

Board for Certification of Genealogists

White Paper

Certification and Standards

In the Practice of Forensic Genetic Genealogy



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Executive Summary

Violent criminals can be identified using consumer DNA databases populated by millions of people who voluntarily upload personal DNA samples. These Direct-to-Consumer databases (DTC) operate within the Terms of Service (TOS) established by each company's owner who also determines whether to give customers the option to allow law enforcement access. Each representing between one million and 40 million individual kits, these data aggregators have been thriving without outside regulations and legislation. Since law enforcement's use of two DTC databases became widespread after 2019, state legislators have struggled to evaluate whether new legislation and oversight is needed.

While most states have taken no action, by the end of 2023, Maryland, Montana, and Utah had acts which prescribe how law enforcement obtains leads using consumer DNA databases. Maryland's law goes one step farther, mandating that genealogists involved in law enforcement work be licensed by a Maryland state body that has yet to be established.

The premiere federally recognized body for the certification of genealogists, the Board for Certification of Genealogists (BCG), has been in existence since 1964. This not-for-profit Board has granted the Certified Genealogist®(CG®) credential to over 1,100 individuals worldwide. Board-certified genealogists must comply with a stringent code of ethics and renew the credential every five years. Agencies such as the U.S. Department of Defense contract with Board-certified genealogists in repatriating remains of unidentified servicemen, forensic genetic genealogy companies employ them to provide leads in certain violent crime cases, and they appear as expert witnesses in a wide variety of court proceedings.

This white paper provides background information relevant to the conclusion that Law Enforcement's use of Forensic Genetic Genealogy needs no new licensing requirements or the prescription of genealogy standards:

- [Forensic Genetic Genealogy's Role in Law Enforcement and Justice](#)
- [BCG's Credential, Standards & Code of Ethics](#)
- Appendices
 - [The Board for Certification of Genealogists: History, Operation, Certified Genealogist® and Certified Genetic GenealogistSM Credentials](#)
 - [Rapid Changes in Law Enforcement and Forensic DNA Evidence Use](#)

Forensic Genetic Genealogy's Role in Law Enforcement and Justice

Privacy has been paramount in medical uses of DNA and U.S. precedent exists for acknowledging individual rights in our own cells.¹

Even so, laws and regulations—in the United States, Australia, and the European Union—allow law enforcement use of DNA because this serves a vital purpose in society.² The collection of a suspect's DNA has been on secure legal footing in the U.S. since a 2014 Supreme Court decision.³

The legal justification for the U.S. Federal Bureau of Investigation's Combined DNA Index System (CODIS)—a database that includes the DNA of convicted offenders and from unsolved crime scenes—was developed in the 1990s. States have signed memoranda of understanding with the Department of Justice regarding how local- and state-level DNA databases operate in support of CODIS and what is communicated between them.

Recently, violent crime cold cases have been solved by law enforcement using DNA databases other than CODIS. These databases are provided by private companies for purposes including the recreational use of consumers who voluntarily upload personal DNA. These Direct-to-Consumer databases (DTC) are operated within the Terms of Service (TOS) established by each company. Such databases have been thriving without regulations and legislation. The largest of the five well-known companies has an estimated 40 million individual kits.⁴ DTC companies may or may not give their customers the option to allow law enforcement access.⁵

Law enforcement is required to use CODIS identification of the suspect in its initial investigation. Only if that investigation fails to identify a suspect is law enforcement permitted to use DTC DNA databases. At that point, law enforcement may employ a forensic genetic genealogist, who uses documentary evidence, including DNA evidence, from public sources to determine how the family trees of volunteer test takers and that of the sample provided by law enforcement intersect. When successful, the genealogist identifies the sample or the relationship level of the sample to a Most Recent Common Ancestor (such as all the grandsons of an individual). The DTC database research and resulting genealogical investigation are usually conducted separately from the law enforcement investigations. At its conclusion, the genealogist communicates the result to law enforcement as a lead for further investigation.

All websites were accessible 20 January 2024.

¹ Will Sullivan, 2 August 2023, "Henrietta Lacks' Family Settles Lawsuit Over the Use of Her Cells Without Consent," *Smithsonian Magazine*, <https://www.smithsonianmag.com/smart-news/henrietta-lacks-family-settles-lawsuit-over-the-use-of-her-cells-without-consent-180982644/> | accessed 23 August 2023.

