

DNA Matrix Tool at DNA Painter

by Jonny Perl - - May 21, 2025

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Jonny Perl recently announced the new DNA matrix tool at DNA Painter, which lets you visualize and analyze how much DNA a group of testers share with each other. You can see a demonstration and hear a spoken explanation by watching his free webinar on the matrix tool at familytreewebinars.com.

<https://familytreewebinars.com/webinar/shared-dna-at-a-glance-the-new-dna-matrix-tool/>

Jonny has DNA tested a number of family members; most recently, he tested a great-niece and a great-nephew. Once the results came back, their parents wanted to know:

How much DNA does their child share with other tested family members?

How does this compare with what might be expected for that relationship?

This second question is interesting for everyone who has observed marked differences in amounts of DNA we share with relatives. Keen to get this information into a convenient format for sharing, Jonny built a DNA Matrix tool. He hopes this will help make the process of sharing and analyzing shared DNA amounts easier.

You could also potentially use the matrix tool for matches where the connection is unknown, analyzing connections and making notes.

You can find the matrix tool within the tools tab on the DNA Painter homepage once you're logged in. There is an example matrix that you can use to explore how it works.

Matrix - - When two people share DNA, the total amount they share is expressed as a number of centimorgans (cM). When collating these shared amounts for several related people, the data can be shown in rows and columns.

	P	J	S
Peter	--	2682	831
Jane	2682	--	914
Simon	831	914	--

A simple matrix showing the cMs of DNA that Peter, Jane, and Simon share with each other

The resulting matrix provides a concise grid of data in which we can quickly look up the amount that two people share. In addition, we can use shading on the grid cells to provide further information. By default, cells are shaded according to the amount shared.

Interestingly, if the tool knows the genealogical relationship between two people in addition to the amount of shared DNA, the cells can be shaded according to how strong the genetic connection is compared with others who share that relationship.

	P	J	S
Peter	--	2682	831
Jane	2682	--	914
Simon	831	914	--

The matrix for Peter, Jane, and Simon shaded according to how much they share compared with what other people shared according to the shared cM project

DNA shared
Less  More **dnainter.com**

Entering and editing data - - When you first visit the tool, you'll see an introductory message with a link to the example matrix and to this blog post.

Manual entry - - You can enter data manually by clicking "Add tester" at the bottom left of the screen.

+ Add tester

The add tester button in the DNA matrix tool

Enter the tester's name, and optionally add the testing company, kit number, year tested and other notes. If you have two testers with the same initials, you can also add a custom short name that will be used in the matrix column headers.

Basic information

Full name

Short name/initials

Testing platform

Kit number

Year tested

Notes

CANCEL SAVE

The Add tester form

Once you click “Save,” you can add further testers and start to enter the amounts they share with each other and their relationship. There are two ways to do this:

Edit mode - - If you click “Edit mode,” the number cells in the grid will become editable and you can add them in one go, clicking “Save” when you’re done.

You are now in edit mode

- Edit cM values in the fields below
- To edit individual testers, click their name
- Drag column or row headers to re-order testers in the grid
- To delete a match, click 'X' and confirm

Cancel Save

		P	J	S
Peter	X	--	2682	831
Jane	X	2682	--	914
Simon	X	831	914	--

Edit mode

Other features within edit mode include:

- To delete a tester, click the “X” next to their name and confirm
- To reorder the grid, you can click and drag a tester and drop them in a new position

Editing a tester individually - - Alternatively, you can add or edit shared amounts and relationships for an individual. To do this, click their name within the left-hand row header, and then click “Edit:”

	P	J	S
Peter	--	2682	831
Jane	682	--	914
Simon	831	914	--

Peter [X]

Company: MyHeritage Year Tested: 2018 [EDIT]

Name	DNA shared with P	Relationship with P	Percentage
Jane	2682 cM 36.05%	Not specified	Unknown
Simon	831 cM 11.17%	Not specified	Unknown

Clicking a name in the left-hand row header will bring up the overlay for that person, where you can click “Edit”

You can then click the “Relatives and shared DNA” tab. In the example below, “Relationship with P” is an auto-complete field. As you type, a list of matching relationships will appear. Once you see the correct relationship, click it. In the example below, “Brother” will be normalized to “Sibling” after you click.

