



Using DNA to Discover Your Ancestors



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Oregon Genealogical Society

- ▶ 975 Oak Alley, Eugene, OR
- ✓ Over 10,000 books from all areas of U.S. and the world
- ✓ Extensive collection of Oregon records
- ✓ Oregon Pioneer files



DNA testing – How do I start?

- ▶ Why test?
- ▶ Which test?
- ▶ Which company?
- ▶ Who to test?
- ▶ What do I get for my money?

Problems with paper records

- ▶ Paper records (wills, probate records, deeds) were lost or never kept
- ▶ Paper records seldom prove an exact biological relationship
 - ▶ E.g. a deed referring to “my brother” does not prove any biological relationship
- ▶ Information is deliberately falsified or kept from paper records and oral histories
 - ▶ illegitimate children or adoptions

Problems with surnames

- ▶ Ancestor adopted a different surname than his/her father
 - ▶ Raised by family of a different name
 - ▶ Wanted to hide from law
 - ▶ Moved to a different county
- ▶ Ancestor modified the traditional surname to distinguish his branch of the family
- ▶ “Correct spelling” of surnames was not established until literacy was common

Quote from DNA researchers

- ▶ “With DNA analysis, we’re finding research errors going back to the early 20th century that have been repeated, even though they were unverified. Many of these errors are heavily cited on the internet.”
- ▶ **With DNA, you can check you answers in the “back of the book.”**

What DNA can tell you

- ▶ Show if two people descended from a common ancestor
- ▶ Show whether your family is related to other families with the same surname
- ▶ Help find lost family lines (which may have another surname)
- ▶ Provide information about your ethnic origins
- ▶ Potentially reveal health information

What DNA cannot tell you

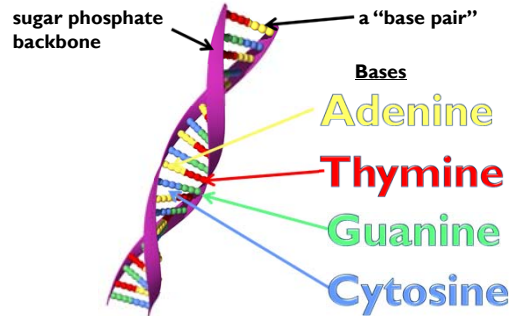
- ▶ Your family tree
- ▶ Your exact relationship to another person
- ▶ Usable information about all your ancestors

What happens when you test?

- ▶ Order a 'kit' online
- ▶ Follow directions when kit arrives
 - ▶ spit or swab to get a DNA sample
- ▶ Wait for results (2-10 weeks)
- ▶ Log into your account and see results



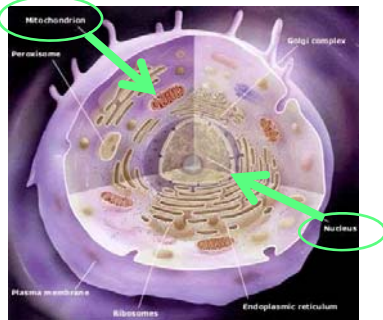
The structure of DNA



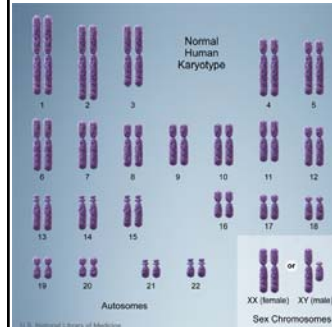
Cell structures

- ▶ Nucleus
- ▶ Mitochondria

Each structure has different DNA and a different inheritance pattern.






Nucleic DNA

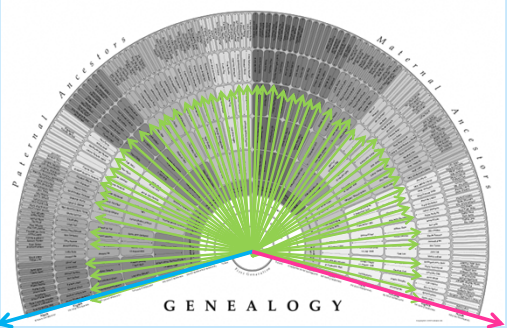


- ▶ Everyone
 - ▶ Autosomal DNA
 - ▶ 22 chromosomes
- ▶ Men
 - ▶ Y-chromosome
 - ▶ X-chromosome
- ▶ Women
 - ▶ 2 X-chromosomes

Types of DNA tests


- ▶ **Nucleic**
 - Autosomal (#1) 
 - Sex chromosomes
 - X-chromosome (#4)
 - tested with autosomal DNA
 - Y-chromosome (#2) 
- ▶ **Mitochondrial** (#3) 

