



Forensic Investigative Genetic Genealogy (FIGG) Resource Document for Illinois Law Enforcement Agencies FIGG Frequently Asked Questions (FAQ)

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Technical Foundations of DNA Typing

Q: What is Forensic Investigative Genetic Genealogy (FIGG)?

A: FIGG (also referred to as FGG, GG, FGGS, or IGG) is an investigative tool that blends DNA analysis with genealogy to identify close genetic relatives to the item of evidence or unidentified human remains (UHR). The DNA methodology used creates a SNP (single nucleotide polymorphisms) profile from the evidence or UHR which is uploaded to a law enforcement authorized genealogical database that consists of other SNP profiles. This provides the basis for a genealogist to construct a family tree that may result in an investigative lead for the agency.

Q: Do any local or state crime laboratories within Illinois perform SNP analysis for FIGG?

A: Currently, there are no local or state crime laboratories performing this type of DNA analysis. Local and state crime laboratories develop DNA profiles using short tandem repeats (STRs) from crime scene evidence to be compared to STR profiles from known standards and/or other evidence. STR profiles generated from evidence may be entered into CODIS based on eligibility requirements.

Q: What is CODIS (Combined DNA Index System)?

A: CODIS is the FBI's software system that is composed of LDIS (Local DNA Index System), SDIS (State DNA Index System) and NDIS (National DNA Index System). This software allows STR profiles entered from crime scene evidence to be compared to other STR profiles that reside at the local, state and national levels. If a match occurs between two STR profiles, it can provide investigative information to the law enforcement agency such as the identity of a potential suspect or the individual's involvement in another crime.

Q: Can a CODIS profile be used to perform FIGG analysis?

A: No, FIGG does not use the same type of DNA analysis as the one used to develop a CODIS profile. A CODIS profile is generated using short tandem repeats (STRs), while FIGG uses single nucleotide polymorphisms (SNPs). Therefore, a SNP profile must be generated from the crime scene evidence for use in FIGG.

Q: How is FIGG used in criminal investigations?

A: A SNP profile is generated and uploaded into a law enforcement authorized genealogical database for comparison to other SNP profiles. If potential genetic relatives are identified through the database search, traditional genealogical research and family trees are used to generate investigative leads regarding the possible source of the unknown DNA profile. Law enforcement agencies use traditional investigative tools to conduct follow-up investigations based on information generated from FIGG. This may include collection of reference samples from potential genetic relatives or the person of interest (POI) for confirmatory STR DNA analysis.

Q: Why must a CODIS profile be submitted prior to FIGG testing?

A: FIGG provides investigative leads, not DNA matches. An STR DNA profile is required for confirmatory DNA testing so it can be directly compared to the STR profile from the crime scene evidence. For federally funded investigations, the DOJ Interim Policy on Forensic Genetic Genealogical DNA Analysis and Searching



(DOJ Interim Policy) requires that the crime scene STR profile has been entered into CODIS before conducting FIGG.

Q: Can DNA profiles generated for FIGG be used to confirm that the DNA profile from the crime scene sample originated from a POI?

A: No. Per the DOJ Interim Policy, a POI in a criminal investigation should not be arrested based solely on a FIGG-generated lead. An STR profile must be developed from the POI and directly compared to the STR profile from the crime scene evidence.

Q: Is FIGG the same as direct-to-consumer (DTC) ancestry testing?

A: No. Both use SNP-based DNA analysis, but law enforcement may only use ancestry databases that permit law enforcement use in the database's Terms of Service (TOS) and privacy policies. DTC ancestry testing such as AncestryDNA, and 23andMe are designed for personal use for individuals to learn about their ancestral origins and family history.

Q: What is the best source of DNA sample for FIGG testing?

A: If available, use the extracted DNA that has been used to generate the CODIS profile. If the extracted DNA is depleted, a second source may be identified from the crime scene evidence that is believed to be from the POI. Consult your local or state crime laboratory to assist in this determination.

Q: How do I determine if there is enough DNA sample left for FIGG?

A: The local or state crime laboratory that generated the CODIS profile and the vendor laboratory that is being considered for FIGG testing should be consulted. Additionally, law enforcement agencies should contact the appropriate prosecutor's office when encountering issues related to DNA consumption of crime scene samples before proceeding with SNP testing.

Q: Can degraded or mixed DNA samples be used for FIGG?

A: It depends. Consult a potential vendor laboratory and ask about their rates of success in obtaining a SNP profile with these types of samples.

Case Suitability & Strategy

Q: In what types of cases is FIGG generally used?

A: Unsolved violent crimes, e.g., sexual assaults and homicides, or unidentified remains cases, when testing has not provided a CODIS association and where reasonable investigative leads have been exhausted.

Q: Can FIGG only be used for cold cases?

A: No. While frequently used in cold cases, FIGG can support active investigations when traditional methods have been unsuccessful at providing an investigative lead.

Q: When might FIGG testing be suitable for a case?

