

Ancestry testing is a form of direct-to-consumer genetic testing designed to inform customers about their genetic ancestry. There are generally three types of ancestry testing: Y chromosome testing, mitochondrial DNA testing, and autosomal DNA testing.

If a person did all three ancestry tests, what types of information could they learn about their genetic ancestry and how does this genetic ancestry information compare and contrast with their cultural heritage (family traditions, etc.)?

In forensic genetics the most effective way of individual identification and ancestry inferences is the Single nucleotide polymorphism (SNP) profiling. A SNP panel was established by this study for the simultaneous individual identification and ancestry assignment of

Caucasian, four East and Southeast Asian populations.

Genetic Ancestry Tests (GATs) operate by assaying variations in an individual's DNA, using a statistical algorithm and comparing them to reference databases of samples from diverse populations around the world, and then to make inferences about the individual's ancestry based on specific links between them.

It is estimated that more than 25 million people across the world have undergone genetic ancestry testing by direct-to-consumer (DTC) companies since it has become available. If a person decided to get tested it would provide vital information about the person's ancestors. They could provide information about an individual's ancestral roots, and can help them to perhaps connect with their relatives, sometimes as distantly related as fourth or fifth cousins. This type of information can be vital if a person does not know their genealogical ancestry, for example many adoptees and the descendants of forced migrants.

Ancestry testing can be done in three ways. The first two are more traditional: the mitochondrial DNA testing, which is transmitted only by females and can reflect the line origin of maternal ancestors and the Y chromosome DNA testing which is transmitted only from father to son and can reflect the line origin of paternal ancestors. The third option, as said in an article from the Department of Human Genetics written by Lynn B. Jorde : "Although a more comprehensive assessment that can be conducted by assaying a half million or more autosomal variants (single-nucleotide variants - SNVs), formerly known as single-nucleotide polymorphisms (SNPs), which are from both parents. Most commonly these SNVs are assayed using DNA microarray, but DNA sequence data can be used as well. For autosomal testing, it is usual to portray the most likely geographic origin of a group of SNVs located within a chromosome segment. By counting the percentage of SNVs originating from each geographic region, the percentage of an individual's ancestry derived from each region can be estimated."

All three of these methods have interpretive value in both clinical and research situations and can provide a more personalized approach to a customer's genetic heritage than do broad categories like race or ethnicity. It all depends on what the person is trying to find out.

In conclusion, genetic ancestry testing can present a person with insights on the geographic origin of their ancestors, along with some information that can aid in determining the height of risk for some heritable conditions. It's the most modern way of discovering our past, present but also the future, and the best way of finding our place on the planet.

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Literature:

Forensic DNA Typing, by John M. Butler, 2005. published by Elsevier/Academic Press