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March 2, 2022

Dear Ms. Doe

This Premium Female Ancestry Report completes your order **Dxxxx.**

You can share this information with your family. Remember, the results for this female haplotype apply to and are equally valid for all female-linked relatives, including all siblings who have the same mother as you.

Now that you know your results you may wish to visit DNA Ancestor Communities. Here you can meet others from the same corner of the world, upload pictures, post family stories and genealogies and follow one or more discussions in several different forums, including World, Europe, Melungeon, Cherokee and Jewish. It's free, so join today!

We hope you enjoy your report for years to come and thank you for entrusting us with your DNA testing needs. Certificates are available for any population or result named in your report, along with a large selection of books to help you pursue your interests. Remember you have a 10% discount on any future orders with the code **dnaplus**. This discount never expires, and you can pass it on to family and friends.

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Best Regards,

Sue

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Jane Doe

Native American DNA Ancestry Report

Dxxxx

A mitochondrial specimen was analyzed at an accredited testing laboratory. The differences from the reference series mutations are reported from the lab in the page at the end of this report (rCRS; Andrews; Anderson). A mutation is any inheritable change in a nucleotide in the DNA sequence of genes. Although mutations in the D loop of mitochondrial DNA do not change the individual or have any effect, they have been found useful in tracing female, or mitochondrial, lineages (Richards and Macaulay).

According to Richards et al. (2000), the subject's mutations belong to haplogroup X with the following matches.

Northeast Europe 1	Egyptian 1	Bedouin 1
West Mediterranean 1	Basque 1	Turkish 2
Alpine 2	Northwest Europe 1	Central Mediterranean 1
East Mediterranean 3		North Caucasus 7
Palestinian 1		Armenian 2

The haplotype was further defined in Phylotree.org as X1-2-3, based on the HVR2 mutation 153G.

Analysis and Conclusion

The subject's oldest direct female ancestor belonged to Haplogroup X, known as Xenia in the scheme of Oxford Ancestors. Xenia lived about 20,000 to 30,000 years ago. X is one of rarest lineages in Europe, being found only is about 1% of the overall population. The highest incidence of haplogroup X is observed in Greece (4%), Macedonia (3%), Romania (2.5%) and around the Caucasus, notably among the Avars (5%), Adyghe-Kabardin (5%), Karachay-Balkars (4.5%), Nogays (4%), Dargins (3.5%), Armenians (3.5%), Azeri (3.5%), North Ossetians (3%) and Georgians (3%). In Western Europe, X peaks in Orkney (7%), Scotland (2.5%), Catalonia (2.5%) and the Basque country (2.5%).

Haplogroup X is also one of the five haplogroups found in the indigenous peoples of the Americas, where it is customarily named X2. Although it occurs only at a frequency of about 3% for the total current indigenous population of the Americas, it is a bigger haplogroup in northern North America, where among the Algonquian peoples it