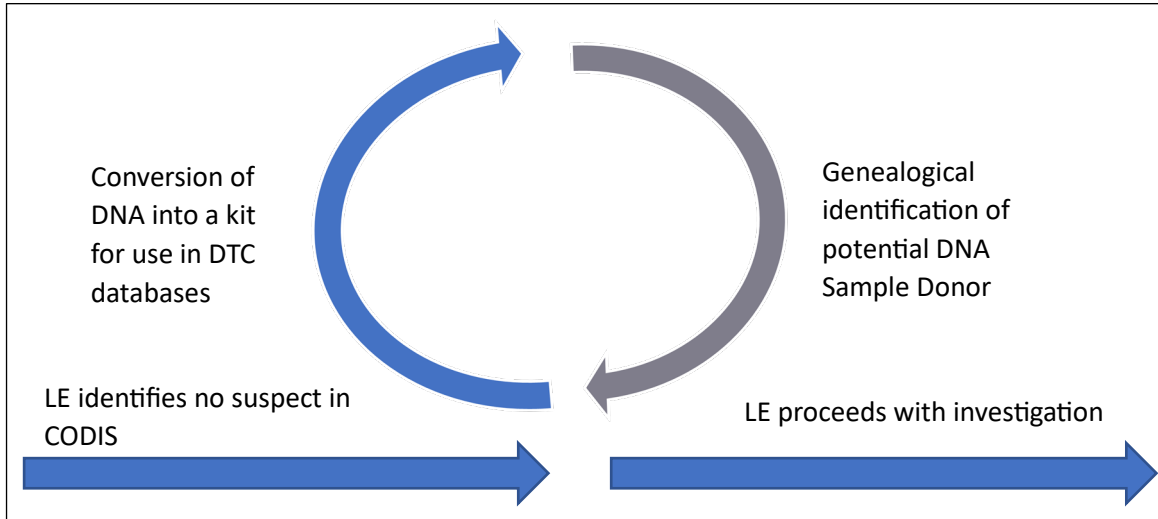
² See generally "Biometric and forensic services," *Australian Criminal Intelligence Commission*, (<https://www.acic.gov.au/services/biometric-and-forensic-services#:~:text=The%20National%20Criminal%20Investigation%20DNA,persons%20and%20unknown%20human%20remains>). See also, Martin Zigler, "Forensic DNA phenotyping in Europe: How far may it go?" *Journal of Law and the Biosciences*, Volume 9, Issue 2, July-December 2022, Isac024, <https://doi.org/10.1093/jlb/Isac024>.

³ *Riley v. California*, 573 U.S. 373, 393 (2014).

⁴ Heidi Borst, "MyHeritage DNA vs. Ancestry DNA: How They Compare," *Forbes*, 7 August 2023; <https://www.forbes.com/health/medical-supplies/myheritage-dna-vs-ancestry-dna/>.

⁵ Judy G. Russell, "The dos and don'ts of DNA," *The Legal Genealogist*, posted 6 March 2022; (<https://www.legalgenealogist.com/2022/03/06/the-dos-and-donts-of-dna/>).

The U.S. Department of Justice has disseminated a workflow for the use of DTC DNA databases by law enforcement. This workflow puts forensic genetic genealogy on an offshoot. Once the lead is provided by the genealogist, law enforcement investigates as usual, ultimately obtaining a suspect DNA sample to compare in CODIS.



Law enforcement use of DTC databases became widespread after 2019 and state legislators are still evaluating whether new legislation and oversight is needed. The public knows what to expect from law enforcement. There are laws, policies, and procedures for gathering and analyzing evidence. These policies protect the innocent.

Recreational genealogy may have embraced SNP DNA evidence first, documenting solutions to personal mysteries, but DNA has had an explosive effect on medicine, judicial systems, and law enforcement. Legal considerations have always lagged behind the technology that permits exceptional precision in naming individuals. For more than two decades DNA of four kinds: Y DNA, mitochondrial DNA, X DNA, and autosomal DNA, has supported human identification based on comparisons among test takers in public DTC databases.

Using DNA evidence for forensic genealogy purposes is the study of identity and kinship as it pertains to the law. Genealogy using DNA evidence is like genealogy using all other evidence. The essential principles remain the same.

Using these techniques, genealogists have identified a 1916 axe murderer,⁶ and made hundreds of identifications where hundreds to thousands of investigational hours had come up empty.

⁶ Katherine J. Wu, "DNA Evidence Identifies Headless Corpse in Cave as 1916 Axe Murderer," *Smithsonian Magazine*, posted 7 January 2020; <https://www.smithsonianmag.com/smart-news/dna-evidence-reveals-headless-corpse-cave-1916-axe-murderer-180973911/>.

The deterrent effect was recognized as early as 2016.⁷ Simply confronting a suspect with the words, “we have the DNA,” has convinced recalcitrant criminals to confess, produce unfound evidence, plead guilty, and reveal undiscovered murders and unreported assaults.

Genealogy leads in heinous crimes have interrupted the decades-long crime sprees of serial killers and other offenders. Recent arrests that have made the news—and many that have not—are helping to solve brutal crimes against victims who can no longer speak for themselves. The concept of lawfully owed DNA has been fully embraced by corrections systems and the public alike. Family members of the missing or murdered have become activists to encourage the addition of DNA collections required by law to databases like CODIS, for rapid identification of murderers before they kill again.

Innocence projects rely on DNA to exonerate people unjustly convicted. Almost monthly we hear of people who spent years or even decades incarcerated for crimes committed by others. This puts everyone on notice that this new evidence works for truth and justice.

BCG’s Credential, Standards & Code of Ethics

Perhaps because BCG’s standards for producing the most accurate genealogical conclusions are not well understood by the general public, legislatures around the U.S. are being tasked by their constituents to develop genealogy credentialing that already exists. As a federally recognized certification body that has been in place since 1964 with over 1,100 individuals worldwide who have achieved Certified Genealogist® or related credentials, we are obliged to raise our visibility.

Similarly, *ad hoc* groups have proposed standards specifically limited to forensic genetic genealogy. The latter groups often include forensic pioneers who are either unaware of or unwilling to recognize the evolution of genealogy standards over the last sixty years. BCG aims to clarify misunderstandings.

