

DNA: the perfect partner to your genealogical research

DNA testing has become an integral part of many people's family history research. Sitting alongside traditional research, DNA can help to find new branches for your tree and to take some lines further back than would otherwise be possible. It can also help to verify ancestral lines already in your tree.

How does it all work? There are three types of DNA tests to consider.

Autosomal DNA

This is the most popular test (and the cheapest) and it is a good test to start with. It will give you matches with both male and female relatives from your maternal and paternal sides of your tree. You are related in some way to each match generally within the last 7-8 generations.

What does an autosomal test give you?

- A list of people you match with and the means to contact them
- An ethnicity estimate showing the geographical location your ancestors could have been from
- The ability to access your raw data to upload to other sites

How does it work?

- Everyone inherits approximately 50% of autosomal DNA from each of their parents.
- When you have a DNA match, you both share a specific portion of DNA and therefore, you must share a common ancestor from whom that portion was inherited.
- The amount of DNA you share with a match indicates what your relationship might be with that person within an expected range.
- Once you have identified your most recent common ancestor with a match, you can add them to your family tree.

Y-DNA

Y-DNA tests your patrilineal line ie. your father's father's father's line. It is passed from father to son, so only males have this chromosome and can take this test. Y-DNA can tell the story of your ancestral path going back centuries. Whilst a female does not inherit Y-DNA, she can still explore this line by asking a suitable relative to test, such as a brother, male cousin or uncle connected through her father's line.

What does a Y-DNA test give you?

- A haplogroup classification and where this haplogroup appears on the Y-DNA [Haplotree](#)
- A list of people you match with and the expected time frame in which you may find your most recent common ancestor. This can be many hundreds or thousands of years ago.
- The story of the ancestral migration of your patrilineal line

How does it work?

- Y-DNA is handed down intact for many generations at a time. However mutations did (and do) occur and it is these that allow Y-DNA testing to define which haplogroup a person belongs to. Mankind can trace its ancestors back to a single group of people living in Africa. From there, members of this group migrated to different areas and unique mutations were developed within each of these separate groups, creating offshoots of the original haplogroup. This continued for many thousands of years. Each new mutation is given a sub-number and, simply put, that is what your haplogroup classification is.
- There are various levels at which you can test your Y-DNA. For example, a Y-37 test will examine 37 markers (or STRs) on the Y chromosome and the Y-111 test will compare a further 74 markers. The most complete test is the Big Y-700, which looks at a minimum of 700 markers.
- Each marker is matched against those of everyone else at that level to generate your matches. The more markers that are tested, the more refined the matching will be.
- The Big Y test examines many more markers as well as SNPs, which are mutations or new branches on the Y-DNA Haplotree. The results from this test will show your unique mutations and provide a block tree which illustrates how your matches fit into this block tree through their unique mutations.
- The Big Y test is not static and your block tree is continually updated as more people test and matching mutations are identified.
- Because Big Y tests are more extensive and include SNPs, your Big-Y haplogroup will be the most recent available. You may find a match that was not apparent at a lower level of testing.

Mitochondrial DNA

Mitochondrial DNA tests your matrilineal line ie. your mother's mother's mother line. It is passed from a mother to her son and her daughter. A male or a female can therefore take a mitochondrial test. Only the female will pass her mt-DNA to the next generation.

What does a mitochondrial test give you?

- A haplogroup classification and where this haplogroup appears on the mt-DNA Haplotree
- A list of people you match with. Your common ancestor with a match can be many hundreds or thousands of years ago.
- The story of the ancestral migration of your matrilineal line (and a personalised explanatory video)

How does it work?

- Mitochondrial DNA works like Y-DNA, where small variations (mutations) occur and are identified to create your mt-DNA haplogroup.
- Mitochondrial DNA is now tested in its entirety but if you test now, you will see results for lower levels of testing so you can compare with anyone who tested at those levels previously.

Where do you do a DNA test?

There are a number of companies offering DNA tests - the following is an overview of some of the bigger ones. Most have sales throughout the year - watch out for them around special family holidays such as Mother's Day.

Remember that you will only see matches within the site you have tested your DNA on, or uploaded your DNA to. To make sure you are not missing out on an important match, make sure you have uploaded your DNA to as many sites as possible. For instructions on how to upload DNA to other sites, see <https://www.nifhs.org/dna/uploading-your-dna/>

- Autosomal tests only
- Doesn't allow uploads of DNA - you have to test directly with them
- No chromosome browser or other advanced tools

23andMe:

- Autosomal tests only
- Doesn't allow uploads of DNA - you have to test directly with them
- Provides a high level haplogroup for Y-DNA and mt-DNA but no match database

MyHeritage:

- Autosomal tests only
- Allows uploads of DNA
- Has advanced tools including a chromosome browser; requires a one-off fee for uploads only

FamilyTreeDNA:

- Y-DNA, mt-DNA and autosomal DNA testing with match databases for all types of test.
- Allows uploads of DNA
- Has advanced tools including a chromosome browser; requires a one-off fee for uploads only
- DNA focussed - not a research site
- Provides DNA Projects connecting you to others with a similar haplogroup, surname or geographical interest for all three types of DNA.

Ethics

Be prepared in case of unexpected results and make sure you interpret results correctly.

- You may find a close relative you were not expecting
- You may find you are not genetically related to a known relative
- Ask for advice if necessary
- If you are asking someone else to take a test for you to manage, discuss these aspects with that person

Privacy

The more information you share, the more chance you have of your matches being able to identify your relationship.

But it's up to you!

- You can list your DNA with an alias
- You can keep your family tree private
- Each site has different privacy levels and conditions - do check

DNA testing is becoming extremely popular and the results can be fascinating.

In particular a marked increase in Y-DNA and mt-DNA testing, along with simplified reporting, means that all testers can now expect to see greatly improved results.

So, what are you waiting for? Give it a go - you may just find that elusive ancestor!