W20 Genetic Genealogy: Science, Law, and Ethics

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Learning Overview: After attending this workshop, attendees will have a better understanding of how genetic genealogy works, how it is used by law enforcement, its admissibility in court, and the ethics of using personal DNA data of relatives to solve crimes.

Impact on the Forensic Science Community: This workshop will impact the forensic science community by providing a clear understanding of the use of genetic genealogy to solve crimes and to better equip forensic scientists to appreciate the legal and ethical issues that it presents.

Since the identification and arrest of the suspect in the "Golden State Killer" investigation in early 2018, using novel DNA and genealogy tools, dozens of law enforcement investigators in North America have effectively used such methods in high-profile cold cases. A combination of advanced DNA methods, using thousands of Single Nucleotide Polymorphisms (SNPs) along with searching of ancestry databases has allowed genealogists to assist investigators in identifying possible persons of interest as suspects in unsolved crimes. These tools have significantly changed the face of genealogic searching and those changes now offer new investigative methods of crime solving.

Several DNA-based public genealogy databases can be searched for even distant relatives of those who leave crime scene DNA evidence, regardless of whether their profile is in a law enforcement database such as the Combined DNA Index System (CODIS). Investigators can submit the raw data files from the crime scene DNA profile to one of these new genealogy databases to help identify individuals who could be biological relatives of the person who left the evidence. While the suspect may not be in CODIS and have never submitted their DNA to any ancestry company, the DNA of relatives who submitted their own data for genealogy search purposes can lead police to a range of possible persons of interest. Confirmatory Short Tandem Repeat (STR) testing is then needed before any arrest is made.

This workshop includes a description of the DNA technology used, the database search process itself, and the methods of genealogy searching from expert leaders in those fields. The results of DNA-based genealogy searching still require careful data analysis and follow-up investigation by police to further narrow the range of possible persons of interest based on age, locale, and other factors associated with the crime. Law enforcement officials will describe how police investigators follow up on the possible suspect(s) generated by the genealogical research to obtain a current DNA specimen upon which to seek a warrant. The entire process may raise potential issues under the 4th Amendment, particularly considering the recent *Carpenter* United States Supreme Court opinions, as well as online privacy laws. These admissibility issues will be presented from both the prosecution and defense perspectives. There are also significant ethical questions presented by this process and those will be discussed by biomedical experts, particularly considering recent actions seeking to expand the "informed consent" for DNA contributors or even to legislatively prohibit the use of genetic genealogy to solve crimes.

Genetic Genealogy, DNA Genealogy, Genealogy Crime Solving

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