VER 2.1

Gene2me ANCESTRY

Name	Min Seob Lee
Analysis Date	06-Feb-2022
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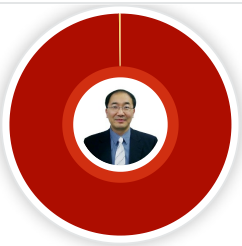
EDGC



MIN **100%**

East Asian & Indigenous American **100%**

Japanese & Korean **99.8%**

Korean **99.8%**

Seoul, South Korea

+5 regions

Indigenous American **0.2%**

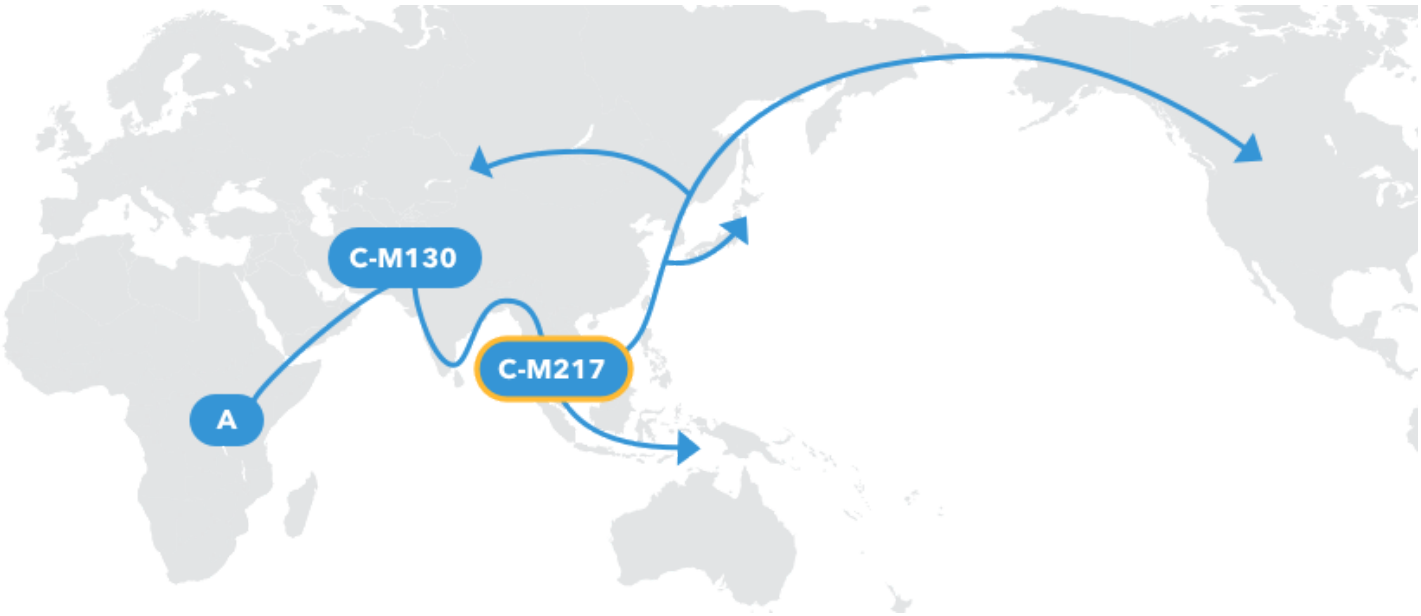
Paternal Haplogroup

You descend from a long line of male ancestors that can be traced back to eastern Africa over 275,000 years ago. These are the people of your paternal line, and your paternal haplogroup sheds light on their story.

MIN, your paternal haplogroup is C-M217.

As our ancestors ventured out of eastern Africa, they branched off in diverse groups that crossed and recrossed the globe over tens of thousands of years. Some of their migrations can be traced through haplogroups, families of lineages that descend from a common ancestor. Your paternal haplogroup can reveal the path followed by the men of your paternal line.

Migrations of Your Paternal Line



275,000 Years Ago

Haplogroup A

The stories of all of our paternal lines can be traced back over 275,000 years to just one man: the common ancestor of haplogroup A. Current evidence suggests he was one of thousands of men who lived in eastern Africa at the time. However, while his male-line descendants passed down their Y chromosomes generation after generation, the lineages from the other men died out. Over time his lineage alone gave rise to all other haplogroups that exist today.

65,000 Years Ago

Haplogroup C-M130

The first steps of your paternal-line ancestors can be traced through haplogroup C-M130, the root of all branches of C. The common ancestor of C-M130 was likely among the earliest of our ancestors to cross the Red Sea and venture far beyond Africa sometime around 60,000 years ago. His descendants split into diverse branches as they migrated across Asia, Australia, and even to the Americas.

50,000 Years Ago

Haplogroup C-M217

Your ancestral line of C is haplogroup C-M217, which arose approximately 45,000 years ago as early humans followed the southern coast and rounded the tip of Southeast Asia. From there, men bearing C-M217 continued north before splitting once again as some headed inland, and others continued through Siberia to North America.

50,000 Years Ago

Origin and Migrations of Haplogroup C-M217

Haplogroup C-M130 can be found across Asia, Australia, and the Americas. It must have originated only briefly after humans began expanding outside Africa. Later, different branches of C colonized different continents. C-M217 succeeded in expanding across much of Siberia and central Asia, where it is one of the major haplogroups today.

C-M217 is the most common haplogroup in Siberia and Mongolia, where it appears to have originated between 45,000 and 53,000 years ago. From there it has spread widely both to the Americas, with people who migrated across the Bering land bridge that connected Siberia to Alaska during the Ice Age, and more recently to Europe and the Middle East with the expansion of the Mongol empire during the 13th century AD.

Native Americans who have Y-chromosomes belonging to haplogroup C-M217 are descended from a small group of men who crossed the Bering Strait toward the end of the last Ice Age, about 12,000 years ago. Lower sea levels at the time, due to the larger volume of water that was locked up in the polar ice caps, made it possible for people to walk from Asia to Alaska. The traditional view is that the first Americans followed herds of mammoths, bison and other big game from Siberia to Alaska.