A: FIGG can be used for unsolved violent crimes or UHR cases that have viable DNA and, per the DOJ Interim Policy, where the crime scene STR profile has been entered into CODIS and the investigative agency has pursued reasonable investigative leads to solve the case or to identify the UHR.

Q: How often does FIGG testing result in an investigative lead?



A: It is difficult to assess as most laboratories provide information about the number of FIGG cases that have resulted in successful investigative leads, but do not provide the total number of cases worked in FIGG.

Q: If FIGG does not generate an investigative lead or a person of interest, what are next possible steps?

A: It will be case-specific. Options may include waiting for the ancestry databases to increase in size, additional reference testing, or reassessing the evidence in the case.

Reference Testing & Family Engagement

Q: When building family trees to identify a POI, why is it sometimes necessary to collect additional known DNA reference samples?

A: Known DNA reference samples may be used to confirm genetic relationships and narrow down potential person(s) of interest identified through genealogical research.

Q: What guidelines apply when obtaining a known DNA reference sample from a potential relative?

A: Consult with your prosecutor's office and follow agency policies and jurisdictional laws. Be transparent, obtain informed consent for relative samples, respect privacy, and document all communications and actions.

Q: If FIGG develops a POI from the genealogical findings, what are the next steps?

A: A DNA sample will need to be obtained from the POI to confirm that the crime scene DNA profile originated from this individual. An STR profile will need to be generated which will then be directly compared to the crime scene STR profile. Prior to collecting a sample from a POI, consult with the prosecutor's office for legal considerations and the local or state laboratory for guidance on the best type of sample for DNA testing.

Vendor Selection

Q: What criteria should be considered when selecting a vendor for FIGG testing?

A: There are different methods for generating SNP profiles. It is important to discuss the specifics of the evidence sample with the potential vendor(s) to identify the most suitable method for the type and quality of sample. The local or state crime laboratory can be a valuable resource to assist with this assessment. Prior to selecting a vendor laboratory, the agency should ensure the vendor lab has a proven history of working with law enforcement.

Q: As the state and local laboratories in Illinois currently do not offer FIGG testing, what resources are available for FIGG testing outside partnering with a commercial laboratory?

A: The Center for Human Identification at University of North Texas Health Fort Worth was the first public laboratory in the United States to offer FIGG and may be a resource for SNP testing. Once SNP profiles are generated, there are resources in Illinois for genealogical research and searching. Fluctuations in funding sources may affect the availability of in-state resources. Contact the FBI's Chicago Regional Field Office to inquire about the availability of genealogical resources for your case.

Q: What vendors have been used by law enforcement agencies in Illinois for FIGG?



A: Illinois agencies report using the following vendors for FIGG (in alphabetical order): Bode Technology, DNA Doe Project, DNA Labs International, Family Tree DNA, FBI, GEDMatch, Identifiers International, IGGnite DNA, Intermountain Forensics, Moxxy Forensics, Othram, Parabon Nanolabs, and Qiagen. This list may or may not be exhaustive for agencies within the state of Illinois.

Q: Do commercial companies offering FIGG services conduct all aspects of FIGG in-house? If not, what are some considerations?

A: Not all companies perform both SNP testing and genealogical searching and research in-house. It is important to understand if the potential vendor performs or outsources the SNP testing. If the vendor outsources the SNP testing component of FIGG, the agency should discuss chain of custody, accreditation, compliance with Terms of Service and applicable legal requirements with the vendor lab.

Q: Do forensic genetic genealogists in the community have different areas of expertise? For example, a case where the individual's genetic relatives originate from a different country?

A: Yes. For example, some genealogists specialize in international record searching and are familiar with regional naming conventions, migration patterns and local records/databases.

Q: It has been stated that FIGG is most effective at producing investigative leads for individuals with primarily European ancestry. Can FIGG be used in cases that involve individuals that have different ancestries?

A: FIGG has successfully generated investigative leads in diverse demographics. An individual's genetic ancestry is complex and may not be accurately inferred from their perceived race or ethnicity.

Q: Is it necessary to work with an outside professional genealogist on a case if an agency has investigators who have completed basic training on the genealogy component of FIGG?

A: While basic training can provide a solid foundation, FIGG is a complex and time-intensive process that often requires advanced skills in genetics, database navigation, historical research and legal documentation. Working with a professional genealogist allows the agency to focus on case strategy and coordination. An experienced professional forensic genetic genealogist can offer the following expertise:

- Experience with complex family trees, including adoption, endogamy, and international ancestry.
- Access to specialized tools and databases that are not always available to the public.
- Efficiency in research, often completing in days what might take a novice weeks or months.
- Legal and ethical awareness, including appropriate documentation for criminal investigations and an understanding of privacy issues.
- Collaboration with law enforcement, ensuring investigative leads are actionable and defensible.

Legal & Ethical Considerations

Q: When is the right time to talk with my State's Attorney's Office or the prosecuting authority about using FIGG in a case?

