



S. C. S. Computer / Genealogy Class SIG  
Thursday, February 9, 2017, 10:00 a.m.  
Karen Ristic

# DNA: Which Test is for Me?

## Part I: Y-DNA: Is This Test for Me?



Part 1  
February

**Y-DNA:**



Part 2  
March

**MtDNA:**



Part 3  
April

**AtDNA:**



Also:

Attachment 1: DNA Testing Comparison Chart  
Attachment 2: Genetic Genealogy Glossary  
Attachment 3: Genealogy Privacy Issues



# DNA: Which Test is for Me?

**1. What Are Your  
DNA Testing Goals?**

**2. What is Y-DNA?**

**3. Y-DNA  
Inheritance**

**4. Y-DNA Testing  
Consists of  
Multiple Parts**

**5. Your Ancestral  
Origins**

**6. FamilyTree  
Y-DNA Test Results**

**7. FamilyTree DNA: Y-  
DNA Matches**

**8. A Strategy for Using  
Y-DNA Test Results**

PLUS: Attachment 1: DNA Testing Comparison Chart  
Attachment 2: Genetic Genealogy Glossary  
Attachment 3: Genealogy Privacy Issues



# 1. What Are Your DNA Testing Goals?

**Interest in DNA testing for genealogy has reached an all-time high** thanks to its increasing sophistication and the resulting visibility in the media. As a result, many family history enthusiasts have expressed their desire to venture into the fascinating world of genetic genealogy, but **don't know where to start**.

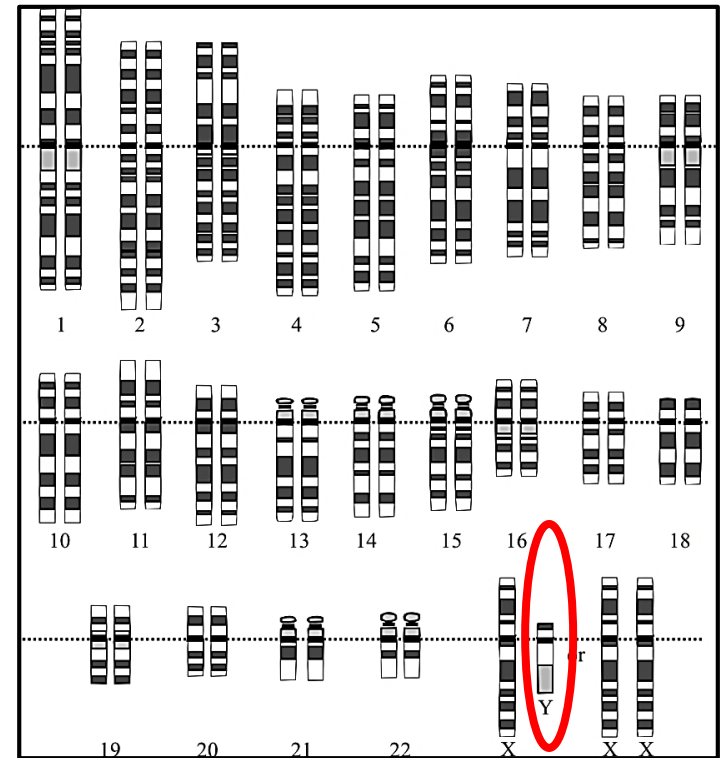
**The first step is to determine your testing goals.** Do you have a general curiosity about genetic genealogy or is your focus more specific? For example, please consider the following questions:

- **Are you primarily interested in researching your surname?**
- **Are there specific brick walls that you wish to target with the use of DNA testing?**
- **How far back in your family tree are these brick walls?**
- **What is the ancestral pattern back to these brick walls, i.e. mother's mother's mother or father's mother's mother's father?**
- **Are you ready for a long-term project or do you desire quick answers?**
- **Are there adoptions in your family tree that you would like to explore?**
- **Is your primary interest receiving a percentage breakdown of your overall ancestral origins or "ethnicity"?**