DNA & your pedigree

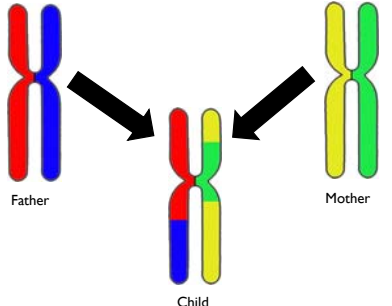


#1 Test - Autosomal DNA

- ▶ Most of the DNA inside cell nuclei
- ▶ 50% comes from each parent
- ▶ Parents 'recombine' their aDNA before passing it to their children



Autosomal recombination



Autosomal DNA

- ▶ Both men and women
- ▶ Find cousins w/n 5 or so generations
 - ▶ ~ Born since War of 1812
- ▶ May find cousins w/n to 9 generations
 - ▶ Early colonial period

Autosomal DNA

- ▶ FamilyTreeDNA

Best for	Specifications	Price
FAMILY FINDER	Genealogy History Ancestry	Autosomal \$99 Learn More
- ▶ AncestryDNA \$99 

Autosomal DNA results

- ▶ List of matches
 - ▶ estimate of type of relationship
 - ▶ contact information
 - ▶ possibly surnames and/or trees
- ▶ Ethnicity estimate
 - ▶ The science is still in its infancy—take all results with multiple grains of salt.

Next steps

- ▶ Focus on closest cousins
- ▶ Look at family trees and surnames
- ▶ Contact them and share information
- ▶ Get together for a family reunion!

Autosomal results (FamilyTreeDNA)

I match 1st cousin Mel (gold) and 3rd cousin Zach (blue) at the same place on chromosome 10—so this chunk of DNA is from my ancestors Henry & Rutha TABOR

Chromosome mapping

- ▶ Autosomal results + family trees allow you to map specific segments of your DNA to specific ancestors

Kitty Cooper
<http://blog.kittycooper.com/tools/chromosome-mapper/>

Ethnicity estimates

- ▶ Fun, but scientifically iffy
 - ▶ Mother 100% Swedish
 - ▶ Father Scots-Irish

#2 Test - Y-DNA

- ▶ **For men ONLY**
- ▶ Passed from father to son almost unchanged
 - ▶ typically follows the surname line
 - ▶ can look 1,000s of years back in time

myFTDNA

Y-DNA tests

- ▶ Men only
- ▶ Order from FamilyTreeDNA
- ▶ Order by number of 'markers' tested
 - ▶ 37 markers—minimum
 - ▶ 67 markers—consider
 - ▶ 111 markers—available
- ▶ Determine a man's deep paternal ancestry

Y-DNA tests - FamilyTreeDNA

Father's Line

Start here. Upgrade later.

Y₃₇	Genealogy History Ancestry	37 markers	\$169	Males only
Y₆₇	Genealogy History Ancestry	67 markers	\$268	Males only
Y₁₁₁	Genealogy History Ancestry	111 markers	\$359	Males only

Y-DNA results: What you get

- ▶ List of people who match your Y-DNA
- ▶ Access to surname research projects
- ▶ Information on your paternal heritage

Matches list

Y-DNA: Mr. Norman Francis Fay

37 MARKERS - 1

Genetic Distance	Mr. Norman Francis Fay	1st Distant Ancestor	Y-DNA Haplogroup
1	Mr. Robert William Fay	In Fay, 1648	R-249
2	Mr. John Moore	on Fellows b. 1826 and d. 1871	R-249
2	Mr. Christopher Jerry Trujillo	In Fay, b. 1648, England; d. 1690, Marlboro, A.	R-249
2	Mr. William Moore	In Fay, b. 1638 and d. 1690	R-249
3	Mr. Robert Anthony Fay	ujillo	R-249
3	Mr. Robert Anthony Fay	In Fay, b.c. 1873, USA	R-249

FORREST DNA RESULTS TABLE

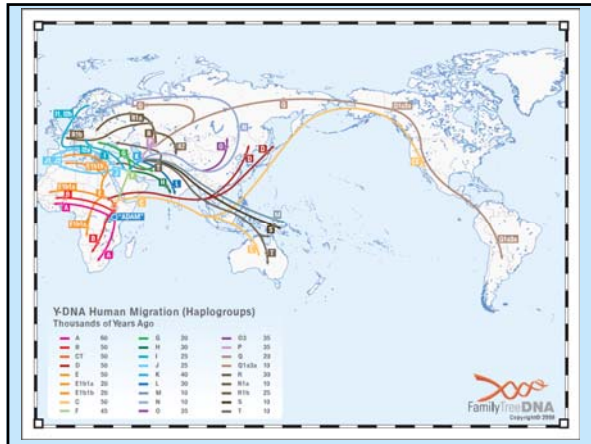
FORREST surname project

Code	FTDNA Ref. Number or Analysis Lab	Search ID	H	I	L	M	N	O	P	Q	R	S	T	V	W	X	Y	Z	Other
Group A																			
Y-200	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Group B																			
Y-200	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Group C																			
Y-200	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Group D																			
Y-200	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Group E																			
Y-200	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Group F																			
Y-200	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000
Group G																			
Y-200	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000	10000

