 306–07 (4th Cir. 1992).

²⁰⁵ *King*, 133 S. Ct. at 1978.

²⁰⁶ See *supra* notes 200–201.

²⁰⁷ Jessica D. Gabel, *Probable Cause from Probable Bonds: A Genetic Tattle Tale Based on Familial DNA*, 21 HASTINGS WOMEN’S L.J. 3, 35–36 (2010) (discussing the special needs and totality of the circumstances test applied to familial DNA searching).

²⁰⁸ Transcript of Oral Argument at 35, *Maryland v. King*, 133 S. Ct. 1958 (2013) (No. 12-207), available at http://www.supremecourt.gov/oral_arguments/argument_transcripts/12-207-lp23.pdf.

²⁰⁹ *King*, 133 S. Ct. 1958 (holding that when officers make an arrest, taking and analyzing a cheek swab of the arrestee’s DNA is a legitimate police booking procedure that is reasonable under the Fourth Amendment).

²¹⁰ *Id.* at 1968.

²¹¹ See MINN. STAT. ANN. § 299C.105 (West 2006).

²¹² *In re Welfare of C.T.L.*, 722 N.W.2d 484 (Minn. Ct. App. 2006) (holding that statutory provisions that direct law enforcement to take biological specimens from individuals who have had a probable cause determination on a charged offense but who have not been convicted are unconstitutional). Of note, Minnesota law allows biological specimens for the purpose of DNA analysis from persons who have appeared in court and have had a judicial probable cause determination on a charge of committing certain levels of crimes. Minn. Stat. § 299C.105 (a)(1) (2015)

In *King*, the Supreme Court lauded the transformative and revolutionary capabilities that DNA technology has and will have on the criminal justice system, stating that DNA has “the potential to significantly improve both the criminal justice system and police investigative practices.”²¹³ Perhaps *King*’s most influential holding, as it relates to DNA databases in general, is that the legitimate governmental interest at play is the identification of individuals, and not crime-solving.²¹⁴ *King* also highlighted the routine use of DNA by stating that “the use of DNA for identification is no different than matching an arrestee’s face to a wanted poster of a previously unidentified suspect.”²¹⁵ This statement diminishes many of the policy concerns that have plagued familial DNA searching arguments in the past.²¹⁶ These statements indicate that the Supreme Court believes DNA testing is not only a routine identification procedure, but also a mechanism of great value to the criminal justice system.

The Court also pointed out that because the DNA testing is limited to the thirteen CODIS loci, the testing “did not intrude on [King’s] privacy in a way that would make his DNA identification unconstitutional.”²¹⁷ Hinting at potential expanded uses of the databases, the Court also stated that future privacy concerns could be implicated if the samples were used in other ways “not relevant to identity.”²¹⁸ The types of testing that the Court was concerned with include additional genetic testing that may signify a predisposition to a particular disease.²¹⁹ The Court concluded that DNA identification of arrestees is a “reasonable search that can be considered part of a routine booking procedure.”²²⁰ The *King* decision indicates that the Supreme Court may favor a DNA-based investigative technique such as familial DNA searching.

IV. TWO APPROCHES TO IMPLEMENTING FAMILIAL DNA SEARCHING: LEGISLATION OR ADMINISTRATIVE POLICY

Although Minnesota does not currently have a specific policy on familial DNA searching, Minnesota may conceivably implement familial DNA searching through state statute or administrative action. The nation’s

²¹³ *King*, 133 S. Ct. at 1966 (citing Dist. Attorney’s Office for Third Judicial Dist. v. Osborne, 557 U.S. 52, 55 (2009)).

²¹⁴ *Id.* at 1970.

²¹⁵ *Id.* at 1972.

²¹⁶ *See, e.g.,* Murphy, *supra* note 85 (discussing racial discrimination, privacy concerns, and societal interest of intact families as policy reasons against familial DNA searching); Gabel, *supra* note 207, at 26 (arguing that familial DNA searching would subject hundreds of thousands of innocent people to a lifetime of genetic surveillance).

²¹⁷ *King*, 133 S. Ct. at 1979.

²¹⁸ *Id.*

²¹⁹ *Id.* (noting that additional privacy concerns would be implicated if the testing was conducted to identify an arrestee’s predisposition to a disease or other hereditary factors).

²²⁰ *King*, 133 S. Ct. at 1980.

current familial DNA searching landscape includes a number of proposed bills allowing familial DNA searching at both the state and federal levels, and administrative policies from state attorney generals, state law enforcement agencies, and forensic science laboratories.²²¹ Conversely, only two states have statutes prohibiting familial DNA searching.²²² Due to the intermingling of legal implications and scientific technicalities, the United States has had a difficult time determining the best approach to implementing familial DNA searching policies at both the federal and state levels.²²³

A. General DNA Database Statutes

Though it has not directly addressed the issue of familial DNA searching, the federal government has passed a number of statutes relating to the establishment of DNA databases and the use of such information. The DNA Identification Act of 1994 was the principal legislation that required the FBI to maintain a national DNA database through which each state could submit and share DNA information.²²⁴ The DNA Identification Act states that “the Director of the Federal Bureau of Investigation may establish an index of—(1) DNA identification records of—persons convicted of crimes; . . . and (2) analyses of DNA samples recovered from crime scenes.”²²⁵ The DNA Identification Act further “allow[s] disclosure of stored DNA samples and DNA analyses only to criminal justice agencies for law enforcement *identification purposes*.”²²⁶ The DNA Identification Act specifically allows for the collection and retention of the DNA identification records of convicted offenders as well as DNA profiles from samples recovered from

²²¹ See H.F. 981, 87th Leg., 1st Reg. Sess. (Minn. 2011); H.B. 2059, 107th Gen. Assemb., 1st Sess. (Tenn. 2011); Utilizing DNA Technology to Solve Cold Cases Act of 2011, H.R. 3361, 112th Cong. (2011); Mem. from Edmund G. Brown Jr., Att’y Gen., to All Cal. Law Enforcement Agencies and Dist. Att’y’s Offices, DNA Partial Match (Crime Scene DNA Profile to Offender) Policy (2008), *available at* http://www.denverda.org/DNA_Documents/Policies/CA%20FS%20Policy.pdf [hereinafter Att’y Gen. Brown Mem.]; COLO. BUREAU OF INVESTIGATION, DNA FAMILIAL SEARCH POLICY (Oct. 22, 2009), *available at* http://www.denverda.org/DNA_Documents/Familial_DNA/CBI%20DNA%20Familial%20Search%20Policy%20Oct%202009%-%s0Signed.pdf [hereinafter Colorado DNA Search Policy].

²²² See D.C. CODE § 22-4151 (2009) (stating that “DNA collected by an agency of the District of Columbia shall not be searched for the purpose of identifying a family member related to the individual from whom the DNA sample was acquired.”); MD. CODE ANN., PUB. SAFETY §2-506(d) (West 2010) (noting that “[a] person may not perform a search of the statewide DNA data base for the purpose of identification of an offender in connection with a crime for which the offender may be a biological relative of the individual from whom the DNA sample was acquired”).

²²³ See *supra* Parts II–III (discussing the scientific background and Fourth Amendment considerations of familial DNA searching).

²²⁴ 42 U.S.C. § 14132 (2006) (establishing an index to facilitate law enforcement exchange of DNA identification information).

²²⁵ *Id.*

²²⁶ *Id.* (emphasis added).

crime scenes.²²⁷ Furthermore, the DNA Identification Act states the purpose of such a database is identification, which is consistent with the Court's decision in *King*.²²⁸

Individual state DNA collection statutes vary in their wording and specificity. Although most are heavy on specifics for what crimes qualify for submission of an offenders DNA profile, the statutes are unclear as to what can be done with the DNA profiles once in the database. For example, the Minnesota DNA collection statute illustrates the general language commonly seen:

As used in this section, "DNA analysis" means the process through which deoxyribonucleic acid (DNA) in a human biological specimen is analyzed and compared with DNA from another human biological specimen for identification purposes.²²⁹

The Minnesota statute further discusses the state database by stating "[t]he bureau shall establish a centralized system to cross-reference data obtained from DNA analysis."²³⁰ The Minnesota statute, like most other state DNA statutes, is invariably vague and silent as to what may be done with samples once collected.²³¹ The focus and detail of DNA database statutes surrounds what offenses qualify for requiring the collection of an individual's sample.²³² The general language of many state statutes adds to the uncertainty of whether familial DNA searching may be conducted under their authority.²³³

B. Familial DNA Searching Statutes

Currently, there are no statutes explicitly authorizing familial DNA searching at the state or national level.²³⁴ However, Maryland and the District of Columbia are the only jurisdictions in the United States that

²²⁷ *Id.*

²²⁸ *Id.*; see *supra* Part III.D (outlining the *King* decision).