## 2. What is Y-DNA ?



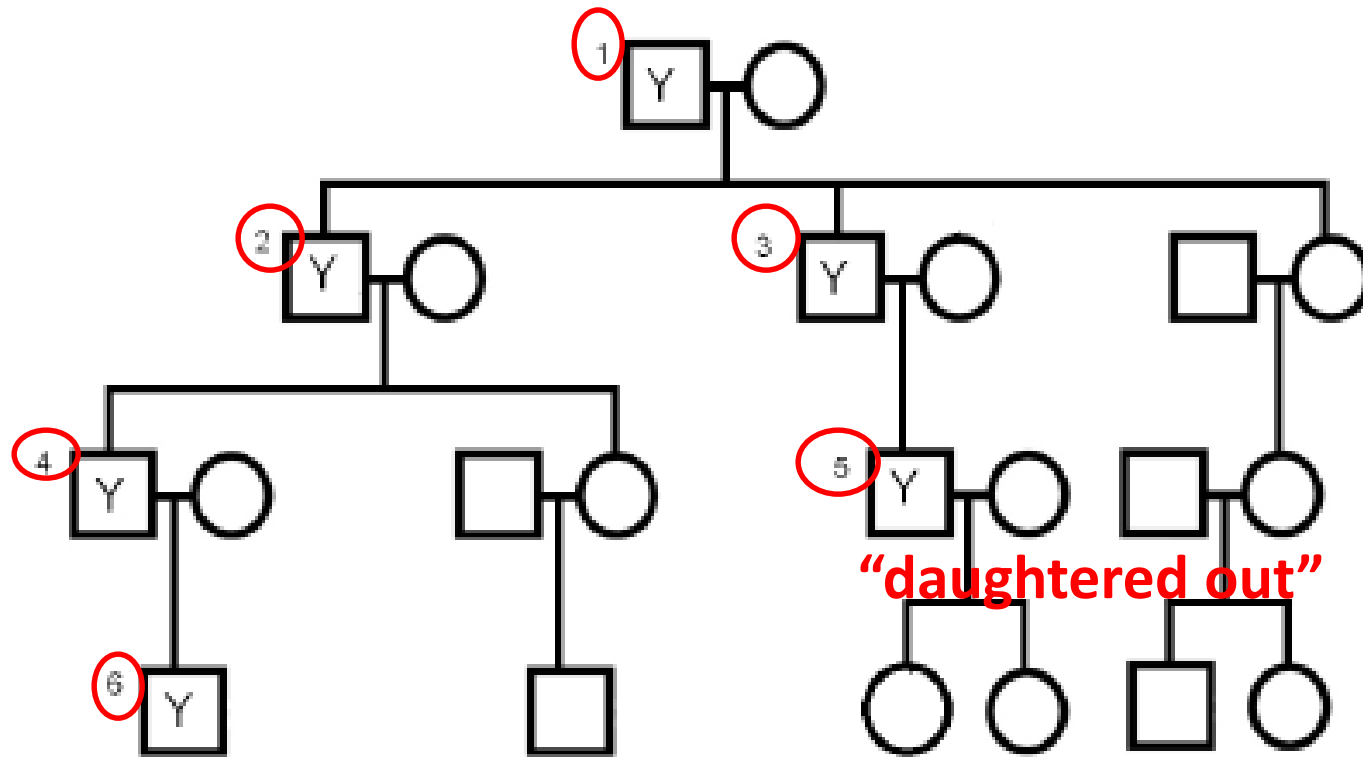
- **Only men have a Y chromosome.** Women who want to use Y-DNA to answer a genealogical question must recruit a male to take the test.
- A male has one X chromosome from his mother and one Y chromosome from his father. As a result, **the Y chromosome is found only in men, who inherit it almost entirely unchanged from their fathers.**
- **Is This Test for Me?** Do you have an ancestor for whom the father is unknown? Do you have a male ancestor whose origin is unknown? Are you unsure about a father-son relationship in your pedigree chart? Was Native American ancestry inherited down the direct paternal line? (Native American ancestry can be indicated, but DNA cannot isolate to a specific tribe.) Could two men share a common ancestor or not?



- **Framing your genealogical question in the context of your own family tree, your Y-DNA test results, and the test results of others will help answer some of these questions.**

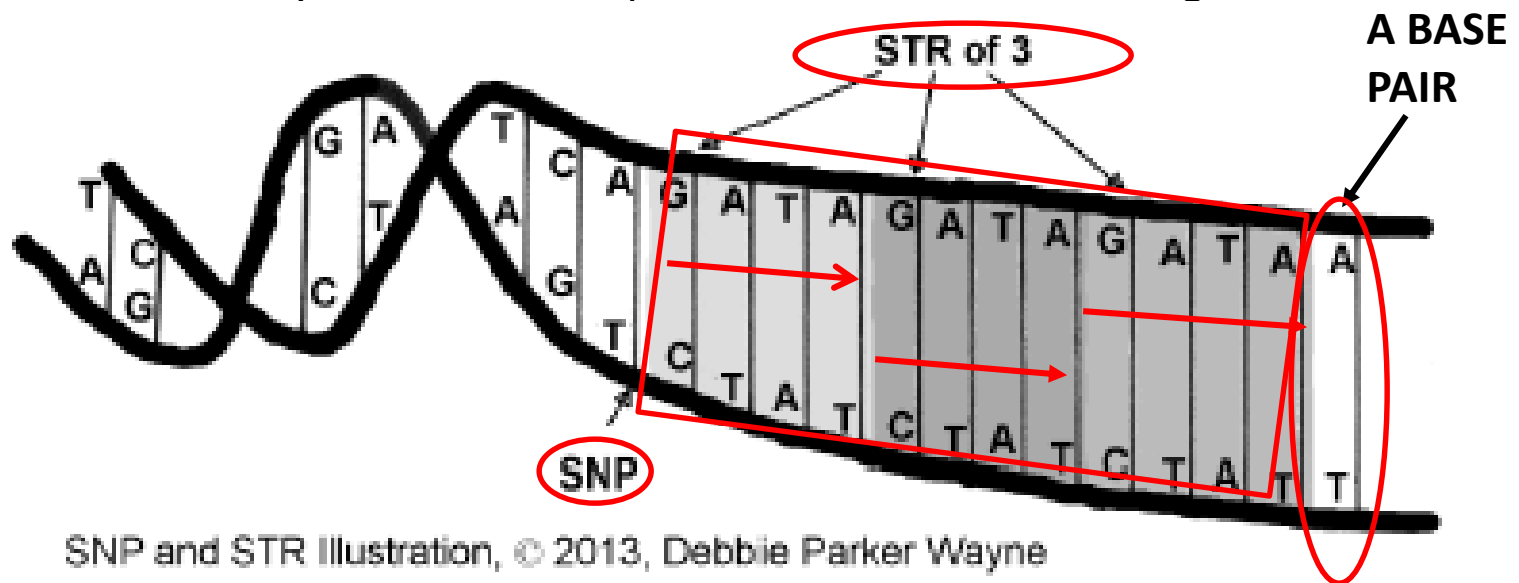
### 3. Y-DNA Inheritance

- **Y-DNA is passed only from a father to his sons.** Daughters do not inherit Y-DNA. The father (1) passes his Y-DNA to his sons (2) and (3). One son (2) passes his Y-DNA to grandson (4) who also passes it to great-grandson (6). One son (3) passes his Y-DNA to grandson (5) who does not pass on his Y-DNA as he only has daughters. Of the descendants shown on the bottom row, only great-grandson (6) will pass the Y-DNA of his paternal great-grandfather (1) to the next generation.