Maryland enacted the first state law to address the use of genetic information in criminal investigations in 2021. The Maryland legislation includes a provision to require the creation of “a licensing program for individuals performing genetic genealogy on or before October 1, 2024.”⁸ Reportedly, this licensing requirement has been sidelined due to the lack of funding;⁹ however, it presents a concern that Maryland or other jurisdictions might prescribe new and unnecessary requirements.¹⁰ A proposal to regulate this area was initiated in 2023 by the National Technology Validation and Implementation Collaborative

⁷ “DNA Database Leads to Lower Crime,” *Rape, Abuse, and Incest National Network*, posted 29 August 2016; <https://www.rainn.org/news/dna-database-leads-lower-crime>. See also Jennifer L. Doleac, “The Effects of DNA Databases on Crime,” Doleac, Jennifer L., *The Effects of DNA Databases on Crime*, posted 1 August 2016; <http://dx.doi.org/10.2139/ssrn.2556948>.

⁸ Md. Code, Crim. Proc. § 17-104; <https://casetext.com/statute/code-of-maryland/article-criminal-procedure/title-17-forensic-genealogy/section-17-104-licensing-programs-practices>.

⁹ Patrick, Terpstra, “Maryland Quietly Shelves Parts of Genealogy Privacy Law,” *WMAR2news.com* (<https://www.wmar2news.com/infocus/maryland-quietly-shelves-parts-of-genealogy-privacy-law>).

¹⁰ For jurisdictions that have enacted DNA arrestee laws some of which reference the “analysis” of DNA evidence, see “DNA Arrestee Laws,” *National Conference of State Legislatures*; posted 17 December 2022, based on data from 2018 (https://web.archive.org/web/20221217221316/https://www.ncsl.org/Documents/cj/Arrestee_DNA_Laws.pdf).

(organized in 2022). It states, “Individual jurisdictions are responsible for establishing their own FIGG policies and procedures, overseeing its implementation, and developing frameworks for evaluating program performances.”¹¹

BCG promulgated the first code of ethics for the field of genealogy, and since 2000 has published *Genealogy Standards*, the field’s only comprehensive set of criteria (referred to as “Standards”) for evaluating genealogical work products.¹² Board-certified genealogists are routinely qualified as expert witnesses in courts of law, where *Genealogy Standards* is viewed as an authoritative text under the learned treatise doctrine.

Significantly, application of the Standards is not limited to those who aspire to obtain BCG’s Certified Genealogist® (CG®) credential, which indicates competence in meeting the Standards—they are effective standards widely acknowledged as the premiere rules for reliable results. They are frequently used by genealogy educators. The Standards prescribe principles and methods for achieving excellence in all phases of research, evidence evaluation, and documenting conclusions. The Standards include the Genealogical Proof Standard (GPS), a test for determining whether a conclusion about an identity, relationship, or event, is reliable. The Standards also include The Genealogist’s Code of Ethics, intended to protect the interests of the public and the profession.

Pursuant to Standard 56, conclusions about genetic relationships require a combination of both DNA evidence and documentary evidence.¹³ Traditional genealogical research is necessarily employed to generate leads for criminal investigators to pursue.¹⁴ Individuals who have not learned and used the Standards, including the GPS, are ill-equipped to base genealogical conclusions on DNA evidence in complex cases where distant clusters, endogamy, same-named individuals, and other complications arise in law enforcement applications.

BCG’s Standards are responsive to advancements in genetic genealogy. In 2018, the Board amended the Standards to provide guidance on the ethical use of DNA evidence in genealogical analysis. These DNA standards were promulgated after a period of public comment. In 2020, BCG amended “The Genealogist’s

¹¹ Ray A. Wickenheiser, Jennifer Naugle, Brian Hoey, Rylene Nowlin, Swathi A. Kuman, Alana Minton, Lance Allen, Claire Glynn, *National technology validation and implementation collaborative (NTVIC) policies and procedures for forensic investigative genetic genealogy (FIGG)* (<https://doi.org/10.1016/j.fsisyn.2023.100316>).

¹² Board for Certification of Genealogists, *Genealogy Standards*, 2nd ed rev. (Nashville, Tennessee: Ancestry.com, 2021).

¹³ *Genealogy Standards*, Standard 56, 32.

¹⁴ Christi J. Guerrino, Ray A. Wickenheiser, Blaine Bettinger, Amy L. McGuire, and Stephanie Fullerton, “Four Misconceptions about investigative genetic genealogy, *Journal of Law and the Biosciences* (Oxford University Press on behalf of Duke University School of Law, Harvard Law School, Oxford University Press, and Stanford Law School, 2021) 15; <https://academic.oup.com/jlb/article/8/1/Isab001/6188446>. According to these experts “the genealogy step of [forensic genetic genealogy]—that is the process of building out family trees based on genetic relationships—serves as a significant practical barrier to the widespread conduct of [forensic genetic genealogy] because it must be conducted by individuals skilled in genetic genealogy.”

Code of Ethics” in response to practical concerns raised by forensic genealogists about the circumstances in which board-certified genealogists could share results with those who use their services.