²²⁹ MINN. STAT. ANN. § 299C.155 (West 2005).

²³⁰ *Id.*

²³¹ *Id.*

²³² See MINN. STAT. ANN. § 299C.105 (West 2006); MINN. STAT. ANN. § 609.117 (West 2010).

²³³ See, e.g., N.D. CENT. CODE ANN. § 31-13-05 (West 2003); IOWA CODE ANN. § 81.3 (West 2005). See also National Conference of State Legislatures, Forensic Science Laws Database, <http://www.ncsl.org/research/civil-and-criminal-justice/dna-laws-database.aspx> (last visited Feb. 15, 2015) [hereinafter *Forensic Science Laws Database*] (permitting users to search state-by-state laws enacted that address the administration and use of forensic science by state justice systems).

²³⁴ See *Forensic Science Laws Database*, *supra* note 233.

currently prohibit familial DNA searching through statutory mandate.²³⁵ Most states are underutilizing familial DNA searching due to the lack of statutory authorization.

Legislation that explicitly authorizes the use of familial DNA searching has been introduced at the state and federal level. At the federal level in November 2011, Representative Adam Schiff introduced House Bill 3361 entitled “Utilizing DNA Technology to Solve Cold Cases Act of 2011,” touting the success of California’s familial DNA testing protocol in the “Grim Sleeper” case.²³⁶ The bill required that the Attorney General adopt policies and procedures to ensure that familial DNA searching was conducted at the national level in federal investigations.²³⁷ Additionally, it allowed state CODIS administrators to request familial searches for state investigations.²³⁸ The bill stated that the privacy interests of persons identified through a familial search must be “carefully protected,” but did not outline how or to what extent this should be accomplished.²³⁹ The bill also specified what types of crimes qualify for a familial search at the federal level.²⁴⁰ Hearings were held by the Crime, Terrorism, and Homeland Security Committee, but no further action was taken on the bill.²⁴¹

In addition to House Bill 3361, three states have introduced state legislation in support of familial DNA searching. In 2011, Minnesota and Tennessee introduced nearly identical bills authorizing the use of familial DNA searches.²⁴² The bills merely stated that familial DNA searching can be conducted, without proscribing how.²⁴³ The Minnesota Public Safety and Crime Prevention Policy and Finance Committee heard testimony on the bill, and the bill was subsequently laid over.²⁴⁴ The main concern with the Minnesota bill was that it transferred full rulemaking authority over to the superintendent of the state law enforcement agency without any oversight or public debate.²⁴⁵ Under the bill, the rules promulgated by the superintendent outlining the details of how familial DNA searching would be conducted were not subject to the rulemaking provisions of the legislature. This lack of legislative oversight, accountability, and public comment was problematic

²³⁵ See D.C. CODE § 22-4151 (2009); MD. CODE ANN., PUB. SAFETY §2-506(d) (West 2010).

²³⁶ Dane C. Barca, *Familial DNA Testing, House Bill 3361, and the Need for Federal Oversight*, 64 HASTINGS L.J. 499, 502 (2013).

²³⁷ *Id.*

²³⁸ *Id.*

²³⁹ *Id.*

²⁴⁰ *Id.*

²⁴¹ *Id.*

²⁴² See H.F. 981, 87th Leg., 1st Reg. Sess. (Minn. 2011); H.B. 2059, 107th Gen. Assemb., 1st Sess. (Tenn. 2011).

²⁴³ *Id.*

²⁴⁴ Public Safety and Crime Prevention Policy and Finance Committee Minutes, Mar. 17, 2011, available at <http://www.house.leg.state.mn.us/comm/minutes1.asp?comm=87015&id=401>

²⁴⁵ *Id.*

for some representatives at the hearing.²⁴⁶ Proponents of the bill noted that familial DNA searching is just another tool for law enforcement to use when investigations in homicides and sexual assaults hit a dead end.²⁴⁷ Moreover, the bill's proponents argued that the detail required in familial DNA searching procedures would best be left in the hands of those most familiar with the intricacies of the testing, and not the legislature.²⁴⁸ The fiscal note to the bill estimated the annual cost for such searches (approximately 10 to 12 per year), at approximately \$59,000.²⁴⁹ Notably, the same bill was introduced again in Minnesota's 88th Legislative Session in 2014 and referred to the Public Safety Finance and Policy Committee.²⁵⁰ To date, nothing has come of either bill.

In 2013, the New York legislature introduced a bill establishing standards and regulations to permit familial DNA searching and to utilize partial DNA matches as an investigative tool in unsolved crimes.²⁵¹ The New York bill was more detailed than either the Minnesota or Tennessee bill, differentiating between partial matches and familial DNA searching.²⁵² Furthermore, the bill required the New York Commission on Forensic Science to "promulgate standards that permit familial searching and the release of partial matches to investigating law enforcement officials."²⁵³ The bill further outlined the types of crimes that may be subject to familial DNA searching and established statistical thresholds be met before names were released to law enforcement.²⁵⁴ Details of the bill also included the requirement of YSTR testing.²⁵⁵ The bill was referred to the Committee on Governmental Operations in April, 2014.²⁵⁶ This same bill was recently reintroduced in January 2015 to the New York Assembly.²⁵⁷ This continual reintroduction of both the Minnesota and New York bills seems to indicate that both states recognize the need for such legislation, but perhaps lack the understanding about the details that would help the bills pass.

²⁴⁶ *Id.*

²⁴⁷ *Id.*

²⁴⁸ *Id.*

²⁴⁹ See Ruben Rosario, *New DNA technique: Does it fight crime or deprive rights?*, TWINCITIES.COM—PIONEER PRESS (Mar. 20, 2011), http://www.twincities.com/localnews/ci_17648547.

²⁵⁰ See H.F. 1907, 88th Leg., 2nd Reg. Sess. (Minn. 2014).

²⁵¹ See Assemb. B. 9247, 237th Leg. Sess. (N.Y. 2013).

²⁵² *Id.*

²⁵³ *Id.* The New York Commission on Forensic Science was established pursuant to state statute in 1994 to develop forensic science standards and accreditation program for laboratories throughout New York. Forensic DNA sub-committee members include a population geneticist, molecular biologist and forensic scientist. See N.Y. Exec. Law § 995-b (McKinney 1999).

²⁵⁴ Assemb. B. 9247, 237th Leg. Sess. (N.Y. 2013).

²⁵⁵ *Id.*

²⁵⁶ *Id.*

²⁵⁷ See Assemb. B. 1515, 238th Leg. Sess. (N.Y. 2015).

The Innocence Project addressed the question of whether familial DNA searching demands statutory authorization, or whether it can be guided sufficiently via administrative policies.²⁵⁸ Despite its official stance against the use of familial DNA searching, the Innocence Project nevertheless recommends that if it is conducted, it should be through statutory authorization.²⁵⁹ The Innocence Project provides three justifications for why this authority and direction must come from the legislature rather than through executive action or deference to law-enforcement:

- (1) The need for legislative authority was recognized when DNA databases were created, and any extensions of power regarding their use must also be made through legislation;
- (2) Legislatures are uniquely capable of considering how the negative collateral effects of the use of familial DNA searching can be minimized; and
- (3) Legislative action fosters public debate.²⁶⁰

No state has yet enacted familial DNA legislation, but the discussion is ongoing and state legislative representatives continue to introduce familial DNA bills.²⁶¹ Despite the lack of statutory authorization, a number of states are nonetheless currently conduct familial DNA searches through administrative action.²⁶²

C. State Administrative Policies

The lack of transparency and public disclosure of state policies and practices regarding familial DNA searching makes it difficult to determine how many states currently use this practice.²⁶³ At least four states have detailed public familial DNA state policies: California, Colorado, Texas, and Virginia.²⁶⁴ California was the first state to officially utilize familial DNA

²⁵⁸ *Innocence Project Position on Familial Searching of DNA Databases*, INNOCENCE PROJECT, available at <http://www.innocenceproject.org/free-innocent/improve-the-law/FamilialSearchPolicyFinal.pdf/view>.

²⁵⁹ *Id.* at 5.

²⁶⁰ *Id.*

²⁶¹ See *supra* notes 250-257 (referencing the bills that were reintroduced in Minnesota and New York).

