

'Touch' DNA & DNA Databases

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Many criminal cases have come to rely on the use of DNA evidence. That is, in instances where there is a usable DNA sample. But, an expanded set of capabilities has been developed in more recent years that allows for a much greater chance that DNA evidence can be collected and used.

"Touch DNA"

Touch DNA, also known as Trace DNA, is a forensic method for analyzing DNA. The analysis only requires seven or eight cells from the outermost layer of human skin.¹ The method has been around for some time; having been used in 2008 to rule out the family and another suspect in the famous 1996 murder case of JonBenet Ramsey. But, the approach has more commonly been used by defense teams to illuminate suspects due to the higher risk of false positives.

More recently, advancements in the methodology have begun to take a front seat in efforts to identify suspects and take on greater weight in suggesting guilt. A non-profit group based in Salt Lake City called Intermountain Forensics is at the forefront of pioneering what Lab Director Danny Hellwig calls "the most novel and cutting edge techniques".² Intermountain Forensics is focused on solving cold cases by extracting "touch DNA" from objects or articles of clothing that could not previously be extracted.

A Pennsylvania news station reported last week about a 33-year old cold case in which investigators are working with Intermountain Forensics, having sent them items used in the crime and swabs from other objects.³

Use of DNA Databases & Forensic Genealogy

As with the 33-year old Pennsylvania case, it can be a real challenge when there are no suspects. This is where firms like Virginia-based Innovative Forensic Investigations can help.⁴ Once the results are completed in at Intermountain's lab in Utah, IFI picks up the investigation with the use of several public DNA databases.

IFI's Jennifer Moore is a Forensic Genealogist who has been conducting forensic genealogy investigations since 2014, solving more than 1,000 unknown parentage cases.⁵ But, with the attention brought to these techniques with some high profile cases, including the capture of the Golden State Killer in 2018, IFI has found strong demand for their services in solving crimes. The field is known as investigative genetic genealogy (IGG).

¹ What is touch DNA?. Scientific American. August 8, 2008. Available at:

<https://www.scientificamerican.com/article/experts-touch-dna-jonbenet-ramsey/>. Accessed on May 6, 2022.

² Farris, Jaccli. The Science of Justice: New technology giving Lehigh Valley murder case new momentum. WFMZ-TV 69 News. May 5, 2022. Available at: https://www.wfmz.com/news/area/lehighvalley/the-science-of-justice-new-technology-giving-lehigh-valley-murder-case-new-momentum/article_b3961918-cc9c-11ec-ae63-e3a96bf9ef4e.html. Accessed on May 6, 2022.

³ Ibid.

⁴ see Innovative Forensic Investigations Website. Available at: <https://innovativeforensic.com/>. Accessed on May 6, 2022.

⁵ Farris, op. cit.

Going Forward

We have come a long way from the early days of DNA evidence in criminal cases. Key among the changes are the means of collecting viable DNA samples and the ability to use this DNA to proactively identify suspects with the use of public databases. Together, these factors have and continue to significantly expand the viable use of DNA evidence in criminal cases.

To the extent that Touch DNA technology has been disputed in the past, the technology is much developed from the early days and appears on track to be viewed in much the same way as traditionally collected DNA samples.

The use of public DNA databases is seen by many as controversial, and raises privacy concerns around the 4th Amendment, which protects our right to be secure in our person and property. How could there be such public databases.

Well, some of these databases include direct to consumer companies, such as 23andMe. Consumers provide these companies with DNA samples as part of a service to investigate and learn more about their own genealogy. But, 23andMe and other do not promise complete protection of user data. The 23andMe privacy policy states that “23andMe will preserve and disclose any and all information to law enforcement agencies or others if required to do so by law or in the good faith belief that such preservation or disclosure is reasonably necessary to...comply with legal or regulatory process”.⁶

There has been some pushback from consumers of these services, as with another company called FamilyTreeDNA, but the response of companies to date has largely been to promise greater transparency regarding their policies.

For other public databases like GEDMatch, users voluntarily upload their profiles to the database and forfeit their privacy. As such, there are no privacy protections that can be expected. That is, until GEDMatch received pushback from users and then changed their terms of service to require individuals to opt into the use of their profiles by third parties. This has reduced the size and scope of the database.

As we have seen with companies like Facebook and Google, controversies flare up from time to time regarding data privacy. Genealogy databases appear no different. But, there remains a great deal of usable information out there for use by investigators. And, it is not necessary for a suspect’s specific DNA to be present in these searches with the use of identity-by-descent (IBD) segments of DNA that indicate shared ancestors. This already allows for a 90 percent chance of identifying at least a third cousin of any American.⁷ That can often be enough to narrow down the suspect pool if not identify the suspect outright.

No matter what a person does to protect your personal data, with DNA we have to think in terms of what others are doing with their data. If “Touch DNA” can be collected years after the fact and implicate someone in a crime, we must think of the privacy implications – but also about whether or not

⁶ see Privacy Highlights. 23and Me Website. Last Updated February 3, 2022. Available at: <https://www.23andme.com/about/privacy/> Accessed on May 6, 2022.

⁷ Khan, Razib and David Mittelman. Consumer genomics will change your life, whether you get tested or not. Genome Biology. Vol. 19. August 20, 2018. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6100720/> Accessed on May 6, 2022.

the presence of such small amounts of these DNA has anything to do with a given crime. These advancements are tremendous. So are our responsibilities to pair this evidence with all else that is needed to prove guilt beyond a reasonable doubt.