A: This ideally should be done prior to contracting with a vendor, initiating any SNP testing, genealogical research and/or collecting DNA from a POI. Prosecutor input is essential for ensuring that all investigative steps comply with applicable legal requirements, database terms of service and best practices. Early collaboration can help avoid missteps and inform decisions as to which cases are best suited for expending resources. Additionally, prosecutors can help assess whether the case aligns with guidance documents such as the DOJ Interim Policy and advise on documentation and chain-of-custody considerations.



Q: Which DNA databases are accessible to law enforcement for FIGG?

A: Currently, GEDmatch PRO, FamilyTreeDNA, and DNA Justice allow law enforcement access. Direct-to-consumer (DTC) commercial databases such as Ancestry do not allow law enforcement access without a warrant. To comply with current Terms of Service (TOS) and privacy policies, it is advised that a genealogical expert engages with these databases. However, law enforcement agencies should still confirm compliance with the Terms of Service (TOS) for any database used by a vendor or genealogist that is not in-house.

Q: What documentation should be maintained during a FIGG investigation?

A: Law enforcement agencies should maintain documentation of sample collection, chain of custody, consent, laboratory and genealogy reports, database uploads and legal approvals as required by jurisdictional discovery rules and legal authorities

Q: Who maintains the SNP profile data?

A: Law enforcement agencies generally do not receive SNP profile data from the vendor. As the SNP profile data may be subject to discovery, law enforcement agencies should discuss data retention policies with the vendor and then consult with their prosecutor's office to ensure compliance with jurisdictional rules and laws. Additionally, law enforcement agencies should ensure that the evidence and its extracted DNA is returned to the agency or their local or state crime laboratory and preserved in accordance with applicable rules and laws regarding evidence retention and storage.

Cost, Time & Funding

Q: How much does FIGG generally cost?

A: The initial cost depends on the needs of the case but typically is between \$5,000 and \$12,000 for a single-sample case.

Q: What factors affect the cost?

A: Cost can be impacted by the quality of the DNA sample, the number of DNA samples analyzed, the type of SNP testing conducted, uploading fees to the public DNA databases, the amount of shared DNA with potential relatives, and the closeness of the family matches and hours of genealogy work. If the initial FIGG work does not yield an actionable investigative lead, more funds may be needed to support additional monitoring and/or sample testing.

Q: How long does FIGG testing take?

A: Timeframes vary greatly and should be discussed with potential vendor laboratories. Illinois agencies that have used FIGG estimated it took between one month and one year for results, with some still pending.

Q: What opportunities exist for assistance in funding FIGG?

A: The following list is a starting point for potential funding opportunities:

- **Federal Grants:** Bureau of Justice Assistance (BJA), Department of Justice (DOJ), National Institute of Justice (NIJ)
- **Federal Agencies:** Federal Bureau of Investigation (regional FIGG units)
- **State/local Agencies:** Cold case units, victim advocacy funds
- **Nonprofit:** These organizations work to reduce or cover the costs of FIGG for agencies, through donations, crowdsourcing or other means. Their criteria vary and agencies should understand the terms of use and privacy policies and strongly consider non-disclosure agreements.



Q: What nonprofits provide funding assistance for FIGG?

A: Several nonprofit organizations provide funding assistance, resources, or subsidized services to support FIGG investigations, especially for cold cases and UHR. An organization's services and privacy policies should be thoroughly reviewed before accepting assistance. Two examples include:

- **DNA Doe Project (dnadoeproject.org)**- Focuses on resolving UHR using FIGG.
- **Season of Justice (seasonofjustice.org)**- Provides grants to law enforcement agencies and nonprofits for cold case investigations.

Resources

The following is a non-exhaustive list of additional resources related to FIGG for law enforcement agencies:

DOJ Interim Policy on Forensic Genetic Genealogical DNA Analysis and Searching

- Available at: <https://www.justice.gov/olp/page/file/1204386/dl>

National Institute of Justice (NIJ) Resources

- National Center on Forensics offers recorded online webinars on FIGG-related topics including DNA 101, Use of Forensic Anthropology and Genetic Genealogy in Investigations, and Advanced Forensic Genetic Genealogy. Available at: <https://nij.ojp.gov/program/national-center-forensics/training>
- Additional FIGG-related NIJ webinars and sponsored articles available at: <https://nij.ojp.gov/taxonomy/term/forensic-investigative-genetic-genealogy>

National Technology Validation and Implementation Collaborative (NTVIC)

- NTVIC publications, positions, public comments, and national presentations and links to publications and policies shared with NTVIC.
- Available at: <https://sites.google.com/view/ntvic/home>

Consortium of Forensic Science Organizations (CFSO)

- June 2023 publication entitled "Forensic Investigative Genetic Genealogy" provides summary of FIGG-related topics. Available at: https://efaidnbmnnnibpcajpcgglefindmkaj/https://thecfso.org/wp-content/uploads/2023/06/FIGG_FINAL.pdf

For more resources and information about the Illinois Forensic Science Commission, visit:

<https://isp.illinois.gov/Forensics/ForensicScienceCommission>