



## DNA for Genealogy

# DNA: The Newest Tool for Genealogists (Y-DNA, mtDNA and atDNA tests)

Presentation to  
Charlottesville, VA FHC  
Family History Conference 2013  
27 Apr 2013  
by Jim Bartlett



## DNA for Genealogy

# Agenda

1. Audience Survey
2. All you need to know – the answers
3. DNA Projects
4. How to get involved
5. Y-DNA: Surname projects
6. mt-DNA: D-I-Y projects
7. at-DNA: For all genealogists
8. What DNA can and can't do
9. Other DNA
10. A word about Deep Ancestry
11. Summary



# Quick Audience Survey

How many of you have... [show of hands]

- genealogy “brick walls”?
- participated in a DNA SURNAME Project?
- participated in the Genographic Project?
- wondered about Deep Ancestry: before records
- heard about the new Family Finder DNA test?



# The Answers

- If two people have matching DNA,  
they have a common ancestor!
- If two people don't have matching DNA,  
they don't have a common ancestor!

[within a genealogical time frame]

**Very powerful, extremely accurate info!**



# Why is this so?

## MEMORIZE THIS:

DNA is passed from parents to children:

- Y-DNA\* only from father to sons
- mt-DNA\* only from mother to children
- at-DNA\* half from each parent to child

**Y** and **mt** are passed virtually unchanged over many generations; **at** is diluted by half with each generation

[\*Y-DNA is a test on the Y-chromosome]

[\*mt-DNA is a test on the mitochondrial DNA]

[\*at-DNA is a test across all DNA, except Y and mt]



# DNA Projects

Tracing all male line = SURNAME Project

- tests the **Y-DNA**: matching = common ancestor
- same SURNAME: easier to research

Tracing all female line... = usually D-I-Y

- tests **mt-DNA**: matching = common ancestor
- all SURNAMEs different: difficult to trace

Searching for all ancestors [**Family Finder**]

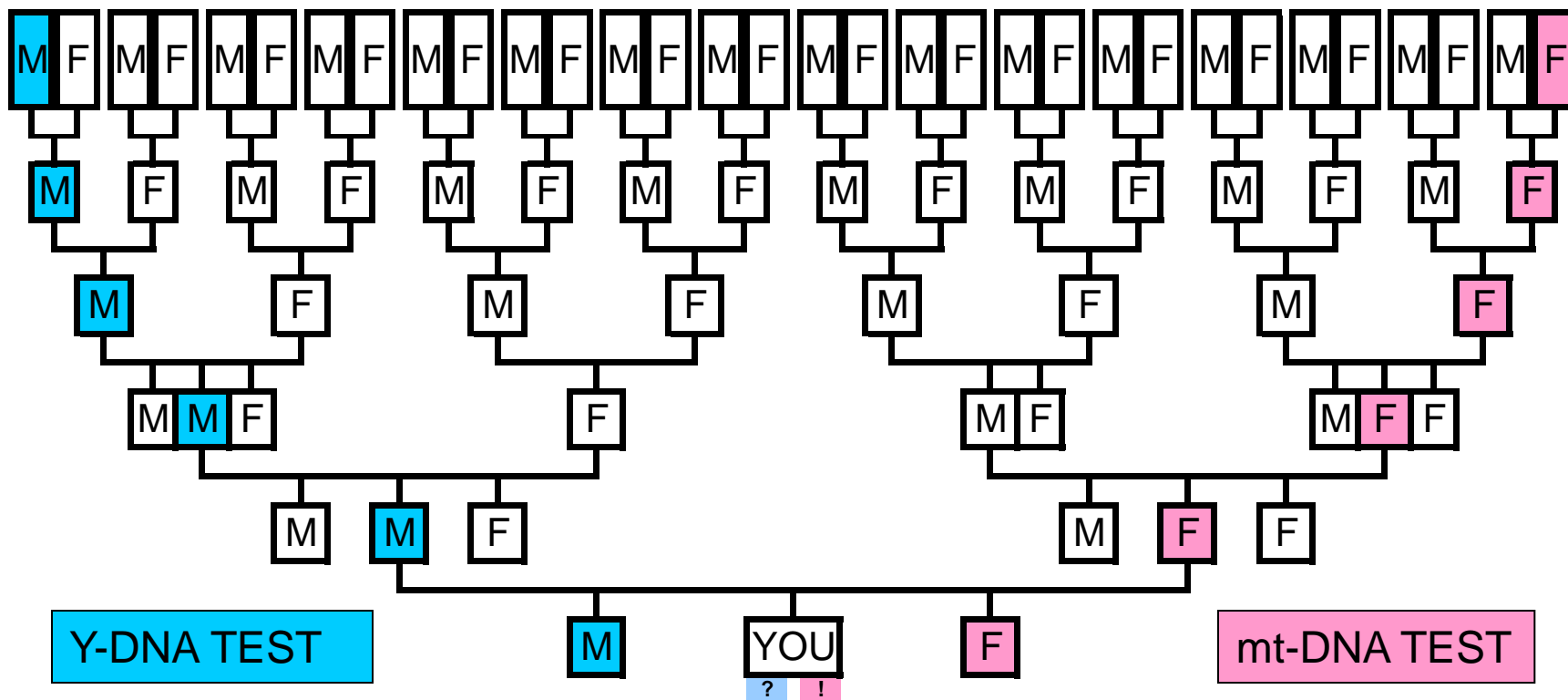
- tests all **at-DNA**: matching = common ancestor
- share/compare with new matching cousins



