

DNA Boot Camp
Additional DNA Tools and Concepts Boot Camp
Saturday, 22 April 2017
Mary Eberle, JD • Mary@DNAHunters.com • www.DNA Hunters.com

Talk 1: Using GEDMatch for Analyzing DNA Results and Finding New DNA Matches

1. Gedmatch.com has a database of people's *autosomal* DNA results from the following DNA testing companies: AncestryDNA, FamilyTreeDNA, 23andMe, and MyHeritage.
 - a. Gedmatch uses the following designations in their kit numbers:
 - i. A = Ancestry
 - ii. T = FamilyTreeDNA
 - iii. M = 23andMe
 - iv. H = MyHeritage (new as of March 14, 2017)
2. If you transfer your DNA results to Gedmatch, you'll find matches from a portion of the other testing companies.
3. Notes:
 - a. You must set up an account at GEDMatch.
 - b. You'll get a kit number for each set of DNA results
 - c. See <http://dnahunters.com/transfer-dna-results-gedmatch/> for instructions on how to transfer your DNA results to GEDMatch
 - d. It's best to transfer only one set of results—Ancestry DNA *or* FamilyTree DNA *or* 23andMe to Gedmatch.
 - e. Gedmatch's database only includes others who've transferred their results there.

Free Features:

1. Compares your DNA results to new people from other companies
 - a. Using One-to-many matches –
 - i. generates a table of your matches
 - ii. click on 3 or more matches & press "submit"
 1. Chromosome browser (2-D and 3-D)
 - a. Lets you view segments of DNA where you having matching DNA
 - b. Chromosome-by-chromosome review
 2. Autosomal matrix
 - a. Tells you how much atDNA you share with your matches and
 - b. How much atDNA they share with each other
 - c. I ignore segments less than 7 cM
 - d. This can tell you if your matches are related to each other
 - i. If they share DNA with each other, they're probably related
 - ii. If you know a match is on your mom's (or dad's) side, and they match another match, then that other match is also on that side

3. Generations matrix
 - a. Tells (predicts) how many generations away you are from your matches and
 - b. They are from each other
 - c. 1 generation = 1 step to shared ancestor/relative
 - i. siblings are about 1 generation
 - ii. $\frac{1}{2}$ -siblings are about 1.5 generations
 - iii. 2C1R are about 3.5 generations
 - iv. 0.5 is sometimes from
 1. 1 generation off
 2. $\frac{1}{2}$ -relationships
 - v. more distant relationships aren't precise
4. X-DNA matrix
 - a. Tells you how much X-DNA you share with your matches and
 - b. How much X-DNA they share with each other
 - c. I ignore segments less than 7 cM
 - d. 196 cM = a full X-chromosome
 - i. father-daughter
 - ii. 2 female $\frac{1}{2}$ -siblings sharing a father
 - iii. remember—for females, you're looking at their 2 Xs together (this makes mom's and son's share 196 cM)
2. One-to-one comparison
 - a. Shows how much DNA do you share with a match
 - b. Can differentiate full siblings from $\frac{1}{2}$ -siblings
 - i. Must show graphic bar when selecting the one-to-one
 - ii. Look at Fully Identical Regions (FIR) in green verses Half Identical Regions (HIR) in yellow
 - iii. Full siblings are 25% FIR
 - iv. $\frac{1}{2}$ siblings are 0% FIR
3. People who match both kits, or 1 of 2 kits
 - a. Helps fish out other people who match you and one other match
4. Many ethnicity tools
 - a. Some are specific to certain ethnicities
 - i. For example,
 - b. Do a google search to find the best one for you
5. Phase kit with only one parent
 - a. This creates two new kits
 - i. One for maternal (labeled PAOldKitNumberM1)
 - ii. One for paternal (labeled PAOldKitNumberP1)
 - iii. Now these kits can be run through the GEDMatch tools
6. Benefit: Compare people tested at different companies
 - a. Transfer kits from different DNA testing companies
7. Fun: Eye color predictor
8. Are my parents related? tool

Paid (Tier 1) Tools (\$10/mont):

