

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

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

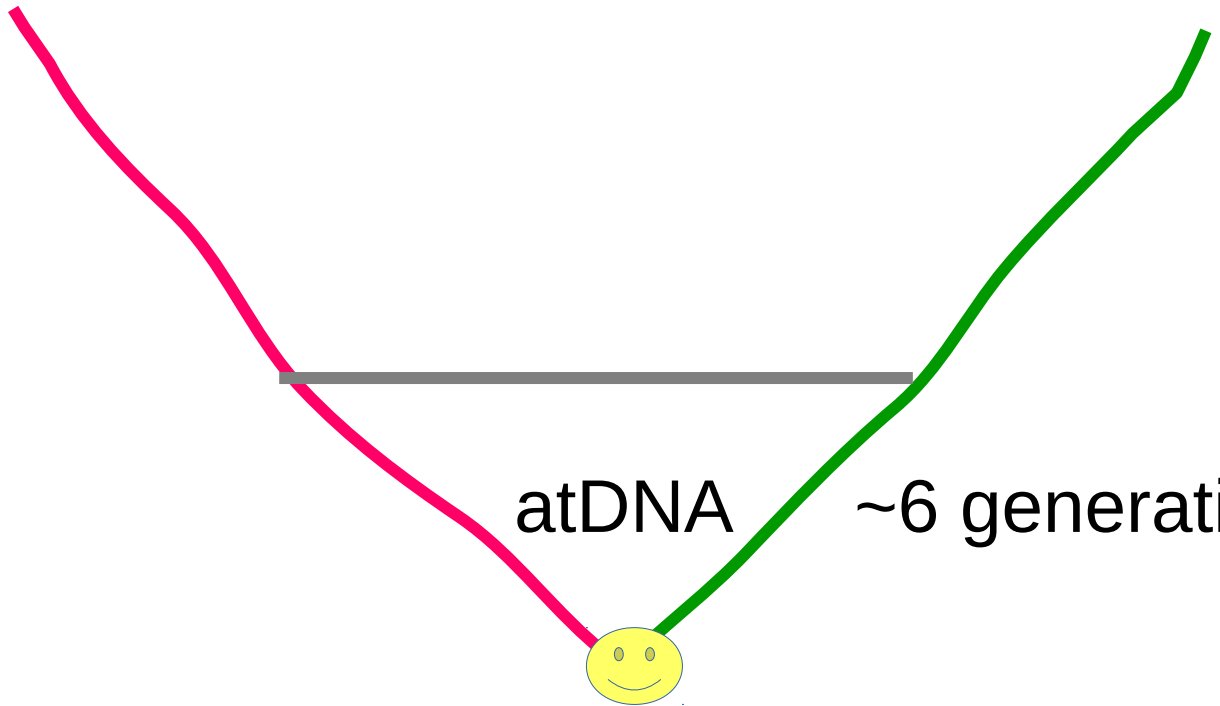
- Autosomal tests can provide matches relatively reliable through 5-6 generations
- Both males & females can take an atDNA test.
- I will concentrate on autosomal testing for the remainder of this presentation.
- Available from all 4 major vendors.

http://isogg.org/wiki/Autosomal_DNA_testing_comparison_chart

Coverage of Y DNA/mtDNA/atDNA

Y DNA

mtDNA



atDNA

~6 generations

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

Chromosome Browser

[Feedback](#) [Refer Friends & Family](#) [Page Top](#)

[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

1 - 10 of 1004

(c/o Lynn Edwards)

(c/o) 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
- 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.