# DNA for Genealogy

# What DNA can test

[each test is for one line]

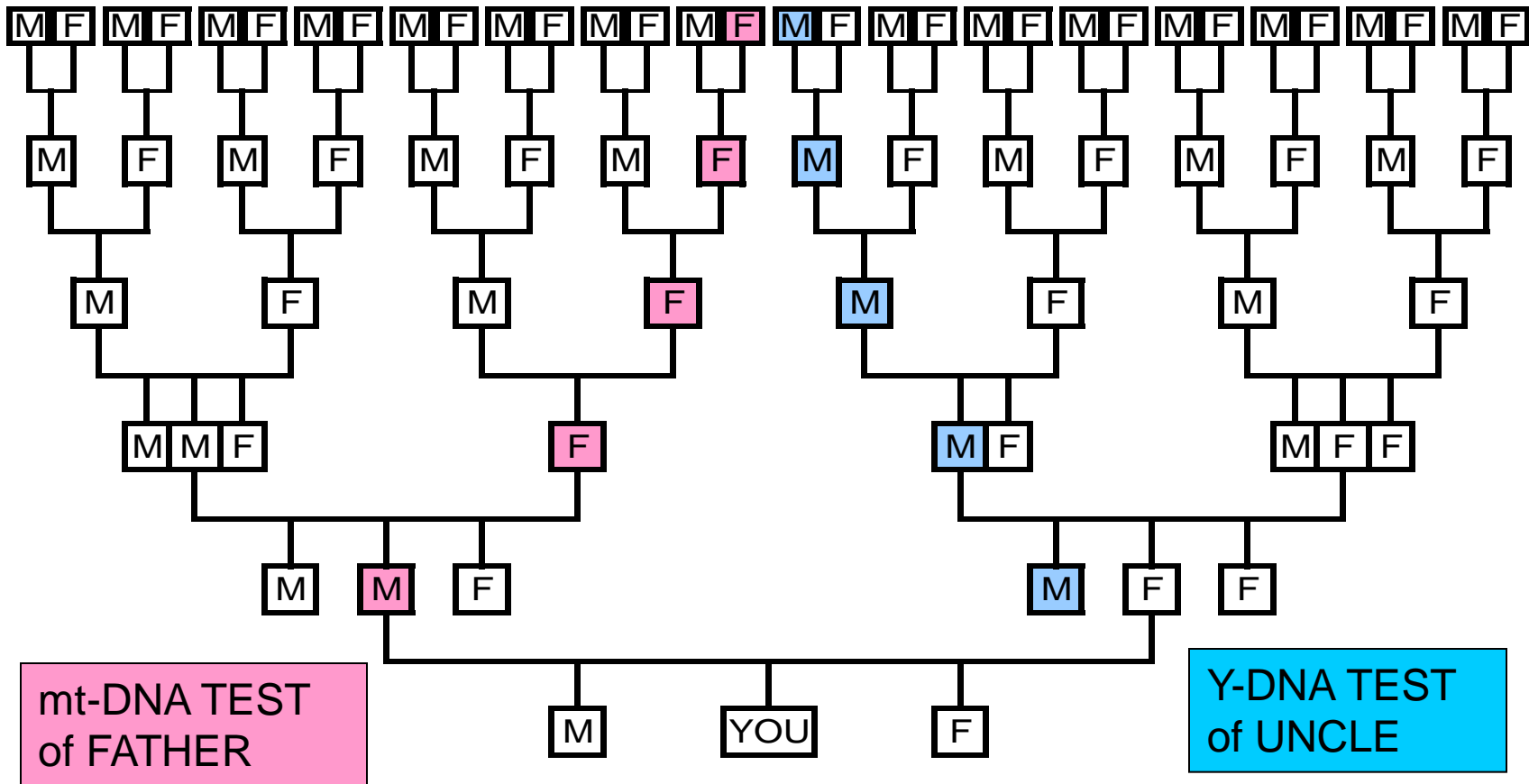




# DNA for Genealogy

# Test other Ancestors

[each test is for one line]



