I Am Adopted—How Do I Use DNA to Find My Biological Parents?

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Genetic genealogy standards and research techniques empower family historians to apply DNA evidence to solve challenging research problems.

Genetic Genealogy Standards

Genealogy standards guide family historians in formulating research goals, ensuring appropriate selection and citation of source documents, evaluating and correlating evidence, resolving conflicting evidence, and writing well-reasoned and substantiated proofs. Some genealogy standards focus on written records, such as the interpretation of handwriting in manuscript sources. Similarly, genetic genealogy standards focus on biological records, such as the interpretation of allele values in DNA test results. The following standards guide family historians in using genetic genealogy effectively in their research.

1. **Terminology and principles.** Genealogists understand terminology and principles related to interpreting DNA test results. This knowledge base may include:

    - biogeographical estimates
    - patterns of inheritance
    - markers and mutations
    - segment information
    - testing companies' and third-parties' tools and algorithms for statistical predictions of relationships

2. **DNA testing is**:

    - **Selective.** Genealogists select DNA tests, testing companies, and analytical tools with the potential to address the genealogical research question.
    - **Targeted.** Genealogists target test-takers based on the potential of their DNA to answer the genealogical research question.

- **Sufficiently extensive.** Genealogists examine the test results and matches of a sufficient number of test-takers to draw conclusions about the relationship posed in the research question. Testing may involve:
    - test-takers descended from a hypothesized common ancestor through multiple lines of descent
    - descendants of multiple possibilities for a common ancestor
    - matches selected to distinguish among segments where a hypothesized genetic relationship might be.

3. **Identifying shared ancestry.** Genealogists using autosomal DNA document the test-taker's pedigree at least to the generation of the hypothesized ancestral couple or beyond in order to rule out, or accommodate for, shared ancestry or gaps on one or more lines.

4. **Interpreting test results.** Genealogists consider relevant factors when they use test results as a part of proof of genetic relationship. Genealogists use valid statistical algorithms in their interpretations of results and their conclusions about relationships. They make conclusions about the absence of relationships cautiously and they do not use DNA evidence to suggest genetic relationships beyond theoretically possible levels. These relevant factors may include:

    - the number and genealogical expanse of people who were tested
    - the markers or regions that have been tested
    - information about mutations
    - reported and typical amounts of shared DNA
    - sizes and locations of chromosomal segments
    - various genetic groups, including triangulated groups

5. **Replicability.** DNA test results are reported so data can be assessed and others can examine the data on which the genealogist relied.

6. **Documenting connecting generations.** Genealogists document the parent-child relationships between the DNA test takers and their target ancestors.

7. **Integration with documentary evidence.** Genealogists use DNA test results in conjunction with reasonably thorough documentary research. They assess the merits and shortcomings of both their documentary and their DNA evidence. They consider points of agreement and disagreement between and within their documentary and DNA evidence. They use those assessments and comparisons to help resolve any conflicts within their evidence, including conflicts between DNA evidence and any category or combination of documentary evidence.

8. **Written conclusions incorporating DNA.** Genealogists report their conclusions in writing and show the numerical data with tables and figures comparing numerical test results and showing hypothesized and tested relationships.

Genetic Genealogy Research Techniques

Powered by genetic genealogy standards, the following research techniques have helped many people break through brick walls in their family history.

1. **Leverage Y-DNA inheritance**. Men inherit their Y-chromosome virtually intact from their fathers, sharing crisp, clean, genetic evidence between fathers and sons over many generations. Y-DNA testing shines a bright light on male lineages. When using Y-DNA, the more patrilineal descendants tested the better. Select test takers with the greatest generational separation possible, ensuring the best chance of 1) recovering the Y-DNA profile of the common ancestor and 2) isolating mutations to specific lines of descent.

2. **Identify and engage candidates for Y-DNA testing**. Tracing male lines of descent through the centuries from a distant ancestor to a living descendant entails substantial time and resources. When tracing multiple lines to the present to find a candidate for Y-DNA testing, some lines will reveal clear parentage each generation while other lines may introduce questions and concerns. Avoid the urge to race to the present, sidestepping thorough research. If possible, pursue lineages most likely to retain the Y-DNA of the common ancestor. In addition, seek living people most suited for your project. Respect privacy laws (DNA testing is legal in only certain countries) and ethical standards. Build a rapport with the test taker and seek informed, written consent.

3. **Utilize Y-DNA projects**. Capitalize on test results available publicly and privately. Public Y-DNA projects, often styled as surname projects, may have attracted hundreds or thousands of participants over the years. Test results are generally available to the public, clustered—by the project administrator—according to the closeness of their test results. You can find the cluster which matches most precisely with your test results. If working on an adoption case or other relationship involving a non-paternity event, see if a single surname emerges, localized to a particular place.

4. **Build cousin trees**. Only a fraction of test takers provide online family trees. Invite your genetic cousins to share their family trees. Help them to build the branches you share. Even when a tree exists, the information may be incorrect. Some trees do not pertain to the test taker but may actually pertain to a relative, such as the test administrator. Some trees assert parent-child relationships which are erroneous or at least not biological. The careful researcher will investigate the trees of genetic cousins with healthy skepticism, validating and extending these trees as needed to reveal overlapping branches with shared matches.

5. **Triangulate cousin trees**. The power of cousin matches is amplified via triangulation: examining shared genetic matches to find shared ancestry. Cluster your cousin matches guided by shared DNA and shared ancestral lines. Use all available tools: shared centimorgans, overlapping segments, shared ancestors, surnames, localities, and other family features. Graft branches from triangulated cousins into a single tree. This technique may be used to build an adoptee's tree branch by branch.

6. **Identify and engage candidates for autosomal-DNA testing**. Finding living people whose autosomal DNA can support or refute your hypothesis. The oldest generation provides the deepest generational resolution for cousin matching, so test grandparents and their siblings first, focusing on the side of the family where you need DNA evidence.

7. **Correlate Y-DNA and autosomal DNA evidence**. Each type of DNA has its own merits in genetic genealogy. Leveraging Y-DNA and autosomal DNA may be advised in order to solve certain genealogical problems.

Recommended Reading

Bettinger, Blaine T. *The Family Tree Guide to DNA Testing and Genetic Genealogy*, Cincinnati: Family Tree Books, 2016.

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