²⁶² See e.g., Meghan Dwyer & Stephen Davis, *Wisconsin now using controversial DNA testing to solve crimes*, FOX6 NOW (Oct. 23, 2014), <http://fox6now.com/2014/10/23/wisconsin-uses-controversial-dna-testing-to-solve-crimes/>; *Familial DNA Database Sources*, DENVER DISTRICT ATTORNEY'S OFFICE, http://www.denverda.org/DNA/Familial_DNA_Database_Searches.htm (last visited Apr. 28, 2015) [hereinafter *Familial DNA Database Searches*] (demonstrating through state policies of California, Virginia, Texas, and Colorado that a number of states are conducting familial DNA searching through administrative action).

²⁶³ Ram, *supra* note 68, at 807.

²⁶⁴ See *Familial DNA Database Searches*, *supra* note 262.

searching.²⁶⁵ California's policy, implemented in 2008, is outlined in a memorandum from the Attorney General and prescribes procedures for when a partial match is obtained through routine searching and how law enforcement may request an intentional familial DNA search.²⁶⁶ The memorandum also outlines criteria for when the name of an offender may be released to the agency.²⁶⁷ Notably, the California Department of Justice has created a familial DNA search committee that reviews information and determines how to proceed with each case.²⁶⁸ California's policy requires that statistical analysis be performed to determine the level of association, that YSTR testing should be conducted, and that non-forensic information be reviewed "in order to identify additional evidence bearing on relatedness."²⁶⁹ A committee composed of California Department of Justice scientists, investigators, and attorneys administers the familial DNA searching program.²⁷⁰ The policy was developed "keeping privacy concerns in mind while at the same time providing information that may be useful in solving a violent offense."²⁷¹ Moreover, the California Department of Justice has an extensive validation study published that outlines and describes its familial DNA searching processes and algorithms.²⁷²

In 2009, the Director of the Colorado Bureau of Investigation promulgated Colorado's policy, which is similar to California's policy in many respects.²⁷³ Colorado's policy specifically states that the lead investigator must have received specialized training in familial DNA evidence, that the report clearly indicates that the association is not an identification, and that the information is for investigative purposes only.²⁷⁴ Meanwhile, Texas' policy, described in the standard operating procedures of the laboratory, distinguishes between a partial match and a deliberate familial DNA search.²⁷⁵ The policy states "[i]n order to ensure transparency and integrity, it is imperative that all agencies involved in the process communicate, work together and understand the limitations of the information the search provides."²⁷⁶

²⁶⁵ Murphy, *supra* note 85, at 293.

²⁶⁶ See Att'y Gen. Brown Mem., *supra* note 221.

²⁶⁷ *Id.*

²⁶⁸ *Id.*

²⁶⁹ *Id.*

²⁷⁰ Chamberlain, *supra* note 104, at 26.

²⁷¹ See Att'y Gen. Brown Mem., *supra* note 221.

²⁷² Steven P. Myers et al., *Searching for first-degree familial relationships in California's offender DNA database: Validation of a likelihood ratio-based approach*, 5 FORENSIC SCI. INT'L: GENETICS 493 (2011).

²⁷³ See Colorado DNA Search Policy, *supra* note 221.

²⁷⁴ *Id.*

²⁷⁵ See TEX. DEP'T OF PUB. SAFETY, STANDARD OPERATING PROCEDURES: PARTIAL MATCHES AND FAMILIAL SEARCHES 1 (April 24, 2012), available at http://www.denverda.org/DNA_Documents/Familial_DNA/Tx%20FS%20policy.pdf.

²⁷⁶ *Id.* at 2.

Even some of the harshest critics of familial DNA searching argue that if a state is going to allow familial DNA searching, the state must implement a comprehensive and robust procedure that allows for public accountability.²⁷⁷ The California policy is heralded by familial DNA opponents for including and considering: (1) a limitation to serious offenses; (2) separation of scientists from the local law enforcement; (3) withholding names until necessary for final investigation; (4) specificity in imposing a threshold match criteria; and (5) developing specialized software.²⁷⁸ Furthermore, there is serious concern that familial DNA searching would be overused and that a policy should include a report on the frequency and results of familial DNA searching conducted by the laboratory to an oversight committee that ensures its scope is appropriate.²⁷⁹ In addition, the FBI recommends that policies and procedures should address, at a minimum, the following topics: (1) privacy considerations; (2) release of information; (3) process for approval of search requests; (4) types of crimes eligible; (5) frequency of searches; (6) use of additional genetic testing (e.g. YSTR) to narrow search results; (7) reporting of search results; and (8) categories searched (e.g. offenders only, offenders and arrestees).²⁸⁰ Regardless of the method of implementation, states should ensure they address all of the unique considerations that familial DNA searching presents.²⁸¹

Certainly, the familial DNA searching landscape is complex. The scientific intricacies and unique constitutional considerations make navigating the familial DNA searching terrain difficult.²⁸² However, this lack of understanding can be overcome through educating both the legal and scientific communities. Laboratories and law enforcement agencies can support this effort by establishing rules and procedures, whether through statutory authorization or administrative actions, that are open to scrutiny and public debate.²⁸³

V. ANALYSIS

Familial DNA searching is a modern investigative tool that should be available to law enforcement when investigations in high-level crimes

²⁷⁷ See *Innocence Project Position on Familial Searching of DNA Databases*, *supra* note 258.

²⁷⁸ Erin E. Murphy, *Familial DNA Searches*, 27-SPG CRIM. JUST. 19, 23 (2012).

²⁷⁹ *Id.*

²⁸⁰ Familial Searching, *supra* note 9.

²⁸¹ See *supra* Parts II–III (discussing the scientific background and Fourth Amendment considerations of familial DNA searching).

²⁸² See *supra* Part II–III (discussing the scientific background and Fourth Amendment considerations of familial DNA searching).

²⁸³ See *supra* Part III (discussing the different approaches to implementing familial DNA searching).

have stalled.²⁸⁴ Familial DNA searching is constitutional, effective, and based on sound scientific principles.²⁸⁵ Moreover, familial DNA searching is often misunderstood by the legal community, which leads to false assumptions regarding its potential to invade the privacy of innocent individuals.²⁸⁶ Minnesota should conduct familial DNA searching at the state level through statutory authorization, whether implicitly, through the existing DNA database legislation, or explicitly, through new legislation that expressly authorizes familial DNA.²⁸⁷ However, the details regarding the methods should be delegated to forensic science laboratories, with oversight from a multi-disciplinary committee.²⁸⁸

A. Familial DNA Searching is an Effective and Scientifically Valid Procedure That Will Assist the Criminal Justice System

Familial DNA searching has generated strong opposition for three main reasons: (1) the legal community and general public do not understand the underlying scientific principles and forensic scientists do not understand the underlying legal implications;²⁸⁹ (2) society is concerned about the sociological ramifications;²⁹⁰ and (3) the method of investigation is rooted in technology.²⁹¹ However, all three of these issues can be addressed with open communication and education regarding familial DNA searching. This comment suggests that a deeper understanding of both the scientific and legal components of familial DNA searching will bridge the gap that exists between scientists and legal professionals.

Familial DNA searching involves genetic principles, a multi-step process, and scientific language to communicate the results.²⁹² However, familial DNA searching is nothing more than an extension of the principles applied when statistics are given between matching DNA profiles.²⁹³ Genetic associations are routinely made between known DNA profiles and DNA

²⁸⁴ See *infra* Part IV.A (discussing the scientific validity and effectiveness of familial DNA searching).

²⁸⁵ See *infra* Part IV.A–B (outlining the scientific principles of familial DNA searching and the constitutional considerations).

²⁸⁶ See BUTLER, *Advanced Topics*, *supra* note 30 at 607 (stating that law professors often raise the unfounded “specter of so-called ‘genetic surveillance’”).

²⁸⁷ See *infra* Parts V.C–V.D (arguing that familial DNA searching is more effective at the state level and detailing the methods of implementation).

²⁸⁸ See *infra* Part V.D.3 (discussing the importance of transparency and proper oversight).

²⁸⁹ See *supra* Parts II–III (discussing the scientific principles and constitutional implications behind familial DNA searching).

²⁹⁰ See *supra* text accompanying note 114 (listing the sociological basis of the effectiveness of familial DNA searching).

²⁹¹ See *supra* Part III.A (discussing Fourth Amendment technology concerns).

²⁹² See *supra* Part II (describing the background and complexities of familial DNA searching).