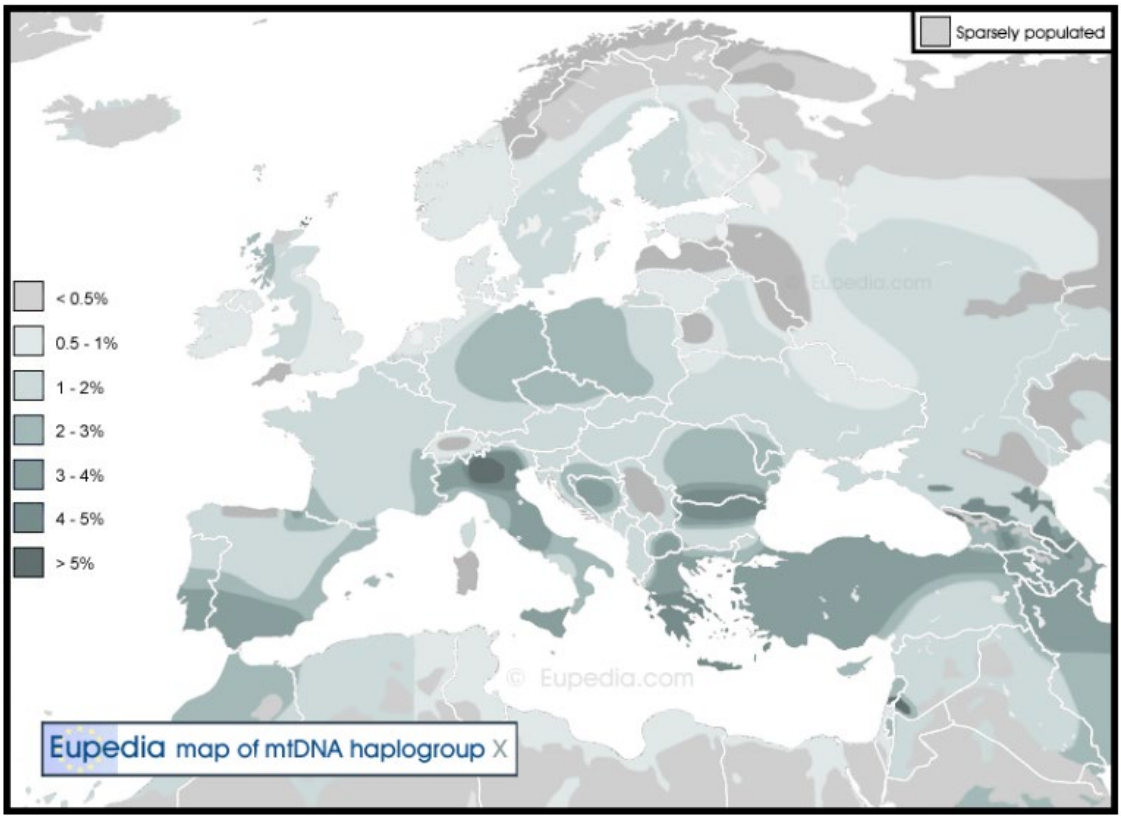
comprises up to 25% of mtDNA types.[13][14] It is also present in lesser percentages to the west and south of this area—among the Sioux (15%), the Nuu-chah-nulth (11%–13%), the Navajo (7%), and the Yakama (5%).[15][16] In Latin America, Haplotype X6 was present in the Tarahumara 1.8% (1/53) and Huichol 20% (3/15). X6 and X7 was also found in 12% in Yanomani people.

Unlike the four main Native American mtDNA haplogroups (A, B, C, D), X is not strongly associated with East Asia. The main occurrence of X in Asia discovered so far is in the Altai people in Siberia.

One theory of how the X Haplogroup ended up in North America is that the people carrying it migrated from central Asia along with haplogroups A, B, C, and D, from an ancestor from the Altai Region of Central Asia. Two sequences of haplogroup X2 were sampled further east of Altai among the Evenks of Central Siberia. These two sequences belong to X2* and X2b. It is uncertain if they represent a remnant of the migration of X2 through Siberia or a more recent input. The only important occurrence of X in Asia discovered so far is in Altaia in South Siberia, and detailed examination has shown that the Altaian sequences are all almost identical (haplogroup X2e), suggesting that they arrived in the area probably from the South Caucasus more recently than 5000 BP.

The relative absence of haplogroup X2 in Asia is one of the major factors causing the current rethinking of the peopling of the Americas. The Solutrean Hypothesis posits that haplogroup X reached North America with a wave of European migration about 20,000 BP by the Solutreans, a Stone Age culture in southwestern France and in Spain, by boat around the southern edge of the Arctic ice pack. An alternative theory is that the presence of X in the New World may be attributable to the Phoenicians, who have roots in the area where the Druze now live in the Hills of Galilee. X has been noted in the Cherokee in particular (data on file).

Haplogroup X accounts for about 2% of the population of Europe, the Near East and North Africa. Many believe it to be the worldwide signature of the Phoenicians. In fact, the greatest frequency of haplogroup X is observed in the Druze, a minority population in Israel, Jordan, Lebanon, and Syria, as much in X1 (16%) as in X2 (11%). The Druze also have much diversity of X lineages. This pattern of heterogeneous parental origins is consistent with Druze oral tradition. The Galilee Druze represent a population isolate, so their combination of a high frequency and diversity of X signifies a phylogenetic refugium, providing a sample snapshot of the genetic landscape of the Near East prior to the modern age.



Associated Medical Conditions

A study conducted by Maruszak et al. (2014) analysed the mtDNA of 395 elite Polish athletes (213 endurance athletes and 182 power athletes) and 413 sedentary controls and found that haplogroup X is among the most overrepresented mtDNA types among endurance athletes at the Olympic/World Class level.