In Asia, the geographical distribution of haplogroup C-M217 matches almost exactly the borders of the Mongolian empire at its maximum extent. That probably isn't a coincidence – in the process of conquering much of Asia the Mongols would have spread their genes, and thus their Y-chromosomes, far and wide. In fact, one particular genetic signature that falls within the C-M217 haplogroup is so common that some geneticists believe it may trace back to Genghis Khan himself. Today, C-M217 is the most common Y haplogroup among Mongolian men.

Today

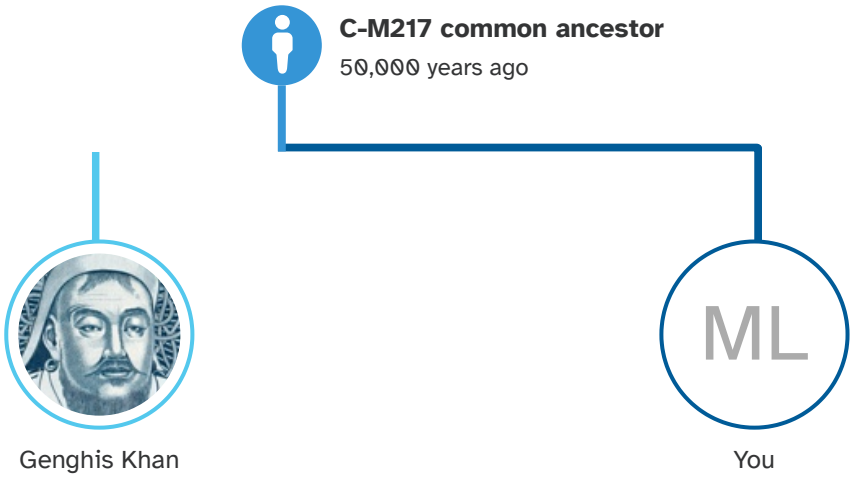
C-M217 is relatively uncommon among 23andMe customers.

Today, you share your haplogroup with all the paternal-line descendants of the common ancestor of C-M217, including other 23andMe customers.

1 in 5,300

23andMe customers share your haplogroup assignment.

You share a paternal-line ancestor with Genghis Khan.



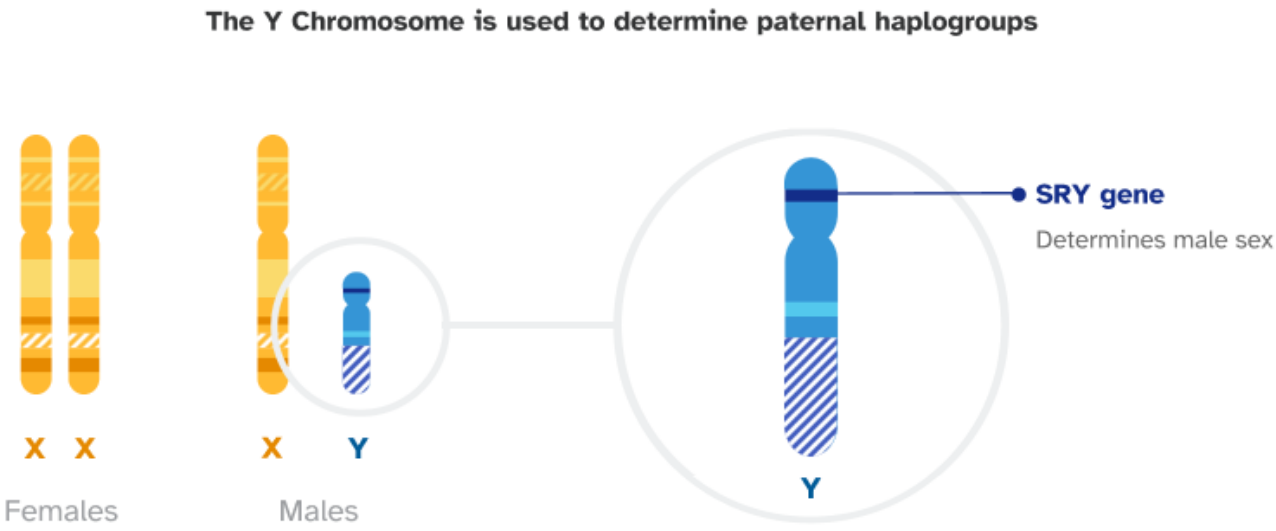
Genghis Khan, the Mongolian conqueror that lived from 1162 to 1227 CE, was likely a member of haplogroup C-M217, and may be responsible for the spread of one of its branches. Half of a percent of all men on Earth, and 8% of men in the region reaching from northeastern China to Uzbekistan, may descend from Genghis Khan. His lineage is most common in Hazara, Mongolian, Uygur, Chinese Kazak, and Inner Mongolian Han populations.

The Genetics of Paternal Haplogroups

The Y Chromosome

Most of the DNA in your body is packaged into 23 pairs of chromosomes. The first 22 pairs are matching, meaning that they contain roughly the same DNA inherited from both parents. The 23rd pair is different because in males, the pair does not match. The chromosomes in this pair are known as "sex" chromosomes and they have different names: X and Y. Typically, females have two X chromosomes and males have one X and one Y.