Edit Tester: Peter [X]

Basic information **Relatives and shared DNA**

Name	Shared cMs	Relationship with P
Jane	2682	Bro
Simon	831	Brother relationship

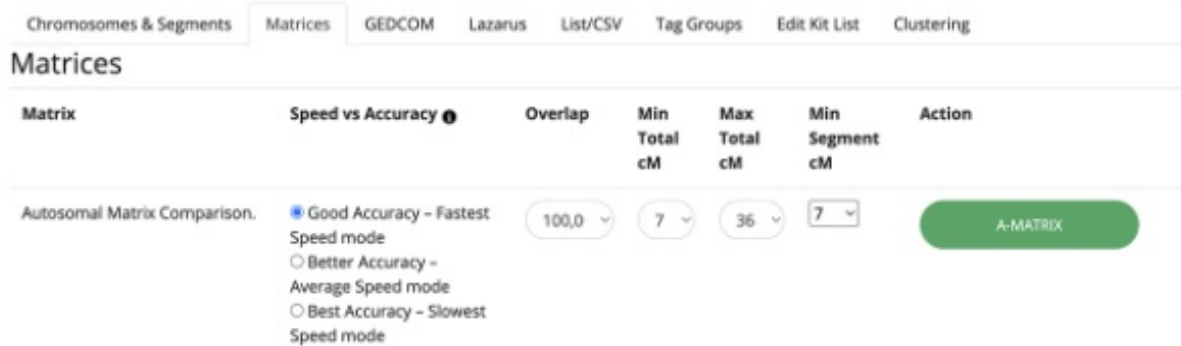
[CANCEL] [SAVE]

The “Relatives and Shared DNA” tab where you can edit the amount two people share and their relationship

Importing data - - If you already have a spreadsheet containing this information, or if your testers are at Gedmatch or FamilyTreeDNA, you can save time by importing the data. At present, relationship information has to be input manually.

Gedmatch matrix - - If you’ve uploaded your testers to Gedmatch, you can transfer the data into this tool as follows:

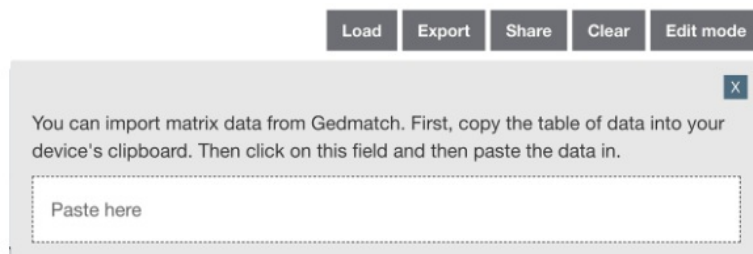
Go into “One-to-many:” Original version (or if you’re a Gedmatch subscriber, one of the One-to-many versions under Tier 1 tools)
 Check boxes to the left of the kits of interest.
 Click the “Visualization” options button above the results table
 Click the green “Visualization” options button, and then click “Matrices”
 Click “Best Accuracy” and then click “A-Matrix.” A table will be generated
 Select the table shown below and then copy it into your computer clipboard (CTRL-C or CMD-C on a Mac)



The matrices tool at Gedmatch

Then within your matrix at DNA Painter:

Click “Load”
 Click on the “Paste here” field
 Paste the data in (CTRL-V or CMD-V on a Mac)



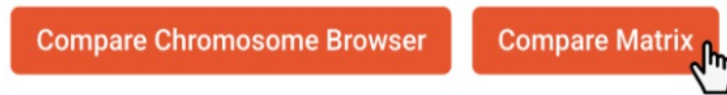
The Load option within the DNA matrix tool at DNA Painter

[FamilyTreeDNA Matrix](#) - - FamilyTreeDNA recently revamped their matrix tool so that it includes shared cM amounts for all selected users. First, go to your autosomal matches list. See a blog post from the FamilyTreeDNA blog here:

<https://blog.familytreedna.com/family-finder-matrix-update/>

You’ll see a checkbox to the left of each match
 After you check up to 10 matches, you’ll see a panel at the bottom with a button that says “Compare matrix”

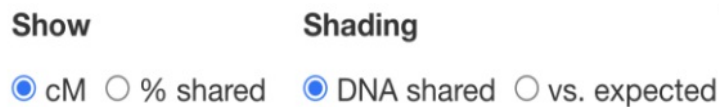
When you click this button and scroll down the page, you'll see a table. You can select and copy this table into your computer's clipboard and paste it in as described above for Gedmatch data.



