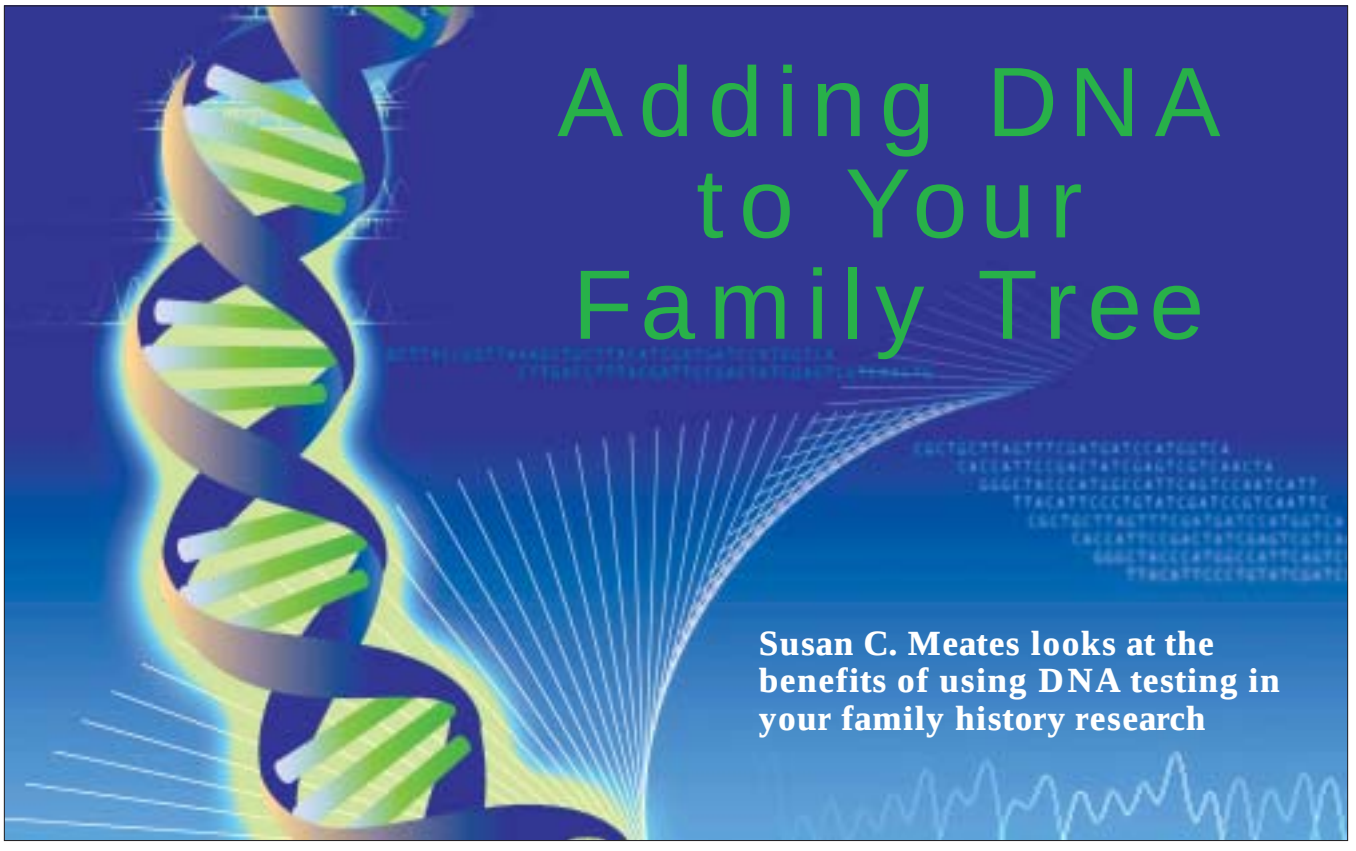


Adding DNA to Your Family Tree

Susan C. Meates looks at the benefits of using DNA testing in your family history research

SINCE 2000, DNA TESTING has been available to genealogists, and provides an opportunity to discover information not available in paper records. This information could be valuable in overcoming a brick-wall, finding others who are related and finding the ancestral homeland. In addition, a test result provides interesting information about your distant origin.

The primary test for genealogy follows the direct male line, which is a male, his father, his father's father and back in time. This DNA test looks at locations on the Y chromosome, called markers. The Y chromosome is passed from father to son, typically unchanged. In most cultures, the surname follows the Y chromosome, making this test very valuable for genealogy research. Males inherit a Y chromosome from their fathers, and an X chromosome from their mothers. Females inherit an X chromosome each from their father and mother. These chromosomes are known as the sex chromosomes, since an XY combination is a male, and the XX combination is a female.

There are cases where the link between the Y chromosome and surname are broken. These include name change, adoption or an illegitimate birth, where the male child takes the mother's surname.

