

The Promise and Challenges of Genetic Genealogy: Select Case Studies

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In the months since the arrest of the suspected Golden State Killer, individuals in over a dozen serious crimes and unidentified victim cases have been identified using genetic genealogy, bringing over 200 years of investigations to a conclusion. The methods employed are revolutionizing forensic investigations by generating highly informative leads as to the possible identity of an unknown victim or offender. First, genome-wide autosomal SNP data are generated from forensic DNA and uploaded to a public database of consenting participants. Algorithms compare the data to individuals in the database to find those who share significant amounts of DNA with the unknown subject. These genetic matches serve as clues to inform traditional genealogy research: first, family trees of the matches are constructed back to the set of possible common ancestors using online genealogy databases, newspaper archives, public family trees, obituaries, and other public records, after which descendency research is employed to enumerate the possible identities of the unknown subject. Other information, such as age, location, triangulation between matches, and/or ancestry and phenotype, can then be used to narrow down the possibilities.

Each case is different depending on the number and types of matches, the amount of information available about the matches and the informativeness of the ancestry and phenotype predictions. Having assisted law enforcement with dozens of cases, the presenter and her team have encountered and overcome a wide range of obstacles during their genetic genealogy investigations, ranging from misattributed parentage and adoption to immigration and a lack of public records. This talk will illustrate the wide range of genetic genealogy cases by describing several distinct cases in detail, the challenges that arose during the course of each investigation, and how the case was ultimately resolved.