

Your Ancestral Journey

The origin of our species lies in Africa: It's where we first evolved and where we've spent the majority of our time on Earth. We have since migrated to every corner of the globe, a journey that is written in our DNA.

With the sample you sent us, we ran a comprehensive analysis to identify thousands of genetic markers—breadcrumbs—in your DNA, which are passed down from generation to generation. By looking at the order in which these markers occurred over time, we can trace the journey of your ancestors out of Africa. Furthermore, with these markers we have created a human family tree. Everyone alive today falls on a particular branch of this family tree. We have examined your markers to determine which branch you belong to. The results of our analysis—your personal journey—are outlined below.

Your Regional Ancestry

(500 Years to 10,000 Years Ago)

We are all more than the sum of our parts, but the results below offer some of the most dramatic and fascinating information in your Geno 2.0 test. In this section, we display your affiliations with a set of nine world regions. This information is determined from your entire genome so we're able to see both parents' information, going back six generations. Your percentages reflect both recent influences and ancient genetic patterns in your DNA due to migrations as groups from different regions mixed over thousands of years. Your ancestors also mixed with ancient, now extinct hominid cousins like Neanderthals in Europe and the Middle East or the Denisovans in Asia. If you have a very mixed background, the pattern can get complicated quickly! Use the reference population matches below to help understand your particular result.

What Your Results Mean

We compared your DNA results to the reference populations we currently have in our database and estimated which of these populations were most similar to you in terms of the genetic markers you carry. This doesn't necessarily mean that you belong to these groups, but that these groups were a similar genetic match, and can therefore be used as a guide to help determine why you have a certain result. Remember, this is a mixture of recent (past six generations) and ancient patterns established over thousands of years, so you may see surprising matches. Read each of the population descriptions below to better interpret your particular results.

Your First Reference Population: Greek

This reference population is based on samples collected from the native population of Greece. The 54% Mediterranean and 17% Southwest Asian percentages reflect the strong influence of agriculturalists from the Fertile Crescent in the Middle East, who arrived here more than 8,000 years ago. The 28% Northern European component likely comes from the pre-agricultural population of Europe—the earliest settlers, who arrived more than 35,000 years ago during the Upper Paleolithic period. Today, this component predominates in northern European populations, while the Mediterranean component is more common in southern Europe.

GREEK	%	YOU	%
Mediterranean	54%	Northern European	42%
Northern European	28%	Mediterranean	37%
Southwest Asian	17%	Southwest Asian	20%

Your Second Reference Population: German

This reference population is based on samples collected from people native to Germany. The dominant 46% Northern European component likely reflects the earliest settlers in Europe, hunter-gatherers who arrived there more than 35,000 years ago. The 36% Mediterranean and 17% Southwest Asian percentages probably arrived later, with the spread of agriculture from the Fertile Crescent in the Middle East over the past 10,000 years. As these early farmers moved into Europe, they spread their genetic patterns as well. Today, northern and central European populations retain links to both the earliest Europeans and these later migrants from the Middle East.

GERMAN	%	YOU	%
Northern European	46%	Northern European	42%
Mediterranean	36%	Mediterranean	37%
Southwest Asian	17%	Southwest Asian	20%

Your Deep Ancestry (1,000 Years - 100,000 Years Ago)

Introduction to Your Story

We will now take you back through the stories of your distant ancestors and show how the movements of their descendants gave rise to your lineage.

Each segment on the map above represents the migratory path of successive groups that eventually coalesced to form your branch of the tree. We start with the marker for your oldest ancestor, and walk forward to more recent times, showing at each step the line of your ancestors who lived up to that point.

What is a marker? Each of us carries DNA that is a combination of genes passed from both our mother and father, giving us traits that range from eye color and height to athleticism and disease susceptibility. As part of this process, the Y-chromosome is passed directly from father to son, unchanged, from generation to generation down a purely male line. Mitochondrial DNA, on the other hand, is passed from mothers to their children, but only their daughters pass it on to the next generation. It traces a purely maternal line.

The DNA is passed on unchanged, unless a mutation—a random, naturally occurring, usually harmless change—occurs. The mutation, known as a marker, acts as a beacon; it can be mapped through generations because it will be passed down for thousands of years.