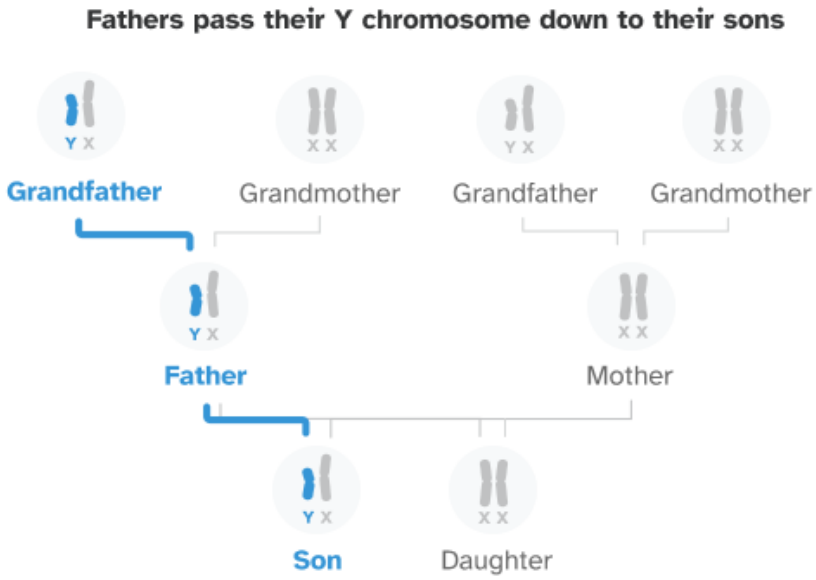
Your genetic sex is determined by which sex chromosome you inherited from your father. If you are genetically male, you received a copy of your father's Y chromosome along with a gene known as SRY (short for *sex-determining region Y*) that is important for male sexual development. If you are genetically female, you received a copy of the X chromosome from both of your parents.



Paternal Inheritance

Each generation, males pass down copies of their Y chromosomes essentially unchanged to their male children. Between generations, the matching chromosomes in the other 22 pairs make contact and exchange segments of DNA. This process shuffles the genetic information that is passed down from parent to child, making it difficult to trace genealogy over many generations. Except for two tiny sections at the chromosome's tips, however, the Y skips this step. Instead, a nearly identical copy is handed down each time.

But, every so often, small changes to the DNA sequence do occur. These changes, called mutations, create new genetic variants on the Y chromosome. Because the Y does not recombine between generations, these variants collect in patterns that uniquely mark individual paternal lineages.

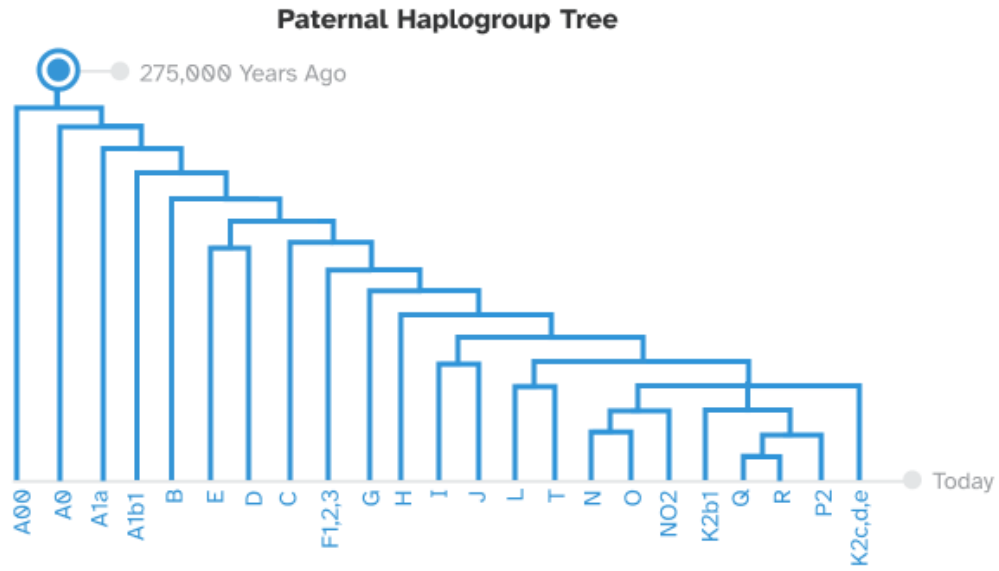


Paternal Haplogroup Tree

To trace the genetic history of paternal lineages, researchers compare the variants found in Y-DNA sequences from around the world. The result is a tree of Y chromosomes that shows how all paternal lines are related.

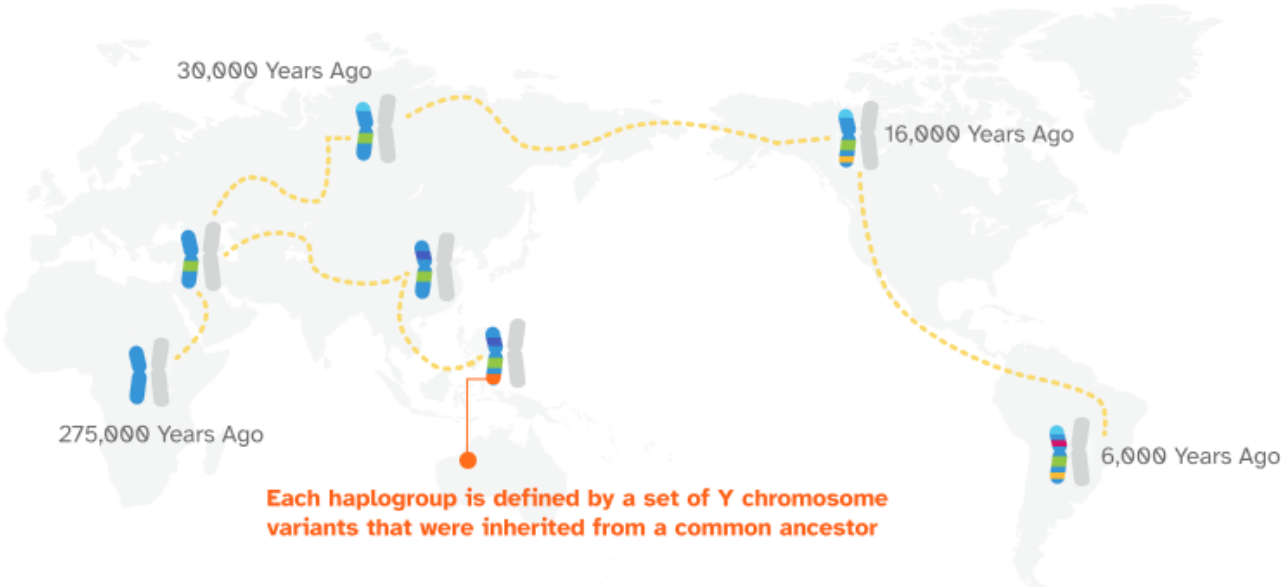
A paternal haplogroup is a cluster of branches on the tree that stem from a common male ancestor and share a particular set of variants. To keep track of all the branches, the major sections of the tree are named with one or more capital letters. Each haplogroup name starts with the letter of the major branch from which it stems and ends with the name of a variant that identifies a particular subgroup.

