



DNA for Genealogy

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This Complete Presentation is available online

At www.dennisAhogan.com, click on
Lectures and Handouts tab

- *DNA for Genealogy*
- Select a handout and save on your computer
- Then you can click on links to try out websites

Ongoing Help with your DNA

The Rochester Genealogical Society (RGS) has an active DNA Interest Group (DIG).

- You do NOT have to be a RGS member to participate in DIG activities.
- There are monthly DIG meetings.
- There are usually twice-monthly DIG workshops.
- See the RGS homepage for details, <https://nyrgs.org>

Why Do A DNA Test?



Why do a DNA test?

- DNA testing can introduce you to previously unknown distant relatives for the purpose of collaborating on your research. (high definition cousin bait)
- Produce estimates of ethnic origins
- DNA testing is an additional tool in your toolbox. It is NOT a silver bullet.
- It does NOT replace the need to do "real" research. In fact you need that research in order to be successful with DNA.

The 3 major types of tests

- Y-DNA
- Mitochondrial DNA (mtDNA)
- Autosomal DNA (atDNA)

Y-DNA

- Y-DNA tests explore the paternal side of a family (more accurately the patrilineal line)
- Only males can take a Y-DNA test
- Classic example is determining the paternity of the children of Sally Hemmings (& Thomas Jefferson)
 - <https://youtu.be/RHXUIDUbq8k>
 - 2 books by Annette Gordon-Reed
- Only available from FamilyTreeDNA
- With this test, you can join surname projects
 - At <https://www.familytreedna.com/projects.aspx> join a project and receive a discount on your Y-DNA

mtDNA

- Mitochondrial tests explore the maternal side of a family (more accurately the matrilineal line)
- Both males & females can take a mtDNA test.
 - All children inherit mtDNA from their mother, but only females can pass mtDNA to their children.
- Possible usage:
 - Are two women were sisters?
 - Haplogroups A, B, C, D, X can indicate Native American, J - Jewish, L - African, etc.
- Only available from FamilyTreeDNA

atDNA

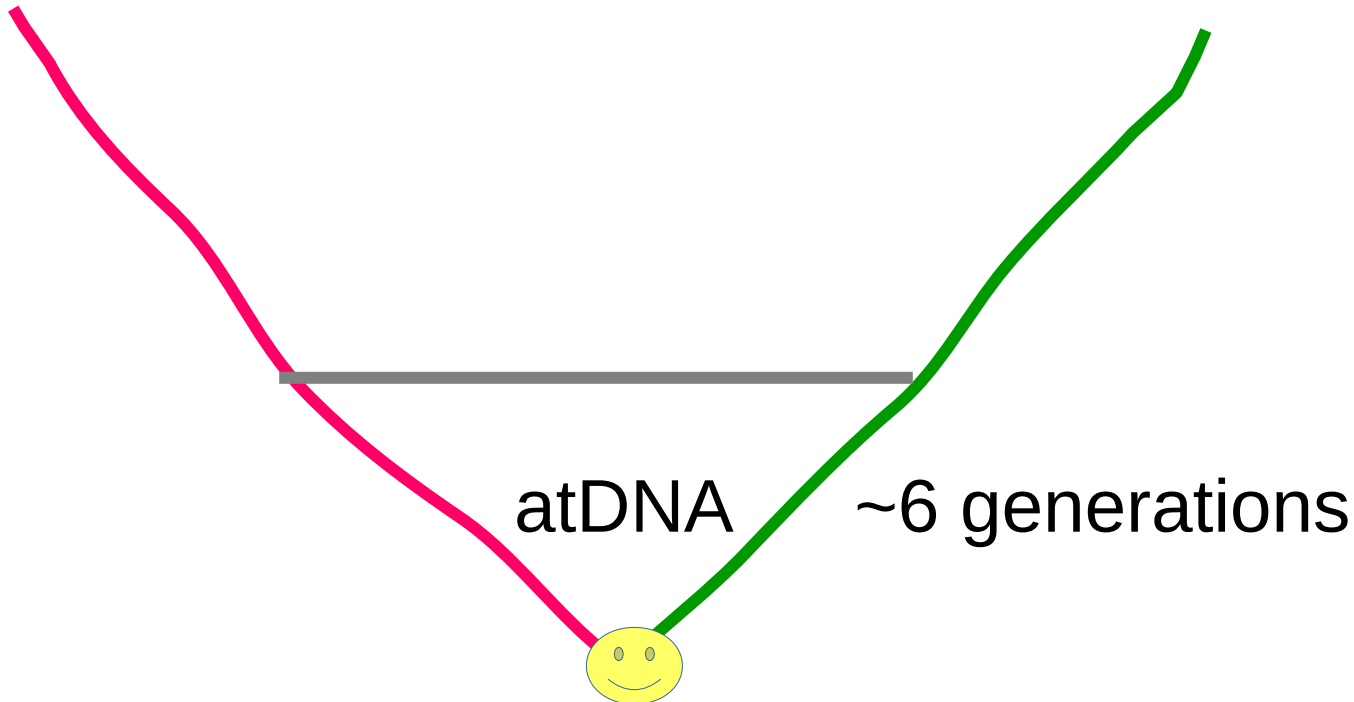
- Autosomal tests can provide matches relatively reliable through 5-6 generations
- Both males & females can take an atDNA test.
- I will concentrate on autosomal testing for the remainder of this presentation.
- Available from all 4 major vendors.

