

DNA and the GPS

The Genealogical Proof Standard

The Genealogical Proof Standard (GPS) guides our research process so that our genealogical conclusions can stand the test of time. It has been “customized” for genealogical research; however, the process is another iteration of the scientific method, which is the gold standard for any research process. The GPS is a five-step, interwoven process that requires genealogists to assemble and evaluate all evidence at their disposal in answering questions of kinship and identity. Traditionally, genealogists have used records and other artifacts in this process. Advances in DNA testing support the inclusion of DNA as a valuable resource for establishing proven genealogical relationships. Each step of the Genealogical Proof Standard will be considered in context of DNA testing.

Reasonably Exhaustive Search

A *reasonably* exhaustive search is one that does not exclude any source that might answer a genealogical research question. This includes DNA testing of individuals carrying the DNA of the research subject as a source. If a DNA test would support or refute a research hypothesis, then it should be considered in order to meet the GPS.

- Y-DNA – use in questions regarding surname origins or other questions of direct paternal connections through several individuals.
- mtDNA – use in questions involving descent from a common maternal ancestor.
- atDNA – use in questions of relationship closer than 5 generations. Generally, at least 2 descendants of the research subject will need to test in order to confirm the line. For questions involving relationships more distant than 5 generations, several descendants should be tested (4+) and where possible direct line tests should be done to “anchor” the results.

As with genealogical research, testing may result in more questions than answers, and additional tests or upgrades to existing tests may be required.

Citing DNA Results

Complete and accurate citations are important for two reasons: first, so that the information can be found by others if necessary; and second to show adequate understanding of the information being cited. We cannot cite what we do not understand. Citing DNA test results may seem to be different than citing other sources; however, if the format set out by Dr. Thomas Jones in Chapter 4 of

Mastering Genealogical Proof is followed, citations involving DNA test results are no different than citations of any other record. The elements of a proper citation are as follows:¹

- Who created the record?
- What is the record?
- Where is the source (publication detail)?
- When was the record created?
- Where in the record is the item of interest located?

Who created the record?

In most cases, the “who” is the DNA testing company, not the individual tested. In some cases, it may be a third party database or a surname or haplogroup project. If the “who” is the same as the publisher/testing company, or the source title, the “who” is omitted from the citation.² In most every case, the “who” information will be contained in the “where is” question.

What is the record?

The “what” is generally the database or report being cited. Examples would include:

- Y-Chromosome or mtDNA database
- Autosomal DNA database such as Family Finder, DNA Relatives or Ancestry DNA.
- Y-DNA surname project
- FTDNA TiP analysis
- Ethnicity estimate

Where is the source?

This item is what was published or who published it. In most cases this is the DNA testing company or the name of the DNA project. It also includes the website URL.

When was the record created?

Generally, this is the date that the information was accessed. Because DNA databases are constantly changing, it is wise to print or take a screen capture of important information on the day that it is accessed.

Where in the record is the item of interest?

This part of the citation describes the match between two people. It can also reference specific details from a surname project or ethnicity report. This part of the citation can also include additional details needed to clarify the specifics of the item of interest such as needing a user name and password to access the match detail, or that the databases are dynamic and changing.

¹ Thomas W. Jones, “Chapter 4: Source Citations,” *Mastering Genealogical Proof*, (Arlington, VA: National Genealogical society, 2013), 33-35.

² Jones,” Chapter 4: Source Citations,” 34

Discursive notes can be added to the end of a reference to further explain the citation.

Citation Examples

“AncestryDNA,” database, *Ancestry.com* (<http://dna.ancestry.com> : 16 September 2014), predicted 4th to 6th cousin match to user “[AncestryDNA user name],” and shaky leaf hint identifying shared ancestors as Fredrick Charles Bush (1859-1938) and Martha White (1857-1938); results from this dynamic database require the username and password of the individual.

“DNA Relatives,” database, *23andMe.com* (<http://23andme.com/you/relfinder> : 1 February 2014), predicted 3rd to 4th cousin match sharing 4 segments and 1.19% DNA to [Name of match]; private message through 23andMe.com dated 23 February 2014 from [Name of match] identified probable common ancestors as Jacob Tueller, Jr. (1855-1939) and Emma Louise Rogers (1865-1949).

Craig Dowd, “O’Dowd/Dowd/Doud/Dowds/Dawdy/Dowdican/Doudy surname Y-dna Results,” database, *The Dowd/O’Dowd/Doud Surname DNA Project*, (<http://mysite.verizon.net/cdowd7/dnatestresults.htm> : accessed 16 September 2014).

“MyOrigins,” ethnicity estimate, *Family Tree DNA* (<https://my.familytreedna.com/my-origins/> : accessed 16 September 2014), 10% Eastern European admixture identified for Angie Bush.

“mtDNA Database,” *Family Tree DNA* (<https://my.familytreedna.com> : accessed 16 September 2014), match for personal genetic markers.