Visit the scientific details to see your lineage in the tree of all paternal haplogroups.



Tracing Male Migrations

Because closely related haplogroups tend to share geographic roots, researchers can use the modern distributions of haplogroups around the world to trace major migrations, from the voyage to Australia over 40,000 years ago to the peopling of North and South America in the last 16,000 years.



Do more with your Haplogroup results.

- Contribute to research and help us understand patterns of genetic variation around the world.
- Visit DNA Relatives to identify relatives that may be on your paternal line.

Scientific Details

Your haplogroup can tell you about your paternal line.

Each generation, males pass copies of their Y chromosomes on to their male children. Whereas most of the genome exists in two copies that exchange pieces between generations in a process called recombination, the Y chromosome is transmitted unshuffled. Because of this unusual pattern of inheritance, the Y contains rich information about paternal lineages.

A small number of DNA changes, called mutations, generally occur from one generation to the next. Because the Y chromosome does not recombine between generations, these mutations accumulate in patterns that uniquely mark individual lineages, and scientists can compare the resulting sequence differences by constructing a tree. This tree shows how paternal lineages relate to one another, including the observations that all human paternal lineages share a most recent common ancestor approximately 275,000 years ago.

The term "haplogroup" refers to a family of lineages that share a common ancestor and, therefore, a particular set of mutations. Each paternal haplogroup is named with a letter indicating the major cluster of branches to which it belongs, followed by the name of a mutation that is shared by a subset of the major cluster.

We identify your haplogroups by determining which branches of the Y-chromosome tree correspond to your DNA. Because more closely related lineages tend to share geographic roots, your haplogroup can provide insight into the origins of some of your ancient ancestors.

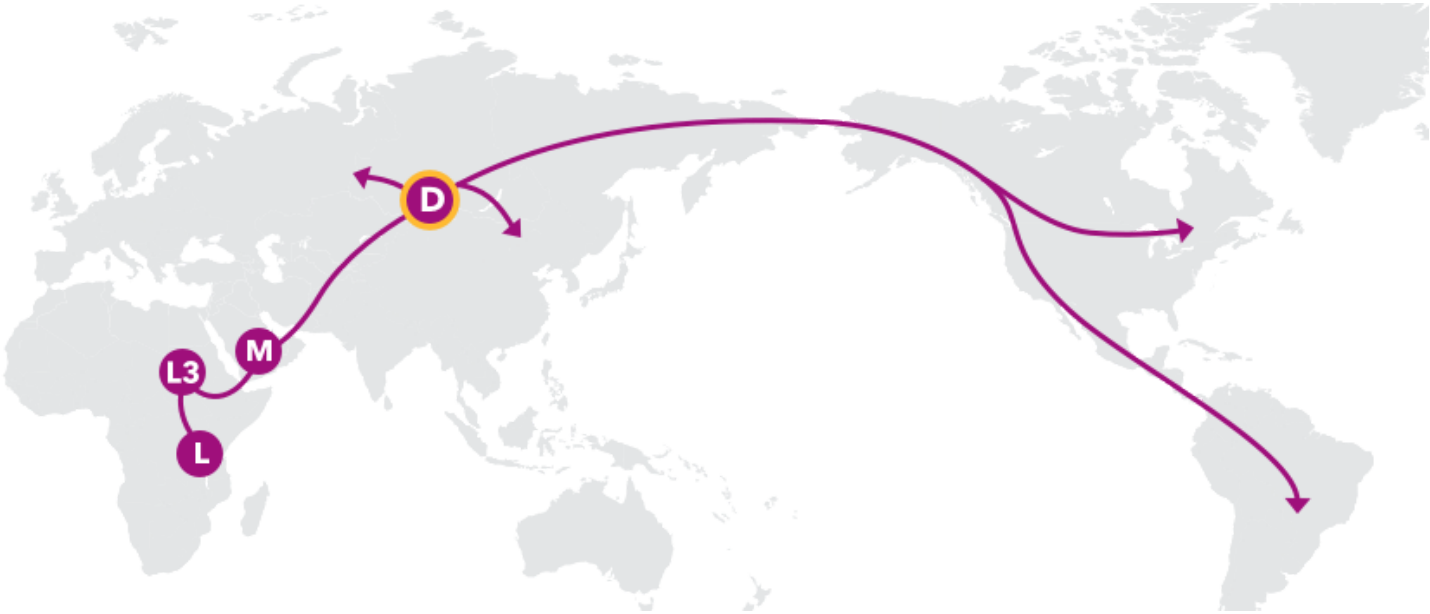
Maternal Haplogroup

You descend from a long line of female ancestors that can be traced back to eastern Africa over 150,000 years ago. These are the people of your maternal line, and your maternal haplogroup sheds light on their story.

MIN, your maternal haplogroup is D4g1.

As our ancestors ventured out of eastern Africa, they branched off in diverse groups that crossed and recrossed the globe over tens of thousands of years. Some of their migrations can be traced through haplogroups, families of lineages that descend from a common ancestor. Your maternal haplogroup can reveal the path followed by the women of your maternal line.

Migrations of Your Maternal Line



180,000 Years Ago

Haplogroup L

If every person living today could trace his or her maternal line back over thousands of generations, all of our lines would meet at a single woman who lived in eastern Africa between 150,000 and 200,000 years ago. Though she was one of perhaps thousands of women alive at the time, only the diverse branches of her haplogroup have survived to today. The story of your maternal line begins with her.

65,000 Years Ago

Haplogroup L3

Your branch of L is haplogroup L3, which arose from a woman who likely lived in eastern Africa between 60,000 and 70,000 years ago. While many of her descendants remained in Africa, one small group ventured east across the Red Sea, likely across the narrow Bab-el-Mandeb into the tip of the Arabian Peninsula.