http://isogg.org/wiki/Autosomal_DNA_testing_comparison_chart

Coverage of Y DNA/mtDNA/atDNA

Y DNA

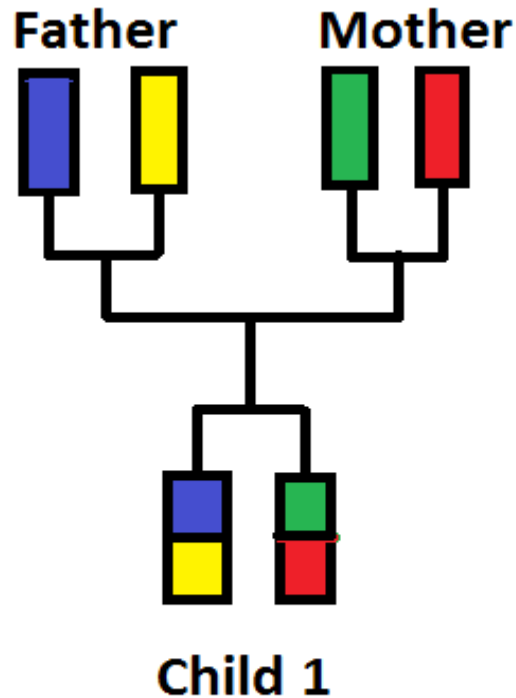
mtDNA



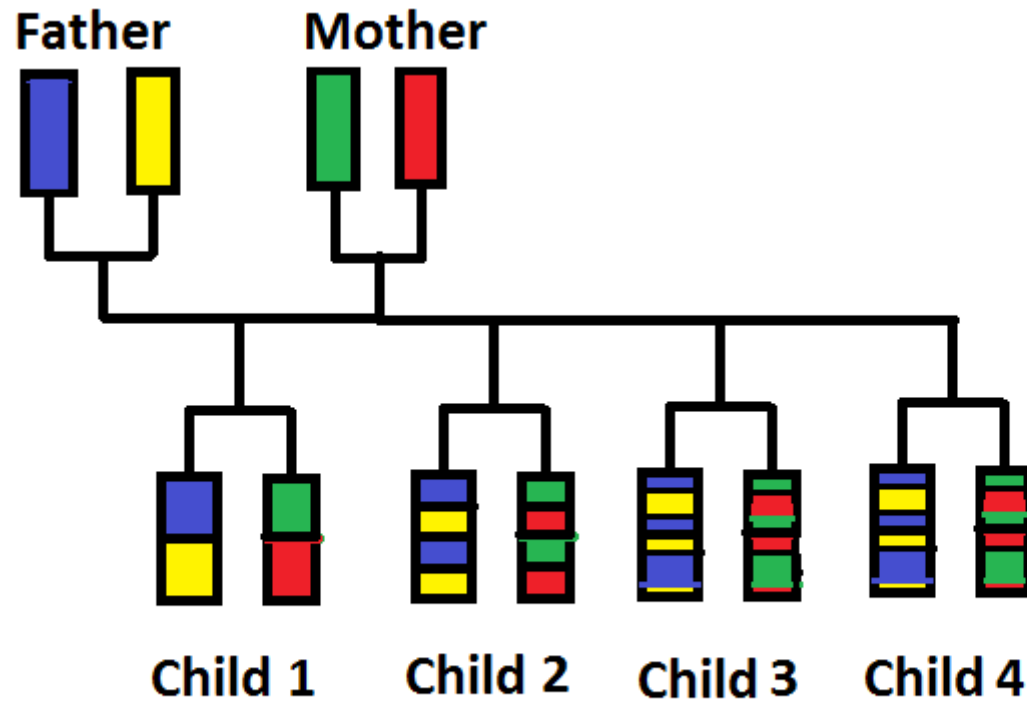
Autosomal Basics

- We all have 23 pairs of Chromosomes.
 - 1 pair determines our sex
 - The other 22 pairs are called autosomes, thus the Autosomal test
- For each of the 22 autosome pairs, we inherit 1 autosome from each parent.
- A child receives 1 autosome based on each parent's 2 autosomes.
- This is done via random recombination.

Autosomal Basics (For each chromosome)



Autosomal Basics



Autosomal Basics

- The random recombination is repeated generation after generation.
- As a result of this process, the "older" DNA segments tend to be shorter or non-existent in subsequent generations.
- In autosomal results, longer segments tend to indicate closer relations.
- Short segments of matching DNA indicates a more remote relation **OR** a false positive due to "accidental" matches.

The 4 major DNA Vendors

Family Tree DNA (FTDNA)

AncestryDNA (from ancestry.com)

23andme

MyHeritage DNA

[GEDMatch - does not sell tests but is an important repository]

Family Tree DNA (FTDNA)

- The autosomal test is called Family Finder
- Price \$79, occasional sale \$59
- Pros:
 - Best tool set including chromosome browser
 - Best response rate, email addresses provided
 - Free easy access to family trees of matches & surname list (if provided by testee)
 - Offers free projects for surnames and locations
- Cons:
 - Smallest database, ~1,000,000

FTDNA Chromosome Browser

[Get Tutorial](#)

Optional Views:

[Download to Excel \(CSV Format\)](#)

[View this data in a table](#)

[Download All Matches to Excel \(CSV Format\)](#)