Analysis of DNA Results

DNA testing results should be analyzed in the context of other DNA tests completed, and in the context of available documentary data. DNA testing answers questions of relationship, and provides evidence supporting or refuting these relationships. It does not answer questions about when an event took place or where it may have taken place. When analyzing test results, the key genealogical question to ask and answer is, “What is this result telling me about the relationship shared with the match?” A test result could confirm a relationship, refute a relationship, provide new research avenues to explore, or provide no new evidence or support for a relationship.

The syllabus material provided on Y-DNA testing, mtDNA testing and atDNA testing includes tables showing the expected or proposed relationships based on the level or genetic distance between two DNA matches. Please refer to this information when determining what a match means.

Resolution of Conflicting Information

If DNA test results will conflict with documentary evidence regarding a suspected relationship, then these conflicts must be resolved in order to meet the GPS. One of the most common conflicts is a Y-DNA test showing matches to a surname that is not the surname of the test taker. This usually indicates mis-attributed parentage for one of the parties in the match. Determining which party has the mis-attributed parentage often requires additional testing and documentary research.

Another example of conflict resolution would include two individuals believed to be first cousins not matching each other on an autosomal DNA test. Relationships that are second cousins and closer are always detected by autosomal testing. If there is no match between individuals who are believed to be second cousins or closer, then this would be another instance of documentary research not correlating with biological events that will need to be resolved in order to use these results in a genealogical proof argument.

Written Conclusion

An old adage states that, “Goals that are not written down are just wishes.” A variant of this adage applies to the GPS. If we do not write down and explain how we arrived at our research conclusion, then we have not met the requirements of the GPS and do not have proof for our conclusions. Proof involving DNA results can be as simple as a statement that identifies the relationship between two individuals, or it may be a much more complex proof argument requiring the use of DNA test results in conjunction with documentary data. Proof statements or arguments should be carefully worded as to not overstate the relationship or information obtained through testing. Examples of simple proof statements involving DNA results may include the following:

The mitochondrial haplogroup identified for Angie Bush is V7b. This haplogroup is found among Eastern European populations, which lends support to her documentary research showing her maternal great-grandmother was born in Romania.

The Y-DNA testing results for [first name] Andrews match three individuals at a genetic distance of zero with the surname Turner. It is likely that [first name] Andrews has a direct, paternal, biological ancestor within the 8 generations who had the surname Turner.

[Name 1] and [Name 2] are identified as 1st-2nd cousins through AncestryDNA. They will have grandparents or great-grandparents in common. Family trees should be compared and examined to determine the identity of these common ancestors.

(Names in this example are fictitious). The slave, Samuel Cooper, inherited several items of great importance from his master in 1871. Family tradition has long held that Samuel was the son of his master James Reeves. Samuel’s great-grandson matched 4 individuals with the Reeves surname at a genetic distance of 0 or 1 on a 37-marker Y-DNA test, indicating that Samuel’s direct paternal ancestors were individuals with the surname Reeves. Samuel’s great-grandson also shares segments of DNA on chromosomes 3 and 21 with five other documented descendants of James Reeves. The biological evidence in combination with family tradition and the provisions made for Samuel in the will of James Reeves leave little doubt regarding the father of Samuel Cooper as James Reeves.

DNA testing is a record genealogists must consider in their research process if their conclusions and research are to be accepted by future generations. In the past, technology and cost prohibited DNA from being a mainstream genealogical source. The Genealogical Proof Standard does not allow for a

source to be overlooked due to inconvenience or other obstacles. If the source is available, then it must be used in order to meet genealogical standards.

Resources

Required Reading for Understanding the Genealogical Proof Standard:

Board for Certification of Genealogists. *Genealogy Standards*. New York : Ancestry.com, 2014.

Jones, Thomas W. *Mastering Genealogical Proof*. Arlington : National Genealogical Society, 2013.

Rose, Christine. *Genealogical Proof Standard: Building a Solid Case*. San Jose : CR Publications, 2009.

Shown Mills, Elizabeth. *Evidence Explained*. Baltimore : Genealogical Publishing Company, 2009.

Other Useful Articles

Hait, Michael. "Traditional vs. Scientific Genealogy?" *Planting the Seeds: Genealogy as a Profession*. 22 June 2011. <http://michaelhait.wordpress.com/2011/06/22/traditional-vs-scientific-genealogy/> : 2014.

Leary, Helen F.M. "Evidence Revisited: DNA, POE, and GPS." *OnBoard 4* (January 1998). Online archive. *Board for Certification of Genealogists*. <http://www.bcgcertification.org/skillbuilders/learyevidencepf.html> : 2014.

Reid, John. "Does meeting the Genealogical Proof Standard require DNA evidence?" *Canada's Anglo-Celtic Connections*. 16 January 2013. <http://anglo-celtic-connections.blogspot.com/2013/01/does-meeting-genealogical-proof.html> : 2014.

Russell, Judy. "DNA and the GPS." *The Legal Genealogist*. 3 August 2014. <http://www.legalgenealogist.com/blog/2014/08/03/dna-and-the-gps/> : 2014