

HOUSE OF REPRESENTATIVES STAFF ANALYSIS

BILL #: CS/HB 453 Forensic Genetic Genealogy Grants

SPONSOR(S): Criminal Justice Subcommittee, Anderson

TIED BILLS: IDEN./SIM. BILLS: SB 678

REFERENCE	ACTION	ANALYST	STAFF DIRECTOR or BUDGET/POLICY CHIEF
1) Criminal Justice Subcommittee	17 Y, 0 N, As CS	Leshko	Hall
2) Justice Appropriations Subcommittee	13 Y, 0 N	Saag	Keith
3) Judiciary Committee			

SUMMARY ANALYSIS

Historically, the most common form of DNA analysis used to match samples and test for identification in forensic laboratories analyzes only certain parts of DNA, known as short tandem repeats (STRs). In the early 1990s, the Federal Bureau of Investigation (FBI) chose 13 STRs as the basis for a DNA identification profile, and the 13 STRs became known as the Combined DNA Index System (CODIS), which is now the general term used to describe the FBI's program of support for local, state, and national criminal justice DNA databases. When a suspect's identity is unknown, a crime laboratory may upload a forensic profile into CODIS to compare against additional DNA profiles uploaded by other federal, state, or local laboratories.

In contrast to traditional methods of DNA comparison using STR profiles in CODIS, investigative genetic genealogy (IGG) utilizes single nucleotide polymorphism (SNP)-based DNA matching combined with family tree research to produce investigative leads in criminal investigations and missing persons cases. IGG differs from the traditional STR DNA matching utilized on CODIS in the technology employed, the nature of the databases utilized, the genetic markers involved, and the algorithms run. Information and data derived from IGG is not, and cannot be, uploaded, searched, or retained in any CODIS DNA Index.

The Florida Department of Law Enforcement (FDLE) has established a Forensic Investigative Genetic Genealogy (FIGG) Program which utilizes the FDLE Genetic Genealogy Team to work with local law enforcement agencies to develop investigative leads based on DNA matches to relatives found in public genealogy databases. The FIGG Program, which is currently funded internally, accepts cases when a CODIS-eligible DNA profile has been developed but no further leads are available.

CS/HB 453 creates s. 943.327, F.S., to establish the Forensic Investigative Genetic Genealogy Grant Program within FDLE to annually award grants, from any funds specifically appropriated to the grant program, to statewide and local law enforcement agencies and medical examiner's offices to cover expenses related to using forensic investigative genetic genealogy to generate investigative leads for criminal investigations of violent crimes and unidentified human remains. The bill requires the grant funds be used only for certain limited purposes.

The bill requires each grant recipient to provide a report, including certain required information, to the executive director of FDLE no later than one year after receipt of funds under the grant program.

The grant program established in the bill is subject to legislative appropriation. If an appropriation is provided by the Legislature, the bill may have an indeterminate fiscal impact on state and local governments to the extent that local law enforcement agencies may receive grant funding from FDLE. The bill may also impact private entities to the extent that testing funded through the program may be outsourced to them.

The bill provides an effective date of July 1, 2024.

FULL ANALYSIS

I. SUBSTANTIVE ANALYSIS

A. EFFECT OF PROPOSED CHANGES:

Background

FBI's Combined DNA Index System (CODIS)

Deoxyribonucleic acid (DNA) is hereditary material existing in the cells of all living organisms. A DNA profile may be created by testing the DNA in a person's cells. Similar to fingerprints, a person's DNA profile is a unique identifier, except for identical twins, who have the exact same DNA profile. DNA evidence may be collected from any biological material, such as hair, teeth, bones, skin cells, blood, semen, saliva, urine, feces, and other bodily substances.¹ "It is a fundamental principle of genetics that individuals who are closely related will share DNA from their common ancestors; and the more distant the relationship, the less DNA is shared."²

Historically, the most common form of DNA analysis used to match samples and test for identification in forensic laboratories analyzes only certain parts of DNA, known as short tandem repeats (STRs).³ In the early 1990s, the Federal Bureau of Investigation (FBI) chose 13 STRs as the basis for a DNA identification profile, and the 13 STRs became known as the Combined DNA Index System (CODIS).⁴ CODIS is now the general term used to describe the FBI's program of support for local, state, and national criminal justice DNA databases, as well as the software used to run these databases.⁵

