Waldensian DNA Project Proposed

By Dale Cardon Alsop

You may have heard in the news media of the amazing research results from DNA testing. Many are familiar with crime show mysteries like CSI where difficult cases are solved using DNA. What you may not realize is that family history mysteries are being solved every day using this same technology.

American presidential scandals are not unique to our generation. One of the oldest family history mysteries was solved in 1998, after more than 200 years, when scientists tested the DNA of a known descendant of Thomas Jefferson's family and a descendant of Sally Hemings, one of Jefferson's slaves. Rumors of a second Jefferson family began in the news media in the 1790s, but without proof, the story died. By the late 1990s, technology had been developed to finally put the rumors to rest. The DNA tests confirmed the rumors to be true.

You may be asking, "So what is DNA testing all about and how can it help me with my family history research?" Before we can answer those questions, we need to learn a little bit about DNA. Each cell in your body contains Deoxyribo Nucleic Acid, usually shortened to DNA. It is the genetic blueprint that makes you who you are—from hair color and height to gender. No two people (except for identical twins) have the same DNA. Most of your DNA is contained in the nucleus of the cell and is therefore called nuclear DNA. Additional DNA is contained in each of the small structures of each cell called mitochondria. This is called mitochondrial DNA.

Although discovered in 1869, little was known about DNA until 1953 when James Watson and Francis Crick discovered its structure. This discovery revolutionized the field of genetics and resulted in a Nobel Prize. They found that the DNA molecule is composed of two strands of sugar and phosphate molecules that wrap around each other to resemble a twisted ladder called a double helix. The strands are held together by 4 chemicals called bases. These base chemicals have long names but are often abbreviated by the letters A, T, C, and G. The order of these 3 billion bases in the nucleus of each cell determines our genetic blueprint.

DNA is organized into 23 pairs of thread-like segments called chromosomes. Twenty two of these pairs are composed of random segments of DNA derived from each parent. The 23rd pair is different. In females it consists of 2 X-chromosomes, one from her father, one from her mother. In males, it consists of an X-chromosome from the mother and a Y-chromosome from the father. The key to using DNA for family history is the fact that the Y chromosome is inherited intact from father to son without recombination with the mother's DNA. Because the Y-chromosome is passed from father to son without recombination, the paternal family line can be identified for many generations.

The only differences from one generation to another are minor mutations that occur in a regular and predictable manner. This pattern of mutations enables researchers to estimate how many generations separate two related people. Genetic distance is measured by how many generations there are back to the Most Recent Common Ancestor (MRCA). Because the mutations occur randomly, the measurement is expressed using statistical probability, i.e. a 90% chance of being related within 8 generations.

There are other useful DNA technologies besides the Y-chromosome test. A test of the DNA contained in the small cellular particles called mitochondria can be used to trace one's maternal ancestral line. Mitochondrial DNA is passed from mothers to their children without recombination with the father's DNA. This enables one to trace his/her maternal family line. However, because mitochondrial DNA does not mutate as rapidly as the Y-chromosome DNA, it is more useful for "deep ancestry" research rather than traditional genealogy that covers only the past 500 years. A newer branch of genetic genealogy that is becoming more popular is called Autosomal DNA testing. This involves examination of genetic markers on the other 22 chromosomes. Because the DNA on these chromosomes is a combination of each parent's DNA, ancestral relationships are much more difficult to identify. It is very useful, however, for determining ethnic and geographical origins. Because the Y-chromosome technology is better suited to identify ancestral relationships, this is the technology that will be covered in the remainder of this article.

