

DNA - IS THE ANSWER IN YOUR GENES?

DNA is an important new tool which is increasingly being used by genealogists as an aid to research. The test is not a replacement for traditional documentary research, but is used in conjunction with the paper records. A DNA test will determine whether or not two people share a common ancestor within a certain number of generations. DNA can therefore validate your research but it will also go back beyond the paper trail by connecting two people with the same surname who have no proof of a documentary link. The first commercial tests for genealogical purposes became available in 2000, and numerous companies now offer a variety of tests. Today there are over 8,000 surname projects worldwide, and it is highly likely that one of the names you are researching is already represented.

There are two types of DNA test which are used for genealogical purposes: the Y-DNA test and the mitochondrial DNA (mtDNA) test.¹ The Y-DNA test looks at various markers on the Y-chromosome, which is normally passed down through the generations unchanged. Very occasionally an error occurs in the copying process, resulting in a harmless mutation on one of these markers. Scientists have calculated mutation rates for the various markers and, using these statistics, it is possible to compare test results and establish whether two men share a common ancestor within a given time frame. The more matches they have, the more closely related they are. Y-DNA follows the direct paternal line (your father, your father's father, etc) which usually corresponds with the inheritance pattern of surnames. The Y-DNA test is therefore of particular value in surname projects. As women do not inherit the Y-chromosome they cannot take a Y-DNA test, but most women will have a father, brother, uncle or cousin in their family who can take the test in their place.

The mtDNA test looks at specific regions in the mitochondrial DNA, and tracks the direct maternal line (your mother, your mother's mother, etc). Both men and women receive mtDNA from their mothers but only women pass it on to the next generation. The test can therefore be taken either by a man or a woman. The mtDNA test is less useful for genealogical purposes, because the markers mutate at a much slower rate. Furthermore, the surname usually changes with every new generation, making it much more difficult to locate potential testers for comparison purposes.

Finding a Surname Project

A Y-DNA test is of most use when the results are compared with other people of the same or similar surname, and for this reason the tests are usually co-ordinated within surname projects. Family Tree DNA are the market leaders for both Y-DNA and mtDNA testing. They now have over half a million Y-DNA records in their database and they host all the major surname projects. It's worth checking their website to see if your surname is represented. The tests are all priced in dollars, and can be ordered online by credit card. At present it is cheaper to pay in dollars rather than ordering from any of the re-sellers in Europe.

Some surname projects focus on a surname in a specific geographical area; others study a surname on a worldwide basis. There are now over 30 surname projects with more than 500 participants, whereas a newly established project might have just one or two testers. As the main purpose of the test is to compare your results with other people the initial success of your test will therefore depend on the number of people in the surname project and in the FTDNA database. The larger the project the greater the chances of finding a match. If you are joining a new project you will probably have to wait longer for a match. However, every project has to start somewhere – with just one tester. Some surname projects have the facility to subsidise the cost of a test through donations from other researchers or through a family association.

Many surname projects started in America and are gradually recruiting British testers. As the first British tester you might have to wait longer for a meaningful match, in which case you might benefit from recruiting another British tester at the same time, so that there is someone with a proven British paper trail with whom to compare your results. Some American projects even offer a free test for Britons with multi-generation pedigrees.

If there is no project for your surname you will either have to wait until one starts up, or take the plunge and become a project manager yourself. FTDNA provide guidance on setting up a project, and it is worth asking questions on the various DNA mailing lists. The International Society of Genetic Genealogy (ISOGG) has educational material on its website to help with the process.

How Many Markers?

The cost of a DNA test varies according to the number of markers tested. Low resolution tests on 12 markers do not provide enough differentiation, and can give either false positive or false negative results, especially with borderline 10/12 matches. The 37-marker test is now the standard entry-level test, but higher resolution 67-marker and 111-marker tests are also available, and can be useful for specific scenarios. You can always start with a lower resolution test and upgrade at a later date.

Understanding your results

Your Y-DNA test result is presented as a string of numbers representing your genetic signature, which is known as a haplotype. You do not have to be a scientist to understand your results. It is rather like buying a lottery ticket and then checking your numbers to see if you have won a prize. Your DNA "ticket" has a much greater chance of success if people with your surname are already included in the "draw". In simple terms, the more matching markers you share with another tester the more likely you are to be related. With a 37-marker test fathers and sons, brothers, and first and second cousins would normally all have perfect matches on 37/37 markers or, rarely 36/37 markers. Seventh cousins sharing a common ancestor from the 1700s might match on 34 or 35 out of 37 markers. If you have too many mismatches you will not share a common ancestor within a genealogical time frame or, in other words, from the time when surnames were introduced from the 1100s onwards.

Conclusion

Family historians are accustomed to spending small sums of money over long periods of time. In contrast, a DNA test might seem at first like an expensive purchase. It should however be regarded as an investment. The money only has to be paid once, and the value of your investment will continue to grow as more people get tested, and you get more matches. As surname projects increase in size, it is possible to learn about the origins and evolution of a surname. Your DNA test will contribute to these findings and will serve as a legacy benefiting not just you but your children, your grandchildren and future generations to come.

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¹ A third type of DNA test known as an autosomal DNA test became available in 2010.