²⁹³ See *supra* note 28 and accompanying text (discussing the frequency estimates of DNA profiles).

profiles obtained from evidence.²⁹⁴ In fact, forensic DNA testing has gained widespread acceptance in United States courts because scientists can represent the probability of that match through statistics.²⁹⁵ The same can be said for familial DNA searching associations. Based on underlying principles of genetic inheritance, combined with the frequency of different alleles, forensic scientists can determine the probability that two DNA profiles are from related individuals.²⁹⁶ An individual shares one allele at each area tested with a biological parent.²⁹⁷ If the evidence profile is not an exact match with an individual within the database but shares one allele at each area tested, there is a high probability that the donor of that evidence sample is either a parent or child of the individual in the database.²⁹⁸ This example is the simplest scenario, but the same principles can be applied to siblings.²⁹⁹

The initial search of the DNA database is only the first step in the process. The software utilized for familial DNA searching produces a potential list of individuals in ranked order.³⁰⁰ Theoretically, the individual ranked first is more likely to be a relative of the individual responsible for the DNA profile obtained from the crime scene than the individual ranked number twenty, but this association is confirmed through additional genetic testing.³⁰¹ Scientists then conduct YSTR testing on the male individuals to determine whether they are in fact related through their male lineage.³⁰² Once the familial association is confirmed through genetics, law enforcement conducts a traditional investigation to determine if it is feasible that this individual could have committed the crime.³⁰³ Imagine the following scenario:³⁰⁴ A crime was committed 20 years ago in Minneapolis and the

²⁹⁴ See *supra* note 29 and accompanying text (describing a random match probability).

²⁹⁵ See *supra* note 4 and accompanying text (stating that DNA testing is reliable because it is based on statistical estimations, unlike fingerprints, where currently, no mathematical association is possible).

²⁹⁶ See *supra* notes 90, 94 and accompanying text (describing the likelihood ratio and how it is applied to familial DNA searching).

²⁹⁷ See *supra* text accompanying note 18 (explaining how one-half of an individual's genetic information comes from his or her father and one half comes from his or her mother).

²⁹⁸ See *supra* Part II.B.4 (describing the procedures involved in identifying and refining a familial DNA search).

²⁹⁹ See *supra* note 141 and accompanying text (noting the difference between parent/child genetic relationships and sibling genetic relationships).

³⁰⁰ See *supra* note 96 and accompanying text (describing the ranking process in familial DNA searching)

³⁰¹ See *supra* note 97 and accompanying text (noting that unrelated individuals may share alleles by chance alone).

³⁰² See *supra* note 32 and accompanying text (explaining the male lineage of YSTR markers. Alternatively, mitochondrial DNA can be used for testing associations between females).

³⁰³ See *supra* note 103 and accompanying text (describing the U.K. approach to refining the initial familial DNA searching results).

³⁰⁴ Chamberlain, *supra* note 104, at 28 (outlining a similar scenario).

witnesses described the perpetrator as an older Caucasian man.³⁰⁵ The convicted offender identified through a possible familial DNA association was an 18 year old African-American man with no siblings.³⁰⁶ He lives in Saint Paul, but his parents still reside in New York where he was raised.³⁰⁷ This information may lead the investigation team to withhold the name of the offender.³⁰⁸ In contrast, suppose the convicted offender was identified as an 18 year old Caucasian male with a father that lived in Minneapolis 20 years ago and matches the description of the perpetrator.³⁰⁹ This information might lead the investigative team to release the name of the offender since the metadata tend to support the familial association.³¹⁰ Familial DNA searching is not conducted in a vacuum, and is only a piece in the investigative puzzle.³¹¹

Familial DNA searching is effective because, statistically speaking, crime runs in the family.³¹² This is not to say that all individuals with a father or mother who commits a crime will fall into a life of crime themselves, but when statistics indicate that there will be a close relative in the database 50% of the time, familial DNA searching should not be overlooked as an effective investigative tool.³¹³ Traditional investigations, those not involving DNA, frequently use familial associations.³¹⁴ Detectives investigating a homicide routinely talk to relatives of a suspect to gather more investigative information.³¹⁵ Nor would it be unusual for a detective to use someone's past criminal history to deem him or her a suspect in a crime that occurred near his or her residence.³¹⁶ These methods of investigation are practiced routinely without the auspicious name "familial DNA searching." Adding science and technology to the equation simply seems to invite critical debate.³¹⁷

Implementing a successful familial DNA searching program now will yield significant benefits in the future. Familial DNA searching will

³⁰⁵ *Id.*

³⁰⁶ *Id.*

³⁰⁷ *Id.*

³⁰⁸ *Id.*

³⁰⁹ *Id.*

³¹⁰ See *supra* text accompanying note 128 (noting that the metadata is only available at the state level).

³¹¹ See *supra* Part II.C (describing the process and successes of familial DNA searching in an investigative context).

³¹² See *supra* text accompanying note 118 (stating that 46% of jail inmates had a family member who had been incarcerated).

³¹³ See *supra* text accompanying note 119 (stating that statistically, there will be a relative in the database approximately half of the time).

³¹⁴ See *supra* text accompanying note 215 (comparing DNA identification to identifying someone from a wanted poster).

³¹⁵ See Kaye, *supra* note 158, at 146 (stating that police may locate relatives through public records).

³¹⁶ *Id.* (discussing the many methods of routine investigation).

³¹⁷ See *supra* text accompanying note 216 (noting the policy arguments that have been made regarding familial DNA searching).

become more effective as DNA databases age.³¹⁸ For example, in 20 years, more parent-child relationships will exist between an individual in the database and an individual who left DNA at a crime scene.³¹⁹ Statutes requiring the submission of convicted offender samples into DNA databases did not become common until the late 1990s.³²⁰ As time goes on, the databases will start to span across generations, which will lead to more potential associations between parent and child.³²¹ In fact, recent successes with familial DNA searching have solved cold cases from decades ago by identifying a child of the perpetrator in the database.³²²

B. Familial DNA Searching Will Withstand Fourth Amendment Constitutional Scrutiny

1. Reasonable Expectation of Privacy

In addition to being consistent with scientific principles and widely-accepted investigative practices, familial DNA searching is likely constitutional under the Fourth Amendment.³²³ According to the Supreme Court's decision in *Katz*, in order to implicate the Fourth Amendment, there must be a subjective expectation of privacy in the thing to be searched and society must be ready to accept this expectation as reasonable.³²⁴ Putting aside the technicalities of familial DNA searching, a more basic question is whether someone would have a reasonable expectation of privacy in his or her DNA profile. In *Jones*, the concurring justices suggested that the reasonable expectation of privacy question has changed with the advent of new technology.³²⁵ Assessing the privacy expectations of a technological society requires a new balancing of what individuals are willing to give up in exchange for increased security.³²⁶ The constitutionality of a familial DNA

³¹⁸ See *supra* text accompanying notes 137–141 (explaining how familial DNA searching will become more effective as databases age).

³¹⁹ See *supra* text accompanying note 138 (noting that the number of relatives in the database will increase as children of previous offenders are included).

³²⁰ See *supra* text accompanying note 3 (stating that the national DNA database was operational in 1998).

³²¹ See *supra* text accompanying notes 137–141 (explaining how familial DNA searching will become more effective as databases age).

³²² See *supra* text accompanying notes 104, 107, 109 (describing the successful familial DNA searching cases in California and Minnesota).

³²³ See *supra* Part II (discussing the scientific validity and investigative process that follows familial DNA searching).

³²⁴ See *supra* text accompanying note 151 (explaining Justice Harlan's concurring opinion in *Katz*).

³²⁵ See *supra* text accompanying note 170 (distinguishing *Jones* from *Katz* due to the presence of new technology).

³²⁶ See *supra* text accompanying note 171 (describing Justice Alito's balancing of interests in assessing a reasonable expectation of privacy with new technology).

search turns on whether society finds that the identification of criminal perpetrators outweighs individual privacy concerns in their DNA profiles.³²⁷

Maryland v. King established the same approach to assessing the expectation of privacy in DNA profiles.³²⁸ Noting that the DNA testing was limited to the 13 CODIS loci, the Court stated that the DNA testing did not unconstitutionally intrude on King's privacy.³²⁹ Even if a court agreed that the extraction of DNA and its testing of the 13 CODIS loci constitute a search, case law does not support that searching the database for a match with this profile constitutes a "search" under the Fourth Amendment, and neither *Davis* nor *King* was dispositive of the issue.³³⁰

Arguably, in light of *Jardines*, whether an individual has a reasonable expectation of privacy in his or her DNA profile may not be the most critical question.³³¹ Rather, the Court in *Jardines* changed course and considered the purpose of the search and the police officer's intention while analyzing the reasonable expectation of privacy inquiry.³³² This distinction could factor into the Court's analysis in a familial DNA searching case.³³³ The question of whether an individual in the database has a reasonable expectation of privacy in his or her DNA profile may change to if that individual understood the "license" to include a search of the database in order to ascertain whether they, or a relative, may have left biological evidence at a crime scene.³³⁴ However, because *Jardines* relied upon a trespass *and* the lack of an implicit or express license, it is difficult to conclude how the Court would have ruled had the physical trespass not occurred.³³⁵

2. Familial DNA Searching as a New and Discrete Investigation Method

Familial DNA searching fits precisely into the category of new and discrete law enforcement methodologies that Justice Sotomayor so

³²⁷ See *supra* text accompanying note 171.

