INVESTIGATIVE GENETIC GENEALOGY

Investigative Genetic Genealogy (IGG) has transformed the ability to identify unknown individuals, providing answers in over 1300 cases since 2018. Its value extends far beyond identifying perpetrators: IGG is equally vital for giving names back to unidentified human remains, thus restoring dignity to victims and providing closure for families.

A key conceptual difference separates IGG from traditional forensic genetics. Forensic laboratories typically use VNTR/STR panels, optimized for direct individual identification and CODIS-style database matching. IGG instead relies on dense SNP genotyping arrays, because only SNP data are compatible with genealogical databases used for long-range kinship inference.

The reason is fundamental: SNP profiles allow detection of segments of DNA identical by descent (IBD) shared between the unknown individual and genetic cousins who have voluntarily uploaded their data to platforms such as FamilyTreeDNA, GEDmatch Pro, or DNA Justice. By quantifying and mapping these IBD segments, IGG practitioners can infer degrees of relatedness and progressively restrict the search to specific families that share common ancestors with the unknown subject. Through genealogical reconstruction, integrating public records, family histories, and demographic information, these families are narrowed down to a small set of potential individuals, who are then confirmed or excluded using traditional forensic methods.

By combining long-range IBD-based kinship signals with classical genealogy, IGG reduces the need for broad investigative sweeps and offers a less invasive, yet far more powerful, approach to resolving cold cases. In doing so, it advances both justice and humanitarian identification efforts.

This is the topic of the article by D. Gurney (1).

1. https://www.ncbi.nlm.nih.gov/pubmed/41365744