

DNA Demystified: A Beginner's Guide to Cracking Your Genetic Code

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DNA testing has become one of the most powerful tools available to genealogists, offering new ways to confirm family lines, uncover hidden branches, and even solve long-standing brick walls. Yet for beginners, the choices and terminology can feel confusing. This session provides a clear and approachable introduction to using DNA in your family history research and is designed to help beginners gain confidence in using DNA results alongside documentary research.

Why do people take DNA tests?

- Discover ethnicity
- Discover Ancestral Homeland
- Confirm previous research
- Find cousins or other relatives
- Break down brick walls
- Answer specific questions
- Research Adoptions
- Learn medical history

What is DNA

DNA, an acronym for deoxyribonucleic acid, is the material in our cells that carries genetic information. This determines an organism's biological features and is passed from an individual to its offspring.

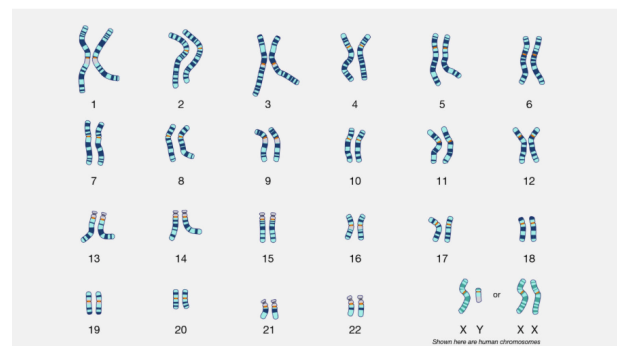
This is useful for family history because it allows us to compare our DNA with others who have already been tested. The more similar our DNA is to another person's DNA the closer we are related.

Types of Human DNA

Our DNA is found in all our cells except our red blood cells. The typical person has 23 pairs of nuclear chromosomes for a total of 46. Of these, 22 pairs are called autosomal chromosomes and 1 pair are the sex chromosomes. These strands or sets of chromosomes come one from your mother and one from your father.

There are two types of sex chromosomes, X and Y. Biological men have 1 X and 1 Y chromosome. Biological women have 2 X chromosomes.

Mitochondrial DNA (mtDNA) is found outside the cell's nucleus in the Mitochondria. It is passed from the mother to all of her children.



<https://www.genome.gov/genetics-glossary/Karyotype>

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YDNA Testing

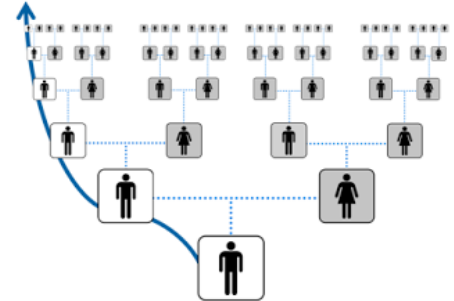
YDNA is a paternal test. It tells you about your father's, father's, father's line. Because of this, it is frequently called a surname test. Only males can take a YDNA test. Women will have to get a brother, father, paternal grandfather, uncle, or paternal male cousin with the surname line you want to research to take the test.

Who sells these tests? Only FamilyTree DNA

Which test should you take? Y67, Y111 marker or Big Y-700.

What do you get?

- List of your matches – consider only a distance of 3 or less
- Your paternal haplogroup can give you evidence of the origins of your paternal line
- Family surname groups



mtDNA Testing

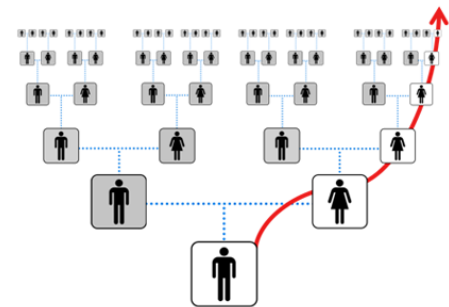
mtDNA or mitochondrial DNA is a maternal test. It tells you about your mother's, mother's, mother's line. Because of this, the surnames will usually change with each generation. Mothers pass their mitochondrial DNA on to both their sons and daughters but sons do not pass on their mother's mitochondrial DNA to their children. Anyone can take a mtDNA test.

Who sells these tests? FamilyTree DNA

Which test should you take? Full sequence test

What do you get?

- List of your matches – only exact matches should be considered
- Your maternal haplogroup can give you evidence of the origins of your maternal line
- Can be used to validate or disprove siblingship



Is it useful? Sometimes, especially if you have a specific question to answer.

