

Mennonite DNA Project mt DNA Results Explained

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Mitochondria are organelles found in each cell that have their own DNA that is distinct from the DNA found in the nucleus. Mitochondrial DNA has 16,569 base pairs arranged in a loop, of which approximately 1122 base pairs found in 2 hypervariable regions (HVR1 and HVR2) don't code for anything. The first woman tested was from England and her sequence became known as the Cambridge Reference Sequence (CRS). Mitochondrial DNA test results are reported as the differences in any one person's mitochondrial DNA with respect to the revised CRS. An alternate method for reporting mitochondrial DNA test results is the Reconstructed Sapiens Reference Sequence (RSRS). The RSRS is designed to be the reference sequence of "Mitochondrial Eve", from whom all mankind has descended. Mitochondrial Eve is believed to have lived in Africa about 200,000 years ago.

Mitochondrial DNA is always passed down from the mother to her children. Thus, mitochondrial DNA testing provides information about what the mitochondrial DNA sequence was for any given individual's maternal line as far as they can trace it back. Mitochondrial DNA mutates relatively infrequently. On the average there is only a 3% chance that there will be a mutation in any of the bases in the mitochondrial DNA sequence in any given generation. Thus, if two people share the same great grandmother on the maternal line of descent then we would expect that those two people would have identical mitochondrial DNA sequences, or at the most have one or two bases that are different in their mitochondrial DNA if a mutation or mutations has occurred somewhere along the line as it was being passed down to each of these two people from their great grandmother.

At this time we have mitochondrial DNA results for 559 people who have Low German Mennonite ancestry on their maternal line of descent. Those results are summarized in the accompanying tables. In one table the data has been sorted first by HVR1 mutations and then by HVR2 mutations. In the second table the data has been sorted by the name of the earliest known matrilineal ancestor for the people who have been tested. The names of the testees are not included in either table but are known to both Glenn Penner and to me. There were 350 people who tested only with the Sorenson Molecular Genealogy Foundation, 205 people who tested with Family Tree DNA, one person who tested with Ancestry.com, one person who tested with Nebula Genetics, and one person who tested with the Genographic Project. Ten haplogroups are represented among these 558 people: A, C, H, I, K, J, T, U, V, and X. The mitochondrial DNA data that is displayed in the accompanying tables is all in the revised Cambridge Reference Sequence format.

The haplogroups and subclades shown in the "Haplogroup known from testing" column are based on the mutations in HVR1, HVR2, and the coding region in the haplotypes for each testee. Family Tree DNA determined the haplogroup based on full mitochondrial DNA sequencing in most of the cases where a haplogroup is shown in this column. The haplogroup was predicted by FTDNA in situations where the person tested only HVR 1 and/or HVR 2 at FTDNA. The haplogroup was also predicted in some cases for people who tested only with the Sorenson Molecular Genealogy Foundation. The primary resources used to predict the haplogroups were data from Family Tree DNA mitochondrial DNA projects, the Genographic Project, Mitosearch, and the Argus Biosciences' Phylogenetic Tree of Global Mitochondrial DNA. To be absolutely definitive about the assignment of any mitochondrial DNA haplotype to a

haplogroup the entire mitochondrial genome needs to be sequenced. If people desire full mitochondrial DNA sequencing, Family Tree DNA is the preferred testing company for the Mennonite DNA Project.

In some cases, the mitochondrial DNA haplogroup for specific testees was inferred from other matches. Information in such cases appears in the “Haplogroup inferred from other matches” column. In some cases no mtDNA haplotype was available, but because the people tested were exact matches to people who have mtDNA test results in the Mennonite DNA project at Family Tree DNA, the haplogroup was able to be inferred. I have made no attempt to predict the haplogroup for the majority of the people who tested only with the Sorenson Molecular Genealogy Foundation.

There are 132 people of Low German Mennonite ancestry who have done full mtDNA sequences at FTDNA. The data for the coding region is available to Glenn Penner and me for 83 of these people. The data for the coding region is held privately by the remaining 49 members of the Mennonite DNA project. The genetic data for the coding region for those people who have done full mtDNA sequences is not included in the accompanying tables.

In situations where the mtDNA data for people who descend from the same matrilineal ancestor is not consistent with the data for other testees who also descend from this matrilineal ancestor, I have made comments about this in the column “Comments about haplotype relative to other matches”. I also added information in this column if the data for HVR1 and HVR2 from the SMGF was incomplete. In all cases, the mtDNA data is consistent with the theory that all of the people who claim to descend from a particular matrilineal ancestor actually descend from that ancestor.

In the last column under the heading “Comments about origin of the haplotype” I have made comments about the ancestral origins of the matrilineal ancestors of people who are exact matches or very close matches with a genetic distance of only one or two from the member or members of the Mennonite DNA project who have tested at FTDNA. In many cases, I could not determine any particular pattern to the ancestral origins of the matrilineal ancestors of the matches. In such cases, the field in this column is blank. In some cases there were close matches who have matrilineal ancestors who lived in the Netherlands or in nearby countries. In other cases, some close matches have matrilineal ancestors who lived in the Germany, Poland or Scandinavia. This information is of interest to Mennonite genealogists.

I recommend that Mennonite genealogists carefully review both tables to see if they can uncover clues that may help them make new genealogical connections. Genealogists should be cautious about making genealogical connections based solely on mtDNA results, however. Due to the fact that the maternal surname typically changes each generation back up the matrilineal ancestral line, it can be very challenging to be certain about genealogical connections even in situations where two matrilineal ancestors have the same surname.

The following is an example where 4 testees share the same mitochondrial DNA haplotype. These 4 testees are descendants of Helena Kroeker (b. 6 May 1825)(Grandma #163353), Justina Klassen (b. 30 Jul 1826)(Grandma #174332), or Susanna Fast (b. ca 1840)(Grandma #229435). This indicates that Helena Kroeker, Gertrude Klassen, and Susanna Fast descend from the same woman on the maternal line of descent at some point in the recent past, likely within the past 1000 years. Exactly how these people were related to each other remains to be determined. Numerous other similar examples of situations where testees share the same haplotype or have a very similar haplotype can be found by reviewing the table where the data has been sorted first by HVR1 and then by HVR2.

If your Low German Mennonite matrilineal ancestral line has not yet been tested with a full mtDNA sequence, I would suggest that you order this test from Family Tree DNA and join the Low German Mennonite DNA project at

<https://www.familytreedna.com/groups/menno/about/background>. In my opinion it is much better to order a full mtDNA sequence than to only test HVR1 and HVR2. If you have done mtDNA testing with Family Tree DNA or with the SMGF, but are unsure how to interpret your results, feel free to contact me at tjanzen@comcast.net.

The following are some additional references that discuss mitochondrial DNA in greater detail:

1. Deep Ancestry, Inside the Genographic Project, by Spencer Wells, 2006.
2. Trace Your Roots with DNA by Megan Smolenyak and Ann Turner, 2004.
3. The Family Tree Guide to DNA Testing and Genetic Genealogy by Blaine Bettinger, 2016.
4. https://isogg.org/wiki/Portal:Mitochondrial_DNA
5. <https://www.mitomap.org/MITOMAP>
6. https://en.wikipedia.org/wiki/Mitochondrial_DNA
7. <https://mitoydna.org>
8. <http://www.familytreedna.com>
9. <http://www.ianlogan.co.uk/mtdna.htm>
10. <http://www.kerchner.com/dna-info.htm>

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Mennonite genealogy resources web site: www.timjanzen.com