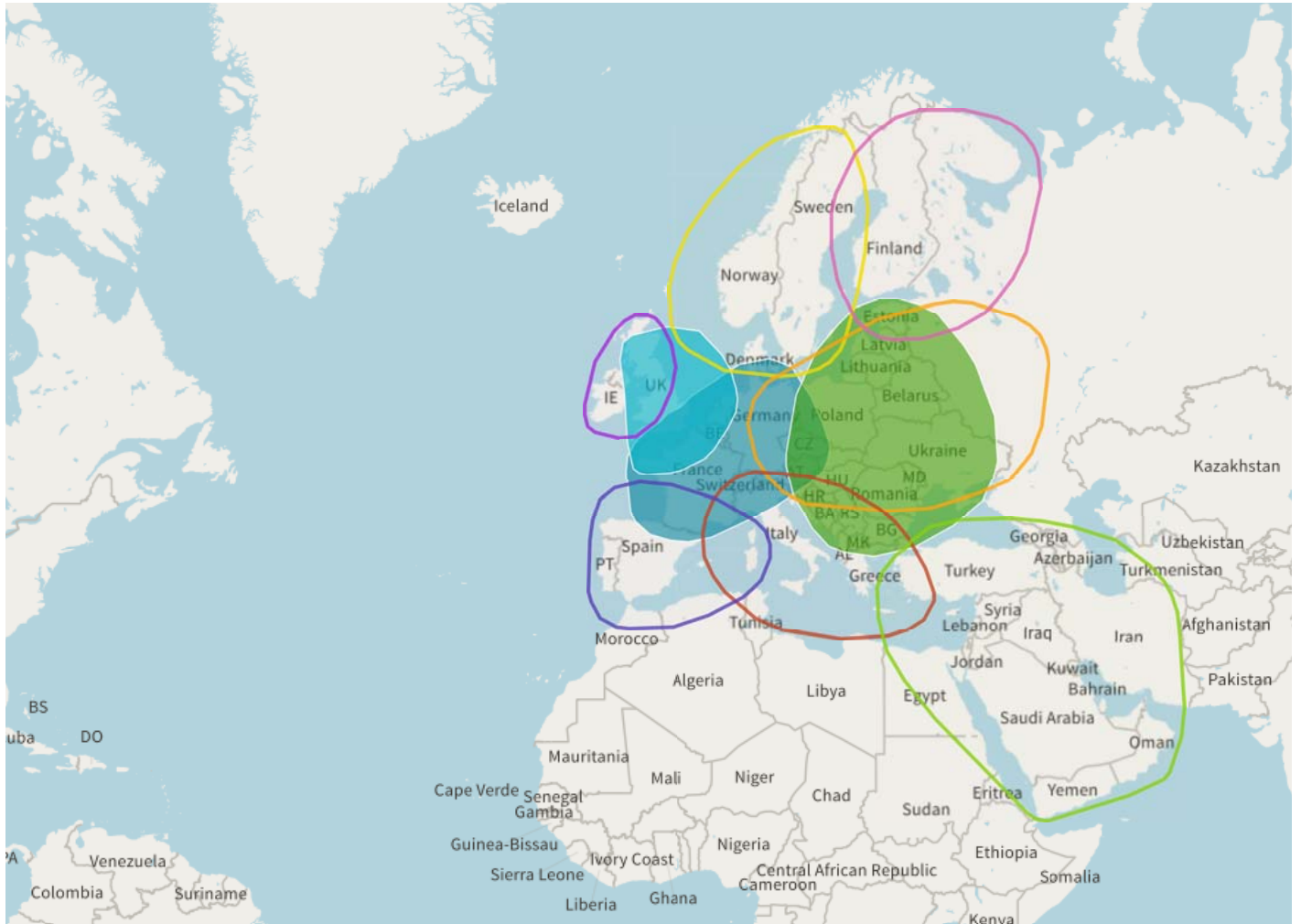




# Ethnicity estimate for William Koerber



REGION

APPROXIMATE AMOUNT

Africa	0%
Benin/Togo	0%
Ivory Coast/Ghana	0%
Africa North	0%
Africa South-Central Hunter-Gatherers	0%
Senegal	0%
Nigeria	0%
Cameroon/Congo	0%