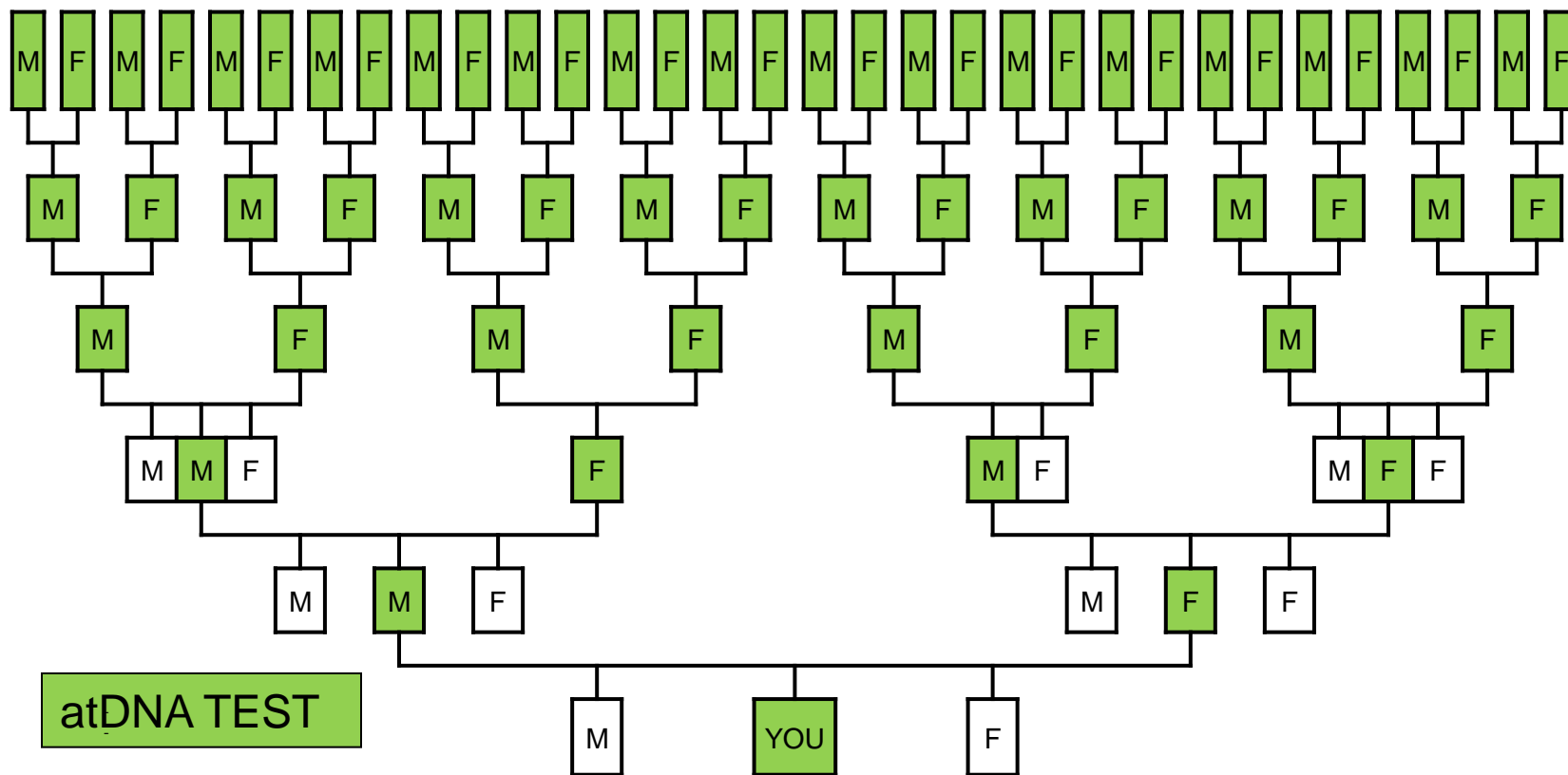




# DNA for Genealogy

# What atDNA can test

[one test is for all ancestors]





## DNA for Genealogy

# DNA: Just DO IT!

Determine which test you want and who will provide the DNA

- **you** (for mt or Family Finder); only male for Y-DNA

Go to [www.familytreedna.com](http://www.familytreedna.com) \*

- order a test (join a project for some discounts)
- have Kit mailed to you or sent to someone else
- pay by credit card or have them bill you

Follow Kit Instructions – like brushing your teeth

(no pain, no blood)

Mail the Samples back – wait.....

[\* you can use other companies, but FTDNA has highest recommendations]



# DNA for Genealogy

# FTDNA Home Page

The screenshot shows the FamilyTreeDNA website home page in a browser window. The browser address bar displays "http://www.familytreedna.com/". The website header includes the FamilyTreeDNA logo with the tagline "HISTORY UNEARTHED DAILY", a search bar, and navigation links for "Home", "Products", "Projects", "Testimonials", "FAQ", "About", "Feedback", and "Login". A secondary search bar is located on the right side of the page. The main content area features a large blue banner with the text "Welcome To Family Tree DNA" and a sub-headline stating "90% of genealogists choose Family Tree DNA – with the largest DNA database. As of January 27, 2013, we have a total of 402,162 records! [more statistics...](#)". Below this banner