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The Golden State Killer investigation and the nascent field of forensic genealogy

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HIGHLIGHTS

- Putative genetic analysis steps taken to identify suspect in Golden State Killer investigation discussed
- Initial and limited use of citizen science community-led genetic databases for criminal investigations reviewed
- Limitations of the reliability of such tests to identify members of distant kinships are assessed in the light of previous suspect hits and misses
- The contrasts between investigative intelligence and normal forensic identification through DNA profiling are highlighted

Abstract

The likely genetic analysis steps taken to identify suspect Joseph DeAngelo in the recently resolved Golden State Killer investigation are discussed. The consequences for the forensic genetics community of introducing much more detailed SNP analysis regimes, as used by the Golden State Killer investigators, are reviewed along with some of the limitations in accuracy and sensitivity that may be involved in such approaches.

Keywords: *Genetic genealogy; DTC genetic testing; GEDmatch; Criminal investigative practice; SNPs*

As a long-standing advocate of the application of genomics to forensic DNA analysis, I followed news reports of the successful detection of the Golden State Killer with increasing interest. Much of the press coverage centered on the ethical issues raised by certain actions taken by the investigators to identify Joseph DeAngelo, namely: surreptitious sample collection; accessing the community-sourced GEDmatch database to detect a criminal suspect – a “citizen science” website originally established to help reunite kinship members or adoptees with their biological parents; and passing off the variant data obtained using DNA from a preserved rape kit from the 80’s, as a personal genome report. The companion commentary by Denise Syndercombe Court discusses these and other ethical aspects to the case. Here I will review the genetics involved (as far as this is possible to discern from often scant or inaccurate reportage), and the consequences of the analyses made by the Golden State Killer investigation, herein GSKI, for forensic DNA analysis and investigative practice in the future.

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