³²⁸ See *supra* text accompanying note 220 (stating that DNA identification of arrestees is a reasonable search).

³²⁹ See *supra* text accompanying note 217.

³³⁰ See *supra* text accompanying text note 186 (noting that a Fourth Amendment search was not implicated when a search of the database was conducted).

³³¹ See *supra* text accompanying note 172 (stating that the Court relied on the common-law trespass doctrine).

³³² See *supra* text accompanying note 175 (asserting that the specific purpose of police when conducting a search was important to assessing a reasonable expectation of privacy).

³³³ See *supra* text accompanying notes 39, 40 (noting that police do not have a suspect when conducting a search of the DNA database).

³³⁴ See *supra* text accompanying note 175 (discussing the scope of the license when determining whether a search is reasonable).

³³⁵ See *supra* text accompanying note 173 (noting that the trespassory invasion of the porch constituted a search).

cautiously discussed in *Jones*.³³⁶ By design, most people do not even know that it occurs in laboratories throughout the country, avoiding the community debate and oversight that may exist were it more visible.³³⁷ In addition, in its current state, without proper procedures in many states, familial DNA searching evades the necessary checks to limit abusive law enforcement.³³⁸ Accordingly, detailed procedures drafted and implemented with the proper oversight are required for familial searching to pass constitutional muster.³³⁹ These procedures should include: (1) the point at which names may be released to law enforcement; (2) the searching parameters used; (3) what types of cases it may be utilized in; and (4) under what conditions searches may proceed.³⁴⁰ Furthermore, having the procedures developed by forensic science laboratories rather than law enforcement would alleviate some of the concern about arbitrary police power.³⁴¹

3. *Familial DNA Searching is a Reasonable Fourth Amendment Search*

In assessing the reasonableness of the search under Fourth Amendment jurisprudence, if the “search” conducted as part of a familial DNA search is targeted at the relative and not the pivot person, the special needs test applies.³⁴² Law enforcement is not suspecting a certain individual when they conduct a familial DNA search.³⁴³ At the point of the search, the relative of the pivot person is not considered a suspect.³⁴⁴ Therefore, under *Maryland v. King*, the special needs test applies.³⁴⁵ However, if the search is conducted on the individual in the database, then a totality of the circumstances weighing may be required.³⁴⁶ How courts dissect and describe familial DNA searches will intimately factor into the potential constitutional

³³⁶ See *supra* text accompanying notes 166, 167 (quoting Justice Sotomayor’s concerns about discrete law enforcement practices operating in the absence of oversight from a coordinate branch of government).

³³⁷ See *supra* text accompanying note 77 (pointing to a survey outlining laboratory policies on partial matches).

³³⁸ See *supra* note 81 and accompanying text (describing how familial DNA searching is being conducted without transparency).

³³⁹ See *supra* text accompanying note 167 (discussing the concerns with a procedure like familial DNA searching being conducted without oversight).

³⁴⁰ See *supra* text accompanying notes 278, 280 (detailing procedures of a familial DNA searching procedure).

³⁴¹ See *supra* text accompanying note 167 (noting the Fourth Amendment’s goal of curbing excessive police power).

³⁴² See *supra* text accompanying note 202 (arguing that the special needs test applies if the search was targeted at an individual who was not suspected of any wrongdoing). The pivot person is the individual who is already in the DNA database.

³⁴³ See *supra* text accompanying notes 39–40 (noting that police do not have a suspect when conducting a search of the DNA database).

³⁴⁴ See *supra* text accompanying notes 39, 40.

³⁴⁵ See *supra* text accompanying note 202.

³⁴⁶ See *supra* text accompanying note 202.

outcome.³⁴⁷ Certainly, limiting the types of cases that qualify for familial DNA searching would help tip the scales by controlling the extent of any illusory privacy invasion.³⁴⁸

Defining and articulating the “constitutional moment” may determine the constitutionality of familial DNA searching.³⁴⁹ The sparse case law detailing the individual steps in the DNA testing process and subsequent searches in the database makes it difficult to assess how courts will view familial DNA searching.³⁵⁰ While the Fourth Circuit in *Davis* indicated that the testing and creation of a DNA profile in the laboratory constitutes an invasion of privacy, the court relied on *Skinner* in its analysis.³⁵¹ *Skinner* fails as an analogy to DNA testing.³⁵² DNA testing of the 13 CODIS loci does not reveal any information except a series of numbers that make up the individual’s DNA profile.³⁵³ This series of numbers means very little to the ordinary citizen.³⁵⁴ A DNA profile reveals no more private information than may be gleaned from looking in the mirror: an individual’s identity.³⁵⁵ Familial DNA searches do not reveal “private medical facts” that the court was concerned with in *Skinner*.³⁵⁶ Furthermore, the D.C. Circuit recently suggested that searching a DNA profile in the database would not rise to the level of a Fourth Amendment search.³⁵⁷

4. An Implicated Relative Would Not Have Standing to Mount a Fourth Amendment Challenge

Assuming that searching a crime-scene sample through a DNA database is deemed a constitutional search, familial DNA searching still requires careful analysis of which individual has standing to contest the database search—the individual whose profile is already in the database or

³⁴⁷ See *supra* Part III.A.2 (detailing the multiple steps in familial DNA searching and the constitutional implications).

³⁴⁸ See *supra* text accompanying note 278 (listing the positive attributes of the California familial DNA searching policy).

³⁴⁹ See *supra* Part III.A.2 (describing the difficulty in determining the constitutional moment in the familial DNA searching process).

³⁵⁰ See *supra* Part III.A.2 (describing the different approaches to determining the constitutional moment in the familial DNA searching process).

³⁵¹ See *supra* text accompanying note 183.

³⁵² See *supra* text accompanying note 184 (noting that *Skinner* did not involve DNA testing, but rather urine testing which implicates more privacy concerns).

³⁵³ See *supra* text accompanying note 217 (noting that testing the 13 CODIS loci would not invade on King’s privacy).

³⁵⁴ *King*, 133 S. Ct. at 1979 (noting that the CODIS loci do not reveal genetic traits).

³⁵⁵ See *supra* text accompanying note 214 (describing the governmental interest in DNA databases is identification of individuals).

³⁵⁶ See *supra* note 184 and accompanying text (describing the factors critical to the analysis in *Skinner*).

³⁵⁷ See *supra* note 186 and accompanying text (stating the holding in *Quander*—that a search of the CODIS database would not constitute a search).

the relative implicated by the search.³⁵⁸ To date, no courts have considered a standing issue akin to that which is encountered in familial DNA searching.³⁵⁹ The dual interests involved, those of the pivot person and those of the relative who is later implicated, complicate the issue. No harm has come to the individual whose DNA profile is being subjected to the search because they are not implicated in the crime. The implicated relative, who becomes the focus of the investigation, and the potential source of the crime scene sample, would likely make a Fourth Amendment challenge.³⁶⁰

The connection between the implicated relative and the database search is too tangential to demonstrate that a legitimate expectation of privacy has been violated.³⁶¹ Arguably, a familial search association is merely a product of diligent police work and no violation of one's privacy has been breached. The police do not actually search the relative's house or obtain their DNA profile.³⁶² Familial DNA searching merely narrows the investigation to a certain individual based on similar attributes.³⁶³

5. Following Maryland v. King, Familial DNA Testing Will be Held Constitutional for Identification Purposes

Now that the Supreme Court gave its stamp of approval in *King* as to the constitutionality of the most liberal collection statute, which requires an arrestee to submit a DNA sample for testing and entry into the database, future challenges will likely focus on the downstream steps in the process: database searches themselves.³⁶⁴ With limited case law supporting either side, how the courts might decide such cases is uncertain.³⁶⁵ Familial DNA searching could certainly be a use of the database that falls within the "identification" category described in *King* and therefore, would not raise additional constitutional concerns.³⁶⁶ Indeed, the Court specifically discussed the potential expansion of DNA databases, and only considered uses "not

³⁵⁸ See *supra* Part III.B (discussing the issue of standing in the Fourth Amendment analysis of familial DNA searching).