When a suspect's identity is unknown, a participating crime laboratory may upload a forensic profile into CODIS to compare against additional DNA profiles uploaded by other federal, state, or local participating laboratories. If a match is identified, the laboratories involved exchange information to verify the match and establish coordination between the two agencies. This match can provide probable cause for law enforcement to obtain a warrant to collect a biological reference sample from an offender. A laboratory can then perform DNA analysis on the known biological sample and present the analysis as evidence in court.⁶

Investigative Genetic Genealogy (IGG)

In contrast to traditional methods of DNA comparison using STR profiles in CODIS, investigative genetic genealogy (IGG), also known as forensic genetic genealogical DNA analysis and searching⁷ or forensic genetic genealogy,⁸ utilizes single nucleotide polymorphism (SNP)⁹-based DNA matching combined with family tree research to produce investigative leads in criminal investigations and missing persons cases.¹⁰ IGG differs from the traditional STR DNA matching utilized on CODIS in the technology employed, the nature of the databases utilized, the genetic markers involved, and the

¹ FindLaw, *How DNA Evidence Works*, <https://criminal.findlaw.com/criminal-procedure/how-dna-evidence-works.html> (last visited Jan. 29, 2024).

² Daniel Kling, Christopher Phillips, Debbie Kennett, and Andreas Tillmar, *Investigative genetic genealogy: Current methods, knowledge and practice*, Vol. 52, FSI Genetics, p. 1, (May 2021), [https://www.fsigenetics.com/article/S1872-4973\(21\)00013-2/fulltext](https://www.fsigenetics.com/article/S1872-4973(21)00013-2/fulltext) (last visited Jan. 29, 2024).

³ Kelly Lowenberg, *Applying the Fourth Amendment when DNA Collected for One Purpose is Tested for Another*, 79 U. Cin. L. Rev. 1289, 1293 (2011), <https://law.stanford.edu/wp-content/uploads/2011/11/APPLYING-THE-FOURTH-AMENDMENT-WHEN-DNA-COLLECTED-FOR-ONE-PURPOSE.pdf> (last visited Jan. 29, 2024).

⁴ *Id.*

⁵ Federal Bureau of Investigation, *Frequently Asked Questions on CODIS and NDIS*, <https://www.fbi.gov/how-we-can-help-you/dna-fingerprint-act-of-2005-expungement-policy/codis-and-ndis-fact-sheet> (last visited Jan. 29, 2024).

⁶ *Id.*

⁷ U.S. Department of Justice, *Interim Policy: Forensic Genetic Genealogical DNA Analysis and Searching*, <https://www.justice.gov/olp/page/file/1204386/download> (last visited Jan. 29, 2024).

⁸ *Supra* note 2, at 2.

⁹ Each SNP represents a variation in a single DNA building block. Medline Plus, National Library of Medicine, *What are single nucleotide polymorphisms (SNPs)?*, <https://medlineplus.gov/genetics/understanding/genomicresearch/snp/> (last visited Jan. 29, 2024).

¹⁰ *Supra* note 2, at 2.

algorithms run. Information and data derived from IGG is not, and cannot be, uploaded, searched, or retained in any CODIS DNA Index.¹¹

IGG examines more than half a million SNP DNA markers which replace the STR DNA markers typically analyzed.¹² Based on the nature of SNP markers scientists are able to identify shared blocks of DNA between a forensic sample and the sample donor's potential relatives.¹³ SNP markers have been identified as being more stable than STR markers and allow for increased accuracy in identifying potential familial connections.¹⁴

The technology to conduct SNP testing became readily available to the general public in 2007 through direct-to-consumer testing companies (DTCs). Consumers purchase test kits and provide DNA samples to the companies who then generate genetic data using SNP microarrays^{15, 16} that produce 600,000 to 700,000 SNP markers. The companies can then analyze the SNP markers for purposes such as:

- Biogeographical ancestry information;
- Identifying potential genetic relatives; and
- Health, wellness, and trait conditions and predispositions.¹⁷