are three promotional boxes for different testing services: "Y-DNA Testing" starting at \$169, "Family Finder Testing" starting at \$289, and "mtDNA Testing" starting at \$159. Each box includes a brief description of the service and a "Learn More" button. The browser's taskbar at the bottom shows various application icons and the system clock indicating 11:54 AM on 1/27/2013.



## DNA for Genealogy

# DNA Pricing

Pricing is based on participation in a SURNAME project (add \$4 S&H)

Y-DNA 12 marker – \$49\*

Y-DNA 25 marker – \$124

**Y-DNA 37 marker – \$149**

Y-DNA 67 marker – \$238

Y-DNA 111 marker - \$339

mt-DNA – \$99

**mt-DNA Plus – \$159**

Y-DNA37 + mt-DNAPlus – \$269

**Family Finder - \$289**

Several other “package” deals

Other tests to determine more details on Deep Ancestry

Specialty testing – by request (other than cheek-cell samples)



DNA for  
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# FTDNA Test Kit





# DNA Testing

## FTDNA has Genetics Lab and uses U or AZ lab

- One of original labs - pioneered genetic testing for genealogists
- Lab only knows “Kit number”, NOT participant names or SURNAME
- Virtually 100% accurate – retests, if needed, are free

## FTDNA posts results on your FTDNA page

- Use your **Kit number** and **password** to view your page, See:
  - DNA results
  - Name and email of each person with matching DNA
  - Deep Ancestry (your Haplogroup and origins of your ancestry)