# 4.1 Y-DNA Testing Consists of Multiple Parts

- Y-DNA is the chromosome found in the cell nucleus and consists of about 59 million locations which **for genealogical purposes analyzes only a small number of those locations.**
- The First Part of Y-DNA test results*** depends on whether an **STR** or **SNP** test is performed. When a chromosome is uncoiled it resembles a ladder as below. Each rung of the ladder is called a **base pair**. When the chemical at an individual ladder rung changes or mutates it is called a **single nucleotide polymorphism (SNP, pronounced snip)**. When a segment of the DNA has a small, side-by-side, repeating pattern it is called a **short tandem repeat (STR, pronounced stir)**. Both SNPs and STRs may be referred to as markers and each of these locations has a name assigned by the scientific community. This is the first part of Y chromosome testing.



SNP and STR Illustration, © 2013, Debbie Parker Wayne



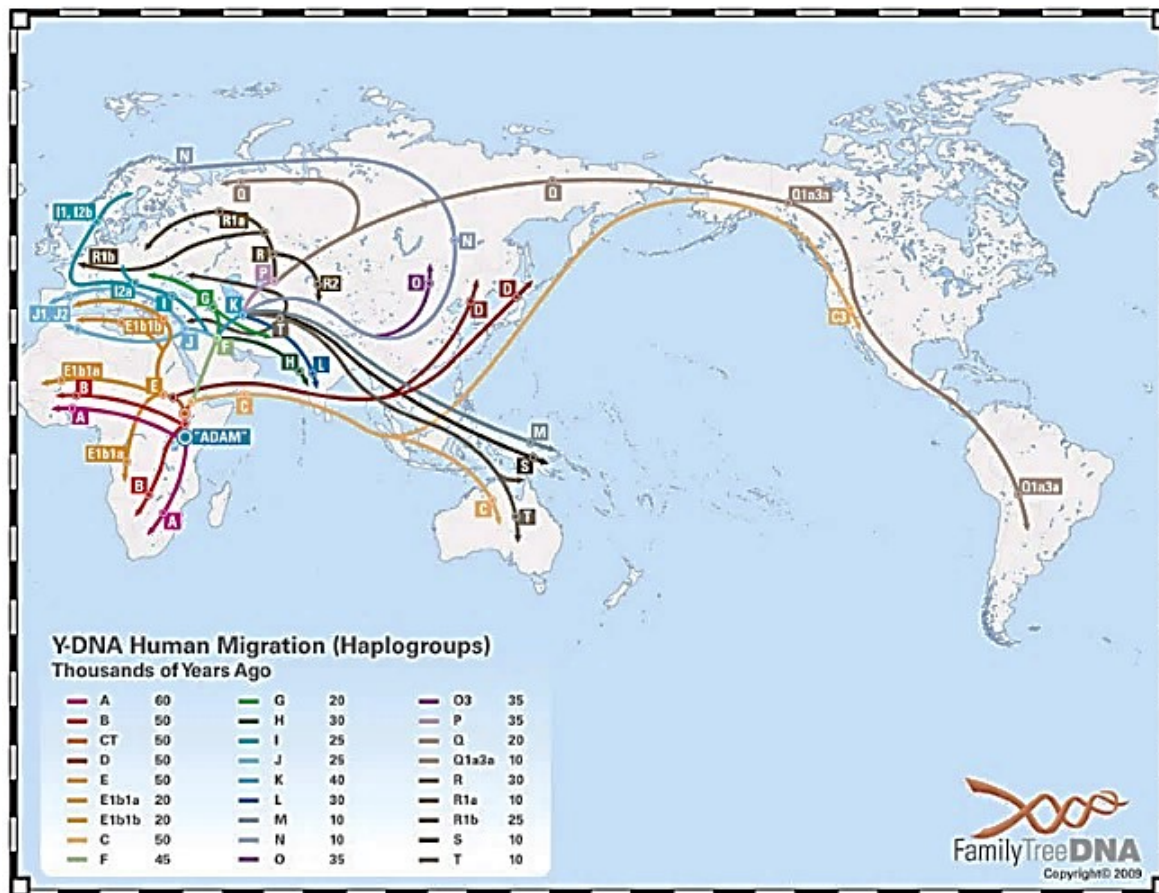
# A Detailed Example of the Y Chromosome A Video

Look for the *double helix*, *base pairs (A-T and C-G)*,  
*STR*, and *SNP*



## 4.2. Y-DNA Test Results Consist of Multiple Parts

- ***The Second Part of Y-DNA Testing*** is a **haplogroup**. This represents the deep roots of the paternal ancestry—the location of ancestors tens of thousands of years ago. Two people in the same haplogroup share a common ancestor, but it might be thousands of years ago.



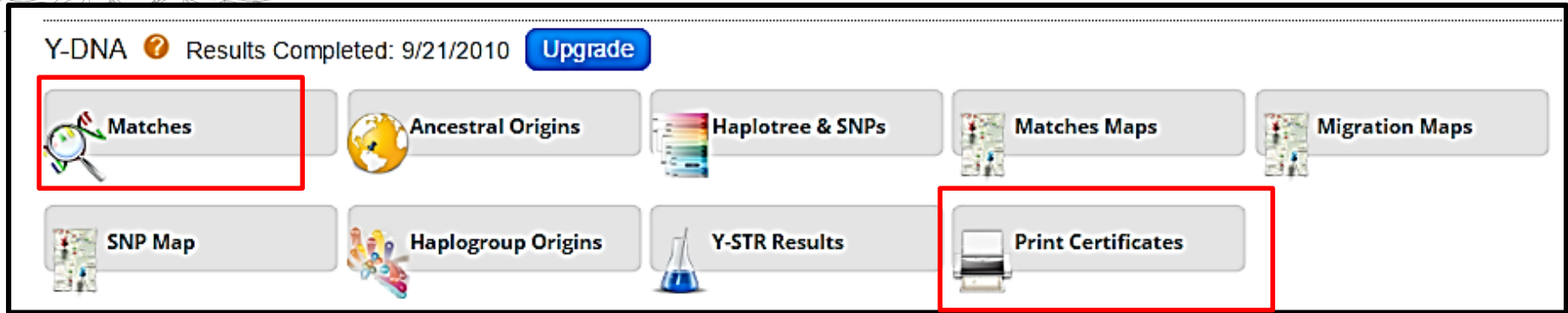
**Haplogroups** have to do with deep ancestry going back thousands of years. They tend to be associated with a geographic location. When there are mutations in the Y chromosome or in MtDNA, it leaves a signature, which is designated by letter and number combinations. With all genetic genealogy research, locations are important. This is true whether a few decades ago, or hundreds or thousands of years in the past. . **With a Y-DNA test you will see a visual representation of this journey, as shown here.**