There is precedent at the federal level for requiring those practicing forensic genetic genealogy to be credentialed, or to be supervised by a credentialed genealogist. The U.S. Government has trusted the Certified Genealogist® credential and the Standards in forensic casework for years. For example, the Defense POW/MIA Accounting Agency (DPAA) (formerly the Joint POW/MIA Accounting Command) is Congressionally mandated to bring each unaccounted for servicemember home. As part of this task, DPAA has contracted since at least 2009 with genealogists holding BCG’s Certified Genealogist credential to perform detailed analyses of historical and current records to identify living relatives who share DNA with deceased POW/MIA servicemembers who served as far back as World War II.¹⁵ Based on results of the genealogist’s work, these relatives are contacted by DPAA for voluntary participation in the collection and comparison of DNA to recovered remains. Genealogists also identify the servicemember’s legal next of kin to enable outreach by DPAA to return decisions about the disposition of remains to family control. The stakes are high. Misidentification by the genealogist of a DNA donor can cause a servicemember’s remains to be misidentified or fail identification. DPAA therefore must have confidence that the next of kin and DNA donors are correctly identified, and that their relationships to the servicemembers are proven. To ensure the most accurate results, DPAA only engages new contractors who hold either BCG’s Certified Genealogist credential or the Accredited Genealogist credential of the International Commission for the Accreditation of Professional Genealogists¹⁶ to work on or manage genealogical investigations on its behalf.

In criminal cases, BCG’s Standards have been recognized as vital by practitioners and educators in the forensic genetic genealogy field. For example, in 2021, the University of New Haven’s Henry C. Lee College of Criminal Justice and Forensic Sciences—an accredited university, and a leading forensic science school—launched its Graduate Certificate in Forensic Genetic Genealogy program, the first of its kind in the world. In addition to learning crime scene DNA collection techniques, students (most of whom are already practicing genealogists, forensic scientists, and members of law enforcement) learn to identify samples through rigorous application of BCG’s Standards to documentary evidence of kinship clusters revealed through DTC database testing. Students develop skills critical to successfully locating relevant evidence, evaluating its credibility, resolving evidence conflicts, and reaching reliable proof of identities and relationships in ways that meet the Standards and will withstand scrutiny. They also learn the privacy and consent implications at each step in the process through application of The Genealogist’s Code of Ethics expressed in the Standards.¹⁷

¹⁵ For general information about DPAA see “Service Casualty Officer Responsibilities,” *DPAA.mil* (<https://www.dpaa.mil/Portals/85/Family%20Members%20Guide%20FINAL%20Dec%208.pdf?ver=KCyMR7p3GFLEWytyY7WYrw%3d%3d>). For year see, Dee Dee King, “No One Left Behind: The Search for An American Military Hero,” *Association of Professional Genealogists Quarterly* (December 2011) 235. DPAA also accepts the Accredited Genealogist® credential from ICAPGen.

¹⁶ Jenny Rizzo Irwin, “From Unknown Parentage to Military Repatriation, The Many Subspecialties of Forensic Genealogy,” *Association of Professional Genealogists Quarterly* (June 2023) 15.

¹⁷ Claire L. Glynn, “The Development of a University Educational Program in Forensic/Investigative Genetic Genealogy to Meet Industry Needs,” *The ISHI Report*, February 2022

BCG Standards are perfectly compatible with the ethical practice of genetic genealogy. Genetic evidence must be evaluated through tests of analysis and correlation just like any other type of evidence. Conflicts in genetic evidence must be discussed and resolved just like any other type of evidence. Written reports or affidavits containing genetic evidence must meet the same Standards as those without genetic evidence.

Ethical use is also addressed by BCG's Standards. Standard 57, relating to "respect for privacy rights," was amended in 2020 to clarify that a genealogist should not make public personally identifying information about living test takers without their informed consent."¹⁸ Standard 57 permits private sharing of DNA match details with law enforcement or others who employ genetic genealogists.

Because it is a national credentialing body, a BCG-certified genealogist is able to work across state lines using the highest standards and strictest ethics without variations that might be enacted by different states. BCG is best positioned to monitor the evolving practice of genetic genealogy and revise applicable Standards as needed. Moreover, BCG provides continuing oversight via the requirement that a credential be renewed every five years.

<https://promega.foleon.com/theishireport/the-ishi-report-february-2022/development-of-a-figg-educational-program/>).

¹⁸ Standard 57, *Genealogy Standards*, p. 32.

Appendix A: The Board for Certification of Genealogists

History, Operation, Code of Ethics, Certified Genealogist[®], and Certified Genetic GenealogistSM Credentials

The Board for Certification of Genealogists is a nonprofit organization founded in 1964 as a professional credentialing body for genealogists. The cream of the genealogy community came together to create a way to ensure quality work for hire. The founders included four fellows of the American Society of Genealogists (ASG), three leaders of the National Genealogical Society (NGS), and three members of allied professions.

Since 1964, BCG has set the standards for competence and ethics in genealogical research through certification, lectures, and publications. These attainable, uniform standards of competence in research, evidence analysis, writing, and kinship determination are generally accepted for the field. First published in book form in 2000, they were clarified and updated in 2014.

BCG originally offered two certifications: Certified Genealogist (CG) and Certified Genealogical Records Specialist (CGRS). Later additions were Certified Genealogical Lecturer (CGL), Certified Genealogical Instructor (CGI), Certified American Lineage Specialist (CALs), and Certified American Indian Lineage Specialist (CAILs). All four research credentials—CG, CGRS, CALs, and CAILs—were merged into the CG credential in 2005. This change simplified the system and acknowledged that the essential skills—research, citation, analysis and correlation, conflict resolution, and writing—apply to all specialties. The education credentials were merged into the CGL credential.