Famous Individuals

The Nancy Hanks Lincoln mtDNA Study traced back the mitochondrial DNA lineage of Abraham Lincoln (1809-1865). The testing of matrilineal relatives of Lincoln's mother, Nancy Hanks, provided evidence that the 16th president of the United States belonged to the very rare haplogroup X1c.

Susan Levin
Senior Associate Investigator
DNA Consultants
March 4, 2022

Disclaimers

This DNA Ancestry Test is a probabilistic prediction of ancestry for personal knowledge only. It is a non-chain of custody form of testing and is not intended for legal or official purposes. Its results may or may not

confirm expected ethnic composition, family history or genealogical determinations. Alone, it may not be used to prove identity, biological relationships, nationality, citizenship, immigration or tribal enrollment.

References and Suggestions for Further Reading

1. Anderson, S., Bankier, A. T., Barrell, B. G., de Bruijin, M. H. L., Coulson, A. R., Drouin, J., Eperson, I. C., Nierlich, D. P., Roe, B. A., Sanger, F., Schreier, P. H., Smith, A. J. H., Staden, R., and Young, I. G. "Sequence and organization of the human mitochondrial genomes." *Nature* (1981) 290:457-465.
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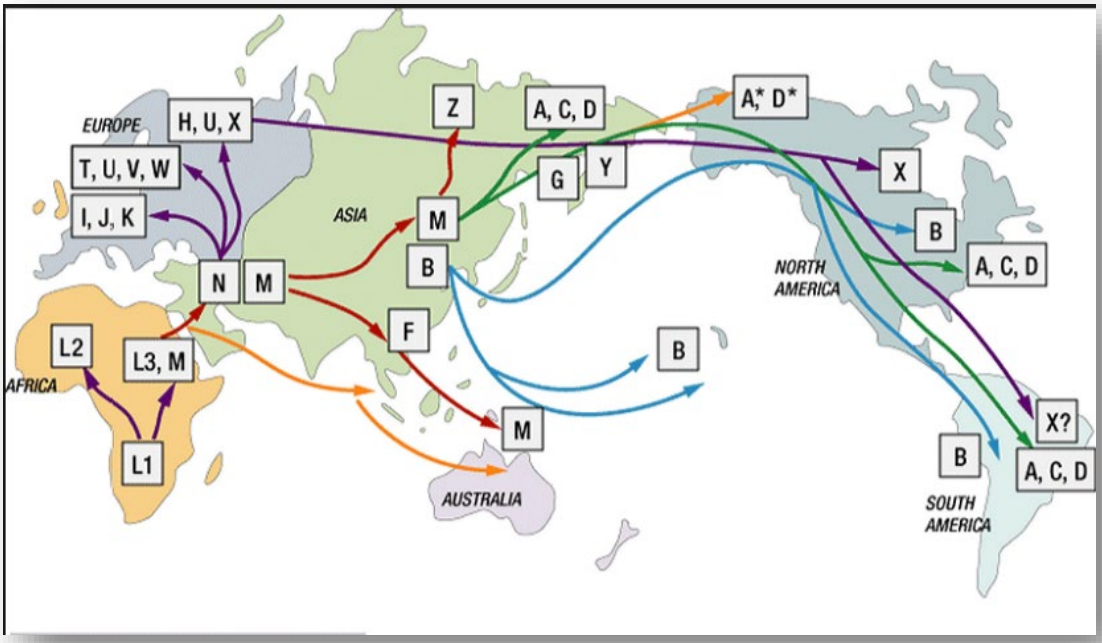
3. Richards, M. et al. (2000). "Tracing European founder lineages in the Near Eastern mtDNA pool." *Am. J. Hum. Genet*. 67: 1251-1276. Supplementary Data (by Vincent Macaulay): http://www.stats.gla.ac.uk/~vincent/founder2000/index.html.
4. Richards, M. and Macaulay, V. (2000) "The mitochondrial gene tree comes of age." *Am. J. Hum. Genet.* 68: 1315-20.
5. Sykes, Bryan (2001). *The Seven Daughters of Eve. The Science that Reveals Our Genetic Ancestry.* New York, Norton. Names the founders of Europe's major female haplogroups Helena, Jasmine, Katrine, Tara, Velda, Xenia, and Ursula.
6. Wells, Spencer (2006). *Deep Ancestry: Inside the Genographic Project.* Washington: National Geographic.

