FamilySearch

Using DNA to Determine Relationships

You've taken a DNA test and have a list of DNA matches or people with whom you share DNA. However, your DNA alone cannot tell you how you are related to each of your DNA matches. In this class, we will walk through the process of determining relationships between you and your DNA matches. Then, we will discuss how you can add DNA to your research toolkit and use DNA combined with traditional paper trail relationship to help determine historical relationships and solve research problems.

Cousin Matches

If you share DNA with another DNA tester, you probably share a common ancestor. For each match, try to identify your most recent common ancestor (MRCA).

Start by Evaluating Each Match

Review the name of the match and the manager of the DNA kit (if different than the match). Identify what generational relationship you may be to the match by comparing ages of the match and their parents or grandparents. Review the Shared cM Project to determine which potential relationships that amount of DNA may suggest. Also consider to what clusters your match belongs. Evaluating the match will give you a sense of where in your tree to search for a common ancestor.

Determine Your Relationship

1. Choose a match. Evaluate the match.
2. Review the match's tree. If the tree is incomplete, either build out their tree or contact the match for more information.
3. Identify the most recent common ancestor or MRCA. Remember that you will need to be familiar with your own family tree in order to identify the MRCA.
4. Determine your relationship to the match. It may be helpful to draw out the relationship in a descendancy chart or by creating a What Are the Odds tree.
5. Record the relationship using the notes feature on the DNA website or in a separate spreadsheet or file.

Types of Trees

Your DNA matches may have different types of trees. Determining your relationship to matches with different types of trees may require unique strategies.

If a match has a **Full Tree**, review their tree and determine the common ancestor. If you cannot find a common ancestor, it is possible there is a non-paternal event (NPE) or misattributed parental event (MPE) either in your line or in the ancestry of your match. Review the shared matches to determine whether the NPE/MPE is in your tree.

If a match has a **Small Tree** with at least one name and date for one ancestor, see if you can fill in their tree either by searching other trees or build their tree for them.

If a match has not yet linked their DNA results to their tree, review all of their unlinked trees and see if you can figure out the relationship. Be careful. If the DNA kit is managed by someone else, the unlinked trees may belong to the kit owner, not the test taker.

If a match does not have a tree or has a private tree, use clusters to determine which line they belong to. If they are part of the line you are researching, contact them. However, keep your communication short and to the point. Remember that many people take DNA tests to see their ethnicity results but may not check back often enough to see your message and reply.

Match Clusters: If your match has no tree, you may still be able to identify which of your family lines you share in common. A match cluster is a group of matches who appear to connect on the same family lines. To create a match cluster:

1. Identify a common ancestor for one of your matches
2. Use the “Shared” or “In Common With” feature to identify other matches who share DNA both with you and with that match.
3. Mark all connected matches as a single cluster.

Using DNA to Solve Research Problems

Finding Unknown Parents

For more recent genealogical problems, you can use DNA to identify biological parents, grandparents, and sometimes great grandparents by starting with DNA and then “fishing” in your DNA matches.

1. Start with a close match who has a tree.
2. Use shared and in-common with features to identify other matches who also share DNA.
3. Review the family trees of the shared matches.
4. Identify the MRCA for the related matches – If you match multiple people who all descend from the same ancestral couple, it is likely you also descend from that couple.
5. Research that couple and identify all of their descendants.
6. Evaluate the descendants – look for connections with known information.

Once you have identified a potential parent or relative, test their DNA or the DNA of known descendants to prove or disprove the relationship.

Finding Clues to Unknown Relatives

When working on a brick wall research problem, DNA can be used to suggest new avenues of research. Once you have thoroughly researched a family and located them in all known records, explore the DNA matches on that line to identify new surnames, locations, or other clues that suggest new research avenues. To use DNA to find clues:

1. Thoroughly research your brick wall ancestor using all available paper trail records.
2. Cluster your DNA matches. Identify DNA matches related to you on that line.
3. Explore the tree for each DNA match in the cluster. Look for surnames or locations that may connect with your brick wall ancestor.
4. Compare the family trees for all individuals within the cluster; identify common surnames or locations. (You may need to build out your matches’ trees or contact them for more information.)
5. Use traditional paper trail records to explore those common surnames and locations. Look for more connections to your brick wall ancestor.

Once you have use records to identify possible relatives, look for records to confirm the relationships. If no records are found, identify additional descendants and ask them to take a DNA test.

Proving Hypotheses

To solve more distant genealogical problems, you may need to start with research and then use DNA to confirm hypothesized relationships.

1. Thoroughly research your brick wall ancestor using all available paper trail records.
2. Identify a possible relative and hypothesize a relationship.
3. Use paper trail research to locate living descendants of your known ancestor.
4. Use paper trail research to locate living descendants of the hypothesized relative of your ancestor.
5. Test the DNA of both sets of living descendants.
6. Compare the DNA from both sets of living descendants.
7. Come to a conclusion.

You can conclude the hypothesized relationships exists if the DNA between multiple descendants of the known ancestor and multiple descendants of the hypothesized relative test at the expected rate and no other relationship can explain the DNA connection.

Other Recommendations

Family Trees and Messages. DNA is the only genealogical record that requires collaboration with other people. In order to use DNA as part of your research process, you need to know how you are related to your matches. This means you need to be able to review the family trees for each of your matches. Because there is so much value in pairing family trees with match lists, make sure you contribute by creating or uploading your own family tree. Make sure your tree is public so others can see how you're related and connect your DNA results to your tree. Also, make an effort to reply to emails and messages from your DNA matches.

Track Your Matches. Most people who take a DNA test find themselves matched with hundreds, thousands, or even tens of thousands of other DNA testers. Find a way to track information about each of your matches including who they are, their relationship to you, and your common ancestor. You can use the note feature provided by most DNA companies or download your matches and create a table or spreadsheet.

Test With Other Companies. If you want to use your DNA to solve a tough research problem, consider contributing your DNA to more than one DNA company. This will give you access to different ethnicity estimates, more matches, and unique tools. Currently, you can upload your raw DNA data for free to MyHeritage, FamilyTreeDNA, and GEDMatch or you may want to take another DNA test with a different company. Also consider taking a different type of DNA test. For example, if your research problem is on your patrilineal line, make sure you or a male family member takes a yDNA test.

Conclusion

Taking a DNA test is only the first step in using DNA as part of genealogy research. Combine DNA testing with traditional paper trail research to determine relationships both with your cousin matches and to help solve brick wall research problems. Many research goals require the use of both DNA and traditional research. Once DNA is added to traditional paper trail research, it may be possible to finally solve some of your tough research problems.