W05 Forensic Genetic Genealogy (FGG): Practical Aspects of Implementation for Law Enforcement and Criminalists

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Learning Overview: After attending this workshop, attendees will have foundational understanding and experiential knowledge of FGG, also known as Investigative Genetic Genealogy (IGG). Unlike other workshops on the subject, this workshop will provide insight into end-to-end practical decision-making that law enforcement and criminalists face from before a sample enters the FGG pipeline through the final genealogical identification process. Topics covered will include: (1) the organization of an FGG unit, including the development of Memorandas of Understanding (MOUs) and criteria for case selection; (2) Single Nucleotide Polymorphism (SNP) data generation technologies and how the choice of which technology to use is influenced by the quality and quantity of the DNA sample available; (3) the impact that quality and quantity have on workflow decision-making and data-driven checkpoints; (4) a live training session using genealogy tools with sample data; and (5) a template for studies that are critical to the development of standard operating procedures and interpretation guidelines. As part of the training session, this workshop will provide insight into how to evaluate data and interpret results and will familiarize attendees with the features, capabilities, and limitations associated with databases such as GEDmatch, as well as look at what new or advanced tools are on the horizon.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing experienced insight and guidance on the implementation of FGG for criminal investigations. Practical recommendations will be presented on the construction of an end-to-end FGG workflow, along with suggestions on how it may eventually be incorporated into a well-established Combined DNA Index System (CODIS) pipeline.

This workshop draws together a multi-disciplinary panel of law enforcement personnel, genealogists, and criminalistics experts who deconstruct the implementation of an FGG (a.k.a. IGG) pipeline and provides attendees with a blueprint for how they can operationalize an end-to-end FGG workflow to generate investigative leads and conduct confirmatory testing. Although FGG has provided closure for more than 200 cold and contemporary cases, law enforcement agencies, the legal community, and criminalistics labs still have questions around the incorporation of kinship Single Nucleotide Polymorphism (SNP) analyses and genetic genealogy databases within an infrastructure of well-established forensic Short Tandem Repeat (STR) analyses and databases such as the Combined DNA Index System (CODIS). Forensic typing methods such as Capillary Electrophoresis (CE) and Next Generation Sequencing (NGS) are well defined; whether a sample is eligible for CODIS upload is made based on protocol. With the advent of FGG, however, the decision-making process is more complex. The technology required to generate a genetic genealogy SNP profile, whether by whole genome sequencing, microarray, or targeted NGS, is currently in the hands of private labs, not-for-profit labs, and genetic genealogy companies. Decisions on whether a sample could or should be used for FGG analysis are based on emerging sample quantity and quality guidelines, such as those stated in the Department of Justice (DOJ) Interim Policy on Forensic Genetic Genealogy, that are not always understood by law enforcement and legal authorities, even with input from those labs and companies. The goal of this workshop is to provide law enforcement and criminalists alike a deeper insight and practical know-how that will enable them to exploit this game-changing technology to enable the most responsible and effective generation of investigative intelligence.

Genealogy, GEDmatch, SNPs