

How DNA Results can be Useful to Family History Research

Cary Lynn Bright

brightgenealogy@gmail.com

Presentation Objectives:

- A review the three DNA Tests that could be valuable to your family history research.
- Learn the five results you can expect from a DNA test and where to find them.
- Explain how the ethnicity estimation or Admixture can identify DNA matches to certain sides of your family tree.
- Learn the importance of testing the best family members to identify the most, great grandparents.
- Learn to identify predictable average amount of DNA that should be shared with a descendant for a family connection.
- Explain the importance of analyzing your DNA matches, leaving assumptions out of the equation.
- Gather Tools for your DNA Genealogy Toolbox
- DNA Terminology – https://isogg.org/wiki/Genetics_Glossary
or by topic: <https://www.isogg.org/wiki>

DNA Inheritance:

DNA is passed down from our ancestors to their descendants in a pattern that can help provide another piece of proof to your family history research. Just like with paper records, DNA will help you prove and disprove an expected biological relationships.

yDNA: 4-12 generations on the paternal line

mtDNA: 125-500 years back

Autosomal: for the first 3 generations and offer probability of a relationship up to 5 generations

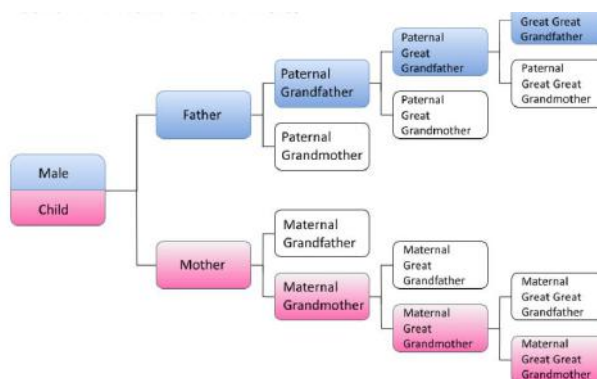


Image from: https://isogg.org/wiki/Paths_of_DNA_inheritance

DNA Tests:

Company	Cost	Type	Store Sample	Start Testing	Website
23andMe	\$99+shipping	Saliva	Yes	Nov. 2007	https://www.23andme.com/
AncestryDNA	\$69+shipping	Saliva	Yes-25 yr min	May 2012	http://www.dna.ancestry.com
FamilyTree DNA	\$79+shipping y-\$129-349 mt-\$159	Swab 1 tube tests them all	Yes	Feb 2010 y/mt-2000	https://www.familytreedna.com/
LivingDNA	\$99+shipping	Swab	Yes	Feb 2019	http://www.livingdna.com
MyHeritage	\$69+shipping	Swab	Yes	2016	https://www.myheritage.com

Learn more: https://isogg.org/wiki/Autosomal_DNA_testing_comparison_chart

ALL DNA Tests should give you the following Results:

1. **Ethnicity or Haplogroup** Identification [yDNA and mtDNA; 23andMe atDNA]
2. Your **personal DNA results** [and ability to get access to the raw data file]
3. A List of **Matches** to YOUR dna [ability to save the match lists[not at Ancestry]
4. **How related** your DNA Matches are to you both by a relationship and assigned value:
Genetic Distance # [lower the better] OR amt of Centimorgans [cMs]- higher #or % = more related
5. **Where** your DNA match segments are [Chromosome #, Start & Stop locations- not available from AncestryDNA]

yDNA – Paternal line from biological father to son [Males only tested]

Matches will share a patrilineal Ancestor in 4-12 generations

Testing Co: FamilyTreeDNA

Test sold by the # of Markers

37[\$119], upgrade to 67[\$99]; 111[\$249] or BigY 700 [\$449]

.Results: Haplogroup

Personal Marker values[from STR's

List of Matches

Genetic Distance "Steps" [0-1 best connection]

Ancestors

need to join a Projects [Surname/Haplogroup] for all Marker #

Analysis: Look for patterns in marker values that make a group aligned to an ancestor

Uses: Prove paternal line ancestor/surname/relationship

Disprove paternal line ancestor/surname/relationship [mis-attributed parent event-MPE]

