DNA Matches – What to do with them?

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You've taken a DNA test and your results are ready. Now what do you do? Prep your family tree, understand relationship estimates, and indentify how you and your matches are related.

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Review of DNA Testing

There are three types of DNA tests: mitochondrial (mt-DAN), autosomal (at-DNA), and Y-DNA. Each has its own inheritance pattern and reveals information about different ancestors.

Mitochondrial DNA is inherited from your mother. It is passed to her children of both sexes. It provides information on your direct maternal line or your mother's mother's mother.

We have 23 pairs of chromosomes, 1 set from each parent. There are 22 pairs of autosomes, numbered 1 to 22. These chromosomes are tested in an autosomal DNA test. This type of DNA provides information on all branches of our family tree back to about our 3rd great-grandparents. Ancestry DNA is an autosomal test.

The 23rd pari are the sex chromosomes. We all inherit an X chromosome from our mother. If we inherit an X chromosome from our father, we are female. If we inherit a Y chromosome from are father, we are male. Since a male inherits a Y chromosome from his father, who inherited it from his father, a Y-DNA test provides information on our direct paternal line. Only a male can take a Y-DNA test. Females can ask their fathers, brothers, and uncles to take a Y-DNA test to provide information on their direct paternal line.

X-matching is not a DNA test but a service provided by some DNA testing companies. It may be included as part of an autosomal DNA test. It is helpful in eliminating some potential common ancestors.

There are over 20 DNA testing companies. Do not overlook the smaller companies as they are often geared toward specific ethnic groups and world populations. When choosing which companies to test with, take into account the ability to download and/or upload your DNA results. Gedmatch.com is not a testing company but a website with DNA analysis tools.

DNA is measured in centiMorgans, cM. The higher the number the more DNA is shared with a match. Segments or blocks of DNA are separate pieces of DNA we share with a match.

Analysis of your DNA matches may reveal secrets. Proceed with caution.

Understanding Relationships

Relationship estimates are only estimates of how you and your match could be related based on the number of centiMorgans you share.

A half relationship exists when two people only share one person in an ancestral couple.

A removed relationship exists when a tester and a match have a different number of generations to the common ancestor. The shortest distance to the common ancestor is used to determine the cousin relationship.

When one relative shares two or more relationships with an individual, it complicates analyzing DNA. This can be caused by cousins marrying cousins, siblings marrying siblings, or endogamy. Endogamy is "the practice of marrying within a specific social group, religious denomination, caste or ethnic group."[1] The tester and match may share more DNA than any one relationship predicts. The shared ancestor may be more distant than expected.

Your family tree software probably includes a relationship calculator. It may or may not distinguish half relationships. Charts to determine actual relationships are available online at the Midwest Genealogy Center, FamilySearch, and the National Genealogical Society.

The pattern for writing relationships is to begin with the ½, if that relationship exists. Next is to state the cousin relationship. End with the removes, if that relationship exists. For example: 1) 1C for 1st cousin, 2) ½ 1C for half first cousin, or 3) 1C2R for first cousin, twice removed.

It is possible to share a common ancestor and not share DNA. Third cousins (3C) could share 0 cM of DNA, 234 cM, or anywhere in between.

Start With Your Tree

For autosomal DNA, fill in or print out a 6 generation pedigree chart. Highlight in blue your direct paternal line, ie your father's father's father etc. Highlight in pink your direct maternal line, ie your mother's mother's mother etc. Highlight in yellow any unknown ancestors. If you are working withY-DNA, fill in a single line, your direct paternal line, as far back as possible. If working with mt-DNA. Fill in a single line, your direct maternal line, as far back as possible.

Create a surname list. Hopefully you have 32, one for each 3rd great-grandparent. Include name changes between your 3rd great-grandparents and you. If ancestors used multiple surnames, include all. For your Y-DNA, you probably only have one surname. If not, create a list for only your direct paternal line. For your mt-DNA, a surname list is probably not necessary.