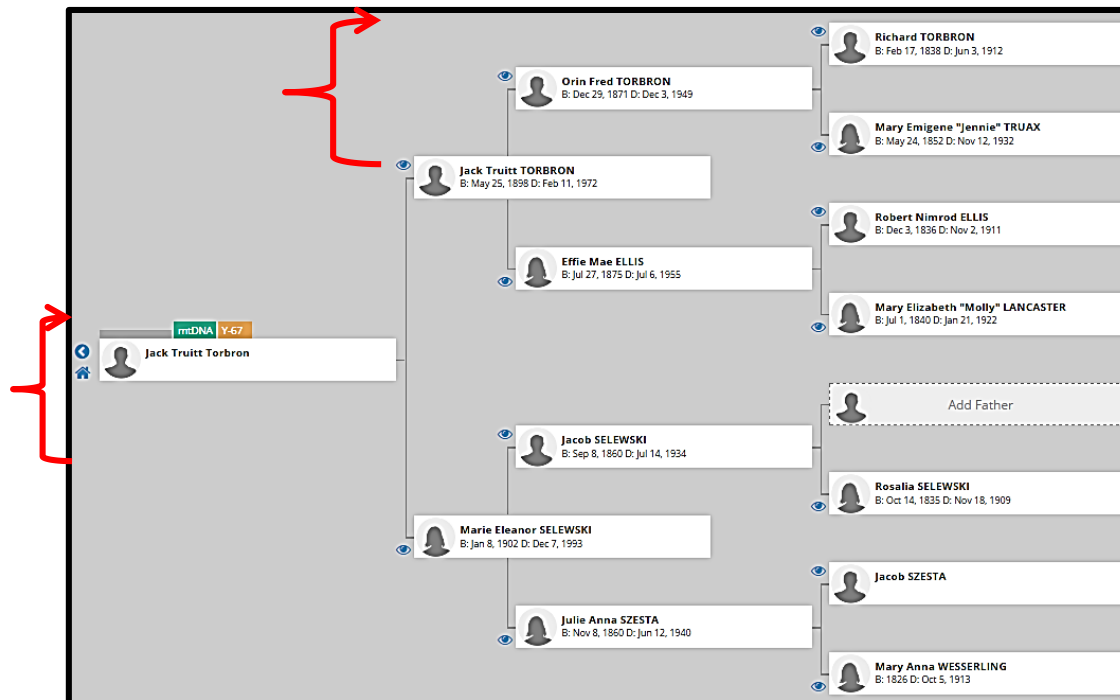
## 5. Your Ancestral Origins

- **FTDNA Y-DNA marks the path from our direct paternal ancestors in Africa to their locations in historic times.** Your ancestors carried their Y-DNA line on their travels. The current geography of your line shows the path of this journey from its origin, “DNA Adam”. You can learn about the basics of your line’s branch on the paternal tree from your predicted branch placement.
- **This information comes from scientists who study the history of populations across geography and time using Y-DNA.** They use both the frequencies of each branch in modern populations and samples from ancient burial sites.
- With these, they are able to tell us much about the story for each branch. **This traces back hundreds, thousands, or even tens of thousands of years.**
- Your branch on the tree tells you where your paternal ancestors are present today and about their likely migration paths listed on the previous slide. **This is your Y-DNA haplogroup.**

# 6. Y-DNA Test Results from Family Tree DNA



**Don't Forget to Add Your Family Tree Especially Your Male Heredity**



# 7. Family Tree DNA: Y-DNA Matches

Filter Matches

Show Matches For:

The Entire Database

Markers:

67

Distance:

All

Matches Per Page:

25

Last Name Starts With:

(Optional)

New Since:

Run Report

67 Markers - 13 Matches

Genetic Distance	Name		Most Distant Ancestor	Y-DNA Haplogroup	Terminal SNP	Match Date
1	Mr. Geoffrey Benjamin Thubron	Y-DNA111	Robert Thubborn b. ~1690	I-Y10660	Y10660	9/25/2014
4	Ricky Allen Moore	Y-DNA111	Isaac Moore. b.VA Res.1820,Floyd Co.,KY	I-M223	M223	9/18/2015
4	Susan Reardon	Y-DNA67	John James Petigrew, b 1921and d. 2001	I-M223		11/19/2014
4	Mr. M. Coburn	Y-DNA67	John Coburn, b.1644 Ipswich, MA, d.1695 Anson, NC	I-M223	M223	9/14/2012
4	Mr. Lowrie Wilson Brown III	Y-DNA67		I-CTS6433	CTS6433	3/5/2012
4	Lewis W. Pennell	Y-DNA111 FF	William A. Pennell, b. 1823, MD	I-M223	M223	7/25/2011
5	James Joseph Richards	Y-DNA111	James Thorburn b. 1773	I-M223		10/27/2016
5	Mr. Wendell Hugh Melrose	Y-DNA67 FF	James Melrose, 9 June 1760 - 14 Aug 1833	I-M223		9/6/2016
5	James Brown	Y-DNA67 FF	Francis Brown, b. ca 1628 England/Connecticut	I-Y10660	Y10660	5/11/2016
5	Scott Moore	Y-DNA67 FF	John Moore b 1769 Wash. Co VA d 1851 Russell Co VA	I-M223		3/17/2016
5	Mr. bobby gordon moore	Y-DNA67	Isaac Moore	I-M223		2/13/2014
5	Printis Johnson III	Y-DNA67 FF		I-M223	M223	1/12/2014
6	Mr. Ian Henderson	Y-DNA67 FF	John Henderson, b. C1750 Glencairn, Dumfriesshire	I-L801	L801	9/1/2010

Download Matches:

CSV

Excel

Download Matches: [CSV](#) [EXCEL](#)

Legend



How closely you are related: 1 is closely related; higher is less so.