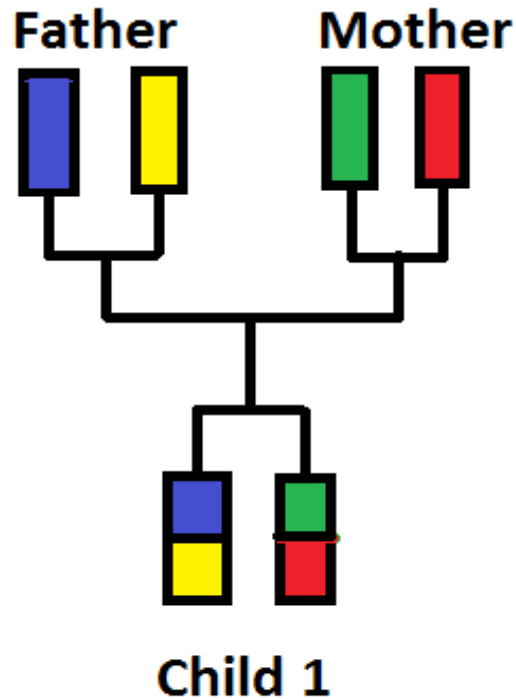
GEDMatch

- 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

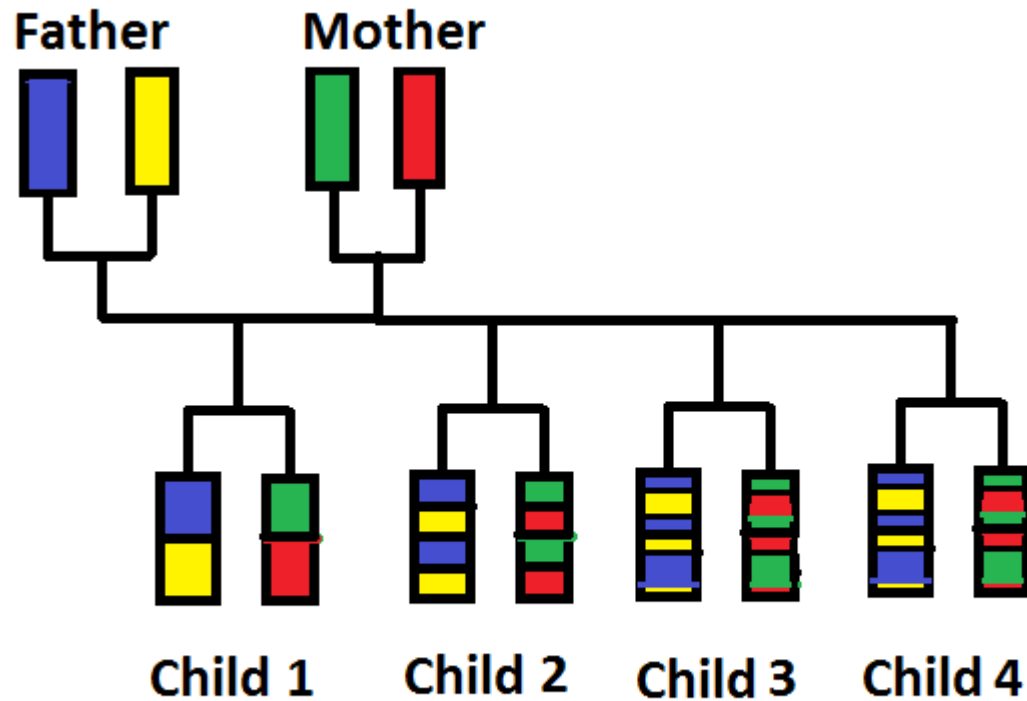
Autosomal Basics

- 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.

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.