## Africa Southeastern Bantu

Mali 0%

America 0%

Native American 0%

Asia 0%

Asia East 0%

Asia Central 0%

Asia South 0%

Europe 98%

Great Britain Range: 14%-62% 38%

Europe West Range: 13%-64% 38%

Europe East Range: 1%-20% 11%

Scandinavia Range: 0%-13% 3%

European Jewish Range: 0%-6% 2%

Italy/Greece Range: 0%-8% 2%

Finland/Northwest Russia Range: 0%-5% 2%

Ireland Range: 0%-5% < 1%

Iberian Peninsula Range: 0%-4% < 1%

Pacific Islander 0%

Polynesia 0%

Melanesia 0%

West Asia 2%

Middle East Range: 0%-5% 2%

Caucasus 0%

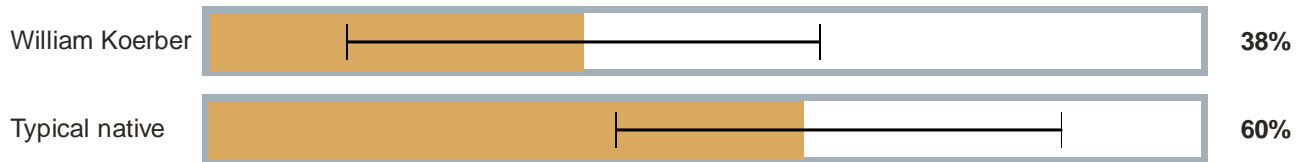
## Great Britain

Primarily located in: **England, Scotland, Wales**

Also found in: Ireland, France, Germany, Denmark, Belgium, Netherlands, Switzerland, Austria, Italy

The history of Great Britain is often told in terms of the invasions with different groups of invaders displacing the native population. The Romans, Anglo-Saxon, Vikings and Normans have all left their mark on Great Britain both politically and culturally. However, the story of Great Britain is far more complex than the traditional view of invaders displacing existing populations. In fact modern studies of British people tend to suggest the earliest populations continued to exist and adapt and absorb the new arrivals.

## How William Koerber compares to the typical person native to the Great Britain region

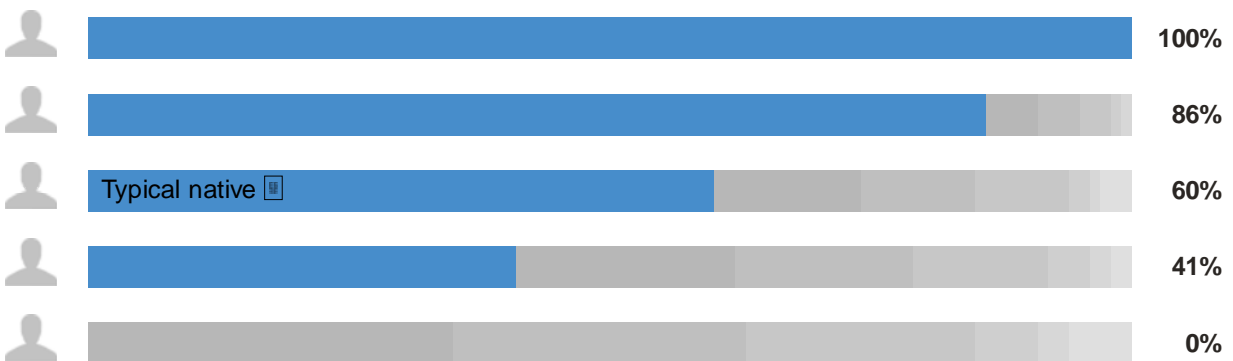


## Genetic Diversity in the Great Britain Region

The people living in the Great Britain region today are more admixed than most other regions, which means that when creating genetic ethnicity estimates for people native to this area, we often see similarities to DNA profiles from other nearby regions. We've found that approximately 60% of the typical native's DNA comes from this region.