5+ cM

non
s: 15

s: 14

s: 21

s: 9

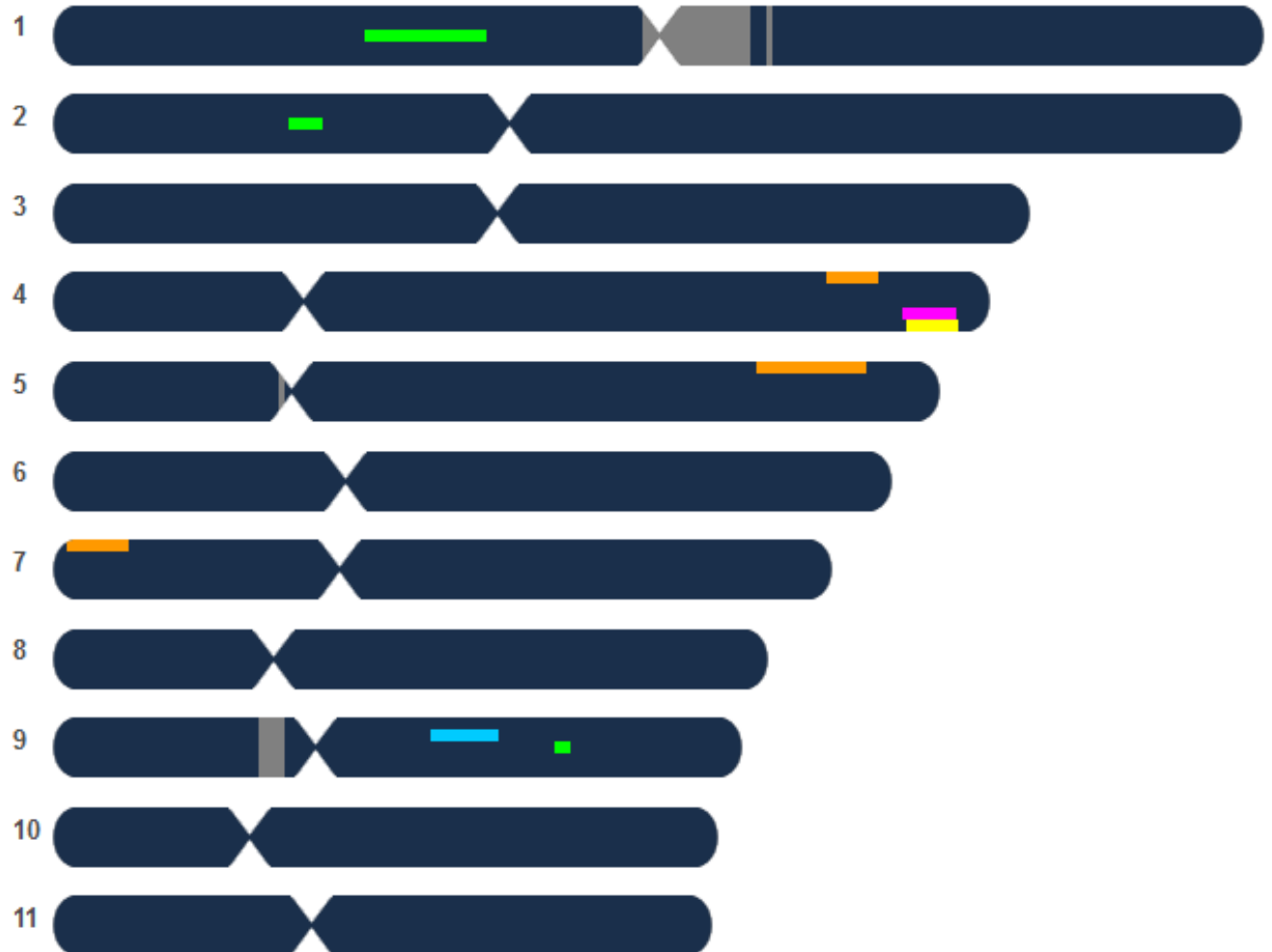
s: 15

[Defaults](#) [Clear Compare List](#)

1 - 10 of 1004

(c/o Lynn Edwards)

de) Marv James



AncestryDNA

- Price \$99, occasional sale \$49
- Pros:
 - Largest database, ~ 15 million
 - Provides hints from its vast resources
 - [Can NOW communicate with matches even if you are not an ancestry.com subscriber]
- Cons:
 - Non-subscribers have limited access to family trees of matches (1st 7 generations if not private) There may still be an "Insight" subscription for \$49.
 - Length of individual segments is not provided (only total)
 - Weak tool set but improving (still no chromosome browser)
 - So-So response, internal messaging
 - Matches often have not researched their family

AncestryDNA - New Features

- ThruLines
 - Proposed Family Tree using DNA matches and their trees.
 - "Replacement" for DNA Circles
 - Requirements include a 3-4 generation connected searchable tree of yours and your matches.
- MyTreeTags & New Match Listing
 - Capability to organize matches.
 - Must opt-in

23andMe

- Price \$199, non-medical test \$99
- Pros:
 - Large database, over 5 million
 - Medical-related option available
- Cons:
 - Price
 - Poor response. Internal messaging & most are not genealogists.
 - Not all testers opt-in to matching and/or open sharing.

MyHeritage

- Price \$79, occasional sale \$49; medical version \$199, sale \$149
- Pros:
 - Quickly growing database of 2,500,000