For more than a decade, genealogists seeking the Certified Genealogist credential could include DNA evidence in their portfolios. In May 2023, the Board of Trustees voted to establish a new credential, Certified Genetic Genealogist. Those who have achieved the Certified Genealogist credential will now have the opportunity to apply for an additional advanced credential focusing on DNA expertise. Currently, portfolio elements, judging rubrics, and acceptance criteria are being finalized. Experienced experts will judge portfolios including DNA work. The first applications will be accepted early in 2024. Applications for certification take the form of portfolios containing elements defined by *The BCG Application Guide*. Each portfolio is graded by three independent judges working from rubrics that measure work against Standards. Judges meet biannually for training, and work at the direction of a judge coordinator and the five-member committee of advanced and experienced judges. Only those genealogists who show excellent work in their original portfolios are invited to be judges.

BCG has two modes to address issues that arise. Any applicant who believes that an application was wrongly denied can appeal to the fifteen-member Board of Trustees for re-evaluation. All fifteen board members judge the portfolio, voting to sustain or overturn the results of the original judges. If complaints about a Certified Genealogist's conduct arise, they are handled by the six-member Executive Committee. These complaints may include ethics, rates, or work product quality. After submission of supporting documentation by the client and the genealogist, the Executive Committee meets in executive session with corporate counsel to decide on a course of action. Responses can range from restitution to the loss of the credentialed status or even public censure.

BCG's triannual educational newsletter, *OnBoard*, was first published in January 1995. It provides news, associate profiles, and feature articles on certification, genealogical standards, skill-building, and under-utilized sources.

In 2000 BCG established the BCG Education Fund. An independent charitable trust, the BCG Education Fund (a Massachusetts charitable trust) provides multiple opportunities for education including an annual day-long workshop, "Putting Skills to Work". The Education Fund also sponsors the semi-annual Helen F. M. Leary Distinguished Lecture Series and administers the annual Donald Mosher Memorial Award in colonial Virginia scholarship.

Beginning in 2002, BCG offered skill-building lecture tracks at national genealogy conferences. A full track is presented annually at the National Genealogical Society (NGS) Family History Conference. Today a series of free online lectures open to the general public also helps Certified Genealogists achieve continuing education credits.

Appendix B: Rapid Changes in Law Enforcement and Use of Forensic DNA Evidence

1964

The Board for Certification of Genealogists was established in Washington, D.C.

1972

The American Genealogist, one of three major genealogical journals, began to publish matrilineal lineages.¹⁹

1984

At the University of Leicester, English scientist Alec Jeffreys realized that an electropherogram acts as a DNA fingerprint, unique to each individual.²⁰



Figure 1: Dr. Alec Jeffreys holding up an electropherogram after his discovery that it can be used for DNA fingerprinting. (Terry Smith / LIFE Images Collection / Getty)

¹⁹ John Bradley Arthaud, "An Umbilical Line," *The American Genealogist* 48 (1972):247.

²⁰ Ian Cobain, "Killer breakthrough – the day DNA evidence first nailed a murderer," *The Guardian*, posted June 7, 2016; <https://www.theguardian.com/uk-news/2016/jun/07/killer-dna-evidence-genetic-profiling-criminal-investigation>.

1986

First use of DNA as forensic evidence occurred in the United Kingdom when Richard Buckland was exonerated and freed from pre-trial detention.²¹

1987

First use of DNA as forensic evidence in the US occurred when the State of Florida convicted Tommie Lee Andrews.²²

1989

The Florida Fifth District Court of Appeal affirmed the use of DNA by denying the appeal by Tommie Lee Andrews.²³

1990

The FBI began to study the implementation of DNA testing for law enforcement.²⁴

1994

United States Public Law 103-322 was enacted. *The Violent Crime Control and Law Enforcement Act of 1994* provided funding for the FBI to initiate DNA testing.

Subtitle C: DNA Identification - DNA Identification Act of 1994 - Amends the Omnibus Act to authorize the use of drug control and system improvement grants to develop or improve in a forensic laboratory a capability to analyze deoxyribonucleic acid (DNA) for specified identification purposes. Sets forth provisions regarding: (1) restrictions on the use of funds; and (2) reporting and recordkeeping (including access to records) requirements. Authorizes appropriations.

(Sec. 210303) Requires the Director of: (1) the FBI to appoint an advisory board on DNA quality assurance methods from among nominations proposed by the head of the National Academy of Sciences and professional societies of crime laboratory officials and issue standards for quality assurance; and (2) the National Institute of Justice (NIJ) to make specified certifications to the House and Senate Judiciary Committees regarding the establishment of a proficiency testing program for DNA analyses.

(Sec 210304) Authorizes the Director of the FBI to establish an index of DNA identification records of persons convicted of crimes, and analyses of DNA samples recovered from crime scenes and from unidentified human remains.

²¹ Ibid.

²² Charity Lynn Clayborn, "Evidence of DNA Fingerprinting Admitted for Identification Purposes in Rape Trial. Andrews v. State of Florida," *University of Arkansas at Little Rock Law Review*, vol. 12 (1990): article 4, p. 543; <https://lawrepository.ualr.edu/cgi/viewcontent.cgi?article=1875&context=lawreview>.