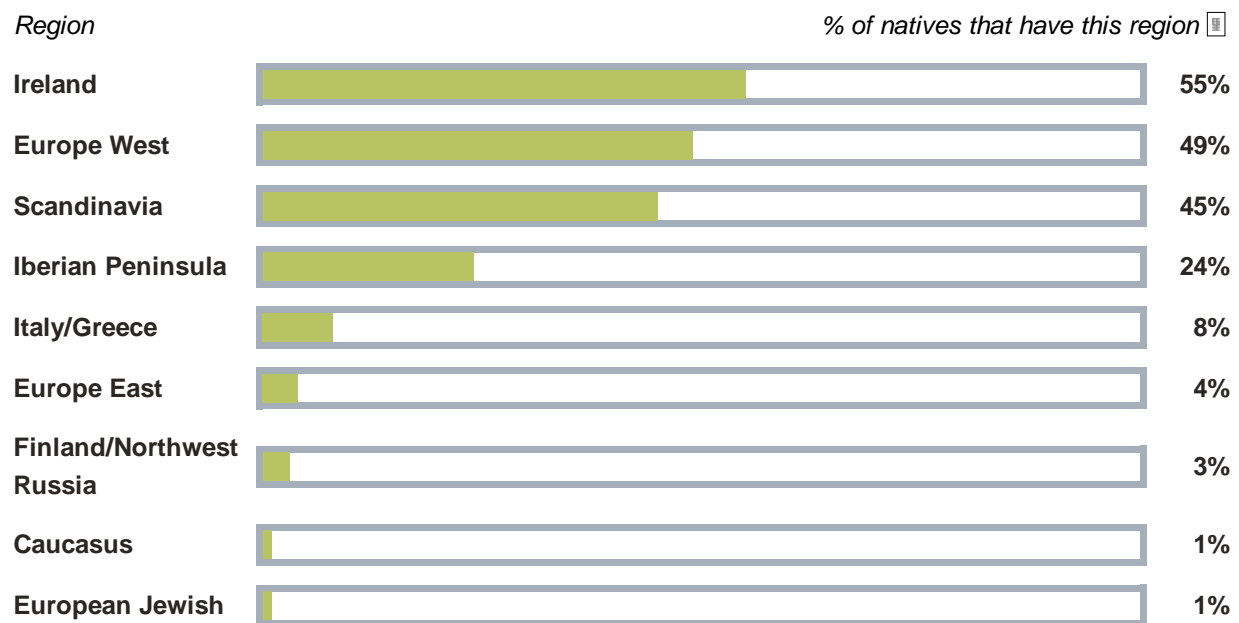
## Examples of people native to the Great Britain region

From a collection of 195 people



## Other regions commonly seen in people native to the Great Britain region

From a collection of 195 people



We have used our reference panel to build a genetic profile for Great Britain. The blue chart above shows examples of ethnicity estimates for people native to this region. For Great Britain we see an extremely wide range—most natives have between 41% and 100% of their DNA showing similarity to this region. It's also possible, however, to find people whose DNA shows very little similarity. Since approximately 60% of the typical native's DNA comes from this region, 40% is more similar to other regions, such as Ireland, Europe West, Scandinavia and the Iberian Peninsula (see chart above, in green).

## Population History

### Prehistoric Britain

At the end of the Last Glacial Maximum, 12,000 years ago, the sea levels around northern Europe were low enough for Stone Age hunter-gatherers to cross, on foot, into what are now the islands of Great Britain. Farming spread to the islands by about 4000 B.C., and the Neolithic inhabitants erected their remarkable and puzzling stone monuments, including the famed Stonehenge.

Beginning in about 2500 B.C., successive waves of tribes settled in the region. These tribes are often termed 'Celts', however that term is an 18th century invention. The Celts were not a nation in any sense, but a widespread group of tribes that shared a common cultural and linguistic background. Originating in central Europe, they spread to dominate most of western Europe, the British Isles and the Iberian Peninsula. They even settled as far away as Anatolia, in modern-day Turkey. Their dominance could not withstand the rise of the Roman Empire, however.