1. One-to-Many Matches—new version
2. Matching Segment Search
 - a. find other kits with segments that match yours
 - b. provides colored DNA segments
 - c. Color changes based on start of segment
3. Relationship Tree Projection—create a possible tree connecting you and your match
 - a. Requires 2 kit numbers
4. Lazarus—recreate the DNA of a deceased ancestor
 - a. Requires 2 sets of relatives
 - i. Children/grandchildren
 - ii. Relative—siblings, parents and cousins
 - b. Generates a new kit
5. Triangulation
 - a. identifies and confirms triangulation groups from your matches
6. Triangulation Groups - Expanded (Beta)
 - a. More graphic representation of groups
 - b. (I get far fewer triangulated groups)
7. My Evil Twin' Phasing (Beta)
 - a. Creates a new kit for the DNA you did NOT inherit
 - b. Requires at least one parent's kid

Drawbacks:

- Must convince someone to transfer their DNA results

Bottom line:

- Great way to find **new matches** from other companies
- Powerful tools for analyzing DNA Results

Talk 2: Y-DNA, mtDNA, & X-DNA

1. Y-DNA
 - a. Companies: Y-DNA
 - i. FamilyTreeDNA is only company providing full Y-testing
 1. Provides:
 - a. Y Haplogroup & Haplotype
 - b. Deep Ethnicity Estimate
 - c. Y-DNA Matches
 - ii. 23andMe provides some Y-DNA info with the autosomal DNA test
 1. Provides:
 - a. Y Haplogroup
 - b. Deep Ethnicity Estimate
 - b. 2 Kinds of DNA Tests
 - i. STR: Provides Y-Haplotype
 1. How many STR locations/markers to test?
 - a. 37, 67, or 111
 - ii. SNP: Provides Y-Haplogroup
 - a. Should SNP be ordered to confirm haplogroup?
 - c. Y-DNA Results
 - i. Y Haplotype
 1. Receive a printable certificate
 - ii. Y Haplogroup
 1. Example: Haplogroup I-M253 (old = I1)
 - a. SNPs **M253**, M307, P30, and P40
 - b. Part of broader Haplogroup I
 - c. Age: dates to 23,000 years ago, or older
 2. Y Haplogroup Migration Map
 - iii. Deep Ethnicity Estimate
 - iv. Y-DNA Matches:
 1. Who in at FT-DNA's Y-DNA database shares DNA with you?
 - a. Table of matches
 - i. Genetic distance = differences between match & you
 - ii. Lists matches' name, their oldest known patrilineal ancestor
 - iii. TiP calculator—estimates of how many generations to a common ancestor
 - iv. Whether the match has done autosomal DNA testing (FamilyFinder (FF) test on FTDNA)
 - d. Y-DNA Genealogical Uses
 - i. Y-DNA can:
 1. On your *patrilineal line*
 - a. Confirm that branch of your family tree
 - b. Find someone, e.g., father
 2. Find a surname
 - a. Y-37 gives surname 30-40% of time

- ii. Projects:
 - 1. Y-DNA Surname Projects
 - 2. Haplogroup Projects
 - 3. Suggested projects based on your surname
 - iii. Interpreting Y-DNA results
 - 1. Look at your haplogroup
 - 2. If you're comparing it to another person's haplogroup, compare the results
 - a. Are they the same?
 - i. Then you might share a common patrilineal ancestor,
 - 1. But s/he might be too far back in time to find a common ancestor
 - ii. Then you might share a father or other relative on that line
 - 1. But this is only going to be true in rare situations, such as trying to decide if Man) A or B is the father.
 - 2. That is, because so many people have the same haplogroup, it cannot be used alone to determine whether there's a shared ancestor.
 - 3. Use it in combination with autosomal DNA.
 - 3. It might tell you about where your patrilineal ancestor came from
 - a. Search on line for your haplogroup to find more information about it. For example, look for:
 - i. Wikipedia
 - ii. Eupedia.com
 - iii. Scientific studies
 - iv. Blogs
 - b. Your haplogroup might help you sort your matches.
2. mtDNA
- a. Genealogy Uses
 - i. Deep ethnicity of matrilineal line
 - ii. Whether woman 1 or 2 is the mother
 - iii. Whether children share the same mother
 - b. Companies & Tests to Order
 - i. 23andMe
 - 1. Part of autosomal DNA test
 - 2. Provides broad haplogroup & info on haplogroup
 - ii. FamilyTreeDNA
 - 1. Separate Test \$\$\$
 - 2. Full mtDNA sequence = the test
 - 3. Provides much more detailed information
 - 4. mtDNA haplogroup and related reports
 - 5. Match list, i.e., your matches @ FTDNA

