

# Getting Started in Genetic Genealogy

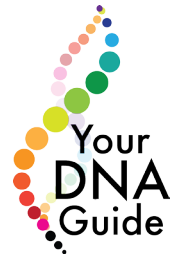
## *A Beginner's Guide*

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Many genealogists have hopped on the DNA testing bandwagon only to be faced with test results that they don't understand. Like any new toy, it just takes someone who knows how, to show you how! There are really only **THREE QUESTIONS** you ask (and answer!) in order to get started.

**FIRST:** Which test should I take?

**NEXT:** What will I get from the testing?

**FINALLY:** Will it help?

With that first question guiding us, let's go over some basic testing principles and the three main test types, what you receive, and determine if it will be useful to you in your genealogy.



### Dealing with a Lab

All of the genetic genealogy tests are administered via the regular mail. The DNA test kit arrives in your mailbox with everything you need to collect the sample and return it back to the laboratory. The collection method is a cheek swab or a saliva sample- painless and simple to administer for most people.

Once the DNA sample is submitted to the laboratory for testing and it is processed, you get two different kinds of results from the testing company: ethnicity results describing your ancestral origins, and a list of individuals in the database who have some kind of genetic relationship to you. It is then your job to work with the other individuals in the database to use genetic and TRADITIONAL genealogical methods to figure out how you are related.

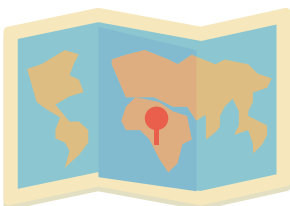
Test Type 1: YDNA

Only available at [www.FTDNA.com](http://www.FTDNA.com)

Test Type 2: mtDNA

The YDNA is the direct paternal line test. It can tell you information about your direct paternal line. Only males can take the test, so if you are a female, you will need to use your powers of persuasion to get a brother, father, uncle, or cousin to test for you.

The mtDNA test traces your direct maternal line. It will help you research your mother's mother's mother. Both males and females can take this test to represent their own mtDNA lines.



With the YDNA and mtDNA tests, the ethnicity portion is called a haplogroup, or a deep ancestral group. It can act like a molecular GPS to help you determine the ancient origins of your direct paternal or maternal line. Most genealogists find this information interesting, but not particularly genealogically valuable without additional testing.

# DNA Profile

Called a "haplotype" if you want to be technical.



Your YDNA and mtDNA profiles work to help you verify and extend your paternal and maternal lines respectively.

Because of the way this kind of DNA is inherited, a living person tested today can almost exactly represent every ancestor on a direct maternal or paternal line for at least 8 generations, and with only a few differences after that point. This means that you have an original document from 8 generations ago right inside of you!

The power of mtDNA and YDNA testing is in finding matches to your DNA profiles. A match indicates that you share common ancestry with that person- you are genetic cousins! Each ancestor has three main qualities that help us identify them, and therefore can help us make connections.

**Haplogroup**  
*A deep ancestral group*

Jewish YDNA tidbits:  
The Cohen Modal Haplotype  
Haplogroup J (and others)

Jewish mtDNA tidbits:  
Haplogroup K (and others)

## 1 The Genetics

What is a "good genetic match"?

Match	Y-DNA	mtDNA	Autosomal DNA
Match 1	100%	100%	99%
Match 2	100%	100%	95%
Match 3	100%	100%	90%
Match 4	100%	100%	85%
Match 5	100%	100%	80%



mtDNA EXACT matches only



YDNA THREE or fewer differences

## 2 The Surnames

While it may be difficult to search for maternal surnames as a key to relatedness, it can be a significant source of help for YDNA testing. Everyone should logon to FTDNA.com and search for ANY and EVERY surname they are researching to find out what YDNA work has already been completed.

**Homework:**  
*Surnames I am going to Google:*

## 3 The Locations

The ability to search by location at FTDNA is especially useful for those with an abundance of matches. Remember that the Matches Maps only displays the earliest ancestral location reported by your match. So not everyone is on there, and not all of their ancestors and locations are represented.

**How Useful is it?**  
*Fill in the star count*

**YDNA**

☆ ☆ ☆ ☆ ☆

Useful Sometimes → Start NOW

**mtDNA**

☆ ☆ ☆ ☆ ☆

Don't have many good matches in your YDNA or mtDNA? There may be some things we can do to look for more, or to explain why. But, unfortunately, patience is a virtue. This database is growing, and sooner or later you are bound to find a relative.

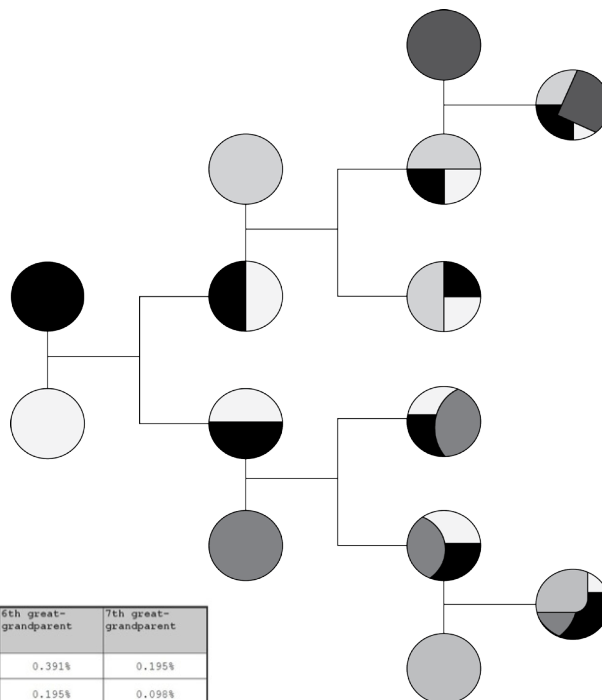
## Test Type 3: Autosomal DNA

Autosomal DNA (atDNA) testing is the newest tool available to genetic genealogists. Unlike the male Y chromosome and the female-inherited mitochondrial DNA, which are both limited to single lineages in your pedigree chart, atDNA can potentially provide information on anyone in your tree.

