Ancestry DNA's New Tools

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DNA SIG handout - - February 7, 2023

Background

Note - - Information in this handout is taken from the explanations found at the AncestryDNA website.

Inheritance is random. Ethnicities may be passed down unevenly, or not at all. Almost everyone gets roughly half of their DNA from each parent. This means that there's half of each parent's DNA that you didn't inherit. The 50% of the DNA you do get is random. That's why you and your siblings don't have identical DNA and may show different ethnicity results. Because your parents passed down only half of their DNA to each child, they may have ethnicities that you didn't inherit. And your siblings may have ethnicities you don't have - - or vice versa. Your ethnicity inheritance only shows the parts of your parents' DNA that you inherited. This means you're seeing only half of each parent's estimated ethnicity.

Ancestry calculates the percentages in your ethnicity estimate (and ethnicity inheritance) by comparing your DNA to their reference panel. They're the most likely numbers, but other percentages may be nearly as likely. If your parents have taken AncestryDNA tests, the same is true of their ethnicity estimates.

To figure out your ethnicity regions, Ancestry compares your DNA to a reference panel made up of DNA from groups of people who have deep roots in one region. They look at 1,001 sections of your DNA and assign each section to the ethnicity region it looks most like. Those results are shown in the percentages you see in your estimate. Your genetic link to these ethnicities can go back hundreds of years or even more.

What's the difference between ethnicity estimate and ethnicity inheritance? Your ethnicity estimate is an estimate of your ethnicity regions. Your ethnicity inheritance is an estimate of which of these regions are related to the DNA you inherited from each parent.

Ethnicity Estimates

There are two kinds of regions in your ethnicity estimate. The regions with solid circles solid dot are your ethnicities. They come from comparing your DNA to the DNA of people in Ancestry's reference panel.

AncestryDNA estimates your ethnicity regions by comparing your DNA to the DNA of people with known origins from around the world. These people comprise Ancestry's reference panel. The reference panel has over 68,714 DNA samples from people with deep regional roots and documented family trees. Ancestry analyzes your DNA at over 700,000 locations on the chromosome and looks at how much DNA you share with people from the reference panel in each ethnicity region.

The Ancestry laboratory generates the most likely estimate for a certain ethnicity, which becomes the percentage that appears in your ethnicity estimate. But it also generates many other likely estimates. A region's range comes from these various likely estimates. The way a range is calculated depends on the region and the value of your most likely estimate.

DNA Communities

A community is a group of people who share DNA because their relatives recently lived in the same place at the same time. Communities are usually much smaller than ethnicity regions and they go back only about 50 to 300 years. Ancestry determines your connection to specific DNA communities by identifying other AncestryDNA members whose ancestors probably came from the same place or cultural group.

The regions with circles and dotted lines dotted dot are your communities. These are people who share a significant number of matches with each other and with you. Members of a community likely descend from a group of people who traveled to the same place around the same time, or from the same place around the same time.

Ancestry finds communities by looking at a network of DNA connections they build using the millions of AncestryDNA members in their database. When Ancestry discovers communities, they use information from family trees that AncestryDNA members have linked to their test results to learn about the historical forces that may have brought their ancestors together.

DNA alone doesn't tell the story of why those connections came about or what their historical significance might be. For that, Ancestry adds ethnicity estimates based on their reference panel, historical information from family trees linked to AncestryDNA tests, and historical research. Since communities reflect fairly recent common ancestry, Ancestry looks for patterns in ethnicity and tree data to help identify times, locations, or groups that members of communities might have in common in their past.

Ancestry also uses birth dates and places to identify common migration routes by looking at the differences between the birth locations of parents and children. Once they see where these people lived, where they moved to, and when, they pass what they learned on to historical researchers in order to match the data with the history that explains it.

Ancestry's DNA Side View

Figuring out which DNA came from one parent and which from the other is a tricky problem. Ancestry has pioneered a new technology called SideView™ that does this job by using DNA matches, i.e., the identical DNA you share with relatives. AncestryDNA is able to do this analysis because they have such a large consumer DNA database. The bigger the database, the more matches there are and the better the results.

All of your matches share one or more segments of identical DNA with you and at least one of your parents. Ancestry uses your DNA matches to split your DNA into the halves that came from each parent. First, they find the segments that connect only to one parent or the other. Then, they separate out the DNA you got from each parent by piecing together the segments that overlap.

After they've separated your DNA into the parts that correspond with each parent, they calculate an ethnicity estimate on the two halves. From this estimate, Ancestry is able to show your "ethnicity inheritance" - - the ethnicity percentages passed down to you from each parent. Since Ancestry can see only half of your parents' ethnicities, this is not an ethnicity estimate for your parents.

To figure out which DNA came from each parent, Ancestry splits the list into the two parts that created it. They do this by looking at a section of DNA that you share with a match. Each match is likely related to only one of your parents. By comparing the shared DNA of many matches, Ancestry is able to figure out the parts of your DNA that were inherited from one parent or the other.

Even with the help of matches, though, your DNA data doesn't indicate which parent each half of your DNA came from; it can only determine that some of your DNA came from one parent, while the other portion came from your other parent. If you are not able to determine which parent in the Side View is your father, and which parent is your mother, there are some strategies you can use. Look for the unique ethnicity among regions you share with your closest matches. If you know which side of your family those matches are on, you can then guess which parent is Parent 1 and which is Parent 2.