Write an email to:

In comparing Y-DNA 67 marker results, the probability that **Mr. Geoffrey Benjamin Thubron** and **Jack Truitt Torbron** shared a common ancestor within the last...

## COMPARISON CHART

Generations	Percentage
4	89.79%
8	98.96%
12	99.89%
16	99.99%
20	100.00%
24	100.00%

tree

Family View Pedigree View

Notes

Click to edit

## 8. Y-DNA Matches at FTDNA

- In addition to providing this deep ancestral migratory route, a **Y-DNA test also provides a list of people in their database who share with you a common direct paternal (your father, father's father, father's father's father, etc.) ancestor within the past 25 generations.** If a person relates to you through a father's father's mother's line, Y-DNA will not connect you to them.
- As surnames are traditionally passed down the direct paternal line, **Y-DNA testing is particularly useful in surname studies** to see how all living people of a certain surname are genetically related.
- **There are different levels of Y-DNA matches available.** Picture Y-DNA as a puzzle with 111 pieces to it. Whatever level of Y-DNA you have, it compares that number of puzzle pieces, or markers, to another person's to see how many markers you have in common.
- **The number of markers you match with another person is called a *genetic distance*.** Generally speaking, the higher the genetic distance, the more distantly related that person is to you. Zero is an exact match. The more markers you test for, the more complete a picture of the puzzle you look at, and the more accurate the genetic distance is.
- **In addition, higher level testing helps refine your matches to those most closely related to you.** In the example below, this person started at a 37 marker level and later upgraded to a 67 marker level. His matches were narrowed from 76 to the 24 closest matches at this higher level. Whatever level of test you get, you can always upgrade to a higher level for the difference in price between the levels.



## 8.a. A Strategy for Using Y-DNA Test Results

- **The steps for using Y-DNA are similar to those for mtDNA, but the databases used and the values compared are different.**
- **Complete your paternal lineage as far back as possible.** Document this to share with Y-DNA matches looking for a common ancestor. List your paternal ancestral names, dates, and geographic origins. The more information included the easier it will be to determine when a person is common to two family trees. **For example:**
  - 1) Perry Anderson **Parker** (1856, Milam County, Texas, to 1925, Dallas County, Texas), m1. Bettie Morrison (unknown birth to about 1891, Lee or Milam County, Texas), m2. Tennessee Angeline Maples (1874 to about 1906, Texas), m3. Bertha Sparks (1883, Alabama, to 1976, Dallas, Texas)
  - 2) Henry **Parker** (1825, probably South Carolina, to 1902, Hood County, Texas; also lived in Illinois, Pope County, Arkansas, and Milam County, Texas), m1. Nancy Black (about 1835, Alabama to 1902, Travis County, Texas), m2. Elizabeth (O'Neal) Kline Quarles (about 1836, Alabama, to 1903, Hood County, Texas)
- **Create a privatized pedigree chart.** For example, list information on your earliest known ancestor down to a great-grandparent or a recent generation that is no longer living. Include geographic locations and dates as above.
- **Join a surname project** as well as Y-DNA haplogroup, lineage, and geographic projects. Ask questions of project administrators who can be very helpful in DNA analysis. To find more potential matches upload data to public databases (YSearch.org). Investigate privacy and security policies before uploading data.
- **Search all databases and project lists for matches.** Review any ancestral information shared online, and contact the match person for more information. Contact the closest matches first as the common ancestor is likely to be more recent. If a common ancestor cannot be identified by name, look for patterns that provide additional research clues such as geographic locales, spouses' names, etc. Matches may not have posted everything they know online. Some people don't respond to contacts, but an attempt should be made. Be patient; the person may respond months after an initial query.












# FAQ at FamilyTree DNA ///// Costs at FamilyTree DNA

<https://www.familytreedna.com/learn/faq/>

Some of the topics  
FamilyTreeDNA answers for  
you:

- Before I Buy
- Shipping
- Billing and Refunds
- After I Swab
- Website Questions
- Privacy

	Best for	Specifications	What you get	Price
	<div>Genealogy</div> <div>History</div> <div>Ancestry</div>	Autosomal	<ul style="list-style-type: none"><li>Family Finder Matches</li><li>Ethnic Percentages</li></ul>	<div>\$79</div> <a href="#">Learn More</a>
	<div>Genealogy</div> <div>History</div> <div>Ancestry</div>	Autosomal + 37 markers	Male-specific bundle includes Family Finder plus our Y-chromosome test that analyzes 37 markers.	<div>\$248</div> <div>Males only</div>
	<div>Genealogy</div> <div>History</div> <div>Ancestry</div>	Autosomal + 67 markers	Male-specific bundle with all the bells and whistles! Family Finder plus our 67 marker Y-DNA test.	<div>\$347</div> <div>Males only</div>
	<div>Genealogy</div> <div>History</div> <div>Ancestry</div>	Autosomal + mtFull Sequence	Family Finder plus a Full Mitochondrial Sequence - For both males and females, our mtDNA test traces your maternal line.	<div>\$278</div>
Father's Line <a href="#">Learn More</a>				
	<div>Genealogy</div> <div>History</div> <div>Ancestry</div>	<div>37</div> markers	<ul style="list-style-type: none"><li>Connect to matches</li><li>Free access to group projects &amp; experts on your lineage</li><li>Automated updates to your results</li><li>Free webinars with a professional genetic genealogist</li><li>Personalized customer support</li><li>Uncover up to 340,000 years</li></ul>	<div>\$169</div> <div>Males only</div>
	<div>Genealogy</div> <div>History</div> <div>Ancestry</div>	<div>67</div> markers		<div>\$268</div> <div>Males only</div>
	<div>Genealogy</div> <div>History</div> <div>Ancestry</div>	<div>111</div> markers		<div>\$359</div> <div>Males only</div>
Mother's Line <a href="#">Learn More</a>				
	<div>History</div>	HVR1+HVR2	<ul style="list-style-type: none"><li>Connect to matches</li><li>Free access to group projects &amp; experts on your lineage</li><li>Automated updates to your results</li><li>Free webinars with a professional genetic genealogist</li><li>Personalized customer support</li><li>Discover up to 180,000 years</li></ul>	<div>\$79</div>
	<div>Genealogy</div> <div>History</div>	Full Sequence		<div>\$199</div>