When the purpose is to search for potential genetic relatives, the SNP DNA profile is compared against genetic profiles of individuals who have voluntarily submitted their biological samples to these databases. A computer algorithm then evaluates potential familial relationships between the sample donor and service users.¹⁸

There are four principal DTCs: Ancestry, FamilyTreeDNA (FTDNA), MyHeritage, and 23andMe. As of August 2020, the four principal DTCs have tested over 36 million people. Many DTC genetic testing providers maintain their customers' SNP data in a database. However, the DTCs permit customers to retrieve their data to personally maintain, control, and share their SNP file. Individuals can share their SNP file with researchers and third-party services, such as GEDmatch, that offer to interpret their SNP data.¹⁹

In addition to the four principal DTCs there are also two frequently-utilized third-party services: GEDmatch and DNASolves. GEDmatch does not provide genetic testing services but instead provides a central location for users to upload and share their SNP file. GEDmatch allows users to search for matches with people who have tested on different platforms at different testing companies and have subsequently shared their SNP file with GEDmatch.²⁰ GEDmatch is also able to accept raw data from both microarrays and whole genome sequencing (WGS) and can be used for law enforcement matching.²¹ Similarly, DNASolves does not provide genetic testing services, but does accept user-uploaded SNP data from the four principal DTCs.²²

¹¹ *Supra* note 7, at 3-4.

¹² *Supra* note 7, at 3.

¹³ *Supra* note 7, at 3.

¹⁴ Alasdair Macdonald and Graham Holton, *What is STR and SNP DNA?, Who Do You Think You Are?*, <https://www.whodoyouthinkyouaremagazine.com/tutorials/dna/what-is-str-and-snp-dna/> (last visited Jan. 29, 2024).

¹⁵ A microarray tool is used to determine whether DNA from a particular individual contains a mutation in genes. National Human Genome Research Institute, *DNA Microarray Technology Fact Sheet*, <https://www.genome.gov/about-genomics/fact-sheets/DNA-Microarray-Technology> (last visited Jan. 29, 2024).

¹⁶ Whole genome sequencing (WGS) is another way to create SNP datasets that mirrors microarray technology and has been widely adopted to ensure sensitivity to challenging forensic sampling. *Supra* note 2.

¹⁷ Scientific Working Group DNA Analysis Methods, *Overview of Investigative Genetic Genealogy*, https://www.swgdam.org/files/ugd/4344b0_6cc9e7c82ccc4fc0b5d10217af64e31b.pdf (last visited Jan. 29, 2024).

¹⁸ *Supra* note 7, at 3.

¹⁹ *Supra* note 17, at 2.

²⁰ *Id.*

²¹ *Supra* note 2, at 13.

²² *Supra* note 2, at 15.

Law enforcement agencies have begun opting to utilize IGG over more traditional searches on CODIS because the profiles uploaded on CODIS use far fewer STR genetic markers than the hundreds of thousands of SNP markers available on genetic genealogy companies' databases.

U.S. Department of Justice (DOJ) Interim Policy on IGG

In response to the increase in the utilization of IGG, the DOJ issued an Interim Policy on IGG. The Policy provides that law enforcement agencies may initiate the IGG process when a case involves an unsolved violent crime or unidentified human remains. The Policy provides guidelines for the IGG process including:

- Before the IGG process may be initiated an agency must have developed a STR DNA profile from a collected crime scene sample and uploaded the sample into CODIS.
- The agency must pursue all reasonable and viable investigative leads, including through a CODIS search.²³
- If a CODIS search fails to produce a probative and confirmed DNA match, the agency may utilize IGG.
- If the case is properly postured to use IGG, the agency must develop, generally through a third-party vendor, a SNP DNA profile from the collected sample and then upload the DNA profile to DTCs and other third-party genetic genealogy companies (collectively referred to as "GG" companies) to identify potential genetic relatives in the database.
- The agency must identify themselves as law enforcement to GG companies and enter and search SNP DNA profiles only in those GG company databases that provide explicit notice to their service users and the public that law enforcement may use their service sites to investigate crimes or to identify unidentified human remains.
- If the search results in one or more genetic associations, the GG company provides law enforcement with a list of genetically associated²⁴ service user names along with an estimated relationship.
- The agency may not arrest a suspect based solely on a genetic association generated by a GG company.
- The agency must treat this information as an investigate lead only and must utilize traditional genealogy research and other investigative work to determine the true nature of the genetic association, including creating a STR DNA profile of the new suspect and comparing it to the forensic profile previously uploaded to CODIS.
- If a suspect is arrested and charged with a criminal offense the agency must direct the GG company to remove from its databases and return the SNP DNA profile and all associated information to the agency.
- Biological samples and SNP DNA profiles may not be used to determine the donor's genetic predisposition for disease or any other medical condition or psychological trait.²⁵