Add family tree relationships to proven yDNA descendants

Surname Project Website can help with tree hints

3 .csv files to upload: Certificate/Your DYS Results/Match List at each level populated[37/67/111]

Toolbox: yDNA Genetic Distance chart:

<https://genealogy.stackexchange.com/questions/9186/genetic-distance-to-generations-calculation-for-y-str-dna-tests>

Mitochondrial [mtDNA]- maternal line from mother to ALL her children[125-500 yrs back]

Testing Co: FamilyTree DNA

Test sold as Full Mitochondrial Sequence [FMS] resulted as HVR1 + HVR2 + CRS

\$159 at FamilyTreeDNA

Results Haplogroup

List of Mutations[your differences to the Cambridge Reference Seq]

List of Matches

Genetic Distance "Steps" [0 best connection]

Ancestors

need to join a Haplogroup Project to see matches differences

Analysis: Look for patterns in the trees/locations

Uses: Prove a maternal line ancestor/relationship

Disprove maternal line ancestor/relationship [mis-attributed parent -MPE]

Add family tree relationships to proven mtDNA descendants

3 .csv files to upload: Certificate/Mutations/Match List/

Haplogroups

Unique letters/numbers or abbreviated

Google yours to learn what it means[letters/numbers/abbreviation]

Consult haplogroup map at FTDNA for 5,000-12,000 yrs destination

Find your haplogroup location on the Y/mt Tree [FTDNA or others]

Maternal/Paternal Haplogroups are very different and do not mean the same

Expect updated MitoTree by 2023

Ethnicity Estimates – based on Reference Population/Panel unique to each DNA company

Estimates and should only be used as hints and companies update them periodically

Can help id unique ethnicity matches to a side of your DNA [mat/pat]

Reference populations size:[analyzed as math plot points – how close do they fall to the ID point]

AncestryDNA	10,000	MyHeritage	7,500
-------------	--------	------------	-------

23andMe	5,000	FTDNA	3,500
---------	-------	-------	-------

Autosomal[atDNA] All relatives 1-2 generations will share, within 3-5 generations possible sharing and outliers that share up to 8+ generations

Testing Co: AncestryDNA MyHeritage FamilyTreeDNA[FTDNA] 23andMe LivingDNA

Company	Accepts other DNA Uploads	Highlights	Lowlights
23andMe	No	Segment locations when sharing with matches;	Internal messaging, Spider Tree
AncestryDNA	No	Color Dot Sorting; Shared matches; Tree links; ThruLine tools; Ethnicity estimates	Internal Messaging; no Segment Locations; No match files; no interface with 3 rd party tools sharing files
FamilyTree DNA	Yes \$19 for tools	Segment locations, shared matches, Matrix tool, Match file uploads; email addresses shared	Ethnicity estimates due to size of reference population
LivingDNA	Yes	UK centric ethnicities;	Low # of matches, no DNA tools or Segment. Locations
MyHeritage	Frequently	Shared matches; Segment locations, Autoclustering files; Match files; family tree; European/Norwegian matches	Internal messaging;

Test: \$39-\$99 and may have extra health trait test [sales frequently]

Results Ethnicity Estimates List of Mutations[your differences to the Cambridge Reference Seq]

List of Matches Centimorgans in common [cMs]

Ancestors[List/Tree Relationship estimation

segments shared

Chromosome browser/map [for location of segments on certain chromosomes]-not at

AncestryDNA

Analysis: Look for matches with like ancestors with segments located on the same chromosome & area

Higher the cMs shared, the closer the relationship

Uses: Prove you are related [1-2 gens only]

Prove a genetic connection to a shared ancestor couple [rule of 3] with similar shared DNA

DNA Toolbox:

Relationships by shared DNA https://isogg.org/wiki/Autosomal_DNA_statistics

Or 23andMe : <https://customercare.23andme.com/hc/en-us/articles/212170668-Average-Percent-DNA-Shared-Between-Relatives>

DNA Shared cM table [paper chart or interactive website]

Chart: <https://secureservercdn.net/184.168.47.225/35b.ded.myftpupload.com/wp-content/uploads/2020/03/Shared-cM-Project-Relationship-Chart.png>