S. C. S. Computer / Genealogy Class SIG  
Thursday, March 9, 2017, 10:00 a.m.  
Karen Ristic

# DNA: Which Test is for Me?

## Part 2: Why Mt-DNA?



Part 1  
February

**Y-DNA:**



Part 2  
March

**MtDNA:**



Part 3  
April

**AtDNA:**





## ATTACHMENT 1: Family Finder, 23andMe, AncestryDNA, and MyHeritage Comparison Chart

from Tim Janzen, MD and Blaine Bettenger (as of October, 2016)

	23andMe	Family Tree DNA's Family Finder test	Ancestry.com's AncestryDNA test	MyHeritage
Website	<a href="http://www.23andme.com">www.23andme.com</a>	<a href="http://www.familytreedna.com">www.familytreedna.com</a>	<a href="http://dna.ancestry.com">http://dna.ancestry.com</a>	<a href="http://www.myheritage.com">www.myheritage.com</a>
Price	\$199 with many more tests offered	\$99 =AtDNA test; \$169 Y-DNA test; \$199 for mT-DNA test	\$89 in the U.S. for At-DNA test	Levels go from free to \$119.40 per year; \$79 for At-DNA test
International product availability	56 countries	Worldwide	35 countries	48 countries
Method for collecting the DNA sample	saliva sample (about 1 cc)	cheek swab	saliva sample (about 1/2 cc)	cheek swab
Means of contacting people who share matches	Contact may be made after seeing your list of matches in DNA Relatives; the matches must be willing to share ancestry reports with you or have opted in to open sharing if you are to see what you share with your matches	email addresses of all matches are available	Contact can be made through Ancestry.com's messaging system	Messaging system
Average responsiveness of matches	Low	Medium	Medium	Unknown
Average level of genealogical knowledge of matches	Fairly low	Medium	Medium	Unknown
GEDCOM file upload allowed	No	Yes	Link is created to Ancestry.com pedigree charts	Yes

	23andMe	Family Tree DNA's Family Finder test	Ancestry.com's AncestryDNA test	MyHeritage
Contact your match	Yes, directly	Yes, via Email	Yes, directly	Yes, indirectly
Search by surname and/or location	Yes	Yes	Yes	Yes
Possible relationship suggested	Yes	Yes	Yes	Unknown
Upload of raw data file allowed from other companies	No	Yes, but 23andMe Version 3 files and Ancestry.com files only	No	Yes
Number of people in the database (as of 30 Nov 2016)	Over 1,200,000	About 275,000	Over 3,000,000	Many family trees
Download of raw data file allowed	Yes	Yes	Yes	Yes
Biogeographical ancestry analysis	Yes, using the Ancestry Composition feature	Yes, using the myOrigins and the AncientOrigins features	Yes, using the Ethnicity Estimate feature	Unknown
Additional comments	The Ancestry Composition feature offers a map view which displays one's ancestral components from various regions of the world as of 500 years ago, a split view for those who also have one or both parents who have been tested by 23andMe, and a breakdown by chromosome	The myOrigins analysis is much improved over FTDNA's previous Population Finder analysis. However, it still lacks specificity, particularly for Europe Estimates are generally applicable to the locations where ancestors were living 2000 to 3000 years ago.	The Ethnicity Estimate generally overestimates the Central European and Scandinavian ancestral components for people whose ancestors were from the British Isles. Estimates are generally applicable to the locations where ancestors were living 2000 to 3000 years ago.	Just recently added the capability of autosomal DNA testing



## ATTACHMENT 2: GENETIC GENEALOGY GLOSSARY

Source: Bettinger, Blaine T. and Wayne, Debbie Parker, *Genetic Genealogy In Practice* (2016, National Genealogical Society, Arlington, VA) pp. 139-148.

*(numbers in parentheses refer to images on last pages)*

### **autosomal DNA (atDNA) (3)**

Chromosomes 1 through 22, also called autosomes

### **base pair (1)**

The chemical bases (G, C, A, or T) found on one rung of the DNA ladder

### **centimorgan (Cm) (4)**

A relative segment-length that incorporates the statistical probability of a segment being separated during recombination; 1 cM is equivalent to a 1 percent (one3 in one hundred) chance that a DNA segment will recombine within one generation; on average 1 cM is equivalent to about one million base pairs, although this varies by location and sex.

