

GEDmatch: Tools to Interpret DNA Matches and Find More Matches

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Background

GEDmatch (<https://www.GEDmatch.com>) has a database of autosomal DNA results from other DNA testing companies including AncestryDNA, Family Tree DNA, 23andMe, MyHeritage, and WeGene. GEDmatch uses the following designations in their kit numbers:

- A = Ancestry
- T = Family Tree DNA
- M = 23andMe
- H = MyHeritage (new as of March 14, 2017)

GEDmatch Genesis is a new version of GEDmatch established to accept DNA results from companies previously not compatible with GEDmatch. This incompatibility is due to different DNA chip formats. DNA testing companies use DNA chips to analyze DNA samples. Ultimately, the original GEDmatch database will be merged with GEDmatch Genesis's database.

Benefits

The benefits of GEDmatch include finding new matches from other DNA testing companies. Your matches will be limited to those people who've also transferred into GEDmatch.

Another benefit is that GEDmatch allows comparison of people tested at different companies. For example, if you tested at Ancestry and your cousin tested at 23andMe, you'll be able to compare your results if you both transfer your results to GEDmatch.

GEDmatch also has an exceptional set of tools for analyzing DNA matches. These are discussed below.

Drawbacks of GEDmatch

There are a few drawbacks of GEDmatch:

- You must convince someone to transfer their DNA results to GEDmatch.
- The security at GEDmatch is probably lower than that at paid DNA testing sites. This might be due to this being primarily a volunteer-run website.
- In addition, once your kit is in GEDmatch, others can use it with all of the tools. All they need is your GEDmatch kit number. If you match them, they'll have your kit number. You can always hide your kit by making it a research kit.

- There's also a risk on GEDmatch of identifying family members carrying a DNA segment associated with a genetic disease. This blog post discusses that issue: <http://thednageek.com/cystic-fibrosis-a-case-study-in-genetic-privacy/>.
- We now know that law enforcement, with the help of genetic genealogists, is using GEDmatch to identify criminal suspects.

Bottom line for GEDmatch

GEDmatch is a great way to find new matches from other companies. It has powerful tools for analyzing DNA Results. But there are a few drawbacks.

Getting Started with GEDmatch

- Set up an account at <https://www.GEDmatch.com>
- On the GEDmatch home page, find the “Raw DNA file Uploads” heading. Click on “Generic Upload FAST.” This provides links for instructions on how to transfer data to GEDmatch from various companies.
- Once results are uploaded, a kit number, e.g., A10000, is assigned to each set of results. More than one person's DNA results can be in one GEDmatch account.
- For each person, transfer only one set of results from one company. Duplicate results clog up the system and burdens your matches, who'll see two of you. If you must transfer results from more than one DNA testing company, please pick a favorite and make the other kit(s) “research kit(s).”

Tools

GEDmatch is a free website. There is also a paid version with more tools. Free tools include the following. The paid tools are discussed after the free tools.

Free Tools at GEDmatch

One-to-Many Matches Tool

Finds your matches in the GEDmatch database. There are 2 options for this: autosomal DNA (atDNA) and X-DNA. The following discussion is about the atDNA option. If you're looking for X-DNA matches, chose that option. It will show your X-DNA matches—even if they share no atDNA with you.

This tool generates a table of your matches. In the table, click on 3 or more matches & press “submit.” Option will appear and include the following.

- **Chromosome Browsers.** There are two chromosome browser options: 2-D and 3-D that display DNA segments shared with your matches. We have pairs of chromo-somes—one from mom & one from dad. They are displayed together.

- **Autosomal Matrix** shows how much atDNA (i) you share with your matches and (ii) the matches share with each other.
 - I ignore totals under 7 cM.
 - If they share DNA with each other, matches are likely related to each other.
 - To determine possible relationships between matches, consult
 - a table in https://isogg.org/wiki/Autosomal_DNA_statistics
 - this website: <https://dnainter.com/tools/sharedcmv4>
 - Use this matrix to sort your matches. For example, if Match 1 is a maternal match, and they match Match 2, then Match 2 is (most likely) also maternal.
- **Generations Matrix** predicts how many generations away you are from your matches. 1 generation = 1 step to a shared ancestor. In general,
 - full siblings are about 1.2 generation
 - 1/2-siblings are about 1.5 generations
 - 2nd cousins, one removed (2C1R) are about 3.5 generations

The 0.5 generation increment is sometimes from when one person is 1 generation off from the other person, e.g., 2C1R. It can also be from ½-relationships, e.g., ½-siblings. More distant relationships aren't precise.