²³ Ibid., pp. 543-544.

²⁴ Office of the Inspector General, Department of Justice, "Introduction," *Combined DNA Index System Operational and Laboratory Vulnerabilities*, Audit Report O6-32, May 2006; <https://oig.justice.gov/reports/FBI/a0632/intro.htm>.

(Sec. 210305) Sets forth proficiency testing and privacy protection requirements and penalties for violations.²⁵

1998

The FBI launched the Combined DNA Information System (CODIS). The FBI supplied software to testing localities. State law determined use of DNA tests in the state database. Although criteria differed among states, the Memorandum of Understanding that each state laboratory signed with the FBI mandated that the national law applies to DNA uploaded to NDIS.

The FBI has distributed CODIS software free of charge to state or local law enforcement laboratory performing DNA analysis. Before a laboratory is allowed to participate at the national level and upload DNA profiles to NDIS, a Memorandum of Understanding (MOU) must be signed between the FBI and the applicable state's DNA Information System (SDIS) laboratory. The MOU defines the responsibilities of each party, includes a sublicense for the use of CODIS software, and delineates the standards that laboratories must meet in order to utilize NDIS.²⁶

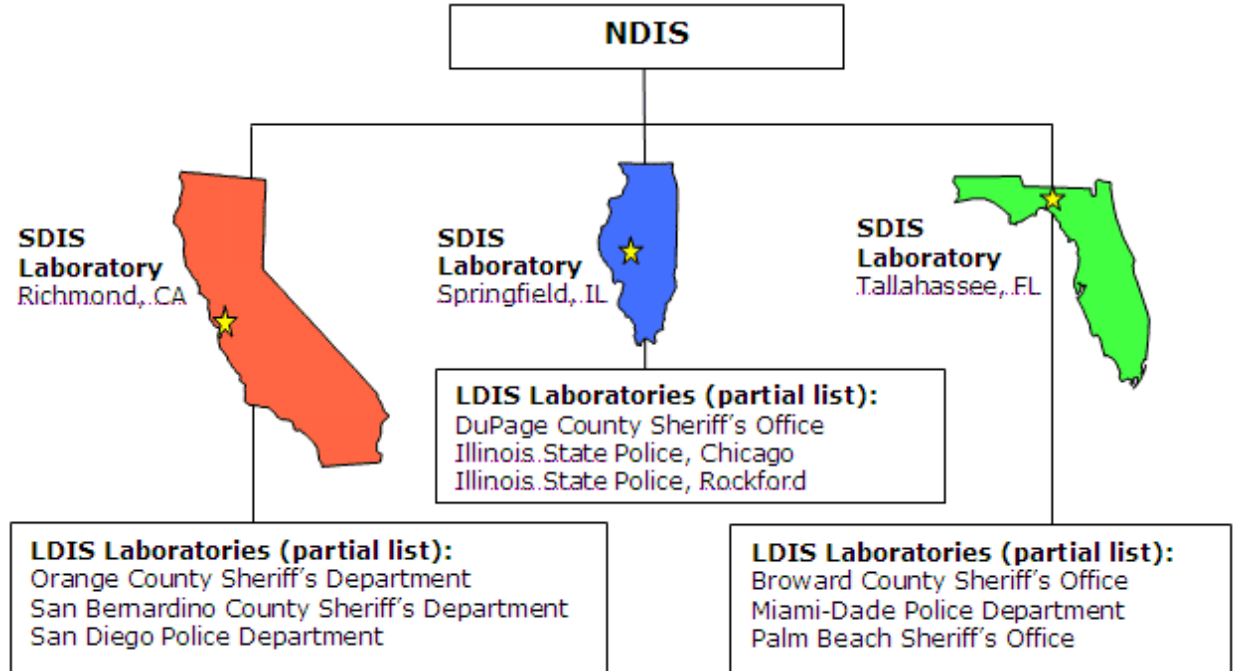


Figure 2: The hierarchy of Local, State, and National DNA Index Systems which -- taken as a whole -- comprise CODIS. Office of the Inspector General, Department of Justice, *OIG Report 06-32*.

²⁵ H.R.3355 - Violent Crime Control and Law Enforcement Act of 1994; <https://www.congress.gov/bill/103rd-congress/house-bill/3355>, Subtitle C.

²⁶ Office of the Inspector General, Department of Justice, "Introduction," *Combined DNA Index System Operational and Laboratory Vulnerabilities*, Audit Report O6-32, May 2006; <https://oig.justice.gov/reports/FBI/a0632/intro.htm>.

2000

The Board for Certification of Genealogists published its *Standards Manual*.²⁷

Family Tree DNA (FTDNA) made DNA testing (specifically Y-DNA STR) available to consumers.²⁸

2002

Ancestry.com and Relative Genetics offered a short-lived DNA testing service (Y-DNA, mtDNA) to consumers. MyFamily.com and Relative Genetics partnered to deliver the most extensive genetic genealogical testing service in the world.²⁹

2005

In April, the International Society of Genetic Genealogy was established.³⁰

2007

Ancestry.com made DNA testing (specifically Y-DNA STR and mtDNA) available to consumers.³¹

In November, 23andme launched direct-to-consumer DNA testing (specifically atDNA) in the U.S.³²

2010

In May, FTDNA started offering atDNA testing.³³

GEDmatch was founded by Curtis Rogers and John Olson. The site allowed users from testing companies to upload their DNA results and compare them to the DNA of other users.³⁴



Figure 3: Human genome SNP autosomal DNA test microchip. Depending on the chip, from 600,000 to 1,200,000 locations can be tested. [Used under GNU Common License.](#)

²⁷ Board for Certification of Genealogists, *The BCG Genealogical Standards Manual* (Orem, Utah: Ancestry Publishing, 2000).