### **chromosome (3)**

A very long double-helix of DNA found in the nucleus of a cell and organized with proteins, humans have twenty-two pairs of autosomal chromosomes and one pair of sex chromosomes

### **Genealogical Proof Standard (GPS)**

A standard used by genealogist to evaluate the strength of a genealogical assertion; its five criteria call for reasonably exhaustive research, sound documentation, skilled analysis and correlation of information and evidence, resolution of any conflicting evidence, and a clearly written discussion of the evidence and the reasoning

### **genetic distance**

Numerical representation of the differences or mutations between two individuals' Y-DNA or mtDNA results

### **genetic genealogy**

The application of DNA evidence to answer a genealogical question

### **haplogroup (5)**

A name given to a large branch of the human genetic tree; there are separate genetic trees for Y-DNA and for mtDNA; two individuals must have the same haplogroup to be closely related on the Y-DNA or mtDNA line

### **haplotype (5)**

A set of two or more DNA-marker values carried by a person or organism

### **International Society of Genetic Genealogist (ISOGG)**

An organization whose mission is to "advocate for and educate about the use of genetics as a tool for genealogical research while promoting a supportive network for genetic genealogist"; see the ISOGG website (<http://isogg.org/>) And the ISOGG Wiki (<http://isogg.org/wiki/>)

### **mitochondrial DNA (mtDNA) (3)**

DNA carried outside of the nucleus of a human cell and passed from a mother to all of her children; males inherit MTDNA from their mothers but do not pass it to their children, while females inherit mtDNA from their mothers and pass it to their male and female children

### **mutation**

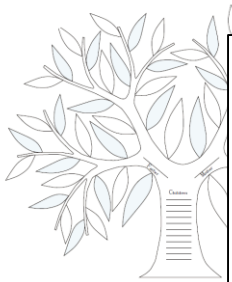
Any variance in DNA that occurs between individuals or between an individual and a reference sequence

### **nucleotide (1)**

The basic structural unit of DNA

### **short tandem repeat (STR) (2)**

A short, repeating pattern of DNA at consecutive rungs of the DNA ladder



### single nucleotide polymorphism (SNP) (1)

The base pair found at one rung of the DNA ladder; a SNP value can vary from one person to another

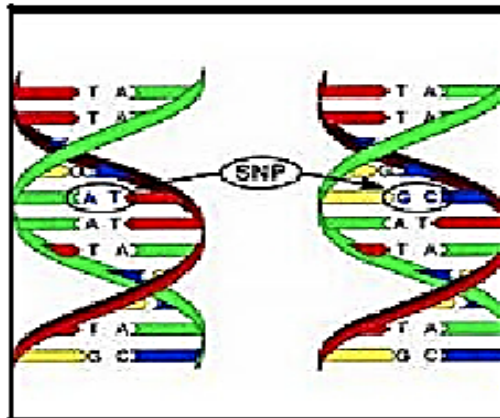
### X-DNA (3)

DNA on the X chromosome; a woman inherits one X chromosome from her mother and one X chromosome from her father; a man inherits one X chromosome from his mother and none from his father

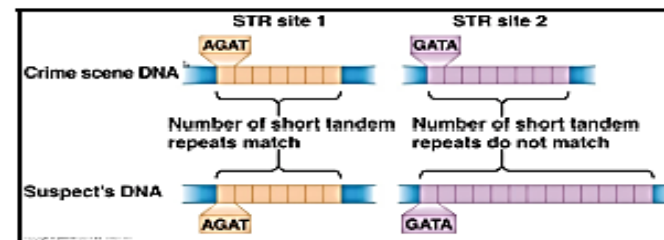
### Y-DNA (3)

DNA on the Y chromosome; a woman does not inherit Y-DNA; a man inherits one Y chromosome from his father and none from his mother.

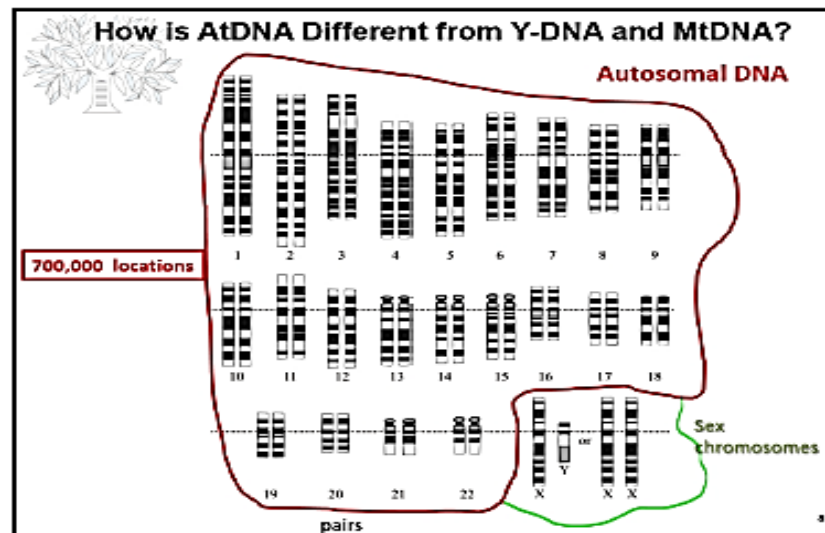
(1)



(2)



(3)