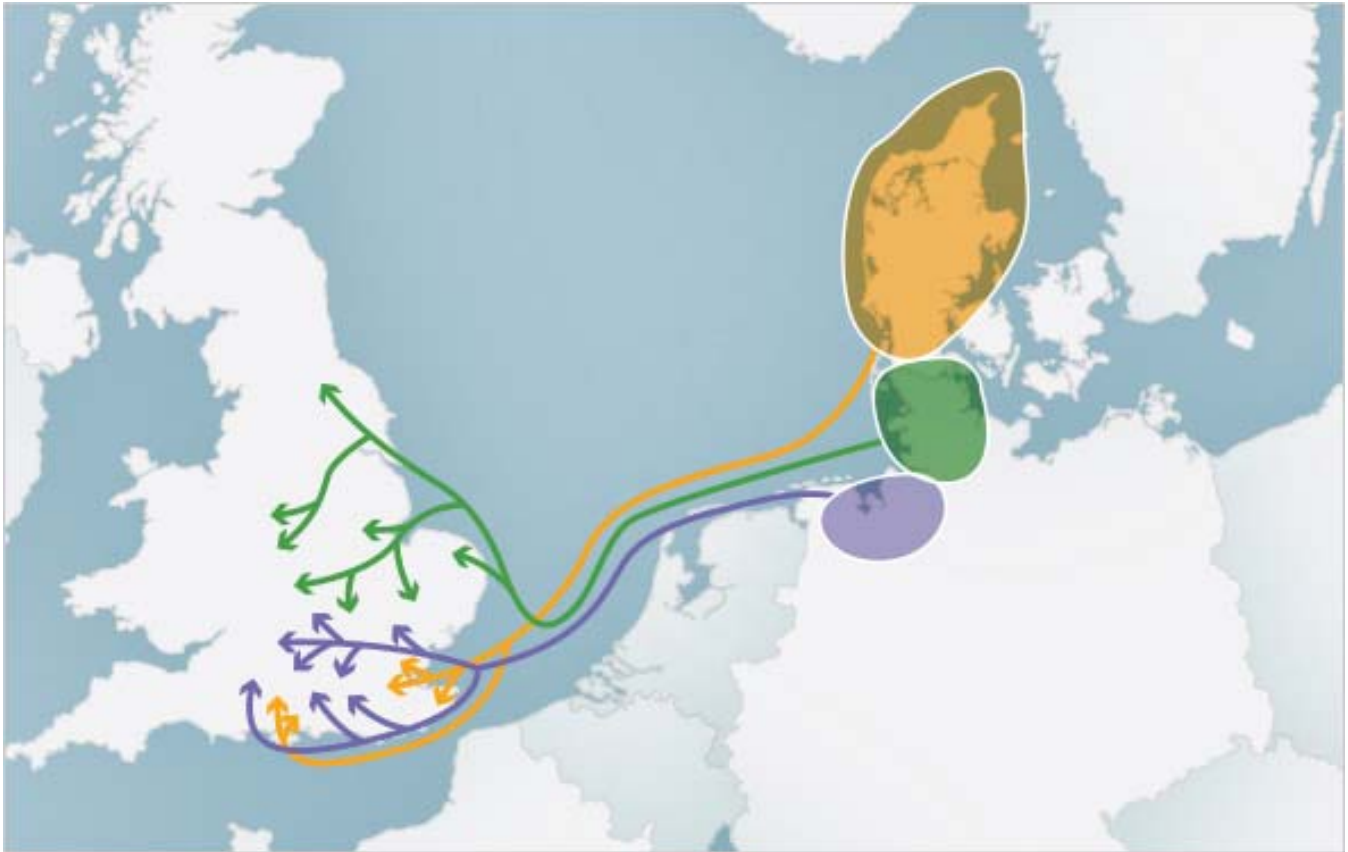
After defeating the Celts of Gaul (modern-day France, Luxembourg, Belgium and western areas of Germany and Switzerland), the Romans invaded the British Isles in 43 A.D. Most of southern Britain was conquered and occupied over the course of a few decades and became the Roman province of Britannia. Hadrian's Wall, in the north of England, marked the approximate extent of Roman control. Those tribes who were not assimilated into the Roman Empire were forced to retreat to other areas that remained Celtic, such as Wales, Ireland, Scotland, the Isle of Man and Brittany. The Roman presence largely wiped out most traces of pre-existing culture in England—even replacing the language with Latin.



*The extent of Roman "Britannia" shortly before the Roman withdrawal*

## **Germanic tribes invade**

With the decline of its Western Empire, Rome largely withdrew from Britannia in 410 A.D. As the Romans left, tribes from northern Germany and Denmark seized the opportunity to step in. The Germanic Angles and Saxons soon controlled much of the territory that had been under Roman rule, while the Jutes from Denmark occupied some smaller areas in the south. The new settlers imposed their language and customs on the local inhabitants in much the same way that the Romans had. The Germanic language spoken by the Angles would eventually develop into English.



*Invasion of Germanic tribes after 410 A.D.*

■ Jutes

■ Angles

■ Saxons

The region was divided into several kingdoms, with the more powerful kings sometimes exerting influence or control over smaller bordering kingdoms. There was nothing like a single, unified English kingdom, however, until the early 10th century and the rise of the House of Wessex.