The surname is a very important element to understanding and using Y DNA testing. For a long time, people were known by their first name. As society grew and became more complex, it was important to uniquely identify a person. Surnames came about in different countries at different times, and evolved over several centuries. At the time of adoption of surnames, multiple men had the same Y DNA result, and this result could have been spread over a geographic area due to migrations. These men probably adopted different surnames.

The surname is therefore a boundary in evaluating Y DNA matches. If the surname matches or is a variant and the DNA matches or is a close match, then the two men are related since the adoption of surnames. If the surname doesn't match, and the DNA matches or is a close match, then the two men are probably related prior to the adoption of surnames. In some cases, this situation could be the result of breaking the link between the Y chromosome and surname.

Y DNA results are shown as a string of numbers, and the length of the string is determined by the number of markers tested. The numbers represent a count of short repeats of DNA at a location. Vendors offer tests ranging from 10 markers to 67 markers. When

14 23 14 10 13 14 11 15 11 12 11 28 17 8 9 8 11 23 16 20 26 12 14 15 15 10 11 19 21 14 14 18 19 34 34 13 10
14 24 15 11 11 14 12 12 12 13 13 29 17 9 9 11 11 25 15 19 29 15 15 15 15 11 11 19 22 16 15 18 16 36 36 12 12

37 marker Y DNA results for two mean with the same surname.

deciding how many markers to test, more markers result in more information.

The table on the previous page shows the 37 marker Y DNA results for two men with the same surname.

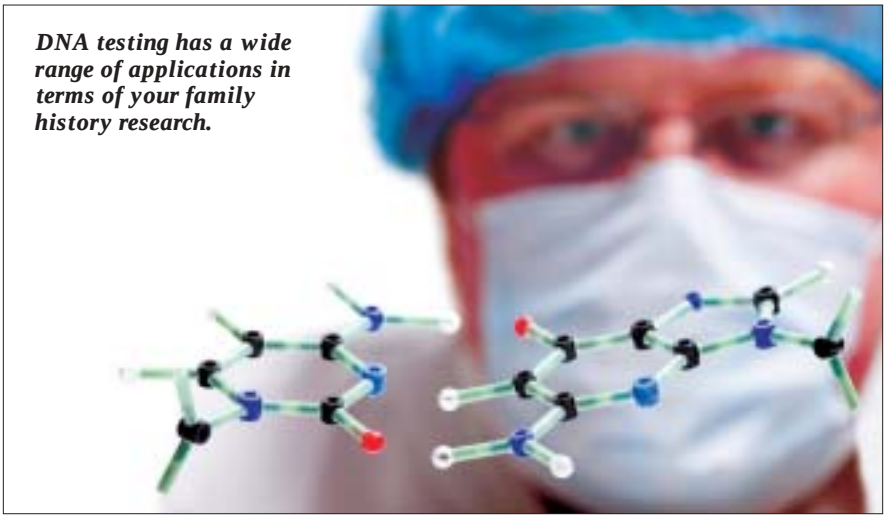
If you compare the results, number by number, you see that there are quite a few differences. These men are clearly not related since the adoption of surnames.

In the genealogy research associated with the above test result, there were multiple families with the same surname located in the census in the same area, and two men had an identical first name. The paper records were inconclusive in sorting out the families, but DNA provided the answer. Direct line male descendents were identified and tested for each household. One group had the first result, and another group had the second result. Therefore, the genealogist was able to identify the households that belonged to her family tree, and select the right William from the two Williams in the census. This saved a lot of research time, and avoided the risk of connecting her tree to the wrong family.

Applications for Y DNA Testing

The applications of Y DNA testing to genealogy research are varied, and range from validating the research, to uncovering the origin of the surname. The list below covers the typical applications:

- Discover information to help with our family history research
- Discover which family trees are related
- Discover information which may solve research problems, and/or resolve brickwalls
- Sort out multiple families found in the same location
- Confirm or get clues regarding migrations
- Confirm suspected events, such as illegitimacy and adoption
- Find any mistaken connections in family trees
- Validate family history research
- Bridge gaps in the paper records
- Confirm surname variants or find previously unknown variants
- Discover information to define the major branches of the tree going back to the origin of the surname
- Discover information about the evolution of the surname
- Discover clues regarding the origin of the surname
- Combine results with research in early records to determine the number of points of origin for the surname
- Preserve DNA results for future research, to protect against any male line becoming extinct
- Discover information about our distant origins



DNA testing has a wide range of applications in terms of your family history research.

Validating your family history research is an important application. The farther back in time you are able to go with your research, there is less detail in the records available. This often leads to making conclusions based on insufficient information. Determining if you are on the right path, and have made the right assumptions and connections, can save time.