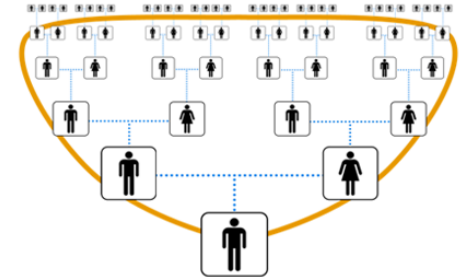
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Autosomal DNA - atDNA also called a Family Finder test or Relative Finder

Autosomal DNA can potentially find information on all the people in your family tree back, reliably, about five or six generations. Autosomes are the 22 pairs of chromosomes we inherit from our parents. In addition there are two sex chromosomes. Females have two X-chromosomes and males have one X-chromosome and a Y-chromosome. You receive about 50% of your atDNA from each of your parents but it is not the same 50% as your siblings receive. You will get about 25% of your atDNA from each grandparent and 12.5% from each great-grandparent. Anyone can take an atDNA test.



Who sells these tests? Ancestry DNA
FamilyTree DNA
23 and Me
MyHeritage DNA
LivingDNA

Who should you test? Test your oldest relatives first and then as many relatives as you can afford.

What do you get?

- Ethnicity estimates
- Ancestral origin/journeys/regions
- Living cousins
- Ancestry.com DNA –
 - Shaky leaf hints
 - paternal/maternal breakdown,
 - colored dots,
 - ThruLines.
 - NEW – ProTools
 - To see full trees, common ancestors, and ThruLines, you will need a membership
- Other companies you may get pedigree charts
- Chromosome browser with FamilyTree DNA, 23 and Me, MyHeritage



DNA Testing

Ancestry DNA – spit test

23 and Me – spit test

FamilyTree DNA – cheek swab

MyHeritage DNA – cheek swab

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Each company will mail you a testing kit. You follow the directions and mail the test back in the provided box or bag. Wait.

Ancestry DNA – autosomal test. – <http://dna.ancestry.com>

Ancestry DNA you must have a subscription to use many of the features.

Cannot upload results from any other company.

FamilyTree DNA – YDNA, mtDNA, atDNA tests <http://www.familytreedna.com>

Can upload tests to FamilyTree DNA from Ancestry, 23 and Me, MyHeritage for \$19, currently \$9 on sale.

23 and Me – autosomal test – <http://23andme.com>

Cannot upload results from any other company.

MyHeritage – autosomal test – <http://myheritage.com>

You can no longer upload tests to MyHeritage from other companies

Strategy

1. Test at Ancestry and download your results
2. Upload your results to FamilyTree DNA
3. Test at MyHeritage and 23andMe

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AncestryDNA® and Memberships

With an AncestryDNA® kit, you can access your results, including your ancestral regions, journeys, DNA matches, and some traits.* However, our memberships could help you make more discoveries.

AncestryDNA® feature	Without a membership	With an Ancestry family history membership	With an Ancestry family history membership AND Ancestry® Pro Tools
Ancestral regions	✓	✓	✓
Ancestral journeys	✓	✓	✓
DNA matches	✓	✓	✓
Contacting matches	✓	✓	✓
DNA compare	✓	✓	✓
Traits			
Traits	Limited to 3 included traits**	✓ Also includes 75+ more traits	✓ Also includes 75+ more traits
Traits compare	Limited to 3 included traits**	✓	✓
Match relationship tools			
Custom match groups	Limited to up to 24 custom groups	✓ Up to 64 custom groups	✓ Up to 64 custom groups
Shared matches	Limited to up to 3 shared matches	✓	✓
Matches' family trees***	See if a match has a family tree, view its size, and whether it's public or private.	✓	✓
Matching surnames in matches' trees***		✓ Up to 7 generations of surnames***	✓ Up to 7 generations of surnames***
Matching ancestor birthplaces in matches' trees***		✓	✓
Common ancestors in matches' family trees		✓	✓
ThruLines®		✓	✓
DNA inheritance			
Matches by parent		✓	✓
Regions by parent		✓	✓
Journeys by parent		✓	✓
Traits by parent		✓	✓
Chromosome painter		✓	✓
Advanced DNA tools			
Enhanced shared matches			✓
Matches by cluster			✓

* Subject to change. Some DNA features may require an Ancestry® membership in the future.

** You may access traits without a membership by purchasing an AncestryDNA + Traits kit or a Traits upgrade to your existing AncestryDNA results (where available). If you previously purchased Traits, your access to those traits will not be affected if your membership is canceled.

*** Access to public trees and trees you're invited to view. Record access depends on membership type.

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Recommended Resources