- **X-DNA Matrix** shows how much X-DNA is shared with your atDNA matches and how much X-DNA they share with each other.
 - Again, I ignore totals under 7 cM.
 - If a full X-chromosome is shared by two people, it'll be 196 cM of X-DNA.
 - Since fathers pass their full X to their daughters, they share 196 cM of X-DNA.
 - Two female ½-siblings sharing a father will also share 196 of X-DNA.
 - Remember—for females, you're looking at their 2 Xs together. This results in mom's and son's sharing 196 cM—even though the son most likely inherited a recombined X from his mom.

One-to-One Comparison

- Shows how much DNA you share with a single match.
- Before contacting a match found in the One-to-Many tool, use this tool to confirm it.

- This tool can differentiate full siblings from ½-siblings. This requires selecting “show graphic bar” when using the one-to-one. In the chromosome browser, look for
 - green Fully Identical Regions (FIRs), meaning at a specific segment, you both inherited the same segment from your mom and your dad,
 - yellow Half Identical Regions (HIRs), meaning at a specific segment, you both inherited the same segment from either your mom or your dad, and
 - red Not Identical Regions, meaning at a specific segment, you both inherited different segments from your mom and your dad.
- Full siblings share 25% FIRs. ½-siblings have 0% FIRs, that is, they have no FIRs.

People Who Match Both Kits, or 1 of 2 Kits

Finds other people who match you (A) and one other match (B). It creates 3 tables:

- matches who match both A and B,
- matches who match only A, and
- matches who match only B.

This helps find related matches. For example, if B is your maternal aunt, then matches in the first table are most likely related through your maternal side.

Ethnicity Tools

GEDmatch has many ethnicity tools, which are called Admixture Tools. Some are specific to certain ethnicities, for example, African. Do a google search to find the best one for you.

Kit Phasing

GEDmatch allows you to phase a kit with only one parent. Phasing a kit means separating maternal and paternal DNA. It creates two new kits:

- one for maternal (labeled PAOldKitNumberM1) and
- one for paternal (labeled PAOldKitNumberP1).

Once created, these kits can be run through the GEDmatch tools.

Eye-Color Predictor

A fun (but not always accurate) GEDmatch tool is eye color predictor.

Are My Parents Related?

GEDmatch also has an Are My Parents Related? tool that does what its name says.

Paid (Tier 1) Tools (\$10/month) at GEDmatch

There are several additional tools provided when you pay \$10/month at GEDmatch. They include the following.

Segment Triangulation

This tool identifies triangulated segments shared by you and at least two other matches. It forms triangulated groups from these segments.

Matching Segment Search

Finds other kits with segments that match yours. It provides colored DNA segments. Any color changes are based on start of segment.

Relationship Tree Projection

Creates a possible tree connecting you and your match. It requires 2 kit numbers (you and your match's).

Lazarus

This tool allows recreation of the DNA of a deceased ancestor. It requires 2 sets of relatives from which it creates a new kit for the deceased ancestor. The more people used in this tool, the more complete the new Lazarus kit will be.

- Set 1: Children/grandchildren
- Set 2: Relative—siblings, parents and cousins

My Evil Twin' Phasing (Beta)

This tool creates a new kit for the DNA you did NOT inherit from your parents. It requires at least one parent's kit.

Bibliography

- **GEDMatch Learning Topics**
<https://www.GEDmatch.com/select.php>
Note: must have an account at GEDmatch to access
Has a menu with learning topics.
- **GEDmatch.com User Group** – Facebook
<https://www.facebook.com/groups/gedmatchuser/>
- **GEDmatch GENEALOGY and Ancestry Group** – Facebook
<https://www.facebook.com/groups/770288949652854/>