We are limited to so few generations because of the way autosomal DNA is shuffled and halved at each generation. The figure on the right represents a possible way in which DNA is passed down in the pedigree of a family, resulting in diverse possibilities of inheritance due to chance.

The chart below helps to quantify these values.

In the circles with the percentages is identified the percentage amount of time that a testing company can accurately describe a particular relationship. So, while they can find your second cousin 99% of the time, only 50% of your fourth cousins will be found.



Start	parent	grandparent	1st great-grandparent	2nd great-grandparent	3rd great-grandparent	4th great-grandparent	5th great-grandparent	6th great-grandparent	7th great-grandparent
parent	Sibling 50.000%	25.000%	12.500%	6.250%	3.125%	1.563%	0.781%	0.391%	0.195%
grandparent	25.000%	1 <sup>st</sup> Cousin 12.500%	6.250%	3.125%	1.563%	0.781%	0.391%	0.195%	0.098%
1st great-grandparent	12.500%	6.250%	2 <sup>nd</sup> Cousin 3.125%	1.563%	0.781%	0.391%	0.195%	0.098%	0.049%
2nd great-grandparent	6.250%	3.125%	99%	1.563%	3 <sup>rd</sup> Cousin 0.781%	0.391%	0.195%	0.098%	0.049%
3rd great-grandparent	3.125%	1.563%	0.781%	95%	0.391%	4 <sup>th</sup> Cousin 0.195%	0.098%	0.049%	0.024%
4th great-grandparent	1.563%	0.781%	0.391%	0.195%	50%	0.098%	5 <sup>th</sup> Cousin 0.049%	0.024%	0.012%
5th great-grandparent	0.781%	0.391%	0.195%	0.098%	0.049%	10%	0.024%	6 <sup>th</sup> Cousin 0.012%	0.006%
6th great-grandparent	0.391%	0.195%	0.098%	0.049%	0.024%	0.012%	0.006%	7 <sup>th</sup> Cousin 0.003%	0.002%
7th great-grandparent	0.195%	0.098%	0.049%	0.024%	0.012%	0.006%	0.003%	0.002%	8 <sup>th</sup> Cousin 0.001%

### Take Home Message:

There are more relatives in the database who cannot be found with your test. If you test more people (siblings, cousins, etc.) then you increase your chances of finding all of your relatives.

## Identifying Best Matches

Most people have hundreds of matches to their autosomal DNA test results. The main problem is in identifying your BEST matches. There are two approaches to finding your best matches. The first is to fully investigate your closest genetic matches. The second is to use the filters and search tools provided by your testing company to identify those matches with shared genealogical elements.

For those with Jewish heritage, you will often find that your genetic relationship is closer than your actual genealogical relationship. This is because many will find that instead of being the predicted 3rd cousins, they are instead 6th cousins 5 times.

The key is to find individuals with longer stretches of shared DNA, which usually indicates a closer genealogical relationship.

# To Sum Up

## mtDNA

- Describes ONLY your direct maternal line.
- If you are ordering, consider the FMS test from Family Tree DNA.
- Anyone can be tested.
- Your maternal haplogroup can give you clues as to the origins of your maternal line.
- Your mtDNA profile is used to find matches in the database.
- Only EXACT matches should be considered further investigation (most of the time).

## YDNA

- Describes ONLY your direct paternal line.
- If you are ordering, consider the 37 or 67 marker test from Family Tree DNA.
- Only males can be tested.
- Your paternal haplogroup can give you clues as to the origins of your paternal line.
- Your YDNA profile is used to find matches in the database.
- Only matches with three or fewer differences (at the 37 or 67 marker level) should be considered further investigation (most of the time).
- You maximize the benefit of YDNA testing when you participate in a family surname project (do your homework!)

## Autosomal DNA

- Can potentially provide information about all of your ancestors back about 6 generations.
- If you are ordering, there are three companies to choose from (see below).
- Anyone can be tested. Capture the DNA of your oldest living relatives first.
- Your Admixture results can give you clues as to the origins of your family lines.
- All three major testing companies provide you with access to your genetic cousins.
- The best way to evaluate your matches for relatedness, when the traditional genealogical methods have been exhausted, is to create a genetic network of tested individuals.

## Testing Companies

As mentioned, there are three major genetic genealogy testing companies, with a fourth earning honorable mention. Only one, Family Tree DNA, offers YDNA and mtDNA testing. All others only offer autosomal (though 23andMe does provide limited YDNA and mtDNA information).

Each has its own niches, so you should investigate each company to help you determine which might be the best fit for you and your genetic genealogy needs.

Family Tree DNA: [www.ftdna.com](http://www.ftdna.com)

AncestryDNA: [www.dna.ancestry.com](http://www.dna.ancestry.com)

23andMe: [www.23andMe.com](http://www.23andMe.com)

My Heritage: [www.myheritage.com](http://www.myheritage.com)

The National Geographic Project: <https://genographic.nationalgeographic.com>

For a great, general, and FREE genetic genealogy resource turn to [www.isogg.org/wiki](http://www.isogg.org/wiki).