³⁵⁹ See *supra* note 196.

³⁶⁰ See *supra* note 191 and accompanying text (suggesting that standing focuses on the actual object that is searched).

³⁶¹ See *supra* text accompanying note 9 (defining familial DNA searching); *supra* Part II.B.4 (describing that the database search is conducted against the pivot person's DNA profile).

³⁶² See *supra* Part II.C (describing the familial DNA searching process).

³⁶³ See *supra* text accompanying note 195 (comparing familial DNA searching to a photo line-up and indicating that the perpetrator looks like the individual in the photo).

³⁶⁴ See *supra* text accompanying note 205 (noting that the Supreme Court upheld DNA collection statutes).

³⁶⁵ See *supra* note 188 and accompanying text (noting that most courts have not taken a comprehensive step-by-step approach to the constitutionality of DNA databases).

³⁶⁶ See *supra* text accompanying note 219 (explaining that the types of additional genetic testing that the Court would be concerned with included testing that would identify who is predisposed to a certain disease).

relevant to identity” as problematic.³⁶⁷ An individual’s DNA profile is nothing more than a sophisticated “picture.” Familial DNA searching may be fairly described as looking at a picture and stating that the perpetrator looks similar to the individual in that picture.³⁶⁸

Additionally, *King* reveals how the Court would consider statutes that have expanded the original intent of the DNA databases.³⁶⁹ None of the original DNA database statutes included the requirement for submission of DNA from individuals arrested.³⁷⁰ The mission creep that is often associated with familial DNA searching may be just that: the gradual broadening of the original objective, which is not necessarily an unintended phenomenon.³⁷¹ By holding that the expansion of DNA databases to arrestees survives constitutional scrutiny in *King*, the Court suggested that expanding the original objective of the database is not only warranted, but constitutional.³⁷² The Court also suggested that it would welcome a new police technique that parallels more traditional investigative methods.³⁷³ Because *Maryland v. King* was the first and only Supreme Court decision to address forensic DNA Fourth Amendment issues, the Court’s approval of a DNA database expansion, which some states had previously found unconstitutional, is a victory for familial DNA searching advocates.³⁷⁴ Even though, on its face, familial DNA searching may be constitutional, how states conduct and implement familial DNA searching policies will weigh considerably on the Court’s assessment.³⁷⁵

C. Familial DNA Searching Should be Conducted at the State Level

Despite their great autonomy at the local and state level, many state CODIS laboratories are reluctant to participate in procedures that are not sanctioned at the national level.³⁷⁶ Adding to the reluctance of state laboratory implementation, many legal professionals feel that state forensic

³⁶⁷ See *supra* text accompanying note 218.

³⁶⁸ See *supra* text accompanying note 195 (noting that the Ninth Circuit, in *Pool*, compared familial DNA searching to a photo lineup).

³⁶⁹ See *supra* note 209 and accompanying text (noting that the *King* decision held that arrestee database statutes were constitutional).

³⁷⁰ See *supra* text accompanying note 227 (providing that the original DNA Identification Act allowed for the collection of convicted offenders).

³⁷¹ MERRIAM-WEBSTER DICTIONARY, <http://www.merriam-webster.com/dictionary/mission%20creep> (last visited Apr. 28, 2015).

³⁷² See *supra* note 213 (stating that DNA has the ability to significantly improve the criminal justice system).

³⁷³ See *supra* text accompanying note 215 (highlighting the routine nature of DNA testing by comparing DNA testing to looking at a wanted poster).

³⁷⁴ See *supra* note 79 and accompanying text (noting that the Minnesota arrestee statute was held unconstitutional by the Minnesota Court of Appeals).

³⁷⁵ See *supra* text accompanying note 166 (noting the Court’s concerns with law enforcement techniques that proceed surreptitiously).

³⁷⁶ See *supra* text accompanying note 47 (describing the autonomy of state databases).

laboratories should not conduct procedures that are not conducted at the national level.³⁷⁷ However, the sheer size and nature of the national databases prohibits many types of searches that are advantageous and appropriate in state or local databases.³⁷⁸ Fortunately, each state has the ability to craft its own guidelines and uses for its DNA database.³⁷⁹ Once the DNA profiles are uploaded to NDIS, the state loses control of how and when those profiles are searched against each other.³⁸⁰ However, each profile also remains at the SDIS and LDIS levels and the states can use their discretion on how best to use this investigative tool.³⁸¹

States' reluctance to wait for national guidance is problematic because the leading DNA forensic science organization, Working Group, has advised that familial DNA searching not be conducted at the national level.³⁸² The Working Group's justifications are sound and based on realities of the CODIS structure, however, its suggestions must not be misunderstood to mean that familial DNA searching should not be conducted at the state level.³⁸³ The Working Group questions the practicality of the searches—not the science.³⁸⁴ The number of profiles at NDIS simply precludes effective and efficient familial DNA searching at that level.³⁸⁵ Furthermore, at the state level, once a laboratory performs confirmatory YSTR testing, law enforcement assesses the association through traditional investigative methods.³⁸⁶ This important step is not possible without the metadata that is only available at the state level.³⁸⁷ In addition to practical considerations, familial DNA searching is more effective at the state level.³⁸⁸ As the size of

³⁷⁷ See *supra* text accompanying note 244 (defense attorney arguing against familial DNA searching in Minnesota because the FBI does not conduct familial DNA searching).

³⁷⁸ See *supra* text accompanying note 126 (explaining that the number of profiles at the national level makes familial DNA searching impractical).

³⁷⁹ See *supra* text accompanying note 47 (explaining that each state operates and maintains its own DNA database).

³⁸⁰ See *supra* note 53 and accompanying text (noting the legislation governing the national database).

³⁸¹ See *supra* text accompanying note 47.

³⁸² See *supra* text accompanying note 125 (concluding that familial DNA searching not be conducted at the national level).

³⁸³ See *supra* text accompanying notes 126–132 (explaining the four main reasons why familial DNA searching should not be conducted at the national level).

³⁸⁴ See *supra* text accompanying notes 126–132 (explaining the four main reasons why familial DNA searching should not be conducted at the national level).

³⁸⁵ See *supra* text accompanying note 55 (noting that there are close to 13 million DNA profiles in NDIS).

³⁸⁶ See *supra* notes 100, 103 and accompanying text (describing certain ways to refine the initial familial DNA search).

³⁸⁷ See *supra* text accompanying note 128 (explaining that metadata, which includes age, population group, and geography, is only available at the state level).

³⁸⁸ See *supra* text accompanying notes 133–136 (demonstrating that familial DNA searching is more effective at the state level due to the smaller size of the database).

the database increases, the less likely it will be to have a relative ranked first in the list of possible associations.³⁸⁹

Familial DNA searching will also be more effective at the state level due to geographic limitations. Criminals that have offended in Minnesota are more likely to reoffend in Minnesota than in another state.³⁹⁰ Additionally, conducting familial DNA searching at the state level still allows for significant investigative leads because family members tend to reside within a certain geographic area.³⁹¹

Finally, familial DNA searching at the state level enables more oversight and control than is feasible at the national level. Proposed familial DNA legislation has invariably required some sort of reporting mechanism to ensure proper oversight, and such oversight is more readily accomplished at the state level.³⁹² Indeed, the Court has stressed that oversight and control are central concerns with new and discrete law enforcement techniques.³⁹³ California's policy is arguably successful because of the cooperation between the laboratory and the attorney general.³⁹⁴ Such interdisciplinary cooperation is more likely to succeed at the state level.³⁹⁵ Additionally, effective oversight of this detail oriented methodology would be problematic at the national level.³⁹⁶

D. Familial DNA Searching Should be Authorized by Minnesota Statute

Familial DNA searching should be conducted in Minnesota at the state level through statutory authorization, whether implicitly through existing DNA database legislation or explicitly through new legislation specific to familial DNA.³⁹⁷ Authorizing familial DNA searching through an explicit statute would enable state funding to be directly allocated to laboratories for this purpose.³⁹⁸ Furthermore, an explicit statute would

³⁸⁹ See *supra* text accompanying notes 133, 134 (detailing the success rates of familial DNA searching in different size databases based on relative ranking).

³⁹⁰ See *supra* text accompanying note 136 (noting that most traditional DNA hits occur at the state level).