When geneticists identify such a marker, they try to figure out when it first occurred, and in which geographic region of the world. Each marker is essentially the beginning of a new lineage on the family tree of the human race. Tracking the lineages provides a picture of how small tribes of modern humans in Africa tens of thousands of years ago diversified and spread to populate the world.

By looking at the markers you carry, we can trace your lineage, ancestor by ancestor, to reveal the path they traveled as they moved out of Africa. Our story begins with your earliest ancestor. Who were they, where did they live, and what is their story? Click "Next" to begin.

Branch: L3

Age: 67,000 Years Ago

Location of Origin: East Africa

This woman's descendants would eventually account for both out-of-Africa maternal lineages, significant population

migrations in Africa, and even take part in the Atlantic Slave Trade related dispersals from Africa.

The common direct maternal ancestor to all women alive today was born in East Africa around 180,000 years ago. Dubbed “Mitochondrial Eve” by the popular press, she represents the root of the human family tree. Eve gave rise to two descendant lineages known as L0 and L1'2'3'4'5'6, characterized by a different set of genetic mutations their members carry.

Current genetic data indicates that indigenous people belonging to these groups are found exclusively in Africa. This means that, because all humans have a common female ancestor, and because the genetic data shows that Africans are the oldest groups on the planet, we know our species originated there.

Eventually, L1'2'3'4'5'6 gave rise to L3 in East Africa. It is a similar story: an individual underwent a mutation to her mitochondrial DNA, which was passed onto her children. The children were successful, and their descendants ultimately broke away from L1'2'3'4'5'6, eventually separating into a new group called L3.

While L3 individuals are found all over Africa, L3 is important for its movements north. Your L3 ancestors were significant because they are the first modern humans to have left Africa, representing the deepest branches of the tree found outside of that continent.

From there, members of this group went in a few different directions. Many stayed on in Africa, dispersing to the west and south. Some L3 lineages are predominant in many Bantu-speaking groups who originated in west-central Africa, later dispersing throughout the continent and spreading this L3 lineage from Mali to South Africa. Today, L3 is also found in many African-Americans.

Other L3 individuals, your ancestors, kept moving northward, eventually leaving the African continent completely. These people gave rise to two important macro-haplogroups (M and N) that went on to populate the rest of the world.

Why would humans have first ventured out of the familiar African hunting grounds and into unexplored lands? It is likely that a fluctuation in climate may have provided the impetus for your ancestors' exodus out of Africa.

The African Ice Age was characterized by drought rather than by cold. Around 50,000 years ago the ice sheets of northern Europe began to melt, introducing a period of warmer temperatures and moister climate in Africa. Parts of the inhospitable Sahara briefly became habitable. As the drought-ridden desert changed to savanna, the animals your ancestors hunted expanded their range and began moving through the newly emerging green corridor of grasslands. Your nomadic ancestors followed the good weather and plentiful game northward across this Saharan Gateway, although the exact route they followed remains to be determined.

Point of Interest

The L branch is shared by all women alive today, both in Africa and around the world. The L3 branch is the major maternal branch from which all mitochondrial DNA lineages outside of Africa arose.

Branch: N

Age: About 60,000 Years Ago

Location of Origin: East Africa or Asia

Your next ancestor is the woman whose descendants formed haplogroup N. Haplogroup N comprises one of two groups that were created by the descendants of L3.

One of these two groups of individuals moved north rather than east and left the African continent across the Sinai Peninsula, in present-day Egypt. Also faced with the harsh desert conditions of the Sahara, these people likely followed the Nile basin, which would have proved a reliable water and food supply in spite of the surrounding desert and its frequent sandstorms.

Descendants of these migrants eventually formed haplogroup N. Early members of this group lived in the eastern Mediterranean region and western Asia, where they likely coexisted for a time with other hominids such as Neanderthals. Excavations in Israel's Kebara Cave (Mount Carmel) have unearthed Neanderthal skeletons as recent as 60,000 years old, indicating that there was both geographic and temporal overlap of these two hominids. This likely accounts for the presence of Neanderthal DNA in people living outside of Africa.