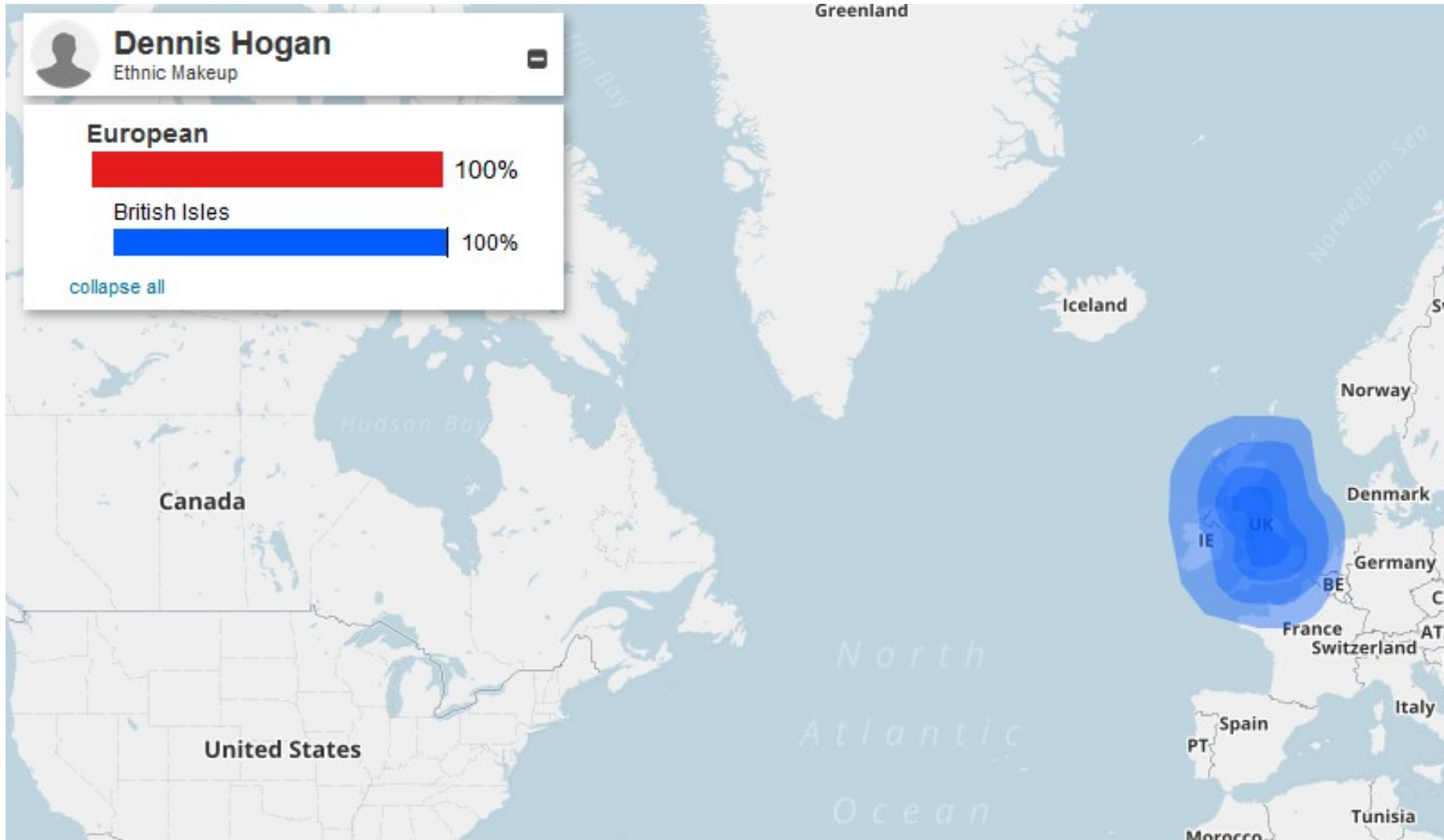
What You Get When You Test

- 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 long or longer.

Ethnic Origins Sidebar

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

FTDNA Results - MyOrigins



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 last week:

- 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
- Theory of Family Relativity
 - For DNA matches, MyHeritage will automatically search it's large collection of trees and historical records and attempt to build your match's tree back to the Most Recent Common Ancestor (MRCA)

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 have no access to.
- 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 after 16 Dec 2018 there will be 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?

- The Leeds Method developed by Dana Leeds may be the answer. (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/>

Happy Hunting!