6. Haplogroup certificate
 7. Migration maps
 - a. Tells deep ethnicity
 8. mtDNA matches—a table of matches
 - a. Genetic distance (differences between you and your matches)
 - b. Matches' name, their oldest known matrilineal ancestor
 - c. NO TiP calculator
 - d. Whether the match has done autosomal DNA testing (FamilyFinder (FF) test on FTDNA)
 9. Interpreting mtDNA Results (see steps above for Y-DNA)
3. X-DNA
- a. Women get:
 - i. One X from mom
 - ii. One X from dad
 - iii. X-chromosome in women *usually* recombines (gets shuffled) when women make eggs
 - b. Men get:
 - i. One X from mom
 - ii. (Because get Y is from dad)
 - iii. X-chromosome in men does not recombine (it's not shuffled)
 - c. *Not the same inheritance pattern as mtDNA!*
 - d. X-DNA Pie Charts
 - e. Understanding X-DNA inheritance lets you interpret your X-DNA matches
 - f. X-DNA Companies
 - i. Test: autosomal DNA test
 1. Ancestry
 - a. Tests, but you don't "see" it unless you transfer to GEDMatch
 2. FamilyTreeDNA
 - a. Indicates X matches & chrom. browser
 3. 23andMe
 - a. Shows X DNA in chromosome browser
 - g. X-DNA Genealogical Uses
 - i. For women, can use X-DNA as follows:
 1. Determine whether 2 ½-sisters share a father
 2. Determine certain relationships b/w matches
 3. X-matches from father's side = his mother (your paternal grandma)
 - a. But also can have X-matches from mother's side
 - ii. For men, can use X-DNA as follows:
 1. Ethnicity of mother (via 23andMe chromosome browser)
 2. X-matches = maternal matches

Resources:

General:

- International Society of Genetic Genealogy
 - isogg.org
 - ISOGG's Autosomal DNA Statistics - http://isogg.org/wiki/Autosomal_DNA_statistics
 - ISOGG's Glossary of Terms - http://isogg.org/wiki/Genetics_Glossary
- DNA Detectives FaceBook Group - <https://www.facebook.com/groups/DNADetectives/>
- Possible Relationship Calculator - <http://dnahunters.com/possible-relationships-calculator/>
- Types of cousins explanation - <https://en.wikipedia.org/wiki/Cousin>
- Short videos on genetic genealogy - <http://learn.genetics.utah.edu/content/basics/molgen/>

Gedmatch:

- <https://www.gedmatch.com/select.php> provides the menu to the right (you need an account to view this info)

Y-DNA:

- Wikipedia: Human Y-chromosome DNA haplogroup
 - Info on specific haplogroups
- Eupedia
 - Distribution of European Y-chromosome DNA (Y-DNA) haplogroups by country in percentage
 - http://www.eupedia.com/europe/european_y-dna_haplogroups.shtml
- ISOGG also has Y-DNA info
 - ISOGG.org

mtDNA:

- Wikipedia: Human mitochondrial DNA haplogroups
 - https://en.wikipedia.org/wiki/Haplogroup#Human_mitochondrial_DNA_haplogroups
- ISOGG also has mtDNA info
 - ISOGG.org

X-DNA:

- ISOGG also has X-DNA info
 - ISOGG.org
- X-DNA Inheritance (including colored pie charts) - <http://dnahunters.com/x-dna-inheritance/>

Learn More

- [Using GEDmatch](#)
For new GEDmatch users
- [GEDmatch Forums.](#)
- [GEDmatch wiki](#)
- [GEDmatch FAQ page](#)
- [DNA for 'Dummies'](#)
- [User Lookup](#)
Find information on your matches.
- [Site Policy Statement](#)
- [New Profile Management Features](#)
- [New One to Many Features](#)