Some members bearing mutations specific to haplogroup N formed many groups of their own which went on to populate much of the rest of the globe. These descendants are found throughout Asia, Europe, India, and the Americas. However, because almost all of the mitochondrial lineages found in the Near East and Europe descend from N, it is considered a western Eurasian haplogroup.

After several thousand years in the Near East, members of your group began moving into unexplored nearby territories, following large herds of migrating game across vast plains. These groups broke into several directions and made their way into territories surrounding the Near East.

Today, haplogroup N individuals who headed west are prevalent in Turkey and the eastern Mediterranean, they are found further east in parts of Central Asia and the Indus Valley of Pakistan and India. And members of your haplogroup who headed north out of the Levant across the Caucasus Mountains have remained in southeastern Europe and the Balkans. Importantly, descendants of these people eventually went on to populate the rest of Europe, and today comprise the most frequent mitochondrial lineages found there.

Point of Interest

This line and its sister lineage are the only two founding lineages to expand out of Africa.

Notable People

Ann Curry of the Today Show belongs to this lineage.

Branch: R

Age: About 55,000 Years Ago

Location of Origin: West Asia

After several thousand years in the Near East, individuals belonging to a new group called haplogroup R began to move out and explore the surrounding areas. Some moved south, migrating back into northern Africa. Others went west across Anatolia (present-day Turkey) and north across the Caucasus Mountains of Georgia and southern Russia. Still others headed east into the Middle East, and on to Central Asia. All of these individuals had one thing in common: they shared a female ancestor from the N clan, a recent descendant of the migration out of Africa.

The story of haplogroup R is complicated, however, because these individuals can be found almost everywhere, and because their origin is quite ancient. In fact, the ancestor of haplogroup R lived relatively soon after humans moved out of Africa during the second wave, and her descendants undertook many of the same migrations as her own group, N.

Because the two groups lived side by side for thousands of years, it is likely that the migrations radiating out from the Near East comprised individuals from both of these groups. They simply moved together, bringing their N and R lineages to the same places around the same times. The tapestry of genetic lines became quickly entangled, and geneticists are currently working to unravel the different stories of haplogroups N and R, since they are found in many of the same far-reaching places.

Point of Interest

Descendants of this line dominate the European maternal landscape, making up 75 to 95 percent of the lineages there.

Branch: U

Age: Around 47,000 Years Ago

Location of Origin: West Asia

Descending from the R group, a woman gave rise to people who now constitute haplogroup U. Because of the great genetic diversity found in haplogroup U, it is likely that this woman lived around 47,000 years ago.

Her descendants gave rise to several different subgroups, some of which exhibit very specific geographic homelands. The very old age of these subgroups has led to a wide distribution; today they harbor specific European, northern African, and Indian components, and are found in Arabia, the northern Caucasus Mountains, and throughout the Near East.

One interesting subgroup is U6, which branched off from haplogroup R while still in the Middle East, moved southward, and today is found in parts of northern Africa. Today, U6 individuals are found in around ten percent of people living in North Africa.

Other members of the larger haplogroup U descend from a group that moved northward out of the Near East. These women crossed the rugged Caucasus Mountains in southern Russia, and moved on to the steppes of the Black Sea. These individuals represent movements from the Black Sea steppes west into regions that comprise the present-day Baltic States and western Eurasia. This grassland then served as the home base for subsequent movements north and west.

Today, this line is part of populations in Europe, West Asia (including Arabia), North Africa, India, and the North Caucasus Mountains. In Europe, this lineage averages 7 percent of the population. In Scandinavian countries (Norway, Sweden, the Netherlands, etc.) it is between 9 and 16 percent of the population. In England, it is about 12 percent of the population. Toward the Mediterranean, this line is between 10 and 12 percent of the population in Croatia and Greece.

Point of Interest

A subgroup of this lineage links the Saami people in Scandinavia to Berber populations in North Africa.

Branch: K

Age: About 27,000 Years Ago

Location of Origin: West Asia

Haplogroup K spawned from a group of individuals who descend from a woman in the U branch of the tree. Because of the great genetic diversity found in haplogroup K, it is likely that she lived around 27,000 years ago.