50,000 Years Ago

Haplogroup M

Beyond Africa, your maternal-line story can be traced through haplogroup M. M is one of two branches that split from L3 soon after humans first expanded out of Africa. Over the 50,000 years since the branch's rise, members of haplogroup M have ventured far and wide in southern and eastern Asia, where many diverse branches split off, many of which are major haplogroups in their own right.

40,000 Years Ago

Haplogroup D

One of those branches is haplogroup D, which traces back to a woman who likley lived in Central or East Asia nearly 40,000 years ago. Since then her descendants have migrated far and wide across Eurasia. Over 14,000 years ago, women who belonged to the branches D1, D2a, D3, and D4h3 migrated even farther east, from Siberia to the Americas.

40,000 Years Ago

Origin and Migrations of Haplogroup D

The common ancestor of haplogroup D was a woman who lived in Asia nearly 40,000 years ago. There are two major branches of the D haplogroup in Asia. D5, which is comparable in age to D itself, is common in southern China but rare farther north. D4, a younger haplogroup that arose about 25,000 years ago, is more common in northern Asia, reaching 18% in southern Siberia.

Haplogroup D4 is particularly common among Koreans and in the populations of Manchuria, which is just north of the Korean Peninsula. Recent archaeological discoveries suggest that the earliest inhabitants of Korea probably came from the Altai-Sayan and Baikal regions of Southeast Siberia. They likely began to move into the region by about 30,000 years ago, when they followed mammoths and other large animals into the peninsula. Among Siberian populations, haplogroup D is most common in the Yupik and Chukchi, two modern indigenous groups in northeastern Siberia whose ancestors are thought to have played a significant role in the peopling of the Americas.

D4g1

6,000 Years Ago

Your maternal haplogroup, D4g1, traces back to a woman who lived approximately 6,000 years ago.

That's nearly 240 generations ago! What happened between then and now? As researchers and citizen scientists discover more about your haplogroup, new details may be added to the story of your maternal line.

Today

D4g1 is relatively uncommon among 23andMe customers.

Today, you share your haplogroup with all the maternal-line descendants of the common ancestor of D4g1, including other 23andMe customers.

1 in 4,000

23andMe customers share your haplogroup assignment.

Haplogroup D and the Origins of the Han

The roots of the Han lie in Zhongyuan, China's Central Plain.

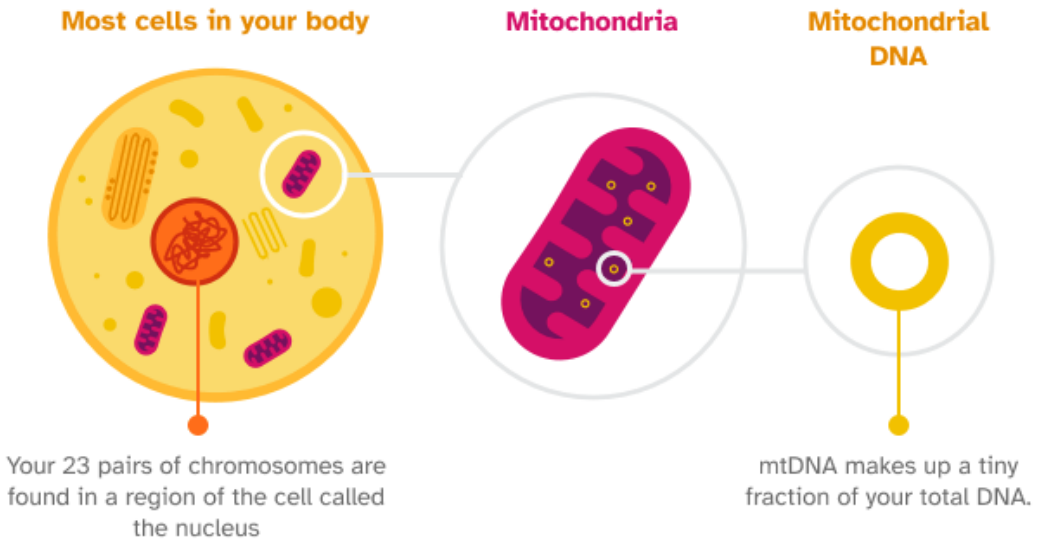
Members of haplogroup D are found in both northern and southern Han Chinese populations at low to moderate frequencies. The Han people, who all share the same language and similar cultural practices, are the largest ethnic group in the world, with about 1.2 billion people. Historical evidence shows that Han people are descendants of the ancient Huaxia tribes that come from northern China, and Han language and culture only expanded into southern China in the last 2,000 years. The spread of Han people and culture from northern to southern China was likely driven by warfare and famine in the north.

The Genetics of Maternal Haplogroups

Mitochondrial DNA

Maternal haplogroups are determined by sets of genetic variants in a tiny, unusual loop of DNA called mitochondrial DNA (mtDNA). As the name suggests, mtDNA is found in the mitochondria, small but mighty structures inside our cells that turn fuel from the food we eat into energy.

Mitochondria evolved over billions of years from an independent bacterial cell that was engulfed by another cell. Instead of becoming lunch, the bacterium helped its new host use oxygen to produce energy. Over time it completely lost its independence and became an integrated part of the larger cell.

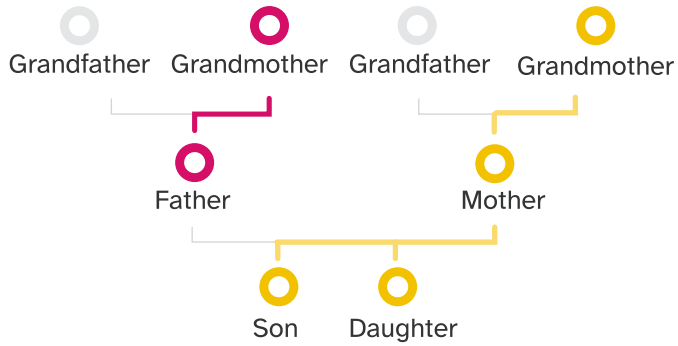


Maternal Haplogroup Tree

MtDNA is a powerful tool for tracing the history of maternal lines because of the way it is inherited: everyone has mtDNA, but only females pass it down to their children. So for example, an individual inherits a copy of their mother's mtDNA, who inherited it from their mother, who inherited it from theirs, and so on through the generations along an unbroken line of female ancestors.

