



## DNA TESTING FOR GENEALOGICAL PURPOSES

The Human Genome has 44 Autosomes (in 22 pairs) plus 2 Sex chromosomes.

There are three DNA tests, which which can be taken to aid genealogy: Y-DNA (direct male line), Mitochondrial and Autosomal DNA. The Y-DNA and mitochondrial DNA tests only cover a single branch of the family tree (e.g., Y-DNA can only be tested in males and only covers the direct paternal line: father, father's father, father's father's father, etc. and mitochondrial DNA (direct female line), which can be tested in both males and females, but only covers the direct maternal line: mother, mother's mother, mother's mother's mother, etc.), but autosomal DNA testing (wider spectrum) is the best test as it covers all lines and branches across your family tree and can be tested by anyone.

ALL blood relatives may have some common autosomal which has the potential to follow ALL lines, not just the direct paternal and direct maternal lines. There is a 99% probability of detecting a match via autosomal DNA with 1st and 2nd cousins, 90% for 3rd cousins, 50% with 4th cousins, and 10% with 5th cousins.

Segments of DNA can be carried across multiple generations, and importantly, different siblings and cousins can have inherited different autosomal and X-chromosome DNA segments, even when they definitely share the same common ancestor.

You and your 5th cousin have the same 4th great-grandparents. For you to have a DNA match with that cousin, the same section of DNA would have to be passed down through six generations to both of you. Since DNA recombination is a random process, there may be no common DNA inherited by both of you.

Involve as many relatives as you can as there is a likelihood that a close relative on one side of your family has a DNA match with a distant cousin on the same side of the family, even if you don't have a DNA match.

Testing is now more affordable, possibly under £100 especially if companies are having sales. Autosomal DNA matches are within the genealogy time-frame (generally up to about 5-7 generations back, but sometimes further back, and it can be done in both males and females.. All that's needed is simple a cheek swab or saliva sample, depending on the DNA-testing company.

DNA testing for genealogy purposes is different from tests for either health or legal reasons, so don't have concerns about either of these. The DNA tests done for genealogy purposes do not test for genes but for "markers" that are spaced along the chromosomes between the genes; these are unevenly spaced from each other, with the testing done only at each of these locations, and missing out everything in between. Your whole genome (that is all the DNA on your chromosomes) is not being sequenced, which would be far too expensive, wouldn't be helpful, and the results would be totally unmanageable.

A DNA test can sometimes provide surprising results, which might challenge your sense of ethnic identity, contradict your laborious genealogical research, or reveal unsuspected relationships. Your results may have an impact on your family members as well. You are your own best judge of your ability to handle the unexpected. It is the exception but **before taking a DNA test ask yourself if you really want to know.**

## Why Test?

DNA testing can be used for Paternity, Ancestry and Immigration.

To confirm (or eliminate) relationships, especially when there is a weak or non-existent paper trail, or when dealing with very common names.

To find totally new cousins through DNA matches and exchange information.

To break down "brick walls". DNA testing may help. In fact, adoptees and others looking to find their biological families are having successes even when they don't have any information at all.

To map DNA to specific ancestors (called "chromosome mapping"). Once you have a DNA match and have worked out who the common ancestor is, you then both know that this matching segment of DNA was inherited directly from this particular ancestor. By doing this for multiple matches (2nd to 4th cousins are particularly useful for this), you can build a map of all of your chromosomes, with various blocks of DNA identified as being from specific grandparents/great-grandparents, and so on. The next step from there is that you know that anyone else matching you over this same area on the chromosome is also related through that same branch on your family tree.

In addition to the above, some people are interested in finding out which world geographical areas their DNA seems to be from, and autosomal DNA testing will give you estimates for that too (These are only estimates but may serve to confirm or otherwise a family rumour.).

## Privacy Concerns

Firstly, your DNA results aren't posted anywhere for someone to find you or have access to them. If the company identifies you as a match to someone else for autosomal DNA, at most all that is shown (and only to your match) is to identify the one or more areas where your DNA overlaps with a suggested relationship ie. 2<sup>nd</sup> - 4<sup>th</sup> Cousin, or 5<sup>th</sup> - 8<sup>th</sup> Cousin etc., without actually showing any results. You can have access to the results and would be shown with a pseudonym or by initials.

All the DNA testing companies have privacy and confidentiality policies and they can't share your results with anyone else. DNA testing is covered under the UK's legislation The Human Tissue and Privacy Act (2004)

## Testing Companies & Useful Web Sites

Before purchasing a DNA test, visit the International Society Of Genetic Genealogy ([www.isogg.org](http://www.isogg.org)) which has compiled a DNA testing comparison chart providing background material on the testing companies and their tests on offer. **Autosomal DNA testing** for genetic genealogy purposes is provided by the following five companies: 23andMe ([www.23andme.com](http://www.23andme.com)), AncestryDNA ([www.ancestry.co.uk](http://www.ancestry.co.uk)), MyHeritage ([www.myheritage.com](http://www.myheritage.com)), Family Tree DNA ([www.familytreedna.com](http://www.familytreedna.com)) and the Genographic Project ([www.genographic.nationalgeographic.com](http://www.genographic.nationalgeographic.com)).

Databases are growing all the time for all testing companies and you can upload your raw DNA data to MyHeritage, Family Tree DNA and other sites such as Gedmatch.com ([www.Gedmatch.com](http://www.Gedmatch.com)) and DNAGedcom ([www.DNAGedcom.com](http://www.DNAGedcom.com)).