## **Viking invasions and the Danelaw**

During the 8th century, seafaring Scandinavian adventurers began raiding coastal areas in Europe. Known as the Vikings, they were not just warriors and pillagers. They also established numerous trade ports and settlements throughout the Western world, including the British Isles, Russia, Iceland and the Iberian Peninsula. A group of Vikings that settled in northern France became known as the Normans and, by the early 11th century, ruled a great and powerful region, sanctioned by the French crown.





*Viking longships*

Danish Vikings began to invade northern and eastern England in 876 and eventually came to control a third of the country, defeating several smaller Anglo-Saxon kingdoms. The rulers of the Danelaw, as the Viking area became known, struggled for nearly 80 years with the remaining English kings over the region. The balance of power swung back and forth a number of times, with an English king, Edward the Elder, gaining the upper hand in the early 900s and a Danish king, Cnut the Great, ruling England, Norway and Denmark from 1016 to 1035. After the deaths of Cnut's sons, the throne returned to Anglo-Saxon control, but it was short-lived, as Edward the Confessor died without an heir. The Normans of France, led by William the Conqueror, sailed across the English Channel and claimed the throne of England, defeating the only other rival, Harold Godwinson, at the Battle of Hastings in 1066. In 1067, William extended his control to Scotland and Wales.



*The Danelaw in 878 A.D.*





*The Battle of Hastings*

## **The Houses of Plantagenet & Tudor**

The Norman kings, ruling primarily from France, gave rise to the House of Plantagenet, a line of kings that began to consolidate and modernize the kingdom of England. Beginning in 1277, Edward I put down a revolt in Wales and led a full-scale invasion, bringing Wales under control of the English crown. He then seized political control of Scotland during a succession dispute, leading to a rebellion there. Edward's campaign against the Scots wasn't entirely successful and remained unresolved at his death. By decisively defeating Edward's son at Bannockburn in 1314, the Scots assured their independence. The House of Plantagenet continued to reign until the 15th century. Towards the latter half of the 15th century the houses of York and the Lancaster, the most powerful Plantagenet branches fought a series of wars for control of the throne. Those wars ended with the Battle of Bosworth Field on the 22nd August 1486. At Bosworth Field Henry Tudor defeated Richard III. Henry took the throne as Henry VII and ushered in the reign of House Tudor. The reign of the Tudors lasted from Henry VII through to Elizabeth I in 1603.

## **The British Empire**



After the defeat of the Spanish Armada in 1588, England established itself as a major naval power. As European nations began founding colonies around the world, England was well positioned to compete for control of the largely untapped resources of the New World. Religious and political upheavals in England in the 17th and 18th centuries played critical roles in establishing and defining early American history, as dissidents left England seeking religious freedom. Subsequent emigrations from England to the Americas ensured a primarily English-derived culture and social structure.



*English ships and the Spanish Armada, 1588*

During the 1760's and 1770's the relationship between the colonies in the Americas and Britain grew fractious due to the British Parliament's attempts to tax colonists without representation in Parliament. This led to the American War of Independence with and the Thirteen Colonies gaining independence and forming a new nation, the United States of America.

The loss of the Thirteen Colonies is seen as the transition point in the British Empire from the First British Empire to the Second British Empire. In the Americas, Britain shifted its attention north to Canada where many of the defeated loyalists from the revolution had migrated to. And to make up for lost wealth in America, Britain now paid greater attention to Asia, the Pacific and later Africa. In the 1770's, James Cook travelled along Eastern Australia and New Zealand claiming them for Great Britain. Shortly after Britain set up penal colonies in Australia transporting large number of convicts to Australia. Over 80 years over 165,000 convicts were sent to Australia. In Asia, through the East India Company the British Empire gained more control throughout the continent. Throughout the early 19th Century the East India Company gained control over Java, Singapore, Hong Kong and India. The Government of India Act in 1858 established the British Raj, with Queen Victoria as Empress of India. India became one of the British Empire's most important colonies. By the end of the 19th Century it was said that the sun never set on the British Empire, since it stretched around the world.

## **Did You Know?**

At lunchtime on the 28th February 1953 an American and British scientist, James Watson and Francis Crick, walked into the Eagle pub in Cambridge and announced that they had "discovered the secret of life". What Watson and Crick had discovered was the famous double helix structure of DNA. Crucial to their discovery was the work of another British scientist, Rosalind Franklin, whose X-Ray photographs of DNA gave vital clues to its structure.