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While some members of your haplogroup headed north into Scandinavia, or south into North Africa, most members of your haplogroup K stem from a group of individuals who moved northward out of the Near East. These women crossed the rugged Caucasus Mountains in southern Russia, and moved on to the steppes of the Black Sea.

Around half of all Ashkenazi Jews trace their mitochondrial lineage back to one of four women, and your haplogroup K represents a lineage that gave rise to three of them. While this lineage is found at a smaller frequency in non-Ashkenazi Jews, the three K lineages that helped found the Ashkenazi population are seldom found in other populations. While virtually absent in Europeans, they appear at frequencies of three percent or higher in groups from the Levant, Arabia, and Egypt. This indicates a strong genetic role in the Ashkenazi founder event, which likely occurred in the Near East.

The term "Ashkenazi" refers to Jews of mainly central and eastern European ancestry. Most historical records indicate that the founding of Ashkenazi Jewry took place in the Rhine Basin where it subsequently underwent vast population expansions. In more recent times, the Ashkenazi population was estimated at approximately 25,000 individuals around 1300 A.D., whereas that number had increased to about 8,500,000 individuals by the turn of the twentieth century.

Point of Interest

Three of this line's descendant branches make up three of the four most common maternal lineages in Ashkenazi Jews.

Notable People

Political satirist and comedian Stephen Colbert is a member of this lineage, as is Katie Couric of the Today Show. The Neolithic-era man whose body was discovered in the Italian Alps in the 1990s, Ötzi the Iceman, also belongs to this line.

Branch: K1

Age: About 22,000 years old

Location of Origin: West Asia

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Branch: K1c2

Age: About 3,800 years old

Location of Origin: Europe

Today, this lineage is present across all of Europe at low frequencies. Members are most common in northwestern Europe, where they are between 1 and 2 percent of maternal lineages in countries such as Scotland, Denmark, and Ireland.

Note: This branch is not accompanied by a major movement on the map, and research on this branch is continuing.

Heatmap for K1

A heat map for your specific haplogroup is not yet available. We hope that as more people from around the world participate in the project we will be able to create a more specific map. We're showing you a heat map for an earlier branch in your path: **K1**.

This next step in your journey is a map showing the frequency of your haplogroup (or the closest haplogroup in your path that we have frequency information for) in indigenous populations from around the world, providing a more detailed look at where your more recent ancestors settled in their migratory journey. What do we mean by recent? It's difficult to say, as it could vary

from a few hundred years ago to a few thousand years ago depending on how much scientists currently know about your particular haplogroup. As we test more individuals and receive more information worldwide, this information will grow and change.

The colors on the map represent the percentage frequency of your haplogroup in populations from different geographic regions—red indicates high concentrations, and light yellow and grey indicate low concentrations. The geographic region with the highest frequency isn't necessarily the place where the haplogroup originated, although this is sometimes the case.

The map of K1 shows that it is primarily in the Middle East and Eastern Europe. K1 spread from its origin in the Fertile Crescent with the expansion of farming during the Neolithic Revolution.

Does this mean you're related to people in the areas highlighted on your map? Distantly, yes! We are all connected through our ancient ancestry. In order for us to learn more ancestry information about where haplogroups settled in more recent times, please choose to contribute your results to science (check the checkbox during Login or from the Account Settings tab of your Profile), and fill out your ancestry information in the Profile section of the site. Also be sure to tell your own story in the Our Story section.

Your Hominin Ancestry (50,000 Years Ago and Older)

Your Hominin Ancestry

When our ancestors first migrated out of Africa around 60,000 years ago, they were not alone. At that time, at least two other species of hominin—our cousins—walked the Eurasian landmass: Neanderthals and Denisovans. As our modern human ancestors migrated through Eurasia, they encountered these hominin cousins and interbred, resulting in a small amount of Neanderthal and Denisovan DNA being introduced into the modern human gene pool.

Most non-Africans are about 2 percent Neanderthal and slightly less than 2 percent Denisovan. Both percentages are calculated using a sophisticated analytical method that looks at parts of your DNA that you share with these hominin populations. The science around this calculation is very new. Thanks to participation from citizens like you, we continue to learn more and refine this method. For this reason, your result may change slightly over time as our accuracy and understanding improves.



3.8%



3.9%
DENISOVAN