 - Provides hints from its vast resources (requires subscription)
 - [Can NOW communicate with matches even if you are not an MyHeritage.com subscriber]
- Cons:
 - So-So response, internal messaging
 - Toolset in process

MyHeritage - New Features

- Theory of Family Relativity
 - Uses a collection of about 10 billion historical records and family trees to suggest relationships between yourself and your DNA matches.
 - Family trees utilized includes MyHeritage, Geni, and FamilySearch.
- AutoClusters
 - Groups DNA matches into groups that likely descend from a common ancestor.

LivingDNA

- Price \$99, sale price \$?
- Pros:
 - Specializes in the British Isles
 - Accepts raw dna uploads from "all" vendors
- Cons:
 - Currently no
 - Small database/new
 - So-So response, internal messaging
 - Toolset in process

GEDMatch

- Does not sell dna tests
- Price \$0, upgrade optional for more tools
- Pros:
 - Excellent tool set including chromosome browser
 - Excellent response rate, email addresses provided
 - Free easy access to family trees of matches
 - Accepts raw dna uploads from "all" vendors
 - Typical users are motivated researchers
- Cons:
 - Small database, ~650,000

We have 2 Trees

- We all have a genealogy tree and a genetic tree and they are different per Blaine Bettinger
- Blaine has a "classic" blog on this topic at

www.thegeneticgenealogist.com/2009/11/10/qa-everyone-has-two-family-trees-a-genealogical-tree-and-a-genetic-tree

Guilt!!!