The use of DNA testing can best be illustrated with an example. Dale C. Alsop and David P. Alsup match on 24 out of 25 genetic markers. A marker is merely a segment of DNA that is known to change over time. The 25th marker is similar but not an exact match. This means there is 90% chance that their common paternal ancestor lived within the last 325 years. Dale traces his paternal ancestry to the early 1600's in Derbyshire, England. David has traced his paternal ancestry to Hanover, Virginia in the mid 1700's. From these test results we can conclude that Dale and David are probably 10th or 11th cousins. Since Dale's ancestors immigrated to America in the 1850's and have never lived in Virginia, it is likely that David's Alsup ancestor also lived in Derbyshire, England in the 1600's. David had long suspected English origins but until he learned of Dale's test results he had no evidence. He now knows a specific area of England in which to focus his search.

Another way DNA testing can be used is to prove or disprove a link to a particular branch of a family. This technique was recently used by the Henry Hendricks family of Cache Valley, Utah. For decades, professional and amateur genealogists believed Henry was descended from Jacob Hendricks Hafte, a 17th century settler in Long Island, New York. One astute family historian found an inconsistency in family naming patterns that cast doubt on that theory. Other researchers who had staked their professional reputations on the earlier theory were unwilling to change their minds without further proof. That proof came a few months later when known descendants of both families tested their DNA. The results provided conclusive proof that the two families were **not** related. Comparison of DNA results from a documented descendant of Hendricks Willemz, who lived in the same location as Jacob, found a strong family match, thus enabling research to continue along the correct ancestral line.

DNA testing has also been used to research a family's deep ancestral origins. "Deep ancestry" is defined as research going back in time to before genealogical records are available (usually 500 years or so). As scientists gather more records of DNA results they have been able to trace ancient migrations of the world's populations. The National Geographic Society has gathered DNA samples from more

than 500,000 people from around the world. When their data is combined with the 600,000 results from genealogical testing companies such as Family Tree DNA and Ancestry, a great deal is being learned about our ancestral origins and geographic migrations.

The study of Waldensian ancestral origins raises some interesting questions. Many historians believe that Waldensian origins began in the 12th century in Lyons, France with the followers of Pierre Valdes (also known as Peter Waldo). Other historians claim a more ancient origin. It may be possible one day to learn more about our ancient origins if we can gather DNA test results from a few dozen men with paternal Waldensian ancestry. Because the people of the Waldensian Valleys lived in near isolation for almost 700 years, we would expect many families, even those with different surnames, to be related to each other as a result of family relationships prior to the adoption of heritable surnames. Heritable surnames became popular in France in the 16th century and in Italy in the 15th century. Many of these family relationships are completely unknown today because they occurred prior to the availability of genealogical records. Establishment of a database of Waldensian DNA results could be a valuable tool in establishing relationships between families with similar and even different surnames as well as to help determine family relationships among people with compound surnames.

It has been suggested that there may be much to learn about our Waldensian ancestors through the formation of a Waldensian DNA project. There are currently thousands of surname projects that have proven that new insights into family relationships can be gained through the use of genetic testing.

Before you become involved with the fascinating field of genetic genealogy you should be aware of the following:

- Despite dramatic reductions in the cost of genetic testing, it is still fairly expensive. The most useful DNA test is the Y-chromosome test that examines the results of 67 genetic markers and costs $238.

- You also have to remember that the Y-chromosome DNA test is only available for males to trace their paternal family line, i.e. their father's father's, father's . . . family.

- Even though several hundred thousand men have been tested so far, you may not find someone who matches your DNA. DNA tests are best suited for studies where the people being tested are specifically chosen because there is some reason to suspect that they may (or may not) be related.

If you are a male with a Waldensian surname and would like to participate in the DNA project, go to www.familytreedna.com and click on the "Projects" tab. Then click on the Waldensian Project under the Y-DNA Geographical Projects category. You will be presented with a list of tests to choose from. The most cost effective test is the Y-DNA67 under the Male Line Testing category. About a week later, you will receive a test kit from FamilyTree DNA (FT-DNA). All you need to do is swab you cheek and send the kit back to FT-DNA.

If you have any questions or have already done a Y-Chromosome test and would like to join the project, please email Dale Cardon Alsop at dalsop@pacbell.net.