The compare matrix button at FamilyTreeDNA

CSV - - You can also paste data from a spreadsheet (such as Excel or Google Docs) into this field. Or alternatively, further down within the “Load” menu, you can browse for a CSV file. (This file will need to be formatted; this DNA Painter Blog post includes a link to download an example CSV; essentially a spreadsheet version of the tables mentioned above.)

JSON - - Display options - - At the top of your matrix, you'll see options for “Show” and “Shading.” Once you click on an option, it will be retained by default in your web browser.



The display option controls within the DNA matrix tool

Show - - The show option controls how the amount of shared DNA is shown. By default, amounts will be displayed in cM as entered. If you prefer, you can display this as a percentage.

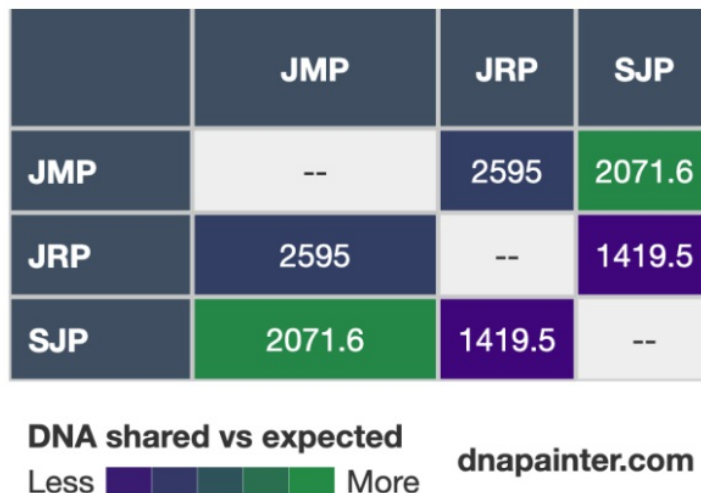
Shading - - As noted above, the boxes will by default be shaded according to the amount of DNA shared, with darker boxes for closer genetic relatives, and paler for those who are more distant.

You can also shade according to the amount shared vs. what would be expected for the relationship. A lower percentile means less DNA shared than usual for that relationship; a higher one means more than typical. In the image below, for example:

Jonny shares 2,071cM with his niece. This is more shared DNA than ~96% of cases in the shared cM project. The shading is therefore green, representing the 96th percentile.

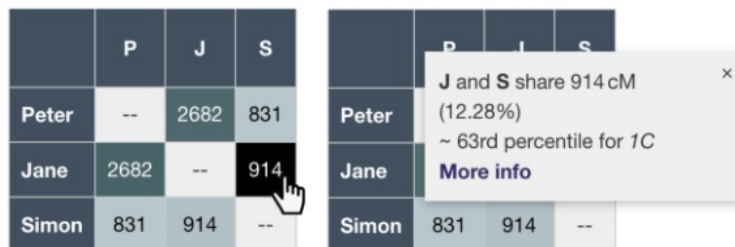
His brother shares 1,419cM with that same niece. This is less shared DNA than ~95% of cases. The shading is therefore purple, representing the 5th percentile.

Jonny and his brother share 2,595cM with each other, which is in the 45th percentile (slightly below the average). The shading therefore falls near the midpoint between green and purple, indicating a typical amount for this relationship.



A graphic showing DNA shared vs. expected for three members of Jonny's family

Clicking on elements in the matrix - - Click on a cell to see more information. When you click on a cell that shows how much DNA two people share, a dismissable panel will appear with additional information.



The dismissable panel that appears when you click on a cell in the DNA matrix tool

Click on column headers to reorder - - You can click on any column header, and the table will then be reordered as follows:

- The person represented by the column you clicked on will appear first
- The other testers will then be ordered by whichever metric is active for shading
- If shading is set to DNA shared, those who share the most DNA will appear first
- If shading is set to vs. expected, those who share in the highest percentile for the relationship will appear first

	P	J	S
Peter	--	2682	831
Jane	2682	--	914
Simon	831	914	--

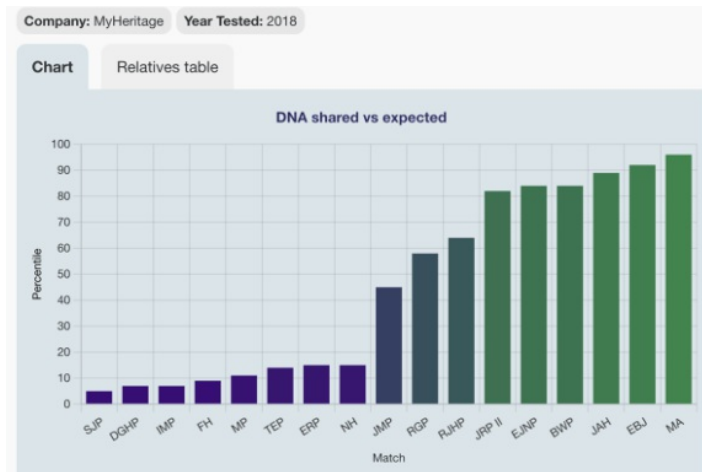
Order by DNA shared with Simon vs expected amount for relationship