Create a location list. Start with your 3rd great-grandparents and work forward. Be as specific as possible. For the United States, list at least the state and county. For foreign countries, list at least the country as well as the county, parish, and/or town if known. If an ancestor's migration path is known, include those locations. For Y-DNA or mt-DNA, narrow to the direct line.

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[1] From en.wikipedia.org/wiki/Endogamy.

Add a simple tree to the DNA website. It can be a separate tree or linking your research tree. Enter the information from your pedigree chart: names, dates, and places. No need to add documents or sources. This will allow for Ancestry and MyHeritage to provide theories. It will also allow your matches to determine their relationship with you.

Investigate the Website

Spend up to an hour. Click on everything and see where it takes you. What information is included for each match? How can you sort your matches? What tools are offered?

Mitochondrial Matches

23 and Me and Living DNA provide only base results without matching. FamilyTree DNA currently offers a full sequence mitochondrial test and matching. It previously offered HVR1 and HVR2. When working with matches, prioritize matches who have taken a full sequence test and have a genetic difference of 0. Look at their earliest known ancestor and linked tree. Can you determine where your matrilineal lines match? Consider joining a haplogroup project.

Y-DNA Matches

23 and Me and Living DNA provide only base results without matching. FamilyTree DNA currently offers three tests based on the number of locations tested on the Y-Chromosome: Y-37, Y-11, and Big Y-700. When working with matches, prioritize matches with a genetic difference of 0 who have tested at least as many locations as you. When reviewing a match, look at the surname and earliest known ancestor. Do you recognize them? Review their tree if available. Consider joining a surname project, haplogroup project, or a location based project.

Autosomal Matches

Whether you took a DNA test out of curiosity or trying to answer a genealogy question, the first step is to identify your matches. Sort your matches by shared DNA. This puts your closer relations at the top of the list. Look for names you recognize. Open up notes and indicate how you are related, name your shared ancestral couple, and their line of descent. Review your match list again. Recognize anyone else? Continue with additional matches.

Does the website offer relationship theories? Ancestry offers Thru-Lines based on member trees. MyHeritage offers Theories of Family Relativity based on trees and historical documents. Treat them as theories and verify. Once you have verified a theory, note your relationship, shared ancestors, and line of descent. Move onto the next match with a theory and verify.

Work with your unidentified matches. Review the user name. Can you make sense of it? Look at linked trees for shared ancestors and locations. Can you determine your relationship? Look at shared cMs and relationship estimates. Any clues? Can you compare ethnicity estimates to narrow down which branch of your tree? Remember to add notes when you identify the match.

Shared matches can be a powerful tool for identifying relatives. Look at shared matches to narrow to a specific branch of your tree. If we know that Cousin B, Cousin JJ, and Cousin Ole are related through different great-grandparents, we have three of our four great-grandparents

identified. If an unidentified match's share matches list does not contain one of these three cousins, we know the match is related through the other set of great-grandparents. Again, add notes.

Whether you call it grouping, color coding, clustering, or labeling your matches, it is a way to indicate that matches share common ancestors. Use it to help identify how you and your matches are related. This technique is helpful when you have unknown ancestors.

If you are still unsuccessful in identifying a match, you can 1) reach out to them via email or messaging within the website, 2) deep dive into descendant research on that branch, or 3) move on to identifying other matches. Whatever you choose, add notes.

DNA Testing Plans

Just as we should be using research plans, we should be using DNA testing plans. The five parts of a DNA testing plan are 1) the research questions, 2) the information known, 3) which DNA test, 4) who to test, and 5) which company to test with. As with any plan, we follow the plan and adapt as needed.

Resources

Ancestry.com learning center and ancestry.com/dna
International Society of Genetic Genealogy Wiki – isogg.org/wiki
MyHeritage.com – myheritage.com/dna
Extended Family Chart from Midwest Genealogy Center

Professional genealogists specializing in DNA to learn from:
Blaine Bettinger – The Genetic Genealogist
Cece Moore – The DNA Detectives
Diahan Southard – Your DNA Guide

Association of Professional Genealogists' member directory

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