- With autosomal testing we have about a 5 generation window of reliability.
- The Genealogist's Regret
 - Why didn't I talk to Aunt Susie when I could have?
- With the advent of autosomal DNA usage for genealogy, we have something else to feel guilty about
 - Why didn't I swab Aunt Susie when I could have?

Who to Test (Autosomal)

- **Oldest living relative on both sides** (this is important because Autosomal is typically helpful for only 5 or 6 generations)
- Yourself
- Your parents
- **If you have deep pockets**
 - Oldest living relative for each "line"
 - 1st & 2nd cousins of your parents
 - 1st & 2nd cousins of yours
 - Every biological aunt and uncle

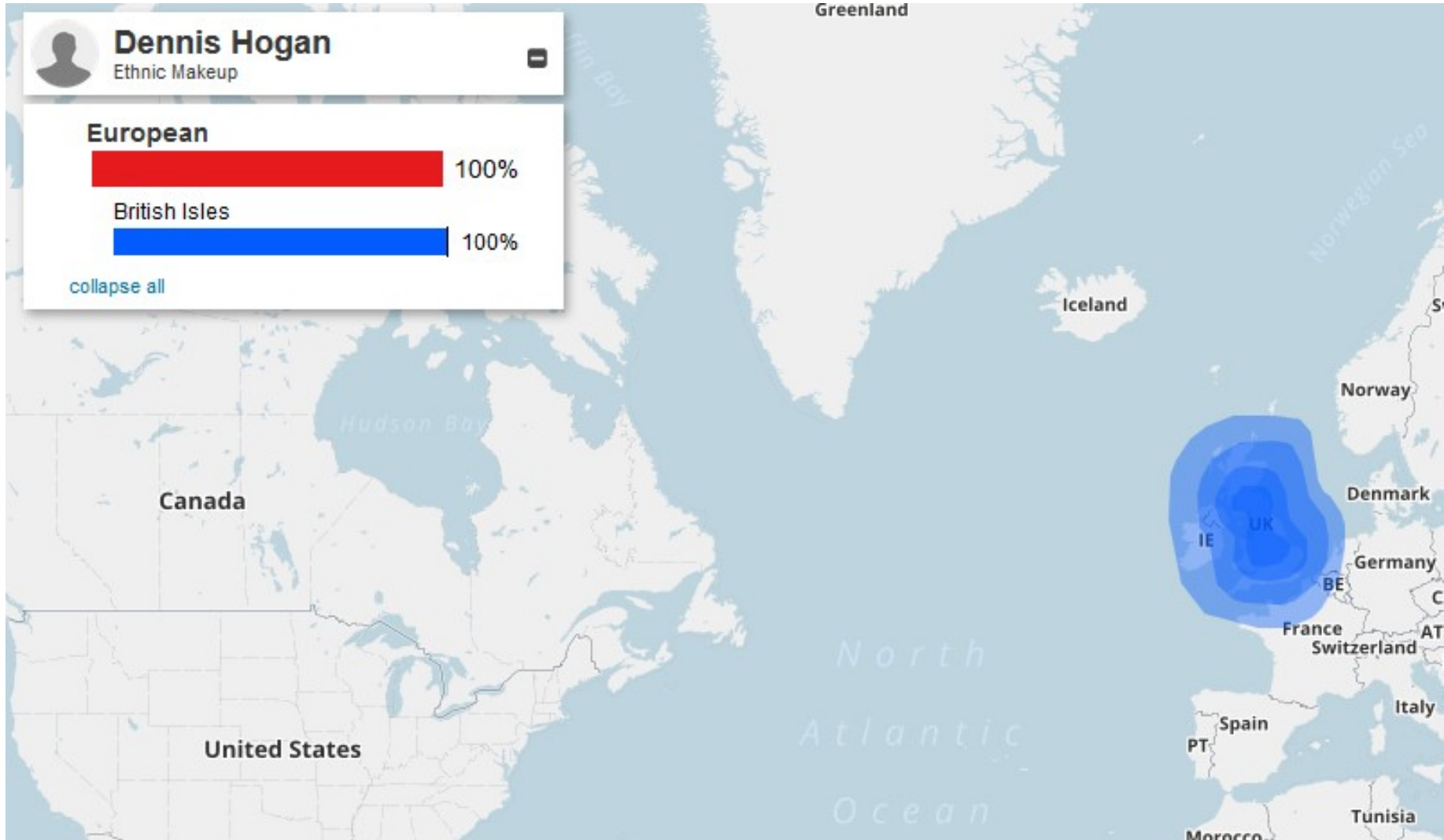
Who to Test (Y & mt)

