

Considering Genetic Testing? How to get started and what to think about first
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What is Genetic Genealogy?

Genetic genealogy uses DNA test results to *supplement* traditional genealogy and research. The test results are those an individual has obtained from a commercial company (Ancestry, 23 and Me, MyHeritage, FamilytreeDNA, etc.).

Why test?

The International Society of Genetic Genealogy (ISOGG by [GNU Free Documentation Licence](#)) notes that a DNA match with an individual has the potential to:

- verify existing research
- establish that two surname variants are related
- provide locations for further genealogical research
- help determine the ancestral homeland
- discover living relatives
- confirm or deny suspected connections between families
- prove or disprove theories regarding ancestry

How is testing done?

A saliva sample (“spit kit”) or mouth swab, depending upon where you are testing, is used to get a sample to sequence a subset of an individual’s DNA. In admixture and genetic genealogy testing this involves looking at SNPs or single nucleotide polymorphisms. A SNP is a change in a base pair that may differ from one person to another. In autosomal DNA testing the SNPs that are evaluated are generally in non-coding DNA. A human’s 20,000 coding DNA segments (genes) are interspaced with huge amounts of non-coding DNA. Unlike our genes, non-coding DNA segments may be variable from person to person without any impact, and this variability is the foundation for admixture and genetic genealogy testing.

Types of testing:

Mitochondrial DNA: to look at mom’s mom’s mom’s, etc. line

Y DNA: to look at the Y chromosome or surname line, dad’s dad’s dad’s, etc. Only men

can do this test (although you can get a male in the Y line to test to get you this information)

Autosomal DNA: the main tool for genealogy. This usually evaluates nuclear DNA from your 22 autosomes (non- sex chromosomes). Some companies look at the X chromosome as well. This is what we'll talk about today, as it is the most helpful for genealogical research and covers ALL our family lines.

What can I expect from testing?

Have reasonable expectations. Testing will not “do” your family tree for you, it instead is used in combination with traditional genealogy. Autosomal testing rarely can answer questions that involve an ancestor further back than a 4th great grandparent or 5th cousin. The testing company will provide some tools to try to figure things out, but you'll usually benefit by further study- don't worry it's fun and easy with some of the resources below. Some questions can only be answered by reaching out to your matches (who may, or may not, respond to your email).

Be prepared for possible surprises in your tree and take this into account before deciding to test. Up to 5% of direct-to-consumer DNA test takers discover an unexpected biological father or mother. Prior studies investigating the consequences of a non-paternity event found that individuals reported feelings of profound grief and loss, along with a destabilization of identity. Since our trees involve many relationships, a far greater percentage of DNA test takers may stumble across unexpected changes in their trees- a grandparent who doesn't “fit” the tree, an unexpected half-sibling or half-aunt/uncle, undisclosed adoption, child conceived by donor sperm (or, in this era, egg or embryo).

Deciding to test:

Once someone has decided testing is for them- and I'd suggest considering the benefits and pitfalls in detail (after reading the privacy statements on the site you chose to test at)- put some consideration into how private or open you want your information to be. You have options with your own information, but for living relatives you either need their explicit permission to share their details or need to anonymize. I'd advise anonymizing regardless initially, you can always be more revealing at a later date.

See Blaine Bettinger's website for a detailed consent for relatives

<https://thegeneticgenealogist.com/2018/02/15/informed-consent-agreement-and-beneficiary-agreement/>

Be sure to read the fine print as you sign-up for testing. Most companies have you “opt-in” but some are “opt-out”. Are you okay with your DNA being used for law enforcement efforts? Are you okay with your de-identified data being used for research? NO company is selling your data, licensing it for any use, cloning, etc.

Who to test?

The further back in your family tree a relative is, the more important it is to test them- they have more DNA in common with your ancestors. Plus, none of us will be here forever- so see if older relatives will test first.

If you can test both your maternal grandparents- there isn't a reason to test your mother and her siblings- you have that DNA information already. Ditto for testing yourself if you were able to test both your parents (and don't have concerns about your parentage that you'd want to address). DNA is our most private information; despite sharing it on the internet, we're still all unique in our DNA. For that reason, my strong opinion is that minors should not be tested (this is backed up by the national genetics and pediatric societies⁰). That being said, most of the testing companies accept minor's samples with a guardian consent.

It may be necessary to ask relatives to test to accomplish certain genealogy goals- finding that lost fourth grandmother, for instance. So, for example, I was able to test my maternal grandmother but not my maternal grandfather. My mother has passed, but I was able to test two of her siblings to get one more DNA-generation back and thus find more of my maternal grandfather's cousins. Since half our DNA "drops-out" each generation, every relative a step further back on the tree adds to our information. Why test two siblings? Siblings each inherit half of their parent's DNA- but it isn't exactly the same half!

Where to test?

Bigger is best! For that reason Ancestry is widely considered the best company to test with. Ancestry and 23 and Me will not accept raw DNA downloads from other companies, they only look at DNA that they received a specimen for. MyHeritage, FamilytreeDNA and Living DNA (in England) will accept downloaded DNA "reads" from other companies for comparison with their database. For downloads you get limited access, but full access is inexpensive (a fraction of the cost of testing from scratch). Thus, the least expensive way to get access to lots of matches is to test at Ancestry and then download to at least MyHeritage. Some testers will be in multiple databases, others will be unique to one (and maybe THE relative you needed to break your brick-wall, or at least dislodge a brick).

23 and Me has some nice features; your autosomal test will include some mitochondrial DNA information (and Y DNA information if you are male). However, they aren't genealogy-focused and your ability to figure out who matches are is impaired. Adoptees who don't manage to find their parents on Ancestry should definitely consider 23 and Me testing, as they have the second largest database.

Ancestry and MyHeritage have the best tools to work with matches and label your findings.

MyHeritage and FamilytreeDNA have swabs to collect samples, which may be easier for the elderly; these companies also let you "see" the DNA segment regions in common

with matches, which is good for science geeks!

Don't pay full price! Look for sales in conjunction with major genealogy conferences (Rootstech), DNA Day (in April), Black Friday, and most holidays.

Admixture/Ethnicity testing (what everyone checks first and the big advertising “hook”)

An assumption is made that the DNA of the **reference** populations —made up of individuals who report their grandparents, for instance, all came from the same area — is the same as the DNA of people who lived in that same area hundreds or thousands of years ago.

Differences between the company admixtures are partially because of how they lump geographic areas and partially because of different reference populations.

In general you should keep in mind that your admixture is:

- An estimate
- An estimate not from historical populations, but instead from a relatively small number of people living today

You should expect your admixture prediction to change (and hopefully improve!) over time. Think about geographic migration patterns to explain some discrepancies.

The relatively new **regional** predictions are from more recent time periods and are more likely to match your known tree.

Admixture is nowhere near as important as the cousin-matching aspects of autosomal DNA testing. However, it can be one way to motivate a relative to provide a sample (since they've seen the ads, no matter how misleading they are).

GOOD LUCK and Happy Hunting:

Some basic reading on genetic genealogy will help you understand your results. I suggest:

https://isogg.org/wiki/Autosomal_DNA_statistics

https://isogg.org/wiki/Identical_by_descent

The above have an amazing assortment of links.

Also, Rootstech videos online cover a broad range of topics, you'll need a familysearch free account to view these. I especially enjoy Beth Taylor's, you might start with:

<https://www.familysearch.org/rootstech/session/dna-and-genealogy-the-basics>