

Using DNA Testing for Genealogical Research

Genetic genealogy is the use of a combination of DNA testing and traditional genealogy research to infer relationships between individuals.

Genetic genealogy began as a tool for historical and forensic research. Examples – DNA used to verify lineage using the remains of the Romanov family; used to verify the genetic descendent connection between Thomas Jefferson and the son of Sally Hemings and by inference to Sally Hemings.

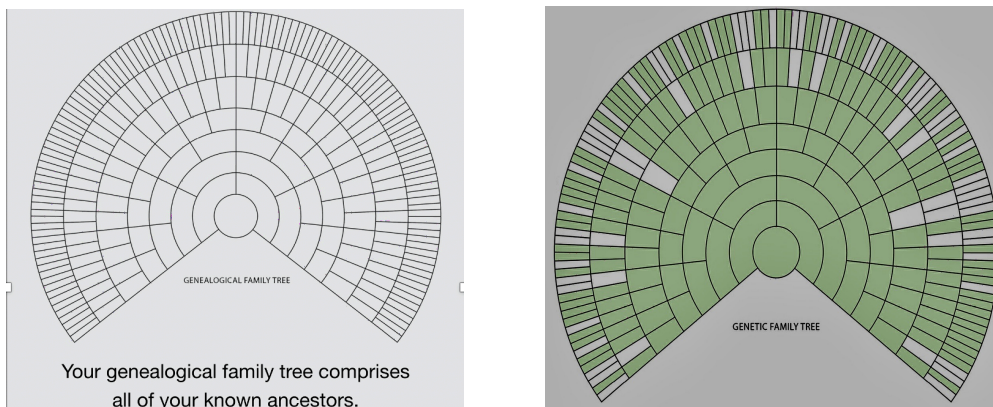
Use of DNA testing for genealogical research began in the late 1900s with the implementation of testing by some genealogy service providers.

Ancestry DNA testing was launched in 2002. Ancestry integrated DNA testing and family tree data in 2007. As of 2020, over 16 million DNA tests are in Ancestry's database. AncestryDNA uses autosomal testing, and works for all test takers, with results not limited by gender.

DNA Testing can be used to confirm or correct family tree information, find new relatives and connections, find separated family members, learn about family ethnic origins over time, combine data from DNA and genealogical research to improve conclusions, and contribute to research combining human traits with specific DNA patterns.

Family Trees before DNA (Genealogical Family Tree) were based on known ancestors, e.g. parents, grandparents, great grandparents, etc. Theoretically every cell in a Genealogical Family Tree could be filled, although research limitations typically lead to some unknown ancestors.

Family Trees prepared using DNA connections can only include ancestors who contribute to your DNA. This includes parents plus biological grandparents, great grandparents, etc. Every generation receives roughly 50% of the DNA from the prior generation. Thus, DNA match likelihood for any specific ancestor decreases with each prior generation.



Source: The Family Tree Guide to DNA Testing and Genetic Genealogy, Blaine T. Bettinger, 2016.

Genetic Exceptionalism

Do the results of DNA testing require higher levels of protection than other genealogical data?

Concern that DNA can reveal information about the test taker's relatives and ancestors

In general, DNA results reveal similar information to that found in other genealogical records

Health records could be considered a separate case

This concern reinforces the need to think about how you would handle ethical unexpected matches or discoveries from DNA research

Four types of DNA Testing –

There are 23 sets of chromosomes in cell nuclei. 22 are non-sex chromosomes. The 23rd set is from sex chromosomes (X-DNA and Y-DNA)

Mitochondrial DNA (mtDNA) – Energy factor

Only type of DNA not found in cell's nucleus

Passed exclusively from mother to child, revealing info about direct maternal (umbilical) line

Autosomal DNA (atDNA) used by AncestryDNA

Twenty-two pairs of non-sex chromosomes found in cell nucleus

One set of 22 chromosomes comes from mother, one set from father

Autosomal DNA contributed in decreasing percentages by generation

About 50% of DNA from each parent

25% from each grandparent

12.5% from each great grandparent, etc.

These are approximate percentages, actual percentages vary

Y-chromosomal DNA (Y-DNA)

Y chromosome only in male DNA

Y chromosome passed from father to son

X-chromosomal DNA (X-DNA) – one of two sex chromosomes

Women have two X chromosomes

Men have one X chromosome

Reveals info about maternal lines for men, both parent lines for women

Unexpected results

May learn of unknown siblings, cousins etc. not previously revealed by family members

May not be able to confirm known relationship

May help adoptees find family lines or family history

AncestryDNA

Current price \$89 (\$99 list) but often discounted further in December

Best information obtained if you have loaded a family tree with known direct ancestors

Tree can be set to public or private

DNA matches displayed in decreasing order by Centimorgans (closest match first)

Multiple search options

ThruLines used to establish relationship paths that you share with your DNA matches

Will not work without family tree on file (public or private)

Centimorgans

A centimorgan is a unit of genetic measurement. It's what experts use to describe how much DNA and the length of specific segments of DNA you share with your relatives. These shared segments are divided up into centimorgans. The more centimorgans you share with someone, the more closely you are related.

Source: Family Search Terms Website.

www.familysearch.org/blog/en/centimorgan-chart-understanding-dna/

Suggestions for Using AncestryDNA

Link your DNA data to a tree that includes your direct ancestors (may be private)

Consider using groups to sort your matches by family category e.g. maternal/paternal line matches

Have and use a DNA reference source, either book or web

Help other researchers if you can

Avoid sharing information that may cause embarrassment or surprise to your family

Use **ThruLines** to view DNA matches based on a specific ancestor

References:

The Family Tree Guide to DNA Testing and Genetic Genealogy, Blaine T. Bettinger, 2016.

AncestryDNA Learning Hub - <https://www.ancestry.com/dna/lp/learning-hub>

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Ancestry and DNA Testing

January 20, 2021