## **Ireland**

*Primarily located in:* **Ireland, Wales, Scotland**

Also found in: **France, England**

Ireland is located in the eastern part of the North Atlantic Ocean, directly west of Great Britain. A variety of internal and external influences have shaped Ireland as we know it today. Ireland's modern cultural remains deeply rooted in the Celtic culture that spread across much of Central Europe and into the British Isles. Along with Wales, Scotland, and a handful of other isolated communities within the British Isles, Ireland remains one of the last holdouts of the ancient Celtic languages that were once spoken throughout much of Western Europe. And though closely tied to Great Britain, both geographically and historically, the Irish have fiercely maintained their unique character through the centuries.

### How William Koerber compares to the typical person native to the Ireland region



### Genetic Diversity in the Ireland Region

People living in the Ireland region today have a slightly admixed genetic structure, which means that when creating genetic ethnicity estimates for people native to this area, we see some similarities to DNA profiles from other nearby regions. We've found that approximately 95% of a typical Irish native's DNA comes from the region of Ireland.

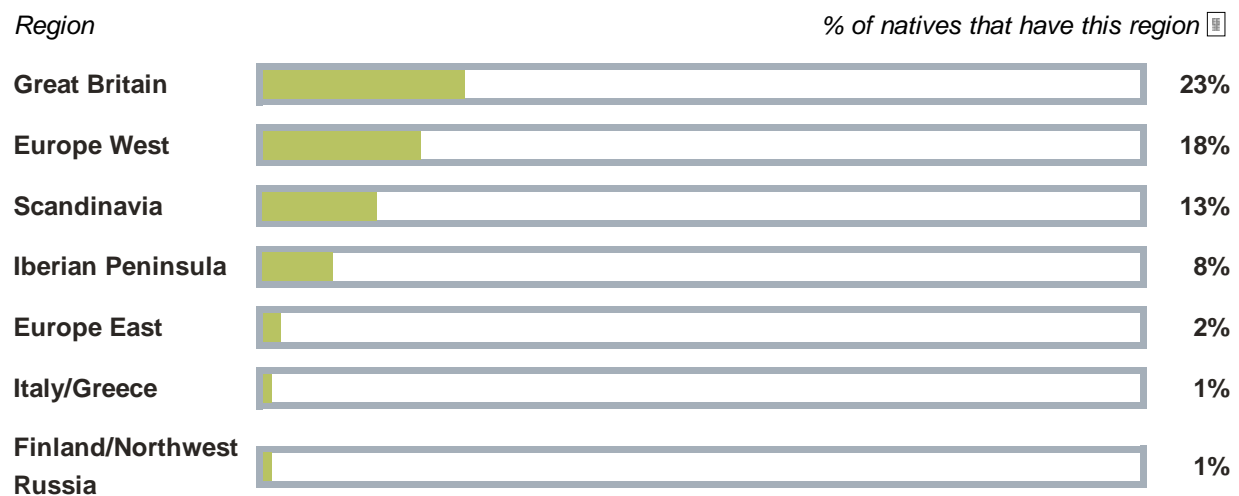
### Examples of people native to the Ireland region

From a collection of 154 people



### Other regions commonly seen in people native to the Ireland region

From a collection of 154 people



We've used our reference panel to build a genetic profile for Ireland. The blue chart above shows examples of ethnicity estimates for people native to the Ireland region. Most Irish natives have between 76% and 100% of their DNA showing similarity to this profile. It's also possible, however, to find people whose DNA shows very little similarity. Since approximately 95% of the typical native's DNA comes from this region, only 5% is more similar to that of other regions such as Great Britain, Europe West, or Scandinavia (see green chart above).

## Population History

### Prehistoric Ireland & Scotland

After the Ice Age glaciers retreated from Northern Europe more than 9,000 years ago, hunter-gatherers spread north into what is now Great Britain and Ireland, during the Middle Stone Age. Some 3,000 years later, during the New Stone Age, the first farming communities appeared in Ireland. The Bronze Age began 4,500 years ago and brought with it new skills linked to metalworking and pottery. During the late Bronze Age, Iron was discovered in mainland Europe and a new cultural phenomenon began to evolve.