# DNA for Genealogy

# My Home Page

https://my.familytreedna.com/default.aspx?ekit=ozuTEo7dgv8%3d

myFTDNA Home

Google Search Share More Sign In

- My Account**
  - Personal Profile
  - Beneficiary Information
  - Change Password
  - Contact Information
  - GEDCOM/Family Tree
  - Match and E-mail Settings
  - Most Distant Ancestors
  - Order History
  - Personal Profile Settings
  - Project Administrator Settings
  - Results Display Settings
  - Surnames
- Y-DNA**
  - Learn More
  - Matches
  - Advanced Matching
  - Ancestral Origins
  - Haplogroup Origins
  - Haplotree & SNPs
  - Matches Maps
  - Migration Maps
  - Printable Certificates
  - SNP Map
  - Standard Y-STR Results
- Family Finder**
  - Learn More
  - Matches
  - Advanced Matching
  - Chromosome Browser
  - Download Raw Data
  - Known Relationships
  - Population Finder
- mtDNA**
  - Matches
  - Advanced Matching
  - Ancestral Origins
  - Haplogroup Origins
  - Matches Maps
  - Migration Maps
  - Results
- Other Results**
  - Learn More
  - Factoid Results
- Resources**
  - Learn More
  - FAQ
  - Forums
  - Glossary
  - Interpreting Results eBook
  - Order Personalized Report
  - MitoSearch.org
  - News
  - Release Notes
  - YSearch.org

12:02 PM  
1/27/2013

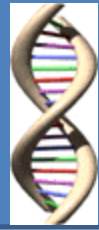


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Y-DNA: Just DO IT!

# Y-DNA – SURNAME Project





## DNA for Genealogy

# Y-DNA: Just DO IT!

Find living male with your SURNAME

- you, brother, father, uncle, cousin

Go to [www.familytreedna.com](http://www.familytreedna.com)

- use SEARCH-BOX for your SURNAME (upper right)

Click on SURNAME to join (or look) & order a Y-DNA kit

- 12, 25, 37, 67 or 111 markers

Your other ancestral SURNAMEs:

- Find a living male descendant with all-male lineage
- ~ Look up SURNAME projects for lines already tested

Learn the Deep Ancestry of your Patriarchs (free)



# Y-DNA: Find Matches

Compare results with others in SURNAME Project

- FTDNA emails you when you when results are posted
- Project Admin will help – they group results into family lines
- Correspond with newly discovered cousins
- **Compare paper trails** – determine common ancestor – share info

FTDNA continues to send you emails as other matches are found

FTDNA helps you and the SURNAME Admin (like me)

FTDNA stores the DNA sample for 20 years

- Use the same sample for other available tests, if you want
- Use the same sample for new DNA tests, developed in the future  
(maybe even after the original DNA donor has died)



# Y-DNA Result

## My FTDNA 25-marker result:

13-24-13-10-16-18-11-12-11-13-11-31-16-9-9-11-11-25-14-20-34-14-16-16-17

Each result is very specific (called a Haplotype)

Matching (or very close) results from same Ancestor

Similar results grouped on Tree of Mankind (Haplogroup)

My Haplogroup = E1b

Most American Colonists = R1b

Other Colonists: I1a, I1b, R1a and E1b



DNA for  
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# BARTLETT-DNA Project

Formed 2002; now over 220 participants:

**23** different lines from Colonial America

- Each line has 2-16 matching results
- Lines have no common ancestor for over 1,000 years
  - Don't look for records to link these lines
- 6 Brits – only 2 match with USA
- Still some major BARTLETT lines untested...

Haplogroups: **15** R1b; **6** I1 or I2; **1** E1b; **1** G

- These haplogroups don't relate for over 10,000 years  
[so much for the BARTLETT Coat of Arms....]



# Learn from DNA

Examples from BARTLETT Y-DNA Project:

1. Link 2 lines [even with different spellings]
2. De-Link 2 lines [they are not related!]
3. Resolve variant spelling
4. Prove or debunk Myths [links to fame]
5. Resolve Paternity issues
6. Untangle mixed up research



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mt-DNA: maybe

# mt-DNA – D-I-Y Project



# mt-DNA Result

## My FTDNA mt-DNA result:

HVR1: 16126C, 16137G, 16294T, 16296T, 16304C, 16519C

HVR2: 00073G, 00146C, 00263G, 00309.1C, 00315.1C, 00458T

Each result is very specific (called a Haplotype)

Matching (or very close) results from same Ancestor

Similar results grouped on Tree of Mankind (Haplogroup)

My Haplogroup = T2b6

Most American Colonists = H

BARTLETT Project: H3, I, J, K, T1, T2b, T4, U, V



# Using mt-DNA Results

Like Y-DNA, FTDNA notifies you of matches

- No [SURNAME] Project Admin to help
- mt-DNA may match a 40<sup>th</sup> cousin
  - = many useless matches
- mt-DNA in a Haystack Conundrum





