

Using DNA to Find Unknown Ancestors:

A step-by-step guide to get started on your DNA research



INVESTIGATE
EDUCATE
ADVISE

Step 1 → Determine your goal.

Which ancestor are you searching for? Let's say it's one of your grandparents ("Unknown GP"). *Please note that these steps can be used to find more distant ancestors too.*

Step 2 → Find a type of DNA to answer your question.

There are three kinds of DNA tests that can be ordered.

- Autosomal DNA (atDNA)—You get 50% from mom & 50% from your dad. The amount halves at every generation. You get roughly 25% from each of your grandparents.
- Y-DNA—People born male get their Y-DNA from their fathers, who got it from their fathers. This line is called the "direct paternal line."
- Mitochondrial DNA (mtDNA)—Everyone gets their mtDNA from their mothers, but only women pass it to their children. This line is called the "direct maternal line."

Step 3 → Find someone who has that DNA

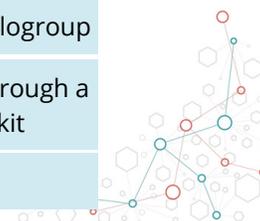
You need to find the right person to test. Most often, atDNA will be used.

- For **atDNA**, it *helps* to find test takers (or those already tested) who share the specific line of your Unknown GP. Testing people from a generation closer to the Unknown GP is best. If not, then having your sibs test also helps.
- To use **Y-DNA** to find your Unknown GP, that ancestor *must have* passed Y-DNA to a direct-paternal-line descendant who tests.
- To use **mtDNA** to find your Unknown GP, that ancestor *must have* passed mtDNA to a direct-maternal-line descendant who tests.

Step 4 → Select a company that tests DNA.

Below are the main DNA testing companies. You can transfer atDNA results from some companies to others to save money (see Page 4). Most often, testing at Ancestry is the best place to start and work.

	atDNA	Y-DNA	mtDNA
Ancestry	Yes	No	No
23andMe	Yes	Basic-gives haplogroup	Basic-gives haplogroup
FamilyTreeDNA	Yes	Full \$\$ Done through a separate kit	Full \$\$ Done through a separate kit
MyHeritage	Yes	No	No



Step 5 → Interpreting your DNA Results

Amount of Shared DNA

How much DNA is shared with a match determines possible relationships to that match. Ancestry provides this information for each DNA match. For other companies, the **Shared cM Project from DNA Painter** provides possible relationships, as well as their probabilities. <https://dnainter.com/tools/sharedcm>

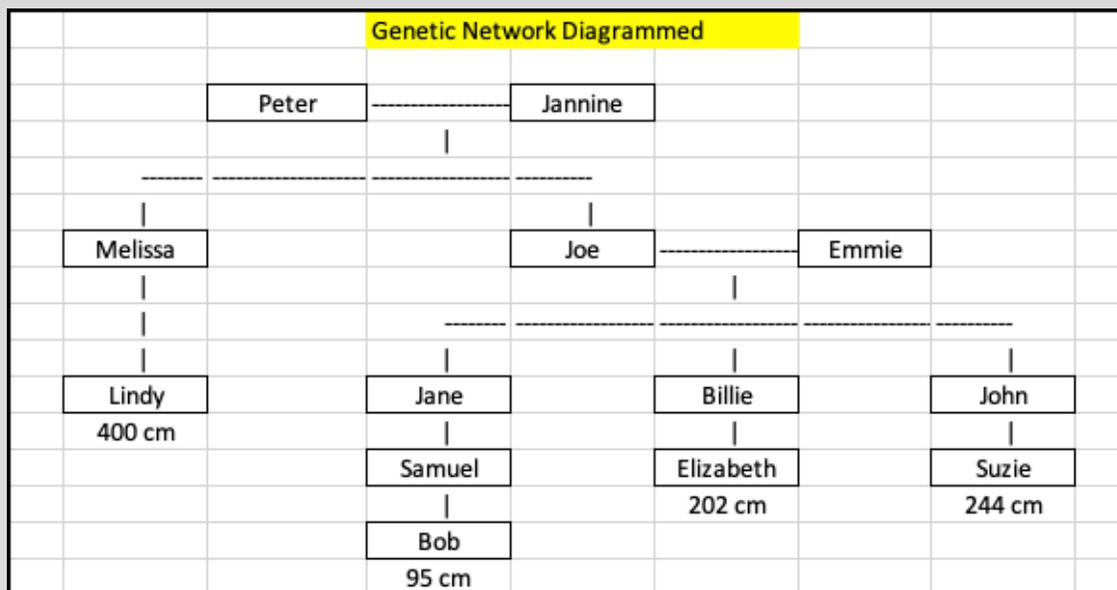
Known Matches & Unknown Matches

For at DNA analysis, identify your "Known Matches" who come from your three *known* grandparents. From this, you'll be left with your "Unknown Matches." They will be enriched for relatives related to you through your unknown GP. Starting with the highest unknown match, find their "Shared Matches" to create a "Genetic Network" of the unknowns.

In the unknown Genetic Network, identify their common ancestor or ancestors by studying their family trees. You might need to build trees for some of them. I do this on Ancestry, typically inside the tree of the person searching for their Unknown GP.

