DNA Basics

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DNA disclaimers:

You need to be prepared for the unexpected. DO NOT assume that your religious heritage means all relationships are biological. If you can't handle finding out secrets - don't mess with DNA. Seriously.

DNA is Science + History. You don't know what you don't know. This journey will cost you money and time. As you learn, you will test additional people. It will be a cycle. Be prepared.

What is DNA?

Deoxyribonucleic acid (DNA) is the genetic code that makes each of us a unique individual. Humans inherit about one half of their genetic code from each of their parents.*

We have 23 chromosome pairs. One chromosome in each pair comes from mom and the other from dad.

X & Y chromosomes determine gender.
Female = XX
Male = XY
Mom always contributes an X. Dad contributes an X or a Y.

Recombination:

Cells contain two sets of chromosomes - sperm and egg have just one. Which chromosome they get from each pair is random. That makes each sperm and egg unique. That is why siblings are unique and different from each other. That is also why we inherit different traits and why our DNA matches are unique to us.

NOTE: DNA cannot "skip a generation". If your parent didn't have it, they can't give it to you.

What types of DNA tests are available?

Y-DNA
Mitochondrial DNA - mtDNA
Autosomal DNA - atDNA

Y-DNA passes directly from father to son and mutates infrequently. This test can trace deep ancestry. This can help you with your surname line. But it can also help you in any part of your tree! If you have a male brick wall, find a living male descendant that follows a straight male line and test that living male.

mtDNA passes directly from mother to child. Anyone can have their mtDNA tested - male or female. It will trace their maternal line. This test also traces deep ancestry. Just like with Y-DNA, you can use mtDNA to solve a brick wall anywhere in your tree. The path between the brick wall and the person being tested must be all female. But the person being tested can be a male or female.

atDNA is accurate in the most recent 5-6 generations and will generate matches for all parts of your tree.

Be aware that there are also ways to use the **X chromosome** to help you with specific problems in your tree. This is deeper science than we will cover tonight, but a link to an article on using the X chromosome is included in the Resource document. *(Email Amberly and she will email this document to you.)*

Who offers what test?

The list of vendors is very, very long. We will just focus on the companies you would actually want to consider testing with.

For Y-DNA or mtDNA, test with FamilyTree DNA.

For atDNA, consider using: Ancestry, FamilyTree DNA, 23 & Me, or MyHeritage.

How do you choose? Consider these factors:

Company	Ancestry	FamilyTree DNA	My Heritage	23 & Me
Collection Method	Saliva Sample	Cheek Swab	Cheek Swab	Saliva Sample
Type of Test	atDNA	atDNA, Y-DNA, mtDNA	atDNA	atDNA, Health
Cost	$99	atDNA - $89, Y-DNA - $169+, mtDNA - $199; bundling deals, add ons	$99	$49 for 2 atDNA kits (through November 23rd, regularly $99), Health + atDNA $199
Accepts free atDNA transfers	No	Yes	Yes	No
Sample Storage	No	Yes, 25 years minimum	Yes, indefinitely	Yes, indefinitely

At some point you have to just dive in and learn.

The **most economical choice** is to test with Ancestry.com, then do a free autosomal transfer of your DNA data to FamilyTree DNA and MyHeritage. This will put your test into the three main vendor's pools of DNA data.

Important Note: *If the Ancestry test was taken AFTER May 2016, the DNA chips used by the testing companies are not identical. You will only get about 20-25% of your matches at FTDNA and MyHeritage. FTDNA & MyHeritage currently use the same chip and are completely compatible. This method of testing with Ancestry and transferring to FTDNA and MyHeritage will still be very effective for adoptees, birth families, and beginners. But you won't get your more distant matches on FTDNA and MyHeritage. This is still the most economical choice for a beginner. Just understand that at some point, you may need to test with another company.*

Remember - your DNA journey will cost you time and money. As you learn, you will spend more time and probably more money.

One important caveat: Sometimes, one of those other vendors - the ones we didn't talk about - is the right one for you. But you probably won't, and can't, know that until after you start somewhere.

Watch for sales: Black Friday, Christmas, New Years, Mother's Day, Father's Day, DNA Month/Day, Halloween, on Groupon, at RootsTech, and plenty of others.

Who do I test and why?

The short answer - everyone
Oldest and sickest family members first. Oldest living descendant of your brick wall(s).

Ethnicity Estimates

Because of recombination, your ethnicity estimate WILL NOT match your tree.

Gumball Example

Reference Populations

Don't throw out your lederhosen for a kilt!

What can DNA do for you?

Make a plan. Start with research, figure out what you already know and what you can discover through records.

Make a testing plan based on what you want to learn. Test. Learn. Develop strategies for evaluating your matches.

Learn how to access trees that aren't linked to DNA results.

Look for surnames you DO NOT have in your tree. These are likely the very surnames you are missing!

Then, switch to traditional research. Make sure the paper trail supports your hypothesis.

Final Advice:

You just don't know what you will find or solve until you try it!

DNA can confirm good research, point out problems, show you when you have an unknown NPE (non-paternity event), and most importantly - help with brick walls!

Adoptees should test with, or transfer results to, EVERY COMPANY!

So what should you do now?

Make a plan.
What do you want to solve or confirm?
Who are you going to test?
What company are you going to use?
Purchase kits.
Test.
Learn.
Keep learning!

If you would like a pdf of learning resources, email Amberly at amberlysfamilyhistory@yahoo.com. All included resources are free, except for one.

* Definition from the FTDNA Learning Center