The copies passed down are not always perfectly identical, however. Small typos in the mtDNA sequence occasionally occur, creating new genetic variants. Over many generations, these variants stack up in unique patterns that are carried by different maternal lines around the world.

Only mothers pass their mtDNA down to their children

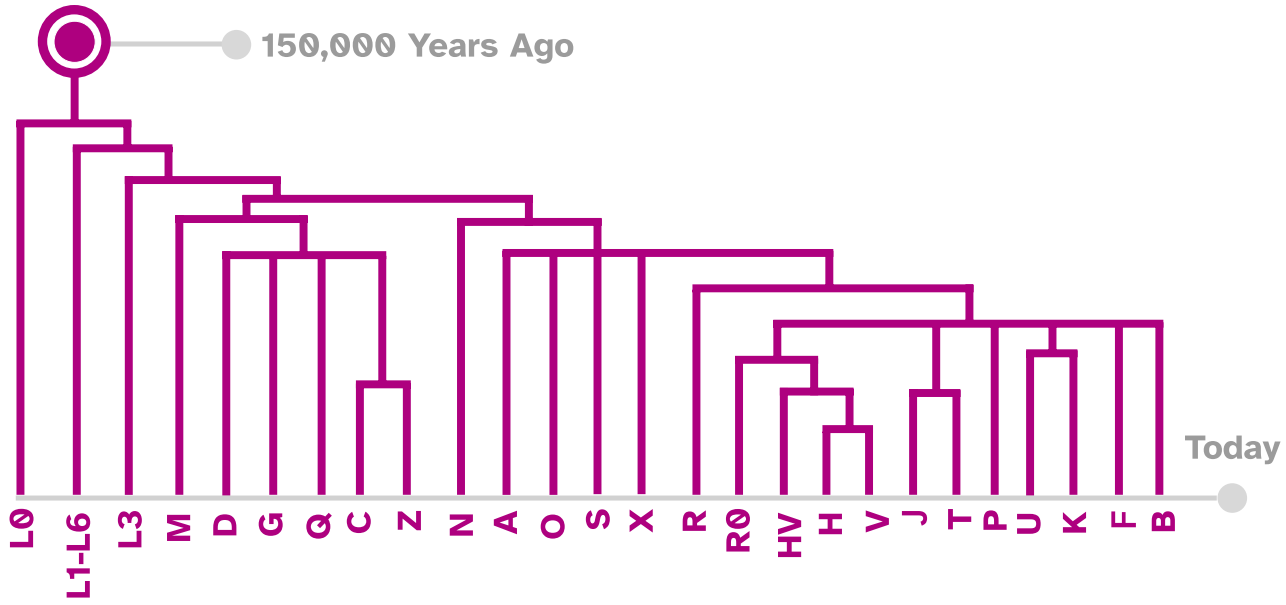


Maternal Haplogroup Tree

By comparing the mtDNA patterns from around the world, researchers identify families of maternal lines. All the lines within each family trace back to a single common ancestor, and share a set of mtDNA variants that they inherited from her.

In fact, when we look very far back in time, all the maternal lines around the world trace back to one woman! Along with her ancestors, she forms the root of a great tree that shows how all maternal lines are related. Each sub-family in this tree is called a "haplogroup" and named with a sequence of letters and numbers that reflect its location in the tree.

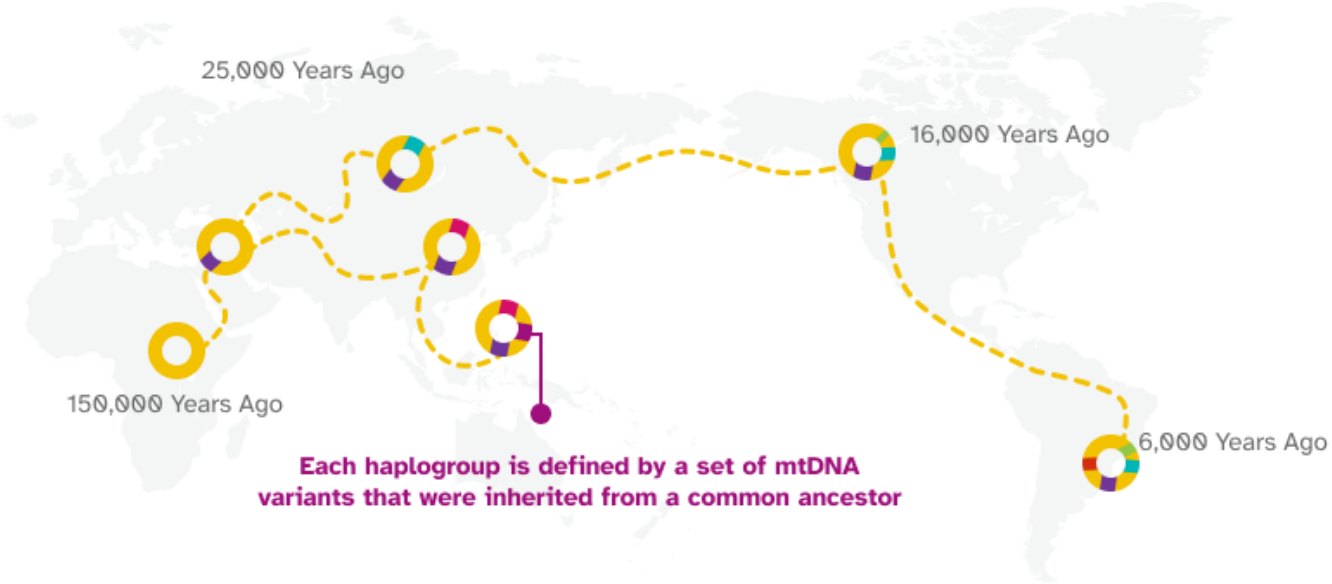
See your line in the tree of all maternal haplogroups.



