



INDIANA STATE POLICE LABORATORY DIVISION

PHYSICAL EVIDENCE

BULLETIN

FORENSIC GENETIC GENEALOGY

INTRODUCTION:

Forensic Genetic Genealogy (FGG) is an investigative technique that may generate leads in unsolved crimes when DNA from the putative perpetrator is present but remains unidentified. In order to perform FGG, the unknown crime scene sample must be re-analyzed to obtain Single Nucleotide Polymorphism (SNP) DNA data, a technology not available at the Indiana State Police Laboratory Division (ISP Laboratory). FGG may provide information leading to the perpetrator when that individual's profile is not in the Combined DNA Index System (CODIS) or searchable public DNA databases that may be used for genealogy purposes.

The SNP DNA data can be searched in public DNA databases, which allow searches by law enforcement (LE) agencies, in the hopes of identifying biological relatives of the individual that left the DNA at the crime scene. Traditional genealogy techniques are then utilized to build the family trees of those relatives, which can then lead to the possible suspect in the case. FGG can also be utilized for the identification of unidentified human remains.

I. SNP ANALYSIS

- A. Re-analysis of the sample(s) utilizing SNP technology performed by a vendor laboratory is required. Funding for SNP analysis is the responsibility of the submitting agency.
- B. The ISP Laboratory maintains a list of known vendor laboratories that provide SNP analysis and will share this resource upon request. The list is not an endorsement of the vendor laboratories and the ISP Laboratory does not guarantee the quality of the work performed by the vendor. It is the responsibility of the submitting agency to research the vendor laboratories and to select the one to be used.
- C. ISP Laboratory Biology Forensic Scientists can assist in determining if a case is suitable for SNP analysis and if there is sufficient sample of good quality remaining for testing. Re-analysis of the sample may require additional DNA extractions to be done, which may be able to be performed by the ISP Laboratory, prior to sending the sample to the vendor laboratory for SNP analysis.
- D. ISP Laboratory Biology Forensic Scientists can assist the agency with preparing the sample for shipment and answering questions regarding the sample and the analysis process.

II. SEARCHING

- A. SNP DNA data from the person of interest can be uploaded to third party databases and compared to individuals from around the world who have voluntarily uploaded their own SNP DNA data.
- B. The closer related two people are, the more DNA they will share. Database searches identify shared DNA segments and produce lists of potential relatives. Search results show how much DNA they have in common with the person of interest, which indicates a range of how close that relationship may be (e.g. 3rd cousin).
- C. Potential relatives that share DNA segments with others from the list can be used as a starting point in looking for a Most Recent Common Ancestor between those individuals and the person of interest.
- D. Public or direct-to-consumer databases, such as GEDmatch or Family Tree DNA, may be available for searching by LE. Not all direct-to-consumer databases allow searching of crime scene profiles by LE. Please contact the ISP Laboratory for a list of current databases that allow access.
- E. Database user agreements and forensic bodies, such as Department of Justice (DOJ), American Society of Crime Laboratory Directors (ASCLD), and others, recommend that LE searches should only be done for violent crimes (e.g. homicides and sexual assaults) or unidentified human remains cases. Database user agreements should be reviewed to verify the types of crime allowed to be searched prior to upload.

III. GENEALOGY

- A. Traditional genealogy techniques utilizing public records (e.g. birth, death, and census records) are used to build family trees for the potential relatives identified in the database search. This work should be performed by a professional genealogist. Funding for genealogy services is the responsibility of the submitting agency.
- B. The ISP Laboratory maintains a list of known professional genealogists who provide FGG services and will share this resource upon request. The list is not an endorsement of the professional genealogist and the ISP Laboratory does not guarantee the quality of their work. It is the responsibility of the submitting agency to research the professional genealogists and to select who will perform the genealogy work.
- C. The privacy of all potential relatives identified in the FGG process must be respected.
 - 1) Potential relatives should only be contacted if it is deemed necessary to further the investigation and their names should not be released publicly.
 - 2) SNP DNA profiles from other potential relatives may need to be developed to aid in building additional lineages in the family tree. If DNA samples from these individuals are needed, database user agreements and forensic bodies, such as DOJ, ASCLD, and others, recommend that these samples should be voluntarily obtained with a documented informed consent.
- D. Individuals in the family tree that have the genetically predicted relationships to the potential relatives identified in the database search might be the source of the crime scene sample. These are further narrowed down using criteria such as age,

whereabouts, and other investigatory information to produce a small number of potential persons of interest.

IV. CONFIRMATION

- A. Any names identified by the use of FGG must be treated like any other investigative lead. After traditional police investigation, if the agency chooses to pursue any of the potential suspects developed by FGG, a new DNA sample must be obtained from the person of interest for direct comparison to the evidence profile via the normal DNA analysis process by the ISP Laboratory.
- B. The forensic DNA comparison can be completed with an evidentiary standard or secondary standard. See ISP Laboratory's *Physical Evidence Bulletin (PEB) - 17 DNA** for details.
- C. If the sample is from unidentified human remains or if the person of interest is no longer living, a forensic relationship comparison to a close relative (i.e. parent, child, or sibling) may be completed by the ISP Laboratory to confirm identity. See ISP Laboratory's *PEB-21 Missing Persons-Unidentified Human Remains** for details.

* PEBs are available at the ISP Regional Laboratories or on the ISP Laboratory's [website](#).

V. POINTS FOR CONSIDERATION

- A. Not all forensic DNA samples are appropriate for SNP analysis. Trace amounts of DNA and complex mixtures are unlikely to produce useable results. Consult with the ISP Laboratory about specific case sample(s).
- B. FGG can be an expensive and time consuming process.
 - 1) All other reasonable leads and types of forensic testing should be exhausted prior to initiating FGG.
 - 2) A commitment from the prosecuting agency is recommended to ensure the case will move forward if a suspect is identified using FGG.

VI. CONTACT INFORMATION

For more information, please contact the Biology Section of the ISP Regional Laboratory in your area with any questions at the following numbers.

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| Evansville | (800) 852-3970 |
| Fort Wayne | (800) 552-0976 |
| Indianapolis | (866) 855-2840 |
| Lowell | (877) 874-0009 |

ISP Regional Laboratory hours are 8:00 a.m. to 4:30 p.m.; Monday through Friday.