A screenshot showing where you would click in a column header to re-order the matrix

Detail view - - If you click on any name, an overlay will appear:

If you've entered the testing company, year tested or any notes, this will appear
 If you've entered relationships and shared amounts, a graph will appear showing which relatives this person is most strongly linked to genetically compared with the expectation for their relationship
 A table showing shared amounts and relationship (if entered) is also available when you click "Relatives" table.

Once you have several testers entered, this can reveal some rather striking differences between how much is shared vs. the expected amount.



Detail view in the DNA matrix tool showing how much Jonny's brother shares vs the expected amount for that relationship

Exporting and sharing - - Jonny Perl was motivated to build this tool in order to make it easier to share this type of information. Within the top menu, you'll see both "Export" and "Share" buttons.

Share - - When you click “Share,” you’ll see a small overlay that will be familiar to you if you’ve used the WATO, WATO Plus, or Coverage tools:

By default, your matrix is visible only to you

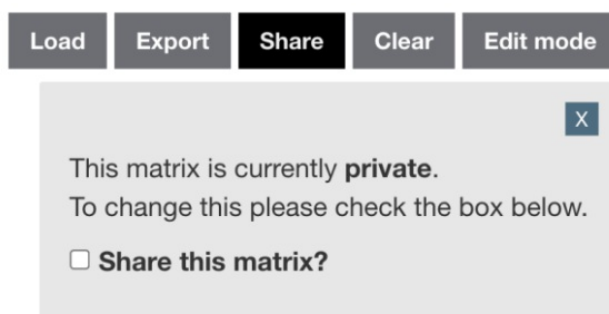
If you mark it as shared, the tool will generate a share link

Anyone with this link will be able to view the matrix in read-only mode

By default, only initials (or whatever you have in the short name field) will be shown

If you want to show full names, uncheck the box Shorten names for privacy

If at any time you want a shared matrix to be private again, you can uncheck the share box in this matrix



The Share overlay within the DNA matrix tool

Export - - Clicking “Export” reveals several options:

“Duplicate matrix” makes a copy of the current matrix and then takes you to that copy

“Save an image” downloads an image featuring the current matrix view to your device

“Export matrix as CSV” downloads a simple CSV file for Excel showing testers and shared amounts

“Export matrix JSON data” downloads a JSON file containing all tester, shared amount, and relationship data you’ve entered

You can load this back into the tool via the “Load” menu

Access to the DNA matrix tool - - Similar to other features at DNA Painter, any registered user can have one matrix, with a DNA Painter subscription required for further matrices.

To create your own matrix, click here.

<https://dnapainter.com/tools/matrix/1477>

Technical notes

Where percentages are shown, these are based on a total of 7,440cMs as they are in the Shared cM Project tool

The percentile data is based on the latest iteration of the Shared cM Project, and will change whenever a new update is released

Most testing companies do not include the shared amount of x-DNA in the total, but you might want to include this info if you have access to it

If you enter Parent-Child relationships into the tool, you'll notice that a percentile value is generated. This is not meaningful, since the proportion of DNA you inherit from a parent does not vary significantly; any variation is likely due to testing company algorithms.

Note - - When prototyping and developing this feature, Jonny Perl made use of AI via ChatGPT 03 and 04

Planned features

Entering relationships manually can be a bit time-consuming. Jonny says he is hoping to be able to develop a family tree upload so that if you select users from that tree, their genealogical relationship with other testers will be pre-filled.

It would be nice to allow users to customize the colors used in cell shading.

Jonny also expects that new features will come to mind as he uses the tool to analyze more unknown DNA matches as opposed to collating family sharing amounts.

Source: DNA Painter Blog
<https://dnapainter.com/blog/shared-dna-at-a-glance-the-new-dna-matrix-tool/>
accessed June 29, 2025; blog post edited by Gail Burk