Tracing Female Migrations

Next, geneticists study the relationships between haplogroups and compare them with the distribution of each group around the world. Because closely related haplogroups tend to share geographic roots, researchers can play a sophisticated version of connect-the-dots to estimate the origins and migration patterns of particular haplogroups.

Finally, combining this genetic evidence with data from other fields of study helps researchers place the story of each maternal line within the broader context of human history.



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The term "haplogroup" refers to a family of lineages that share a common ancestor and, therefore, a particular set of mutations. We identify your haplogroup by determining which branches of the mtDNA tree correspond to your DNA. Because more closely related lineages tend to share geographic roots, your haplogroup can provide insight into the origins of some of your ancient maternal-line ancestors.

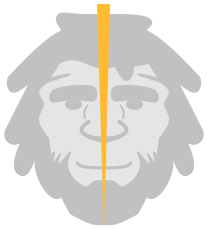
Maternal haplogroups are named with sequences of letters and numbers that reflect the structure of the tree and how the branches relate to one another.

We improved our analysis and your results may have changed.We improved our analysis to better identify Neanderthal ancestry in non-European populations, and your results may have changed. **Learn more**

Hey MIN!
You have more Neanderthal DNA than 58% of other customers.

Neanderthals were prehistoric humans who interbred with modern humans before disappearing around 40,000 years ago.

What does this mean?



You have <2% Neanderthal DNA

You inherited a small amount of DNA from your Neanderthal ancestors. Out of the 2,872 variants we tested, we found **282 variants** in your DNA that trace back to the Neanderthals.

All together, your Neanderthal ancestry accounts for less than **~2 percent of your DNA.**

You have Neanderthal DNA that may influence your traits

This report highlights associations between your Neanderthal variants and your traits, but it does not explore how other factors may be involved — such as your many other DNA variants, your environment, or your lifestyle.

You have one variant associated with
having a worse sense of direction.

You have one variant associated with
being a better sprinter than distance runner.

You have one variant associated with
having more dandruff.

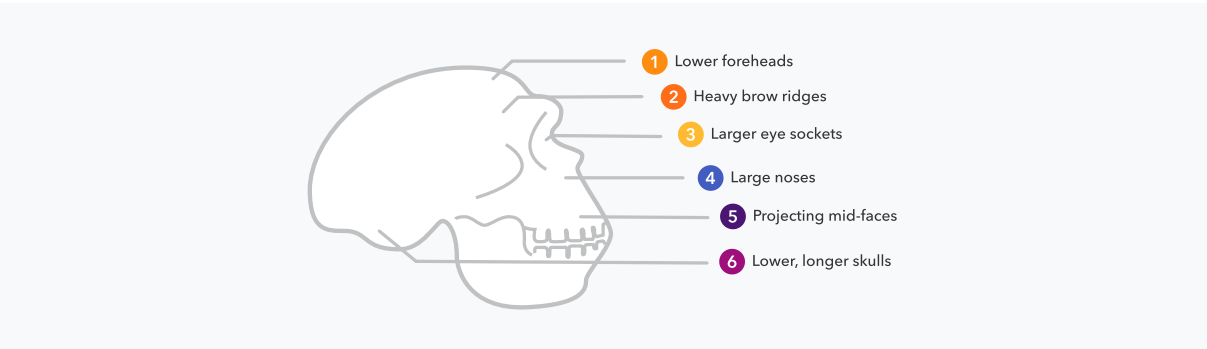
See all possible traits

Neanderthal Facts

What does Neanderthal mean?

The word “Neanderthal” is a nod to a 17th-century German theologian named Joachim Neander and the secluded valley (Thal) he loved to visit. Nearly 200 years after Neander’s death, peculiar bones were found in the valley — initially believed to belong to a human with bone deformities (it was, in fact, a Neanderthal). It wasn’t until 1886, when two nearly complete Neanderthal skeletons were found in Belgium, that the scientific community recognized the remains for what they were — a unique flavor of human.

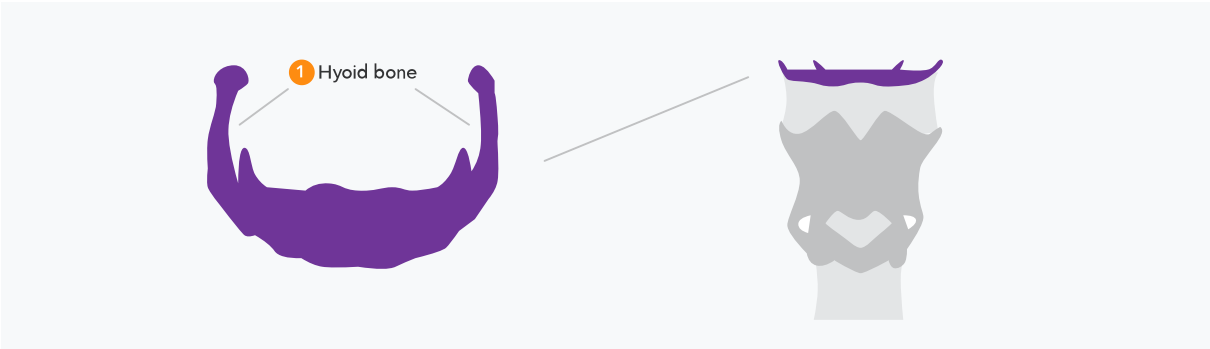
What did Neanderthals look like?



Neanderthals were similar to modern humans in many ways, but their skeletal remains reveal a handful of differences, particularly in the face and head. Where modern humans have a relatively flat face and round skull, Neanderthals had a sloping forehead, elongated skull, heavy brow ridge, projecting midface, and almost no chin. Neanderthals also had a more robust body with a “barrel-shaped” chest and thicker bones.