Diagram the Genetic Network

Next, diagram the unknown Genetic Network, starting with the common ancestors. Note the shared amount of DNA of each DNA match. Here's an example.



Place yourself into the diagram

Now, place yourself into the diagram. Your placement depends on possible relationships with DNA matches in the Genetic Network. See the example on the next page.



Step 5 → Interpreting Your DNA Results, Continued

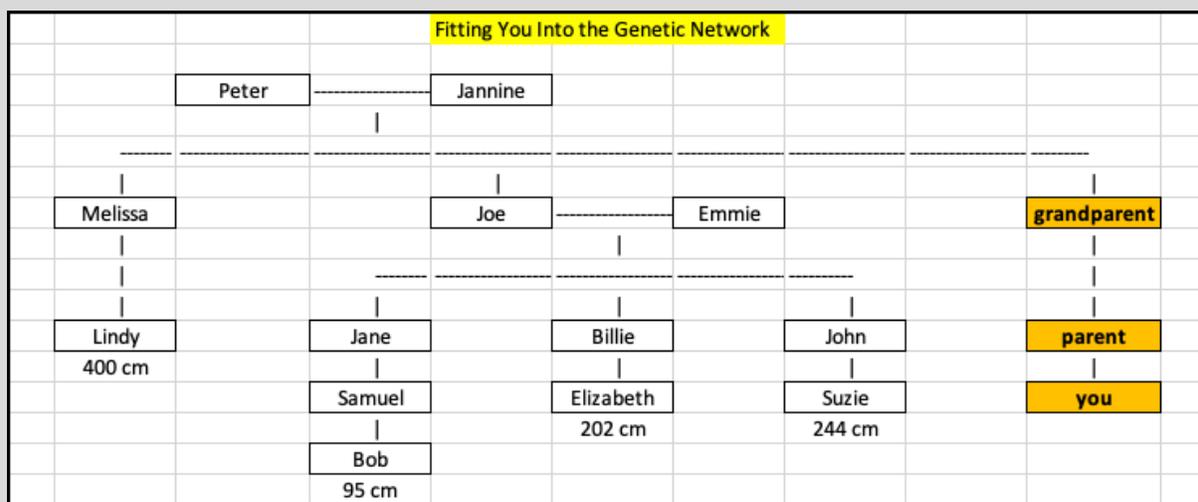
Here the top match, Lindy, at 400 cm might be a 1st cousin, once removed (1C1R). Elizabeth (202 cm) and Suzie (244 cm) might be your 2nd cousins (2Cs). Bob at 95 cm might be your 2nd cousin, once removed (2C1R).

If Lindy is your 1C1R, then one of your grandparents is the other person’s great grandparents. If Elizabeth and Suzie are your 2Cs, then you’d share one set of great grandparents. If Bob is your 2C1R, then one of your great grandparents is the other’s great-great grandparents.

It helps to know who the common ancestors are for each relationship (my trick is cousin level minus 1 = grandparent level, so 3C share 2-great-grandparents). It’s also important to know what “once removed” means (one generation difference to common ancestor), as well as a ½-relationship (only sharing one person from a couple).

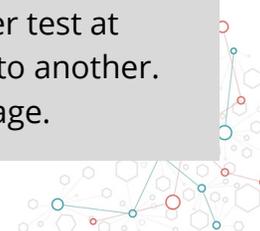
Based on these possible relationships, the diagram below shows one way you could fit into the diagram above (see people highlighted in orange). For an unknown GP, you now have evidence that Peter and Jannine are his/her parents and your great grandparents.

You now can look at Peter and Jannine’s other children (not Melissa or Joe) to see if one of them could be your Unknown GP.



Step 6 → (Optional) Get more DNA matches.

If you don’t have enough DNA matches to solve your mystery, you can either test at more companies, or you can transfer your DNA results from one company to another. There are restrictions on this. Options available are outlined on the next page.



DNA matches connect us with our cousins, who can help our family research. If you haven't tested, I recommend starting out with *autosomal* DNA testing at **AncestryDNA**.

Unlocking all of the DNA tools to review your Ancestry DNA matches requires a membership at Ancestry.

Did you receive enough DNA matches to help with your family history? If not, you can transfer your AncestryDNA results to:

FamilyTreeDNA (FTDNA)

Transferring is free, but if you pay the small fee (currently \$19 US), you'll get all the DNA tools as if you tested there.

Note that **law enforcement** is using FTDNA to identify criminal suspects & victims. All non-EU residents are opted IN to this and can opt out.

MyHeritage

Transferring is free, but if you pay the small fee (currently \$29 US), you'll get all the DNA tools as if you tested there.

GEDMatch

Transferring is free, but there is a paid version (currently \$10 US/month) that provides all of their DNA tools.

Note that **law enforcement** is using GEDMatch to identify criminal suspects & victims. All users are opted OUT of this. You can opt in.

If you still need more DNA matches, you can test at **23andMe**. If you don't want additional health information, order their Ancestry kit. This gives you *autosomal* DNA matches, your *mitochondrial* haplogroup, and your *Y-DNA* haplogroup (if you have a Y-chromosome).

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Note:

You can start at other points on this map. The black arrows show you where you can transfer your results to.