# Using mt-DNA – Part 2

## Design your own mt-DNA Project:

Pick an Ancestress (maiden name optional)

- Trace her daughters, trace their daughters, keep tracing the all-female line descendants down to the present
- Get two living distant cousins (male or female) mt-DNA tested. Their mothers must have an all-female line back to the Ancestress
- If the mt-DNA results match, you've confirmed the paper trail, AND the mt-DNA Haplogroup of your Ancestress!
- If the mt-DNA results don't match, you know there's a problem with the genealogy paper trail or the maternity somewhere.
- You can repeat this with any (and all) Ancestress
- You'll really get to know your cousins and your ancestors!

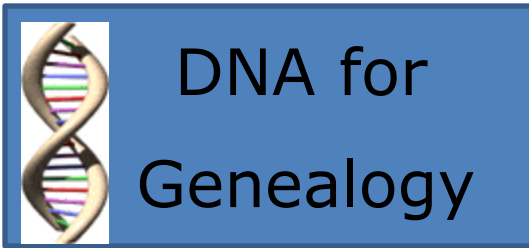


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at-DNA: Absolutely!

Family Finder

All Your Ancestors?



# Family Finder Test

## FTDNA now has new Family Finder Test\*

Uses microarray chip to test 700,000+ places across whole DNA

- Measures much more than Y-111 or Full mt (16,569)
- Measures specific places from over 95% of your DNA

Males and females can take this test

- Male and female DNA is same for all areas tested
- Your DNA comes from any/all of your ancestors
- Any path (ancestor down to you) via males and/or females is OK
- Your matches are your cousins – you share a Common Ancestor!

\* [www.23andMe.com](http://www.23andMe.com) and [www.Ancestry.com](http://www.Ancestry.com) offer same test.



# Who Matches?

All close cousins; many distant cousins!

- 2<sup>nd</sup> cousins ~ 99% of the time (all of them) (8 ancestors)
- 3<sup>rd</sup> cousins ~ 90% of the time (9 out of 10 of them) (16 ancestors)
- 4<sup>th</sup> cousins ~ 50% of the time (5 out of 10 of them) (32 ancestors)
- 5<sup>th</sup> cousins ~ 10% of the time (1 out of 10 of them) (64 ancestors)
- 6<sup>th</sup> cousins ~ 2% of the time (1 out of 50 of them) (128 ancestors)

DESPITE low % for 6<sup>th</sup> cousins, you will get matches

Generally you'll get more 6<sup>th</sup> than 5<sup>th</sup>; more 8<sup>th</sup> than 7<sup>th</sup> cousins

- After 8<sup>th</sup> cousins: you'll still get some, but it drops off...



# Family Finder Results

What you get as part of your results:

**-Names and emails of matches**

- Estimate of relatedness – e.g. 4<sup>th</sup> cousin
- Total DNA segments & length of each
- Tree and/or surnames of matches, maybe
- Chromosome Browser
  - compare up to five of your matches
  - download matching data of matches
- Ethnicity (geographic % of your DNA)



# Family Finder: What to Do

What to do with results:

- Email your matches** – you want to share
- Provide your list of surnames/Patriarchs
  - Ahnentafels & Trees are too much info
  - Make it easy for your match to review your info
    - Alphabetize your list
    - Include some date and place info
- Get and review each match's info
- Determine Common Ancestors
- [more info in Intermediate Class]



# My Family Finder Results

In the past three years for me:

- 432 Family Finder matches/emails
- Confirmed paper trails with 70
- range: 3<sup>rd</sup> to 12<sup>th</sup> cousins; 5 are 10<sup>th</sup>
- from me to 90 Common Ancestors:
  - over 200 different ancestors
  - 80 different surnames!
  - 8/8 G-gpar; 14/16 2G-gpar; 15/32
- Helped three adoptees



# Family Finder Expectations

What should you expect:

- Only some will respond (be persistent)
- Matches will occur out to 10<sup>th</sup> cousins
- Many won't have obvious Common Anc.
  - Common Ancestor may be beyond your brick walls
- Common Ancestors (plural): man & woman
- Many matches don't have much info
  - Just starting on genealogy
  - They or a parent were adopted
- Many new cousins if you work it out.