In the prior example, if the researcher had selected William #2 instead of William #1, and continued on with the family tree, the final tree would be incorrect, because William #2 wasn't part of her tree. This error would have lead back to England, when in fact, the correct William would have lead her to Ireland.

Perhaps you are stuck at a brickwall, and your ancestor appeared at a location and you have been unable to determine where they came from. Often a migration resulted in a new form of the surname arising, due to different pronunciations. This makes overcoming the brickwall even more difficult.

DNA testing can also help in this situation. Take the example where the surname is found on the east coast, in New England and South Carolina. In 1810, you have hit a brick wall, when your ancestor arrives in Missouri. Did they come from New England, South Carolina, or did they migrate directly to Missouri from another country?

It was assumed the family came from South Carolina, based on the family legend of a pirate ancestor. DNA testing uncovered the answer. The Y DNA result didn't match either the New England or the South Carolina results, and further testing showed a match with an unknown surname variant from France, that come to Canada and then Missouri. Without this information, the genealogist would continue to spend time looking in South Carolina records for her ancestor's baptism.

How to Get Started

Regardless of where you are in your family history research, whether you are just starting or have spent decades, it is never too early to add DNA testing to your research. Plus, you can explore and benefit from testing the various direct male lines in your family

tree. All that is needed is to find a living male in the direct male line to test. This enables you to add DNA research to any direct male line that occurs in your family tree.

For example, you could learn about your mother's father's direct male line, by testing her brother, or another male in this direct male line. As your research goes back further up this branch, the DNA information will provide additional information to benefit your research.

The place to start is to decide which branch of your tree is the highest priority. If there is a living direct line male for the branch you select, you are ready to proceed.

Visiting the vendor websites is the first step in selecting a vendor. All the vendors provide a surname search facility, which will tell you if a surname project exists for your surname. Y DNA testing is organized into surname projects, due to the role of the surname in interpreting results. It is important to find a surname project, if one exists, since ordering a test kit within a surname project provides a discount. If a surname project doesn't exist, you can consider starting a project, so that the discount is provided for the test kit. There is no cost to start a project. Another option is to order under a geographic project to get the discount, and when a surname project is established, join the project.

When ordering a Y DNA test, there will often be several test choices, depending on the number of markers tested. The more markers the more information, as well as additional cost. In most cases, you can select a lower number of markers and upgrade later. This approach will enable you to space out the cost of testing. The tests are categorized as low resolution and high resolution. A test is categorized as low resolution, if less than 23 markers are tested. These low resolution tests are best at determining who is not related. High resolution tests range from 23 to 67 markers. These tests have the advantage of providing sufficient information to determine accurately the degree of relatedness.

Ordering a test kit is done online and the kit arrives in the mail, with directions. A painless process of swabbing the inside of your mouth, and putting the tips of the applicator into small test tubes of fluid, is quick and easy to do. The test kit is then mailed back to the vendor.

Test results typically include a private personal page at the vendor's website, where you can click "Match" to see whom you match, as well as other selections to learn more about your ancestry. The vendor may also provide a certificate and report in the mail.

Possible Extinction of Male Lines

If your family tree contains any male lines with the possibility of extinction, then it would be important to test the remaining males while it is still possible. For example, perhaps your mother's brother is the last male in his direct male line, and he has two daughters. Testing him will preserve his sample for future research, and ensure that his direct male line is represented in the project for his surname, providing a benefit to all genealogists researching that surname. In addition, when you reach the brickwall on this branch of your tree, his result will be available.

Most DNA testing vendors provide storage of the sample, ranging up to 25 years, at no additional charge. The discipline of DNA testing for genealogy, called genetic genealogy, is relatively new, and many scientific advances are expected in the future. Having a sample on file ensures that you will be able to take advantage of these scientific advances.

Conclusion

DNA testing for genealogy will provide information not available from the paper records. Often this information will provide clues to further your research, including overcoming brickwalls, sorting out families at the same location, bridging migration, and bridging lost or destroyed records. More advanced applications include finding the ancestral homeland and determining the location of the surname origin.

For Reference

Vendors

- Family Tree DNA
http://www.FamilytreeDNA.com
- DNA Heritage
http://www.DNAheritage.com
- Relative Genetics
http://www.Relativegenetics.com
- Free educational newsletter provided by Family Tree DNA
http://www.familytreeDNA.com/fgregister.asp
- Past issues of the Family Tree DNA free newsletter
http://www.familytreeDNA.com/facts_genes.asp?act=past

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Susan Meates is an experienced genealogist who has been working on a global one-name study for over a decade. Susan is a member of the Guild of One-Name Studies, and Chairman of the Guild's DNA Advisory Panel. In addition, Susan started and manages one of the largest DNA Projects in the world, with over 275 participants in 16 countries.