²⁸ "The Moneymakers: Bennett Greenspan, DNA Testing Crosses Paths with Genealogy," *Houston Chronicle*, January 18, 2005; <https://www.chron.com/business/article/moneymakers-bennett-greenspan-1657195.php>.

²⁹ Nebula Genomics, "Ancestry review — Is it still the best ancestry test? *Nebula Genomics*, posted 6 June 2020 (<https://medium.com/nebula-genomics/ancestry-review-is-it-still-the-best-ancestry-test-5697705ec24c>).

³⁰ "Genetic Genealogy 2005," *International Society of Genetic Genealogy*, undated; https://isogg.org/wiki/Timeline:Genetic_genealogy_2005.

³¹ "Ancestry.com Launches Online DNA Testing Service Combining Science and Social Networking," *Ancestry*, posted October 16, 2007; <https://blogs.ancestry.com/circle/?p=1956>.

³² Thomas Goetz, "23AndMe Will Decode Your DNA for \$1,000. Welcome to the Age of Genomics," *Wired*, posted November 17, 2007; <https://www.wired.com/2007/11/ff-genomics/>.

³³ Diane Elder and Nicole Dyer, "DNA Milestones – Look at the Progress! *FamilyLocket.com*, posted 17 April 2022 (<https://familylocket.com/dna-milestones-look-at-the-progress/>).

³⁴ "About," *GEDmatch.com*, (<https://www.gedmatch.com/about/>).

2012

Ancestry offered consumer autosomal (atDNA) testing.³⁵

2014

The collection of a suspect's DNA was placed on secure legal footing via a 2014 Supreme Court decision.³⁶

Michael Usry was suspected in 1996 Idaho murder of Angie Dodge because police and reporters misunderstood the word "match" as it pertains to a 34/35 match with Y-DNA. So-called surname search eventually proved to be correct in 2019 when another man, Brian Leigh Dripps, who was genetically a Usry Y-line descendant, but did not bear the surname, was arrested.³⁷

2016

MyHeritage offered consumer atDNA testing.³⁸

2017

Following the 2016 release of an advanced genetic genealogy workbook edited by the late Debbie Parker Wayne, the Boston University Genealogical Research Certificate Program added a graduate level module

³⁵ "Ancestry.com Launches Autosomal DNA Test," *Ancestry*, posted May 13, 2012; <https://bloodandfrogs.com/2012/05/ancestrycom-launches-autosomal-dna-test.html>.

³⁶ *Riley v. California*, 573 U.S. 373, 393 (2014).

³⁷ Jim Mustian, "New Orleans filmmaker cleared in cold-case murder; false positive highlights limitations of familial DNA searching," *The New Orleans Advocate*, 12 March 2015. It is important to remember the meaning of "Match" differs between STR and SNP testing.

Match (in CODIS testing, for the meaning of the term when used in SNP testing, see below): only two types of matches are available in CODIS. The exact match is to the person, excluding the possibility statistically that the sample belongs to someone else. In an exact match, the length of STR at each testing site in each sample is the same.

Some states permit familial matching in CODIS. For a familial match, statistics must show that only a close family member (parent, sibling, child) could not be excluded. Within STR technology, this is a calculation based not just on the number of loci that have exact STR lengths but also on the prevalence of that length of STR at that position within the general population. It is very easy to have up to seven loci match in STR, but have no relationship at all. This can be confusing as in SNP testing a statistical match indicates a relationship, but within STR testing, there have to be a set of matches that - when calculated together -- are too rare within the population to be random and cannot be excluded from being the person.

Match (in SNP testing, for the meaning of the term when used in CODIS testing, see above): a test taker who shares a statistical portion of DNA with another test taker. In autosomal DNA testing, that portion could be as high as 50% (about 3,200 centiMorgans, *i.e.*, parent to child, or sibling to sibling), or as low as 0.02% (7 centiMorgans, *i.e.*, very distant cousins). The DNA shared could be within the full 23 chromosome pairs, and/or in the Y chromosome, and/or the X chromosome, and/or in mitochondrial genetic material, depending on which tests are being compared.

³⁸ "Our History," *MyHeritage*, timeline; <https://www.myheritage.com/about-myheritage/>.

on DNA evidence to its forensic genealogy courseware. All students had to pass with a B or higher to achieve the certificate of completion.³⁹

2018

The Board for Certification of Genealogists updated *Genealogy Standards* to include best practice guidance for the use of DNA for genealogy.