- Because Y & mt are typically consistent for many generations, there is not the sense of urgency to test the oldest generation.
- If you are male, your Y & mt test results should be sufficient.
- If you are female, your mt test should be sufficient and you will need a Y test from your father, brother, uncle, etc.

What You Get When You Test

- Ethnic origins
 - These estimated percentages are NOT currently reliable. All vendors are actively developing their capability.
- Matches
 - The matches are reliable when the longest shared segment is ~8-10 centimorgans or longer.

FTDNA Results - MyOrigins



Ethnic Origins Sidebar

- Elizabeth Warren's recent test
- Roberta Estes blogs about the facts (non-political) of Elizabeth Warren's test results:
 - <https://dna-explained.com/2018/10/16/elizabeth-warrens-native-american-dna-results-what-they-mean/>

FTDNA Results - Matches

Most Common Surnames:

8 Jones

6 Smith

5 McCarthy



Relations: [Show All Matches](#)

Sort By: [Relationship Range](#)

Name: [Hogan](#)

Ancestral Surnames:

[Apply](#)

[Show Simple View](#)

◀ 1 2 3 4 5 ... 100 ▶▶

Match Date

Relationship Range ↑

Known Relationship

Shared cM

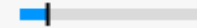
Ancestral Surnames

Dr. philip [redacted]



10/9/2014

2nd Cousin - 4th Cousin



90.61

Common Matches

Tests Taken: Y-DNA67 FMS

+ Compare in Chromosome Browser

Longest Block: 28.52

Y: R-M269 | mt: U5b3b

Donna [redacted]



6/17/2015

2nd Cousin - 4th Cousin



64.54

Common Matches

Tests Taken: N/A

+ Compare in Chromosome Browser

Longest Block: 27.95

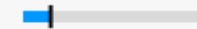
Y: N/A | mt: N/A

[redacted]



9/22/2015

2nd Cousin - 4th Cousin



58.95

Browne (Galway, Ireland)...

Common Matches

Tests Taken: N/A

+ Compare in Chromosome Browser

Longest Block: 22.90

Y: N/A | mt: N/A

AncestryDNA Results - Ethnicity



Ethnicity estimate for Dennis Hogan

REGION APPROXIMATE AMOUNT

Europe 100%

Ireland 94%

Trace Regions ? 6%

Great Britain 4%

Europe West < 1%

European Jewish < 1%

Show all regions





AncestryDNA Results - Matches

Sort by: Relationship | Date < 1 of 80 >

Filters HINTS NEW STARRED SEARCH MATCHES

4TH COUSIN

★  [vhogan52](#) 👤 294 people [VIEW MATCH](#)
Possible range: 4th - 6th cousins ?
Confidence: Extremely High
Last logged in Mar 11, 2016

★  [jesswneighbor](#) 👤 No family tree [VIEW MATCH](#)
Possible range: 4th - 6th cousins ?
Confidence: Very High

What are your goals?

- Many matches indicate that they are NOT interested in sharing info
 - They do not attach a tree or their tree is private
 - They do not use other features to make their surnames visible
 - They are not responsive to inquiries
- If you want to maximize your opportunity to collaborate with matches to advance your family history
 - Send the message that you are accessible!!

FTDNA - Tips

- In *MyProfile*, enter
 - **Surname list**...include surnames of all ancestors
 - Ex: Hogan County Clare, IRL (I've given birthplace of oldest known ancestor in that line)
 - Haplogroups, if you have tested Y-DNA or mtDNA
 - Most Distant Ancestors
 - Projects are optional, many require Y-DNA testing
- **Upload your family tree (& link your DNA profile to you in the tree)**

AncestryDNA - Tips

- Member Profile
 - AncestryDNA does not display surnames/locations of matches like FTDNA. However, matches can view your member profile, so include that type of info here under Research Interests.
 - Ex: Hogan County Clare, IRL (I've given birthplace of oldest known ancestor in that line)
 - Your Ancestry Public Trees are also listed in your profile. If you have not already created a tree, you should (& link your DNA profile to you in the tree).