³⁹¹ See *supra* text accompanying note 114 (describing the five principles that form the basis of the U.K. familial DNA searching program).

³⁹² See *supra* notes 242, 251 (referencing the familial DNA searching bills proposed in Minnesota and New York).

³⁹³ See *supra* text accompanying note 167 (emphasizing Justice Sotomayor's concern with new technology without oversight).

³⁹⁴ See *supra* text accompanying note 266 (noting that California's policy was promulgated by the attorney general).

³⁹⁵ See *supra* text accompanying note 276 (suggesting that in order for a familial searching program to be effective, close communication between agencies is critical).

³⁹⁶ See *supra* text accompanying note 125 (noting the SWGDAM recommended that familial DNA searching not be conducted at the national level due to logistical concerns).

³⁹⁷ See *supra* Parts IV.A–B (describing the current DNA database statutes and the proposed familial DNA searching statutes).

³⁹⁸ See *supra* text accompanying note 249 (detailing the fiscal note associated with the Minnesota familial DNA searching bill).

facilitate public debate.³⁹⁹ Due to the many misconceptions that surround familial DNA searching, public debate would provide important opportunities for clarification and reassurance about the process.⁴⁰⁰

The current statutory landscape for familial DNA searching is barren, but the question of why there are no statutes expressly authorizing familial DNA searching and why there are so few public state policies can be answered.⁴⁰¹ Lack of advocacy on the part of legislators and reticence on the part of forensic laboratories are two key reasons. First, familial DNA searching has not benefitted from strong legislative advocacy because most politicians and attorneys do not have an understanding of DNA principles and processes that enables them to argue knowledgeably on the subject.⁴⁰² Second, many forensic science laboratories do not want to take on the added work that familial DNA searching will necessitate, because done properly, it is a resource-heavy endeavor.⁴⁰³ In addition, forensic science laboratories might be unwilling to assume the liability and unknown legal consequences of a state policy without statutory authorization.⁴⁰⁴ Familial DNA searching thus suffers from a problem often encountered in forensic science disciplines due to the combination of a technologically sophisticated scientific process with highly complex legal doctrines.⁴⁰⁵ When science is combined with the law, there are few that are experts in both aspects, and the successful implementation of innovative forensic techniques requires inter-agency cooperation and education.⁴⁰⁶

1. Familial DNA Searching May Implicitly Fall Under the Original Minnesota DNA Database Statutes

Familial DNA searching may already be authorized implicitly under Minnesota's current DNA database statute. The text of the Minnesota statute on DNA databases is arguably broad enough to allow for familial DNA

³⁹⁹ See *supra* text accompanying note 260 (providing that legislative action fosters public debate).

⁴⁰⁰ See *supra* text accompanying note 216 (noting the policy arguments that have been made regarding familial DNA searching).

⁴⁰¹ See *supra* Part IV.B and Part IV.C (describing the failure of familial DNA bills passing and the limited number of official state policies).

⁴⁰² See *supra* text accompanying notes 250, 256 (noting that familial DNA bills are being forwarded to committees without further action).

⁴⁰³ See *supra* Part II.B.4 (describing the steps involved in conducting and refining a familial DNA search).

⁴⁰⁴ See *supra* Part IV.C (noting the limited number of familial DNA searching state policies).

⁴⁰⁵ See *supra* Part II (describing the scientific basis of familial DNA searching) and Part II (explaining Fourth Amendment issues with familial DNA searching, including reasonable expectation of privacy and standing).

⁴⁰⁶ See *supra* text accompanying note 276 (suggesting that in order for a familial searching program to be effective, close communication between agencies is critical).

searching.⁴⁰⁷ In fact, any “searching” of the DNA database constitutes “cross-referencing.”⁴⁰⁸ The statute is silent with regard to the different levels of databases, match criteria, searching algorithms, or mixtures.⁴⁰⁹ By not defining database use with any specificity, the legislation necessarily transfers discretion to the administrator of the database to determine its applicable uses.⁴¹⁰ The legislature presumably intended for the statute to develop as DNA technology developed. Indeed, many of the decisions regarding familial DNA searching in Minnesota are the responsibility of forensic science laboratories.⁴¹¹ As the DNA database statute’s main purpose was to help identify individuals who committed crimes, familial DNA searching is a derivative use of an already established DNA database that was held constitutional by the Supreme Court.⁴¹²

The use of DNA databases in ways that likely were not contemplated when the DNA database statutes were created is not a new practice.⁴¹³ When CODIS was implemented, DNA mixtures were not commonplace and were not entered into the database or searched.⁴¹⁴ However, as the forensic science community realized the value of DNA mixtures in solving crimes, they adapted the use of the databases to include the possibility of not only searching, but uploading mixtures to NDIS.⁴¹⁵ Searching DNA mixtures “moderately” at NDIS can produce similar results with consequences similar to familial DNA searching.⁴¹⁶ Searching DNA mixtures can produce false associations.⁴¹⁷ Without the proper training and interpretation of those results by scientists, investigations may mistakenly focus attention on a suspect who

⁴⁰⁷ See *supra* text accompanying notes 229–230 (noting the broad and vague text of the Minnesota DNA database statute).

⁴⁰⁸ See *supra* text accompanying note 227 (pointing out that the Minnesota statute allows for cross-referencing of data).

⁴⁰⁹ See *supra* text accompanying notes 229–231 (discussing the scope of the Minnesota DNA database statute).

⁴¹⁰ See *supra* text accompanying note 230 (showing that the statute leaves discretion for the “bureau” to establish and operate the database).

⁴¹¹ See *supra* text accompanying note 81 (discussing the Minnesota case that utilized familial DNA searching).

⁴¹² See *supra* text accompanying note 226 (noting that the DNA Identification Act of 1994 was designed for identification purposes).

⁴¹³ See *supra* note 65 and accompanying text (explaining searching of DNA mixtures in databases and defining DNA mixtures).

⁴¹⁴ See *supra* note 65 and accompanying text (describing DNA mixtures).

⁴¹⁵ See *supra* note 53 and accompanying text (describing types of samples that may be uploaded to NDIS).

⁴¹⁶ See *supra* Part II.B.3 (explaining the distinction between deliberate familial DNA searching and fortuitous partial matches which can both be made through a moderate search).

⁴¹⁷ See *supra* text accompanying note 84 (stating that every time a moderate search is conducted, a partial match may be obtained).

was not involved in the crime.⁴¹⁸ Yet forensic science laboratories have not experienced the same opposition to searching mixtures in the database as they have with familial DNA searching.⁴¹⁹ Most likely because searching mixtures did not require coining a term, laboratories just began to practice the method from a scientific basis.⁴²⁰

Similarly, even though identifying partial matches from DNA database searches was not an original use of DNA databases, it has become a prevailing practice in both state and national laboratories.⁴²¹ The FBI's formal statement on partial matches implies that because the match occurs spontaneously, without intention, the implications and associations are somehow different from familial DNA searching.⁴²² The FBI's contradiction and focus on intention is problematic. Deliberate familial DNA searching is not conducted at the national level, yet the FBI facilitates sharing information if the association is made fortuitously.⁴²³ Concerns with familial DNA searching do not focus on the actual searching component, but rather on the downstream sharing of information and the theoretical expansion of the database.⁴²⁴ Whether the search is deliberate or fortuitous, the *results* of that search are the same.⁴²⁵

Finally, the makeup of the databases has expanded beyond the scope of what state and federal statutes originally dictated. The initial crimes requiring DNA sample submission were limited to homicide and sexual assaults.⁴²⁶ In time, the type of crime requiring sample submission expanded to all felonies in a number of states.⁴²⁷ Many states now require individuals arrested of crimes to submit a DNA sample to the database.⁴²⁸ This expansion through statutory authorization sheds light on the desired use of

⁴¹⁸ See *supra* text accompanying note 274 (describing how Colorado's familial DNA searching program requires additional training of investigators to understand the associations that are made with partial matches).

⁴¹⁹ See *supra* note 53 and accompanying text (describing types of samples that are routinely be uploaded to NDIS).

⁴²⁰ See *supra* text accompanying note 65 (noting that moderate stringency searches were implemented to search DNA mixtures). See *supra* note 317 and accompanying text.

⁴²¹ See *supra* notes 82, 83 and accompanying text (pointing out that the FBI facilitates partial match searching between states).

⁴²² See *supra* note 83 and accompanying text (making the distinction between intentional searches and unintentional matches).

⁴²³ See *supra* note 82 and accompanying text.