On 18 May, William Earl Talbott II was arrested by Snohomish County, Washington, sheriffs for the murder of Tanya Van Cuylenborg.⁴⁰

24 April, Joseph James DeAngelo was arrested for crimes committed by the “Golden State Killer” due to research conducted by Barbara Rae-Venter, JD, PhD, and her team which identified any sons of Joseph’s parents as possible exemplars of the sample provided by law enforcement. CODIS testing found an exact match among the sons, proving the work of Dr. Rae-Venter and her team to be accurate.⁴¹

In November, law enforcement entities around the world learned about genealogical research’s value for identifying DNA samples beyond the confines of CODIS.⁴²

2019

In April GEDmatch changed its Terms of Service to require that users opt-in for law enforcement access to kits.⁴³

In June, in a precedent-setting (first of its kind) case, Snohomish County jury found William Earl Talbott II guilty of two counts (Cook and Cuylenborg) of first-degree murder in 1987.⁴⁴

Ancestry, Helix, and 23andme launched the Coalition for Genetic Data Protection.⁴⁵ (As of October 2023, Individual users of these three database services are still not given the choice to opt-in to law enforcement access.)

December, GEDmatch was acquired by Verogen.⁴⁶

³⁹ Melinde Lutz Byrne, program director, to Ruth Ann Murray, director, Boston University, Center For Professional Education, Fall Semester, 2017 personal communications held by Byrne, who developed the module.

⁴⁰ Karin Larsen, “DNA genealogy match leads to arrest in 1987 slayings of B.C. high school sweethearts,” *CBC News*, broadcast 18 May 2018, as cited in *Wikipedia*.

⁴¹ Barbara Rae-Venter, *I Know Who You Are: How and Amateur DNA Sleuth Unmasked the Golden State Killer and Changed Crime Fighting Forever* (New York: Ballentine Books: 2023).

⁴² Melinde Lutz Byrne, “When CODIS Fails Forensic Genealogy May Succeed,” FBI CODIS conference, Norman, Oklahoma, November 2018.

⁴³ Natalie Ram, “The Genealogy Site That Helped Catch the Golden State Killer Is Grappling with Privacy,” *Slate.com*, posted 29 May 2019; <https://slate.com/technology/2019/05/gedmatch-dna-privacy-update-law-enforcement-genetic-genealogy-searches.html>.

⁴⁴ Caleb Hutton, “Man guilty of 1987 murders solved with genetic genealogy,” *HeraldNet*, published 28 June 2019, as cited in *Wikipedia*, viewed 5 September 2023.

⁴⁵ Alex Gangitano, “DNA testing companies launch new privacy coalition,” *The Hill*, posted June 25, 2019; <https://thehill.com/regulation/lobbying/450124-dna-testing-companies-launch-new-privacy-coalition/>.

⁴⁶ VEROGEN press release, “GEDmatch Partners with Genomics Firm,” posted 19 December 2019; <https://verogen.com/gedmatch-partners-with-genomics-firm/>.

2020

By December Verogen introduced a sister site, GEDmatch PRO, for law enforcement only.⁴⁷

2021

January, Australian company MyDNA, Ltd., purchased Gene By Gene, parent company of FTDNA.⁴⁸

December, William Earl Talbott II's guilty verdict was overturned by Washington appellate court citing juror bias. No challenge made to the use of forensic genealogy.⁴⁹

2022

In December, the National Conference of State Legislatures reported on the status of DNA testing legislation in each of the 50 states as of 2018.⁵⁰

In December, Washington State Supreme Court reinstated the two guilty verdicts in William Earl Talbott II 1987 double murders, citing defense's failure to dismiss the juror. No challenge made to the use of forensic genealogy.⁵¹

2023

January, Qiagen (based in Europe) completed purchase of Verogen and strengthened EU-style personal protections.⁵²

In May, the Board for Certification of Genealogists approved development of the Certified Genetic Genealogist credential.

2024

On March 1, 2024, The Board for Certification of Genealogists began accepting applications from Certified Genealogists for the advanced Certified Genetic Genealogist credential.

⁴⁷ "Terms of Service and Privacy Policy," *GEDmatch.com*; <https://www.gedmatch.com/terms-of-service-privacy-policy-may-31-2023/>.

⁴⁸ MyDNA press release, "Pharmacogenetic and genealogy pioneers merge for historic partnership," posted 7 January 2021; <https://www.prnewswire.com/news-releases/pharmacogenetic-and-genealogy-pioneers-merge-for-historic-partnership-301202798.html>.

⁴⁹ AP, "Citing Juror Bias, Washington Appeals Court Overturns Conviction of Man Linked by DNA to Slaying of Young Couple," posted 7 December 2021; <https://lawandcrime.com/crime/citing-juror-bias-washington-appeals-court-overturns-conviction-of-man-linked-by-dna-to-slaying-of-young-couple/>.

⁵⁰ National Conference of State Legislatures, "DNA Arrestee Laws," posted December 17, 2022 but covering laws as of 2018, pdf download available at https://web.archive.org/web/20221217221316/https://www.ncsl.org/Documents/cj/Arrestee_DNA_Laws.pdf.

⁵¹ AP, "Court reinstates guilty verdicts in 1987 killings of couple," *FOX 28 Spokane*, broadcast 23 December 2022, as cited in *Wikipedia*, viewed 5 September 2023.

⁵² QIAGEN press release, "QIAGEN completes acquisition of Verogen, strengthening leadership in Human ID / Forensics with NGS technologies," posted 9 January 2023, <https://corporate.qiagen.com/English/newsroom/press-releases/press-release-details/2023/QIAGEN-Completes-Acquisition-of-Verogen-Strengthening-Leadership-in-Human-ID--Forensics-With-NGS-Technologies/>.