DTCs and Third-Party Companies and Law Enforcement Access

Of the four principal commercial companies only FTDNA allows law enforcement matching within the opted in section of its database. Law enforcement agencies that want to use the FTDNA database are required to register all forensic samples and genetic files prior to uploading. FTDNA may grant permission to use the database only after the required documentation is submitted, reviewed, and approved. Even if permission is granted, access is limited for the purposes of identifying remains of

²³ "Reasonable investigative leads" are credible, case-specific facts, information, or circumstances that would lead a reasonably cautious investigator to believe that their pursuit would have a fair probability of identifying a suspect. *Supra* note 7, at 5.

²⁴ A genetic association means that the donor of the sample *maybe* related to the service user. *Supra* note 7, at 4.

²⁵ *Supra* notes 7 and 17.

deceased individuals and identifying perpetrators of homicide, sexual assault, or abduction.²⁶ FTDNA allows users to opt out of law enforcement searches.²⁷

GEDmatch, a citizen science website founded in 2010, proved crucial to the initial development of IGG. GEDmatch allows DNA profiles to be uploaded from a wide variety of sources, including law enforcement agencies. GEDmatch launched a dedicated law enforcement portal in December 2020. GEDmatch allows samples of unidentified human remains to be compared against the entire database, while profiles uploaded to identify the perpetrator of a violent crime²⁸ may only be matched against the opt in portion of the database. GEDmatch users are automatically opted out of law enforcement searches but may choose to opt in.²⁹

DNASolves was setup in December 2019 and is intended to be a dedicated SNP database for law enforcement use. Users on DNASolves contribute data solely to solve crime, there is no public-facing search and users cannot be matched with relatives. Users may voluntarily submit their name, date of birth, and their parents' names to assist investigators.³⁰

Florida Department of Law Enforcement (FDLE) Genetic Genealogy Team

FDLE has established a Forensic Investigative Genetic Genealogy (FIGG) Program which utilizes the FDLE Genetic Genealogy Team. The Genetic Genealogy Team is composed of experts in genetic genealogy, analytical research, forensics, and investigations who work with local law enforcement agencies to develop investigative leads based on DNA matches to relatives found in public genealogy databases.³¹ The FIGG Program accepts cases when a CODIS-eligible DNA profile has been developed but no further leads are available. FDLE currently uses internal funds to administer this program.³²

Effect of Proposed Changes

CS/HB 453 creates s. 943.327, F.S., to establish the Forensic Investigative Genetic Genealogy Grant Program within FDLE to annually award grants, from any funds specifically appropriated to the grant program, to statewide and local law enforcement agencies and medical examiner's offices to cover expenses related to using forensic investigative genetic genealogy to generate investigative leads for criminal investigations of violent crimes and unidentified human remains.

The bill requires the grant funds be limited to the following purposes:

- The analysis of DNA samples to generate profiles that have a minimum of 100,000 markers and that are compatible with genetic genealogical databases that permit law enforcement use and searching.
- The use of forensic investigative genetic genealogy to solve violent crimes and to identify unidentified human remains.

The bill requires each grant recipient to provide a report to the executive director of FDLE no later than one year after receipt of funds under the grant program. The report must include all of the following:

- The amount of funding received.
- The number and type of cases pursued using forensic investigative genetic genealogy.

²⁶ *Supra* note 2, at 12.

²⁷ *Supra* note 17, at 3.

²⁸ GEDmatch defines "violent crime" as murder, non-negligent manslaughter, aggravated rape, robbery, and aggravated assault. *Supra* note 17, at 3.