⁴²⁴ See *supra* text accompanying note 260 (noting concerns from the Innocence Project including expansion of the databases and the negative collateral effects of familial DNA searching).

⁴²⁵ See *supra* Part II.B.3 (describing deliberate and fortuitous searching).

⁴²⁶ See *supra* note 232.

⁴²⁷ See *supra* note 233.

⁴²⁸ See *supra* text accompanying note 210 (noting that 28 states and the federal government have statutes authorizing the collection of DNA samples from individuals arrested for certain crimes).

DNA databases and the legislature's approach to DNA's role in identifying perpetrators of crime.⁴²⁹

2. *Explicit Statutory Authorization Versus Administrative Policies*

Explicit statutory authorization of familial DNA searching would serve two main purposes. First, it would force public discussion and foster debate.⁴³⁰ This discussion and debate would ideally lead to a better understanding of the process by attorneys, legislatures, and the public.⁴³¹ Familial DNA searching is not necessarily an endeavor that scientists should be taking on by themselves.⁴³² Forensic scientists do not fully appreciate the legal consequences, specifically with regard to establishing procedures that will withstand constitutional scrutiny.⁴³³ Second, explicit statutory authorization would relieve some of the uncertainty that scientists have regarding the legality of familial DNA searching.⁴³⁴ The hesitancy to adopt this type of database searching is apparent by the inadequate use of familial DNA searching throughout the United States.⁴³⁵

However, explicit statutory authorization may be difficult to implement. The repeated introduction of bills in both Minnesota and New York are evidence of the failures of both states to pass familial DNA legislation.⁴³⁶ While the Minnesota bill was vague, the detail of the New York bill was similar to the California attorney general policy in many respects.⁴³⁷ Both made the important differentiation between partial matches and familial DNA searching and required the use of YSTR testing to further refine the results of the searches.⁴³⁸ Most importantly, both the New York bill and the California policy involved the oversight of a multi-disciplinary

⁴²⁹ See *supra* text accompanying note 210 (noting that 28 states and the federal government have statutes authorizing the collection of DNA samples from individuals arrested for certain crimes).

⁴³⁰ See *supra* text accompanying note 260 (providing that legislative action fosters public debate).

⁴³¹ See *supra* Part II (discussing the complex scientific background of familial DNA searching).

⁴³² See *supra* Part III (discussing the numerous Fourth Amendment concerns surrounding familial DNA searching).

⁴³³ See *supra* Part III (discussing the numerous Fourth Amendment concerns surrounding familial DNA searching).

⁴³⁴ See *supra* Part IV.C (noting the few state policies that exist regarding familial DNA searching).

⁴³⁵ See *supra* Part IV (noting the lack of legislation regarding familial DNA searching and the few state policies in place).

⁴³⁶ See *supra* text accompanying notes 250, 257 (pointing out that both Minnesota and New York bills were reintroduced for a second session of the legislature).

⁴³⁷ See *supra* text accompanying note 252 (noting the detail in the New York bill).

⁴³⁸ See *supra* text accompanying notes 252, 255, 266, 269 (outlining the details of the New York bill and California policy regarding partial matches and YSTR testing).

committee.⁴³⁹ Whether through explicit statutory authorization or administrative policy, this cooperation between law enforcement, scientists, and legal professionals is paramount to implementing a successful familial DNA searching program.

3. *The Rulemaking Process and Procedures Should be Transparent*

States must take action to implement familial DNA searching policies. While the legal community debates the constitutionality of familial DNA searching, labs across the country perform these searches ad hoc without transparency or accountability.⁴⁴⁰ This is problematic for two reasons. First, familial DNA searching procedures should involve a written, detailed, multi-step process to protect privacy rights and limit false associations.⁴⁴¹ Lack of written procedures and policies for a complex process such as familial DNA searching invites reckless and careless actions with undesirable consequences.⁴⁴² Second, undocumented procedures are not subject to public or legal scrutiny. Any robust state policy must be subjected to both scientific and legal scrutiny.⁴⁴³ Furthermore, when a law enforcement technique appears clandestine, the reasonable response from the legal community is suspicion.⁴⁴⁴ Because laboratories are proceeding with familial DNA searching in absence of either statutory authorization or procedures made open to the public, society assumes something untoward is occurring.⁴⁴⁵ On the contrary, familial DNA searching is constitutional and based on sound scientific principles.⁴⁴⁶ In order for the familial DNA storm to subside, laboratories and law enforcement must be transparent and forthright about their policies and procedures.

The lack of understanding the distinction between deliberate familial searching and fortuitous partial matches allows laboratories to veil their

⁴³⁹ See *supra* text accompanying notes 253, 270 (describing the committees involved in both the New York bill and the California policy).

⁴⁴⁰ See Ram, *supra* note 68, at 777 (“Of the forty-one responding jurisdictions that have some policy or practice regarding partial matches, at least eighteen have left these policies unwritten.”); *supra* text accompanying note 109 (noting that Minnesota performs familial DNA testing while hiding under the “new technique” language).

⁴⁴¹ See *supra* Part II.B.4 (describing the extensive process of performing a familial DNA search, evaluating the association, and refining the ranking list).

⁴⁴² See *supra* text accompanying notes 79–80 (explaining how states use language to proceed surreptitiously).

⁴⁴³ See *supra* text accompanying note 245 (noting that a main concern with the Minnesota bill was lack of public debate regarding the rulemaking).

⁴⁴⁴ See *supra* text accompany note 166 (mentioning the community hostility that can accompany new law enforcement techniques that evade the checks to constrain abusive police practices).

⁴⁴⁵ See *supra* text accompanying note 216 (noting the policy arguments that have been made regarding familial DNA searching).

⁴⁴⁶ See *supra* Part II (describing the scientific foundation for familial DNA searching).

practices in ambiguous terminology.⁴⁴⁷ A recent law enforcement case is a clear example of this lack of transparency.⁴⁴⁸ Investigators solved a 1981 cold case homicide with the use of familial DNA searching, but the public was only informed that the match was made due to “new technology.”⁴⁴⁹ The reason for the mischaracterization is likely two-fold: the laboratory does not have an official policy regarding familial DNA searching and the laboratory was afraid of the political fall-out if they used the term “familial DNA searching.”⁴⁵⁰ This case exemplifies the issues surrounding familial DNA searching.⁴⁵¹ Minnesota is conducting familial DNA searching, but has no public authorization or policy.⁴⁵²

VI. CONCLUSION

The complex interplay of technicalities and constitutional considerations has made familial DNA searching the black sheep of the forensic DNA family.⁴⁵³ Both the scientific and legal communities, independently, are not confident in how to proceed and implement this methodology effectively.⁴⁵⁴ However, the recent Supreme Court decisions addressing not only advanced technologies, but DNA testing specifically, will hopefully bridge some of this gap between science and the law.⁴⁵⁵ Familial DNA searching should be implemented in Minnesota through statutory authorization, whether implicitly through the already existing DNA database legislation or explicitly through new legislation specific to familial DNA.⁴⁵⁶ Regardless of the method of implementation, it is imperative that laboratories and agencies are forthright and transparent about their procedures.⁴⁵⁷ This openness will foster public debate and, hopefully,

⁴⁴⁷ See *supra* Part II.B.3 (describing deliberate and fortuitous searching).

⁴⁴⁸ See *supra* note 81.

⁴⁴⁹ See *supra* note 81 and accompanying text (describing how familial DNA searching is being conducted in Minnesota without transparency).

⁴⁵⁰ See *supra* note 81 and accompanying text.

⁴⁵¹ See *supra* note 81 and accompanying text.

⁴⁵² See *supra* Part IV (noting the lack of legislation and state policy in Minnesota regarding familial DNA searching).

⁴⁵³ See *supra* Parts II–III (discussing the scientific background and Fourth Amendment considerations of familial DNA searching).

⁴⁵⁴ See *supra* Part IV (noting the lack of legislation regarding familial DNA searching and the few state policies in place).

⁴⁵⁵ See *supra* Part III (discussing the recent Supreme Court cases and their implications for familial DNA searching).

⁴⁵⁶ See *supra* Part IV (discussing the different approaches for state implementation of a familial DNA searching program).

⁴⁵⁷ See *supra* text accompanying notes 166–167 (quoting Justice Sotomayor’s concerns about discrete law enforcement practices operating in the absence of oversight from a coordinate branch of government). See *supra* text accompany note 166 (mentioning the community hostility that can accompany new law enforcement techniques that evade the checks to constrain abusive police practices).

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continued education and understanding regarding this important investigative tool.