## DNA for Genealogy

# DNA Can/Can't Do

Can give haplotype = string of numbers

Can't give you your pedigree

Can tell you if you match someone, or not

Can't tell you who is common ancestor

Can't tell you which generation is match

Can give DNA of paternal or maternal line

Can't link your Y/mt-DNA to other ancestors

Can link to all ancestors with Family Finder



# Other DNA Tests

## BEWARE:

- What percent race/ethnicity you are
- Where in African you came from
- Which Native American nation

## BEWARE:

23andMe

deCODEme

Over-the-Counter

Cheap and free generally aren't helpful



## DNA for Genealogy

# Deep Ancestry

Genographic Project is using DNA to map migration of mankind...

Scientists are studying patterns from DNA results, worldwide

New results published daily

Tree of mankind: 20 main branches of Phylogenetic Tree = A-T

Broken down to R1a and R1b; I1 and I2; E1b1; etc.

R1b is most common DNA Haplogroup in European populations

Now smaller branches: R1b1b2d = found primarily in British Isles

DNA groups have formed to focus on specific Haplogroups; like E1b1b2a...

Your Haplogroup gives you insight on where your cavemen ancestors were.

Google your Haplotype for a lot more info and links



# Summary

## The Answers:

Matching DNA means Common Ancestor

No DNA Match means Different Lines

DNA is a TOOL; use it with paper trails  
and other Genealogy Tools

DNA is powerful and ~100% accurate

Just DO IT!



## DNA for Genealogy

# Have Fun!

DNA breathed new life into BARTLETT research  
Men volunteering; Women tracking down cousins  
New speculation => new research directions  
New research networks formed; more sharing  
Designing targeted DNA “projects”; including mt  
Excitement about each new result  
Take a DNA-Kit to a Family Reunion  
Look into Deep Ancestry  
Enjoy!



# DNA Books

“Deep Ancestry – Inside the Genographic Project”  
by Spencer Wells

“The Journey of Man – A Genetic Odyssey” by  
Spencer Wells

“The Seven Daughters of Eve” by Bryan Sykes

“Saxons, Vikings, and Celts – The Genetic Roots  
of Britain and Ireland” by Bryan Sykes

“Have a Nice DNA” by Fran Balkwill & Mic Rolph



## DNA for Genealogy

# DNA Companies

**Family Tree DNA** – [www.familytreedna.com](http://www.familytreedna.com) Oldest, largest (by far), the best!

DNA Heritage – [www.dnaheritage.com](http://www.dnaheritage.com)

Sorenson Molecular Genealogy Foundation – [www.smgf.org](http://www.smgf.org) (~BYU)

Relative Genetics – [www.relativegenetics.com](http://www.relativegenetics.com) (Sorenson) => Ancestry.com

**AncestryDNA** – [dna.ancestry.com/aboutDNA.aspx](http://dna.ancestry.com/aboutDNA.aspx) (Ancestry.com)

Genetic Genealogy – [www.dnaancestryproject.com](http://www.dnaancestryproject.com) (GeneBase)

Oxford Ancestors – [www.oxfordancestors.com](http://www.oxfordancestors.com) (Dr. Bryan Sykes)

African Ancestry – [www.aftricanancestry.com](http://www.aftricanancestry.com)

Trace Genetics – [www.tracegenetics.com](http://www.tracegenetics.com) (DNA Print Genomics)

Genographic Project – [www3.nationalgeographic.com/genographic/](http://www3.nationalgeographic.com/genographic/)

Family Genetics – <http://87.194.109.241/default.htm>

**23andMe** – [www.23andme.com](http://www.23andme.com) DNA testing is more than genealogy...

deCODEme – [www.decodeme.com](http://www.decodeme.com) DNA testing for disease, etc.



## DNA for Genealogy

# DNA Info Web Sites

<http://www.familytreedna.com/dna101.html> FTDNA Tutorials and links to other info

<http://www.kerchner.com/dna-information.htm> Links to many intro web pages – very well done.

<http://blairdna.com/dna101.html> Another very good primer on DNA, genetics, genealogy

<http://www.familytreedna.com/> FTDNA home page – also surname SEARCH TAB

Subscribe to: [Genealogy-DNA@rootsweb.com](mailto:Genealogy-DNA@rootsweb.com) novice to expert advice