Paternal heritage

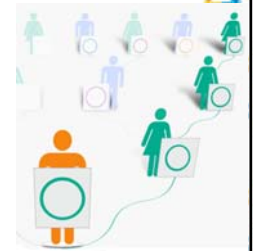
- ▶ Haplogroup R1b
 - ▶ Common group in western Europe

Haplogroup
a group of people who share a common ancestor who had a specific DNA mutation



#3 Test – Mitochondrial (mtDNA)

- ▶ Everyone has mtDNA
- ▶ Mothers pass mtDNA unchanged to all their children
- ▶ mtDNA shows the distant origins of mother's mother's heritage



Mitochondrial DNA

-
- ▶ 16,569 positions
 - ▶ Control region
 - ▶ Two hyper- variable regions (HVR1 and HVR2)
 - ▶ Coding region
 - ▶ Everything else

mtDNA

- ▶ Both men and women
- ▶ Full sequence test
 - ▶ All 16,569 positions
 - ▶ Match w/n 16 generations – 1500 A.D.
- ▶ Determine your deep maternal ancestry

mtDNA tests - FamilyTreeDNA

mtDNA Ancestry Tests
Discover your heritage on your mother's line

Connect on your direct mother's line Uncover your maternal heritage

only \$199 Add to cart

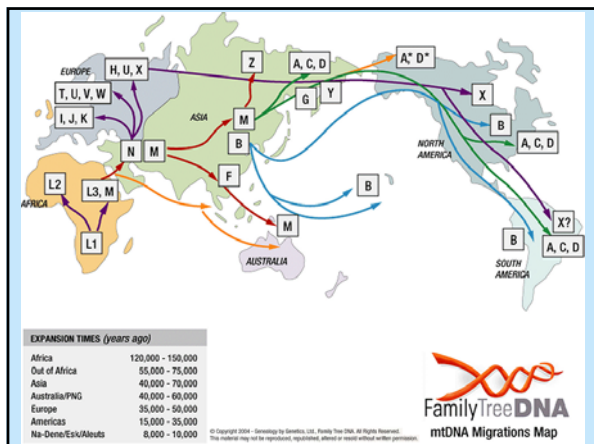
mtDNA results (FamilyTree DNA)

- ▶ List of matches
 - ▶ Most are very distant
- ▶ Deep maternal ancestry

mtDNA - Results
Haplogroup X2b-T226C
Your Origin

Haplogroup X is 30,000 years, a haplogroup X is within haplogroup of the world. Fu regional historic

USAGE POLIC



#4 Test - X-chromosome

- ▶ Included with autosomal tests at Family Tree DNA and 23andme
- ▶ X has a different pattern of inheritance than any other type of DNA
 - ▶ Men pass a non-recombined X to daughters, but not to sons
 - ▶ Women pass a recombined X to all their children
- ▶ Tricky to understand but can be very helpful
- ▶ **Don't worry about X at first!**

The "Big 3" testing companies

- ▶ **Family Tree DNA**
 - ▶ the most popular site for serious genealogists
 - ▶ autosomal (with X), Y-DNA, mtDNA
 - ▶ best analysis tools
 - ▶ best means of contacting matches (your cousins!)
- ▶ **Ancestry**
 - ▶ separate site for DNA results
 - ▶ can connect to family trees
 - ▶ autosomal
- ▶ **23andme**
 - ▶ Autosomal (with X)

Which company is best?

- ▶ If you really want to know, test at both
 - ▶ FamilyTreeDNA has better tools and easier ways to contact matches
 - ▶ AncestryDNA has better trees
- ▶ 23andme
 - ▶ test is equivalent to other companies, but very difficult to compare your DNA with others

'Fish' in all three ponds

- ▶ Test at all of the "Big Three" companies
 - ▶ You don't know where your cousins have tested
 - ▶ The price is about \$99 each

Who should be tested?

- ▶ Yourself
- ▶ Your oldest living ancestors
- ▶ If female, brothers or paternal cousins
- ▶ Cousins on different parts of your pedigree chart
- ▶ Any relative you can convince to test

Health information

- ▶ Family Tree DNA are not designed for health results, although some tests can find traits like male pattern baldness, etc.
- ▶ 23andme specifically tests for health results, but has been barred by FDA from reporting them. This may change.
- ▶ Autosomal and full sequence mtDNA results can be compared to online published mutations linked to diseases.



Company Websites

- ▶ FamilyTreeDNA
 - ▶ <https://www.familytreedna.com/>
- ▶ AncestryDNA
 - ▶ <http://dna.ancestry.com/>
- ▶ 23andMe
 - ▶ <https://www.23andme.com/>



Resources

- ▶ “I Have the Results of My Genetic Genealogy Test, Now What?”
 - ▶ by Blaine Bettinger
- ▶ https://www.familytreedna.com/pdf-docs/Interpreting-Genetic-Genealogy-Results_web_optimized.pdf



Thank you and happy testing!

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- ▶ www.oregongenealogicalsociety.org/