DNA Painter: <https://dnapainter.com/tools/sharedcmv4>

Who to test & Target Testing

Your oldest living relative immediately

Yourself

Key 2nd Cousins the represent your 8 Grandparents

Parents/Siblings [add yDNA & mtDNA for your parents] [poss. Generation closer then YOU]

If a choice, pick the target closet to the ancestor you are exploring

Where to Test

Elder – swab company [FTDNA or MyHeritage]

One shot to get a test – [FTDNA]

Stores test forever /Can be upgraded to add more DNA testing at a later date

European Ancestors – [MyHeritage]

English/Scottish Ancestors – [LivingDNA]

DNA Super Tips

DNA results are all about unique values that form a pattern with matches – Find the patterns!

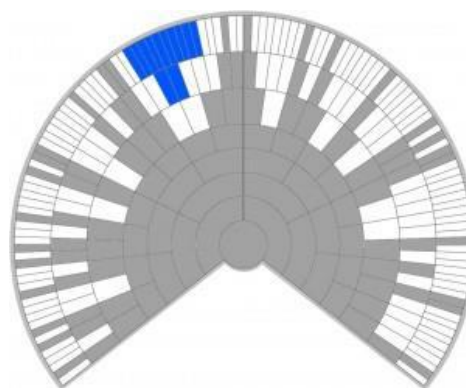
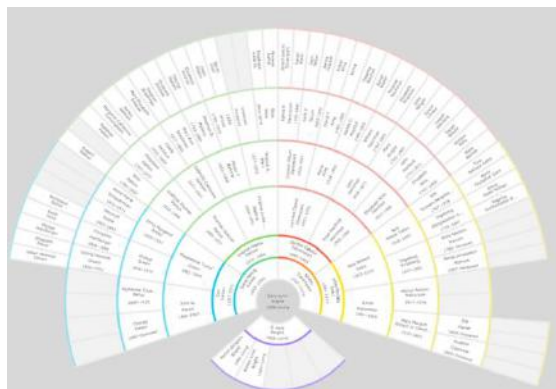
You will spend more time building trees for DNA Matches, then finding DNA matches

Record your analysis/thoughts

DNA website comments/notes on each match profile

DNA Match Log

Each time you work with your DNA matches, you should accomplish a task
 DNA is a research time sucker
 You have 2 trees – family tree & genetic tree and they are not EQUAL



<https://thegeneticgenealogist.com/2013/11/05/understanding-autosomal-dna-with-just-a-few-basic-tenets/>

DNA is another piece of documentary evidence to prove a relationship to an ancestor couple
 DNA testing results will last beyond your lifetime
 DNA can have more negative evidence than most records
 DNA is a game of patience

The “Rights” need to align

Question to solve with DNA
 DNA Test
 DNA Company
 DNA Match

Confirmed relationship based on cMs
 Family Tree with shared ancestor/surname
 Shared segment in the same locations
 YOU realize all this!

Summary of DNA Test Uses

Confirm ancestor relationships you know about
 Help provide a hint/name/MPE to a brick wall
 Confirm a biological relationship to a family [especially for adoptees]
 Determine male/female line
 DNA analysis can be enhanced by using DNA Co. and/or 3rd party tools
 Extends family beyond the paperwork of recent centuries or lack of any paper proof
 Provides clues and additional evidence to work with traditional family research evidence

Resources:

Online resources reflect the changing DNA information
 Find the way your brain works the best [words/graphics/oral talks...]
 ISOGG.org <http://www.isogg.org> click on “Newbies” from the left menu bar
 YouTube videos about varied DNA Topics and processes
 Each testing company has wonderful tutorials:
<http://www.familytreedna.com> <http://www.23andme.com>
<http://myheritage.com> <http://www.ancestry.com/dna>

Blogs to follow:

Blaine Bettinger Your Genetic Genealogist <https://thegeneticgenealogist.com/>
 Roberta Estes’ DNA-Explained <https://www.dna-explained.com>
 Judy Russell’s The Legal Genealogist <https://thelegalgenealogists.com> [DNA topics on Sunday]
 Leah Larkin The DNA Geek <https://thednageek.com/blog/>

DNA Facebook Groups [over 50+]

DNA citations: <https://familylocket.com/dna-source-citations/>