

Using DNA in Genealogy – SGGEE Convention

by Earl Schultz

Types of DNA Tests:

Y-DNA test can only be done by males and tests the male y-chromosome which is passed only from fathers to sons. This test provides information on the direct male/paternal ancestral line and through the provided haplogroup gives the ancestry back over 100,000 years. The minimum number of markers you should test is 37 but if you are likely to have a lot of matches (common surname or you are testing males known to be related paternally) then go for the 111 marker test.

Mt-DNA is the mitochondrial DNA test which, like the y-DNA test, provides information on the direct female/maternal ancestral line and through the provided haplogroup gives ancestry back to “Eve” in Africa. However, mt-DNA does not mutate very fast and so even a 100% match could result from a common ancestor 20 generations ago. This test has little genealogical value unless you are trying to resolve a problem on your maternal line. Always go for the Full Sequence test because the lesser tests provide little information except for your deep ancestry.

Autosomal DNA test (at-DNA) is the least expensive test and the one most commonly done. It will generally give you 100s of matches with real cousins but because your autosomal DNA comes 50% from each parent it is very difficult to know what ancestral line your common ancestor will be found on. While the other tests can take you back thousands of years, the at-DNA test is generally only good for about 6 generations unless there is intermarriage. By testing 1st and 2nd cousins, etc. you can use the results to figure out which side of your family the common ancestor will be found. If someone’s DNA matches you and your maternal 1st cousin, you know that they are related to you on your mother’s side. Similarly, matches to you and your maternal 2nd cousin will tell you which set of grandparents the common ancestor will be found on.

Where to Test

For genealogical research, there are basically only 3 places to go for DNA tests but only one company does all 3 tests. Ancestry and 23andMe do only autosomal DNA tests. Ancestry has a large genealogical database but until recently they only tested USA residents so their database is USA oriented. 23andMe uses your DNA for medical/health research and many of the people in their database have no interest in genealogy so it can be difficult getting people to provide information on their ancestors. Family Tree DNA is the only organization that does all 3 DNA tests. In addition, they sponsor surname, geographical and haplogroup DNA projects where people with a common surname or from a common area can submit their results for researchers.

Gedmatch.com

No matter which organization you test with, you can transfer your autosomal DNA results to Gedmatch which is a free service. You will find Ancestry, FTDNA and 23andMe testers at this site. Gedmatch allows you to easily do comparisons of smaller DNA segments than the other

companies do. In addition, by using the DNA results of you, your parents and your cousins, you can recreate the DNA that distant ancestors would have had. It is an essential part of using your DNA for genealogical research.

Finding Cousins

The advantage of DNA versus paper documents research is that all your matches are cousins; with paper you never know even if the paper says you are related. The only questions are when and where is the common ancestor. All suppliers of autosomal DNA tests provide estimates of how close the relationship is, eg. 3rd to 5th cousin. Start with the closer cousins, contact them and share information. Compare the match to other known cousins to determine which ancestral line the common ancestor is likely to be on, looking for common DNA segments that would have been inherited from the same ancestor. Once a DNA segment is found to be common between cousins and the ancestral source identified, it can be used to find others descended from the same ancestral line. It can be a long, slow process but it can help you find lost branches of your family and overcome brick walls.

Don't forget the X-chromosome which also comes with the autosomal testing as it is inherited differently and it is easier to find common ancestors using this chromosome. Males get their X-chromosome from their mothers and females get their two X-chromosomes from each parent. Using this chromosome inheritance pattern eliminates a large number of your ancestral lines to look at.

Y-DNA testing will not get you as many matches as autosomal testing but the common ancestor is always on your paternal ancestral line. Based on the number of differences (GD or Genetic Differences) the common ancestor can be close or very distant, i.e. 1000s of years ago. Contact the closest matches and always ask to compare their autosomal DNA results with yours at Gedmatch. A distant y-DNA match who also shows up as a distant autosomal match may give you information about where your paternal ancestors were living 300+ years ago. In some cases the "distant" y-DNA match may be closer than expected because mutations occur randomly and this is why it is important to do an at-DNA comparison at Gedmatch with y-DNA matches.

Mt-DNA results are best used to solve genealogical problems where the mother is not known for sure such as adoptions. The results can pinpoint a family but not necessarily an individual but then the paper records can be useful in narrowing down your search.

Workshop Examples

This workshop will use several real-life examples to show how genealogical research can be advanced through DNA testing. Paper records are frequently wrong or altered such as in cases of 18th century adoptions and only DNA will show if your paper records are accurate or not.