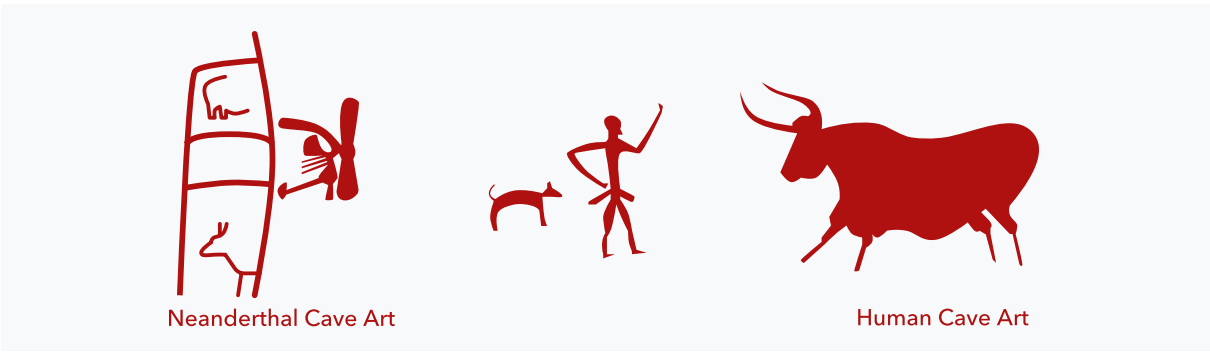
Fun fact: the tallest Neanderthal ever found was around 5’10” — a whopping five inches taller than the average Neanderthal male.

Could Neanderthals talk?



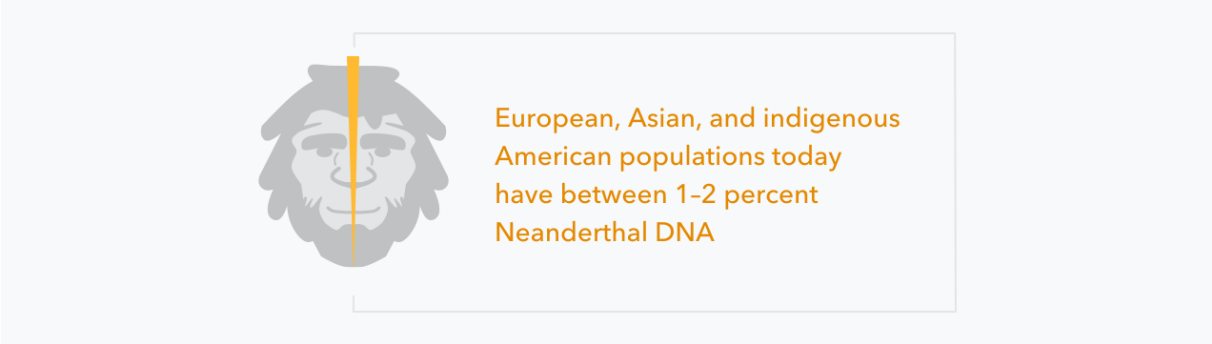
In 1983, a Neanderthal skeleton was found in Israel, and one bone in particular drew the attention of archaeologists and linguists around the world: the delicate, U-shaped hyoid. In humans, the hyoid bone allows for a wide range of sounds required for speech, and the Neanderthal hyoid bone looked human, suggesting Neanderthals were able to talk. Neanderthals also had a nearly-human version of FOXP2, a gene known to be critically important for normal speech and language. The jury's still out on whether Neanderthals could talk, but the evidence speaks volumes.

Were Neanderthals intelligent?



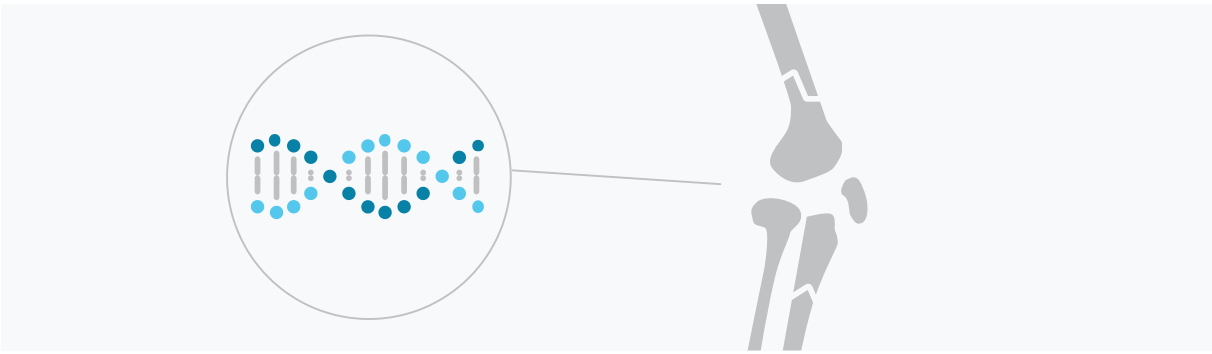
While they may have looked a little different, Neanderthals were probably a lot like us. They tended to have slightly larger brains than modern humans, and shared many of our capabilities. They made fire. They used tools and they could probably speak. There's also evidence that they created jewelry and art. For example, the earliest European art — red-pigment paintings that decorate the walls of caves throughout the continent's southwest — may have been created by Neanderthals 20,000 years before modern humans arrived in Europe.

Who has Neanderthal ancestry today?



European, Asian, and indigenous American populations today have between 1–2 percent Neanderthal DNA, but Sub-Saharan African populations have significantly less. While Neanderthal remains have been found close to Africa there is no evidence that Neanderthals ever called the continent home.

What about Denisovans?



We've known about Neanderthals for over a century. But did you know there was at least one other population of archaic humans who interbred with our ancestors? Meet the Denisovans. Bone fragments unearthed in Siberia and Tibet are the only remains ever found belonging to the Denisovans. After their genome was sequenced in 2015, scientists learned that Denisovan ancestry is found in modern humans, reaching 5 percent in some Oceanian populations. However, Denisovan ancestry remains very low in most other groups — typically far less than 0.1 percent. The studies of Denisovan DNA also revealed they were more closely related to Neanderthals than to modern humans.

Gene2me ANCESTRY

Gene2me Ancestry Genome Report

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291 Harmony-ro, Yeonsu-gu, Incheon 22014, South Korea
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