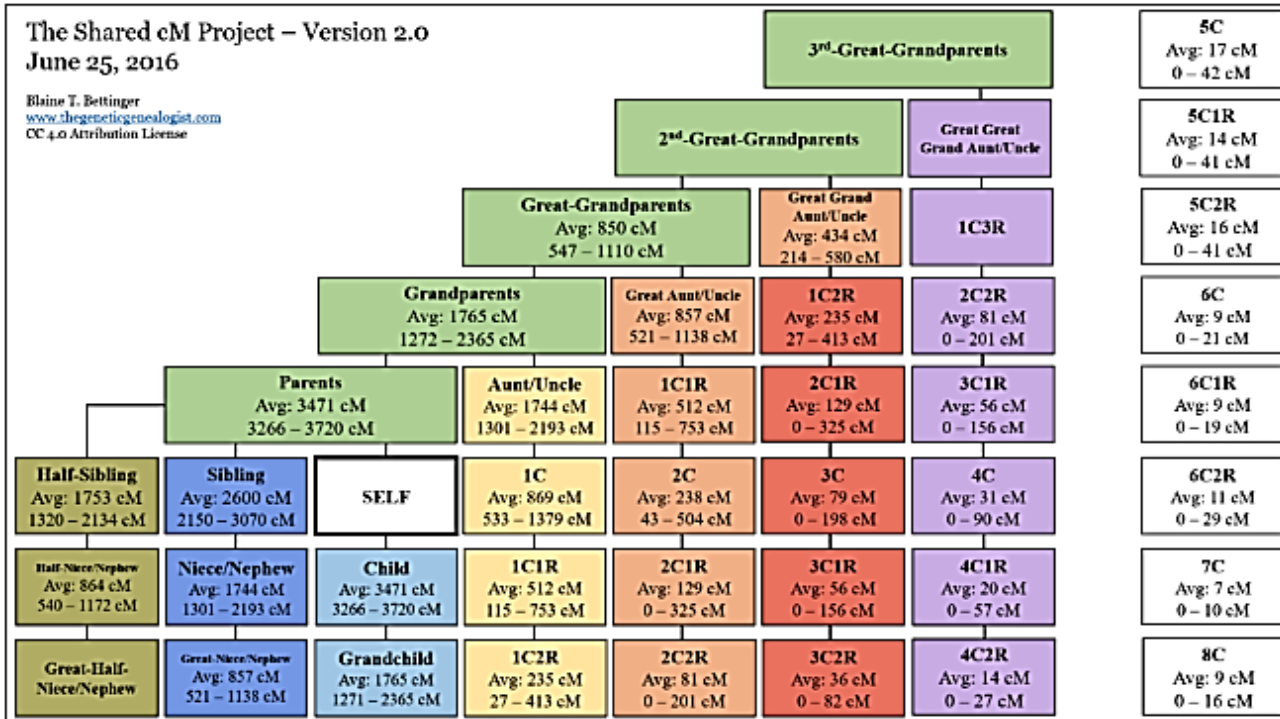




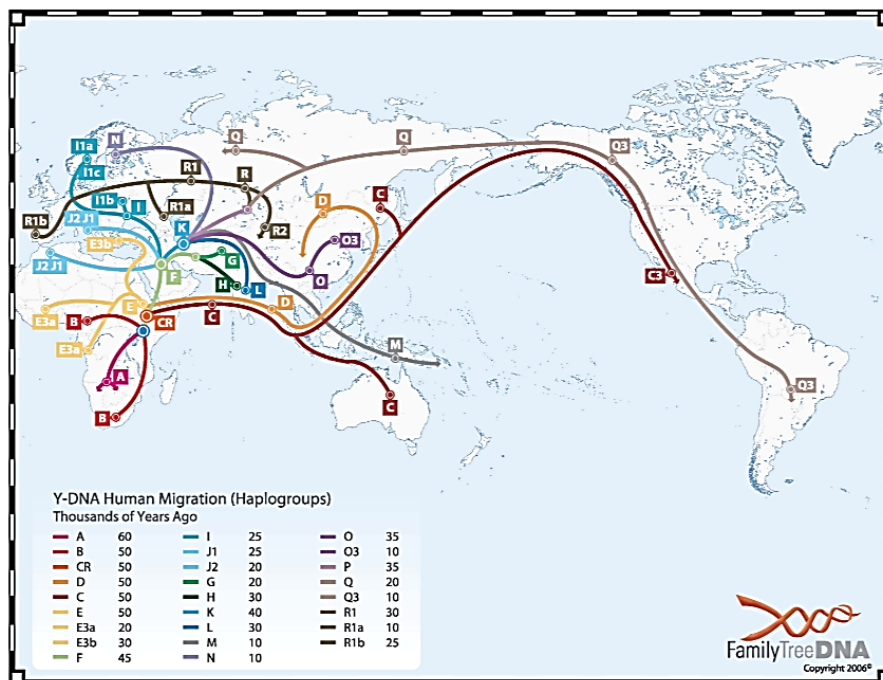
(4)

# The Shared cM Project – Version 2.0 June 25, 2016

Blaine T. Bettinger  
www.thegeneticgenealogist.com  
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(5)





## ATTACHMENT 3: Genealogy Privacy Issues

from Dick Eastman's Newsletter, January 9, 2017

### Family Tree Website Reveals Personal Address, Family Information

Snopes.com (a website which reports misinformation) reported on a family tree website that is causing a lot of alarm to the general public as it reveals a lot of personal information.

[FamilyTreeNow.com](http://FamilyTreeNow.com) claims to be a family history and genealogy web site but seems to be primarily a site that publishes public information about individuals. In fact, there are a number of other web sites that do the same (Spokeo, Intellius, BeenVerified.com and perhaps a dozen or so others) for a fee but FamilyTreeNow.com provides basic information free of charge.

The website allows anyone to enter a person's name and then displays whatever personal information the web site knows about people of that name. In many cases, results show personal information along with the names, ages and addresses of people they are related to.

I searched for my own name and found that I wasn't listed. (Hooray!) Several other men with the same name as mine were listed, however. I then searched for the names of several of my friends and family members. Every one of them was listed, usually with their full names, age, the names of their nearest relatives along with current and past home addresses.

The [FamilyTreeNow.com](http://FamilyTreeNow.com) site claims to have "...billions of historical records including census (1790-1940) records, birth records, death records, marriage & divorce records, living people records, and military records." However, when I searched for several rather common names, all I ever saw displayed was twentieth and twenty-first century records with the majority of the displayed records showing names, addresses, and relatives of living people.

While this is causing a buzz on many social media sites, nobody should be surprised at the information being displayed. All of it appears to be public domain information, whether the folks listed like it or not.

Persons whose information appears on the web site can supposedly "opt out" of having their information displayed, but the site says it may take up to 48 hours to remove the information. I would consider opting out to be a waste of time simply because other web sites also have the same information and future web sites will probably do the same. After all, it is public domain information, anyone can legally create a web site and display the same information. I doubt if you can opt out of all of the current and future web sites in this "business."

However, if you do want to opt-out of FamilyTreeNow.com's listings, here's how:

You need to visit [familytreenow.com/optout](http://familytreenow.com/optout)

Select each profile or variation of your name

Click the red opt out box for that record on the website.

According to the website, removal can take up to 48 hours to complete.