²⁹ *Supra* note 17, at 4.

³⁰ *Supra* note 2, at 15.

³¹ Florida Department of Law Enforcement, *Forensic/Investigative Genetic Genealogy*, <https://www.fdle.state.fl.us/Forensics/Disciplines/Genetic-Genealogy.aspx> (last visited Jan. 29, 2024).

³² Florida Department of Law Enforcement, Agency Analysis of 2024 House Bill 453, p. 2 (Dec. 22, 2023).

- The type of forensic investigative genetic genealogical methods used, including the name of the laboratory to which any testing was outsourced, if applicable, the technology employed, the name of the genetic genealogy database used, and the identity of the entity conducting any genetic genealogical research.
- The result of the DNA testing including whether or not testing was sufficiently successful to permit genetic genealogy database searching and the results of any such searching and any additional genealogical research, such as decedent identification, perpetrator identification, or no identification.
- The amount of time it took to make an identification or to determine no identification could be made.

The bill defines “forensic investigative genetic genealogy” to mean the combined application of laboratory testing, genetic genealogy, and law enforcement investigative techniques.

The bill provides an effective date of July 1, 2024.

B. SECTION DIRECTORY:

Section 1: Creates s. 943.327, F.S., relating to Forensic Investigative Genetic Genealogy Grant Program.

Section 2: Provides an effective date of July 1, 2024.

II. FISCAL ANALYSIS & ECONOMIC IMPACT STATEMENT

A. FISCAL IMPACT ON STATE GOVERNMENT:

1. Revenues:

The bill may have an indeterminate positive impact on state revenues as FDLE and other statewide law enforcement agencies may receive grant funds.

2. Expenditures:

The bill may have an indeterminate impact on state expenditures to the extent the bill authorizes FDLE to distribute funds specifically appropriated for the grant program. Any such impact is subject to legislative appropriation.

B. FISCAL IMPACT ON LOCAL GOVERNMENTS:

1. Revenues:

The bill may have an indeterminate positive impact on local government revenues to the extent that some local law enforcement agencies and medical examiner’s offices may receive future grant funding.

2. Expenditures:

None.

C. DIRECT ECONOMIC IMPACT ON PRIVATE SECTOR:

The bill may have an indeterminate positive impact on the private sector to the extent that the bill authorizes recipients of grant funds to cover expenses related to using certain DNA testing to generate investigative leads for specified criminal investigations, which may require outsourcing to a private entity.

D. FISCAL COMMENTS:

None.

III. COMMENTS

A. CONSTITUTIONAL ISSUES:

1. Applicability of Municipality/County Mandates Provision:

Not Applicable. This bill does not appear to require counties or municipalities to spend funds or take action requiring the expenditures of funds; reduce the authority that counties or municipalities have to raise revenues in the aggregate; or reduce the percentage of state tax shared with counties or municipalities.

2. Other:

None.

B. RULE-MAKING AUTHORITY:

The bill provides FDLE with rulemaking authority pursuant to ss. 120.536(1) and 120.54, F.S., to implement and administer the Forensic Investigative Genetic Genealogy Grant Program and to establish the process for the allocation of grant funds.

C. DRAFTING ISSUES OR OTHER COMMENTS:

None.

IV. AMENDMENTS/COMMITTEE SUBSTITUTE CHANGES

On January 25, 2024, the Criminal Justice Subcommittee adopted a strike-all amendment and reported the bill favorably as a committee substitute. The amendment:

- Specified that grant funds may be awarded to both statewide and local law enforcement agencies.
- Clarified that grant funds may only be used in:
 - The analysis of DNA samples to generate profiles that have a minimum of 100,000 markers and that are compatible with genetic genealogical databases that permit law enforcement use and searching.
 - The use of forensic investigative genetic genealogy to solve violent crimes and to identify unidentified human remains.
- Added additional reporting requirements for grant recipients.
- Provided rulemaking authority to FDLE to implement the grant program and to establish the process for the allocation of grant funds.
- Removed the definition of “forensic genetic genealogy methods” and added a definition for “forensic investigative genetic genealogy.”

This analysis is drafted to the committee substitute as passed by the Criminal Justice Subcommittee.