This isn't proof, however, since a match could have inherited the same ethnicity you did from a parent who isn't related to you. But if several matches on the same side of your family share that ethnicity and it doesn't appear (or it appears much less often) on the other side of your family, this can be a clue.

Check out the percentages. Many people inherit the same regions from both parents, but in different amounts. For example, imagine parent 1 passed down 25% Egypt and parent 2 passed down 3% Egypt. If you know one of your parents has only 5% Egypt themselves, that may be the parent who passed down the 3%. This is also only a clue, since ethnicity estimates are merely estimates. Each region in your ethnicity estimate could actually be a range of possible numbers. Ancestry assigns the most likely number as the percentage, but the most likely number is not the only possible number.

People in neighboring regions can have DNA that is so similar that it's hard to tell apart. A good example of this is France and Germany. It is nearly impossible to separate out German or French ethnicity, since ancestors from that region in Europe have intermingled over many centuries.

If you have a region in your ethnicity estimate that does not show up in either of your parents in the Side View, check for regions on the parents' estimate that geographically neighbor your ethnic region. For example, if you have 10% France with a range of 0-20% and neither parent has France, your France may actually be Germanic Europe.

There are additional strategies you can employ to try to determine which parent is Parent 1 and which is Parent 2. Look for a unique ethnicity. Did Parent 1 or Parent 2 pass down an ethnicity to you that the other didn't? If so, figuring out which side that ethnicity came from can give you the answer. Use records to trace your family tree, looking for birthplaces in the region of the unique ethnicity. If you find these on one side of your family and not the other, this is a clue as well.

DNA Matches by Parent (beta)

Some months after introducing SideView™, Ancestry DNA began allocating our DNA matches to Parent 1 or Parent 2. If you have been doing a lot of grouping of your DNA matches, by reviewing the shared matches for each match and assigning them to one or another ancestral group and labeling with Ancestry's colored dots, you should be able to look at your groups to see which colored dot groups belong to Parent 1, and which colored dot groups belong to Parent 2.

In my case, I was not initially able to determine which parent was Parent 1, and which parent was Parent 2, in my Side View results, because both my mother and father had such similar ethnicity percentages in spite of coming from completely different geographic and cultural backgrounds. Once Ancestry began allocating my matches to one or the other parent, however, I was able immediately to determine which parent was Parent 1 because I knew that the ancestral groups I had made from my shared DNA matches could only be from that parent.

I also had identified several unknown groups of DNA matches who all matched me and each other, but had no identifiable surnames to clue me into which ancestors might be associated with those groups. With Ancestry's parental allocation of my matches, I could easily determine which unknown group was a paternal group, and which unknown group was a maternal group. This was a real game-changer!

New Version of the Shared Centimorgan Tool

DNA Painter recently launched a new version of the Shared Centimorgan Tool. The Shared cM Tool is still free to use. The new version allows you to narrow down the list of possible relationships associated with a range of shared DNA between you and two DNA matches. The new version provides a simple way of comparing results when siblings or cousins in the same generation share different amounts of DNA with a mystery match.

As Blaine Bettinger explains, there are a few requirements for using this tool. You need:

1. A tested sibling or cousin (which tested cousins can be used for this tool is discussed below);
2. Some access to those results (and there are many variations of access, including sharing DNA results as well as good old fashioned over-the-phone collaboration!);
3. A DNA match to at least one of the tested siblings or cousins; and
4. A difference in shared DNA amounts with that DNA match.

Requirement #4 is key! Although technically you can enter the same amount in both boxes, this doesn't really help eliminate any relationships. And elimination is really the major goal here; by entering a second shared DNA amount, we hope to eliminate some of the possible relationships. Generally, the greater the difference between the two siblings or cousins, the more valuable the tool will be.

And as with the original version of the tool, don't forget to click on the relationships to view the histograms, which are helpfully labeled with both shared DNA amounts. Now this system doesn't always work when one result is 0 cM.

Shared cM amounts over 90 cM will not be affected by the TIMBER algorithm at AncestryDNA (TIMBER only affects results of 90 cM or less). If you have a shared amount of less than 90 cM and above 0 cM at AncestryDNA, you might consider using the pre-TIMBER amount of shared DNA, especially if it provides a larger variation.

And there's no reason this tool won't work for cross-company comparisons. While there are variations in matching algorithms from DNA company to company, and thus variations in shared amounts, this just isn't going to have a huge impact on this tool. Remember that every relationship prediction tool can only provide clues about possible/likely relationships. There is no tool in existence that can identify an exact genealogical relationship using any shared DNA amount.

There are actually many relationships other than siblings that can be utilized. For example, the tool can work with cousins in the same generation as long as there is no additional relationship between yourself and the DNA match, or the cousin and the DNA match. The tool could work well for the following relationships (not an exhaustive list):

1. Full siblings – by definition, full siblings have the SAME genealogical relationship to all matches;
2. Half siblings – can use this tool for relationships via the shared parent, provided there are no relationships via the non-shared parent;
3. First cousins – can use this tool for relationships via the shared ancestor, provided there are no other genealogical relationships;
4. Second cousins – can use this tool for relationships via the shared ancestor, provided there are no other genealogical relationships;

But what if you have three siblings? Or yourself and four first-cousin siblings? You can utilize this new tool by selecting the best two shared DNA results. In general, use the two shared DNA results that are the most different. In other words, to get the most out of this tool, use the greatest possible range of shared DNA.

Take a look at your DNA match allocation by parent, and check out the new version of the Shared cM Tool. These are two new aids to understanding our DNA matches.