AncestryDNA Results - Techniques

Blaine Bettinger provides a great blog on tips for identifying your matches at AncestryDNA:

<http://thegeneticgenealogist.com/2017/03/11/are-you-doing-everything-to-identify-your-matches/>

"The first purpose is to help people identify their AncestryDNA matches even if the match has no tree, has a private tree, has a meagre tree, and/or is not communicating."

Here's a youtube from Blaine for using AncestryDNA:
<https://youtu.be/UmOZXCxsqNU>

MyHeritage - Techniques

Tips for using MyHeritage:

<https://www.family-tree.co.uk/how-to-guides/dna-testing/how-to-explore-your-my-heritage-dna-matches>

MyHeritage - The Future

Future features announced at LIVE 2018:

- Segment Escalation
 - Virtual DNA kits for deceased ancestors
- Extracting DNA from Old Envelopes and Stamps
 - A 3rd party will process and create a "kit" in MyHeritage

The Future - Artifact Testing

Artifact Testing includes envelopes and stamps, but also go further to includes such items as hair, clothing, tools, etc.

For a great overview of artifact testing see the following blog:

https://thegeneticgenealogist.com/2018/11/19/testing-artifacts-obtain-dna-evidence-genealogical-research/?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+TheGeneticGenealogist+%28The+Genetic+Genealogist%29

Adoption or Unknown Parentage

- DNAadoption, <http://dnaadoption.com>
- <http://dnagedcom.com>
- Adopted Project,
<https://www.familytreedna.com/landing/adopted-project.aspx>
- ISOGG Wiki on Adoption,
http://isogg.org/wiki/Utilizing_DNA_testing_to_break_through_adoption_roadblocks
- For a thorough list see:
www.isogg.org/wiki/Autosomal_DNA_tools

Fish in Many Ponds Not Just 1

- Most people test with only 1 company and therefore their results reside in only 1 database.
- The cousin connection who can help you break through your brick wall probably tested with a different company and therefore their results are sitting in a database that you cannot access.
- So it is preferable to “fish in many ponds”
- **All testing companies allow you to download your “raw dna” file. This file can then be uploaded to other “ponds” (mostly free).**

Fish in Many Ponds Cont'd

- Ancestry and 23andme DO NOT ACCEPT raw dna uploads (so the only way to be in their database is to test with them)
- FTDna accepts raw dna uploads but you then have limited access to their toolset. For \$19 you receive full access to their tools.
- MyHeritage accepts raw dna uploads but there is a charge (\$29) to unlock all features.

Fish in Many Ponds On the Cheap

- Test with Ancestry.com (and/or 23andme if interested in medical info)
- Download your raw dna file & save to your computer (free).
- Upload your raw dna file (free) to:
FTDNA, MyHeritage, and GEDMatch
(there are additional 3rd party sites but these are the major ones)

What Do You Do Now?

- You probably have an overwhelming number of matches - too many to contact. A standard approach is to cluster the matches into family groups. Matches in a cluster potentially have a common ancestor.
- The clusters may be based on the lines for your grandparents:
 - Paternal grandfather
 - Paternal grandmother
 - Maternal grandfather
 - Maternal grandmother

Clustering Tools

- Manual Tools
 - Leeds Method
 - AncestryDNA new colored dots feature
- Automated Tools
 - Autoclustering

The Leeds Method

- The Leeds Method was developed by Dana Leeds. (Groups your matches into "grandparent" quadrants by using shared matches.)
 - Read all of her blogs but start with this one:
<https://dnawithdana.com/dna-color-clustering-the-leeds-method-for-easily-visualizing-matches/>
- Roberta Estes explains how to use the Leeds Method with examples for matches on Ancestry, Family Tree DNA, MyHeritage, and 23andMe:

<https://dna-explained.com/2018/09/26/the-leeds-method/>

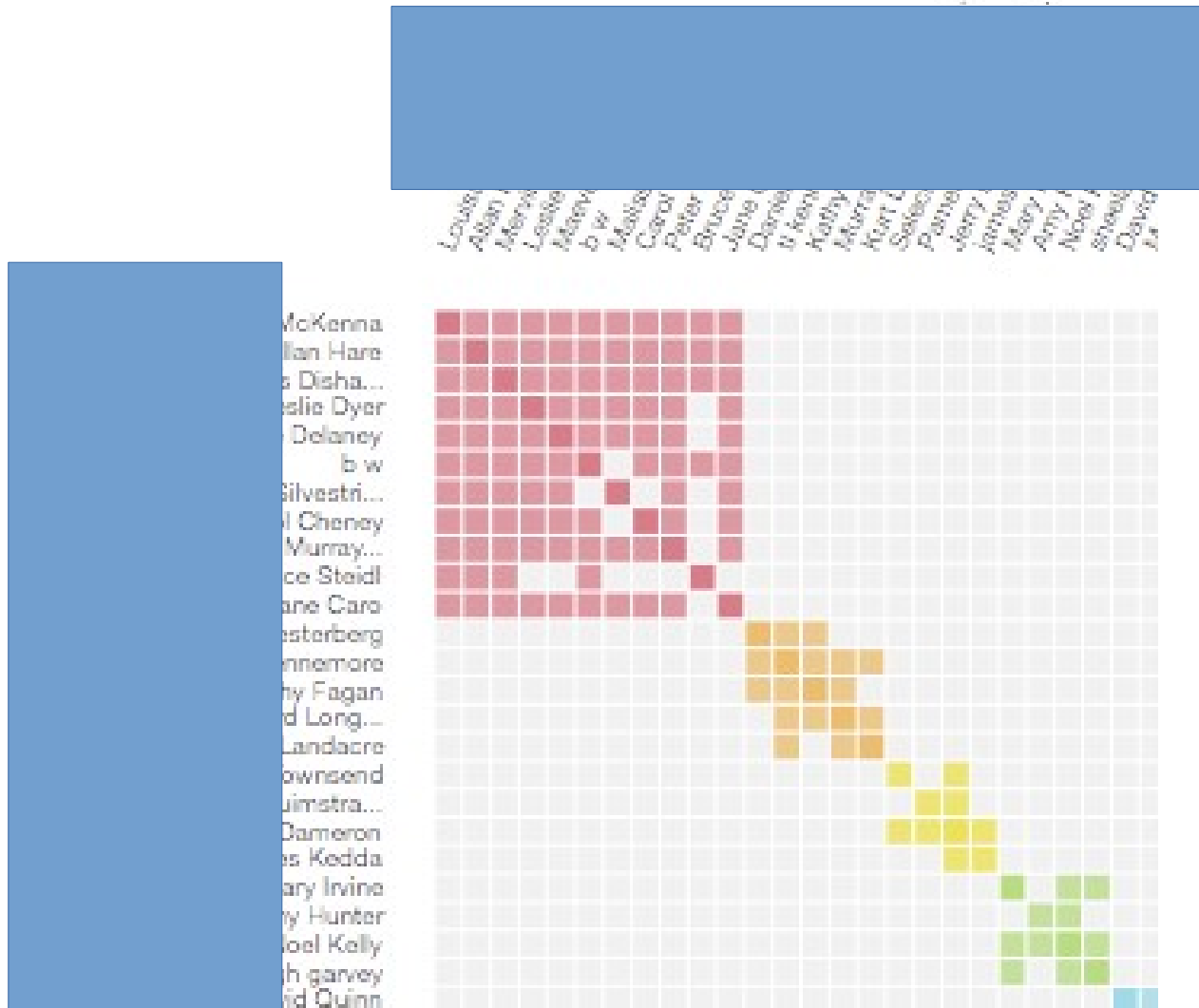
Leads Sample

C	D	E	F	G	H	I
Predicted	O'S	<u>Hegerty</u>		Hogan?		O'S
3rd	*					
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AutoClustering

- Already mentioned that MyHeritage has a built-in autocluster tool.
- GEDmatch Genesis, <https://www.gedmatch.com> has a Tier 1 (\$) tool
- The same tool is also available for 23andMe, FamilyTreeDNA, and AncestryDNA via <https://geneticaffairs.com/>
 - Genetic Affairs is a pay site although they have a very liberal free introductory deal.

AutoClustering Sample



Happy Hunting!