Understanding Your Female Lineage

Your haplogroup (H, J, K, L etc.) describes what broad family of female lineages you belong to—the "daughters of Eve." These lines are conventionally called Helena (H), Tara (T), Jasmine (J) and the like and have all been traced back about 20,000-50,000 years to different regions of the world like Western Europe, Northern Europe, the Middle East, Africa or the Americas. Geneticists believe all people alive today are descended from a woman who lived in East Africa about half a million years ago (mitochondrial Eve). A map of female haplogroup migrations clearly shows the human family expanded out of Africa.

A haplotype, as defined in your mitochondrial DNA lab report, is a specific lineage within that haplogroup. Your unique genetic profile reflects your direct line of maternal descent from a common female founder. This is defined by a set of mutations on the control section of your mitochondrial genome passed down only by females. All female-linked relatives of the mother have the same lineage (children, daughter's children, brothers and sisters, mother, maternal grandmother, maternal grandmother's mother etc.).

It is a mistake to say that mitochondrial DNA is the same as the X chromosome. While it is true that females have two X chromosomes and males an X and a Y, mitochondrial DNA is not located on any chromosome but is extra-nuclear material with its own genome.



How do mutations occur? Are they harmful?

Mutations are changes in the copies of DNA passed from a parent to offspring. They crop up in the DNA record in a random way according to their "molecular clock." In other words, they are not caused by anything. Sometimes the DNA just changes, and this affects a certain position on the long strands of it that are in every cell of your body. In almost all cases, these changes do not do anything. Only in the case of genetic disease do the mutations have any effect on us. Even though they do not do anything, though, they continue to be passed down in exact copies from parent to offspring. So they are useful in identifying individuals who come from the same ancestor. All these descendants are in the same lineage. Once a mutation occurs it stamps that line as unique and distinctive forever. Descendants are said to be "downstream" from that change.

Remember the “distaff side” is not remembered or recorded as scrupulously as the male. The names of female ancestors in family trees are often forgotten or even purposely buried, especially if they were of diverse background, say American Indian, Jewish or a person of color.

The female stories in our past are often at odds with the received, standard version you read about in the history books! The exploration of your mitochondrial lineage can be a deeply rewarding experience even if you do not turn up a connection with royalty, famous personages or a prestigious surname.

Suggested Reading

1. Eupedia, "Distribution of European Mitochondrial DNA Haplogroups" (major guide to European types), Europe Forum (and other free forums).
2. Cavalli-Sforza, Luigi Luca and Francesco Cavalli-Sforza (1995). *The Great Human Diasporas* (New York: Basic). Wonderful, readable classic on human genetics and prehistory by father and son.
3. Hirschman, Elizabeth C. and Donald N. Yates (2004). "DNA Haplotyping and Diversity: An Anthropogenealogical Method for Researching Lineages and Family Ethnicity." Paper published in the Proceedings of the Fourth International Conference on Diversity in Organisations, Communities and Nations, Los Angeles, Calif., July 6-9, 2004. *International Journal of the Humanities* 2:2043-55.
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5. Oppenheimer, Stephen (2006). The Origins of the British. A Genetic Detective Story. New York: Carroll & Graf. ------(2005). *The Real Eve.* New York: Carroll & Graf. ------ (1999).
6. Richards, M. et al. (2000). Tracing European founder lineages in the Near Eastern mtDNA pool. *Am. J. Hum. Genet*. 67: 1251-1276. Supplementary Data (by Vincent Macaulay): http://www.stats.gla.ac.uk/~vincent/founder2000/index.html.
7. Salas, Antonio et al. (2005). "Charting the Ancestry of African Americans." *American Journal of Human Genetics* 77/4:676-80.
8. Schurr, Theodore G. (2000). Mitochondrial DNA and the Peopling of the New World. *American Scientist* 88/3:246-53.
9. Thomas, M.G. et al (2002). "Founding Mothers of Jewish Communities: Geographically Separated Jewish Groups Were Independently Founded by Very Few Female Ancestors." *Am J. Hum. Genet*. 70:1411-1420.
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11. Wells, Spencer (2006). *Deep Ancestry: Inside the Genographic Project.* Washington: National Geographic.
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For help in evaluating your matches, contact us Monday through Friday 10 a.m. to 5 p.m. Mountain Time. We pride ourselves on customized service and will be glad to walk you through your report and answer all your questions personally.