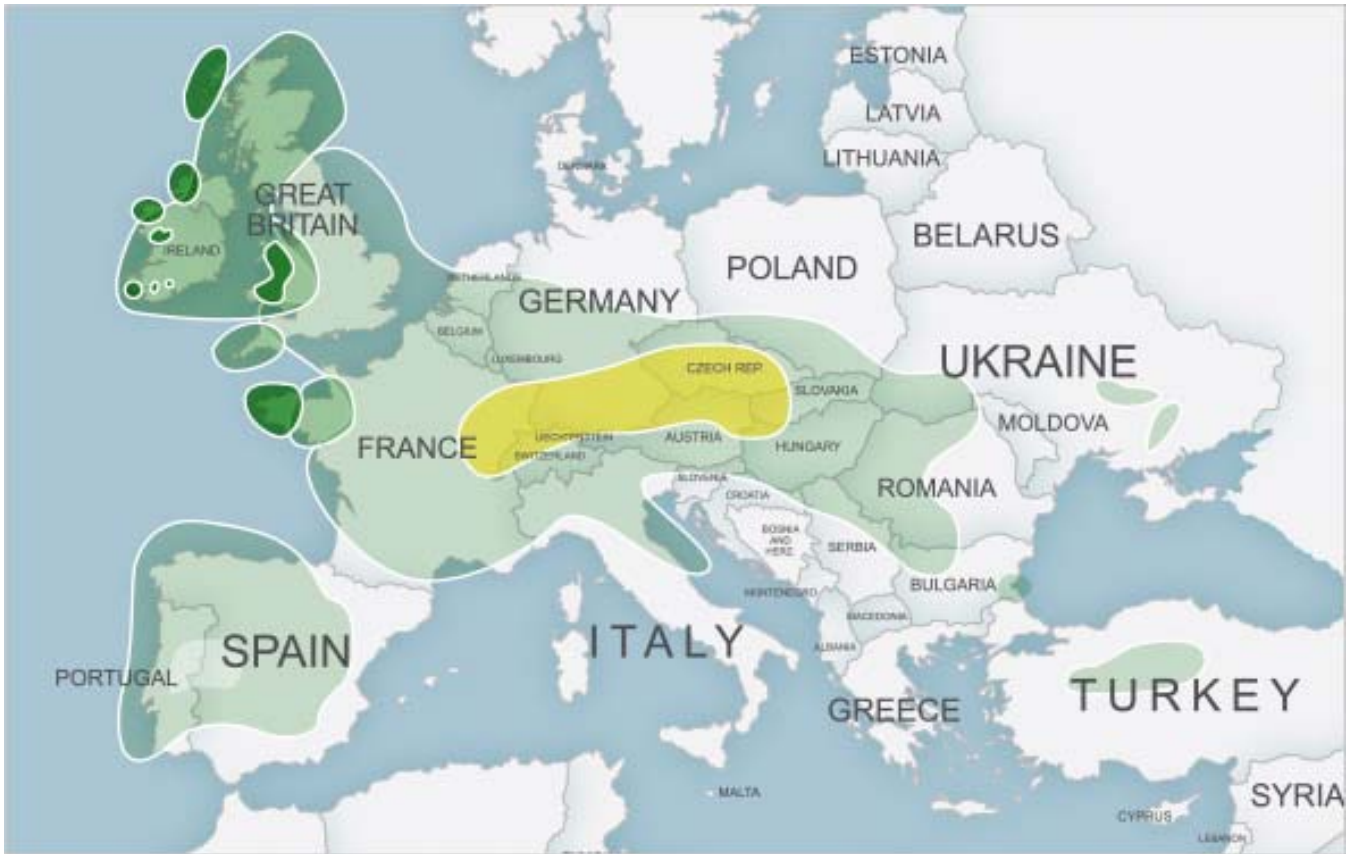
Around 500 B.C., the Bronze Age gave way to an early Iron Age culture that spread across all of Western Europe, including the British Isles. These new people originated in central Europe, near what is Austria today. They were divided into many different tribes, but were collectively known as the Celts.

### The Celts

From around 400 B.C. to 275 B.C., various tribes expanded to the Iberian Peninsula, France, England, Scotland and Ireland—even as far east as Turkey. Today we refer to these tribes as 'Celtic' though that is a modern term which only came into use in the 18th century. As the Roman Empire expanded beyond the Italian peninsula, it began to come into increasing contact with the Celts of France, whom the Romans called "Gauls."



*A Tribe of Gauls on an Expedition by Alphonse De Neuville*



*This map shows the expansion of Celtic tribes by 275 A.D. (in light green) from their presumed origin, the Bronze Age Hallstatt culture (in yellow). Dark green areas show regions where Celtic languages are still spoken today.*



*Retreat of Celtic influence into Ireland & Brittany*



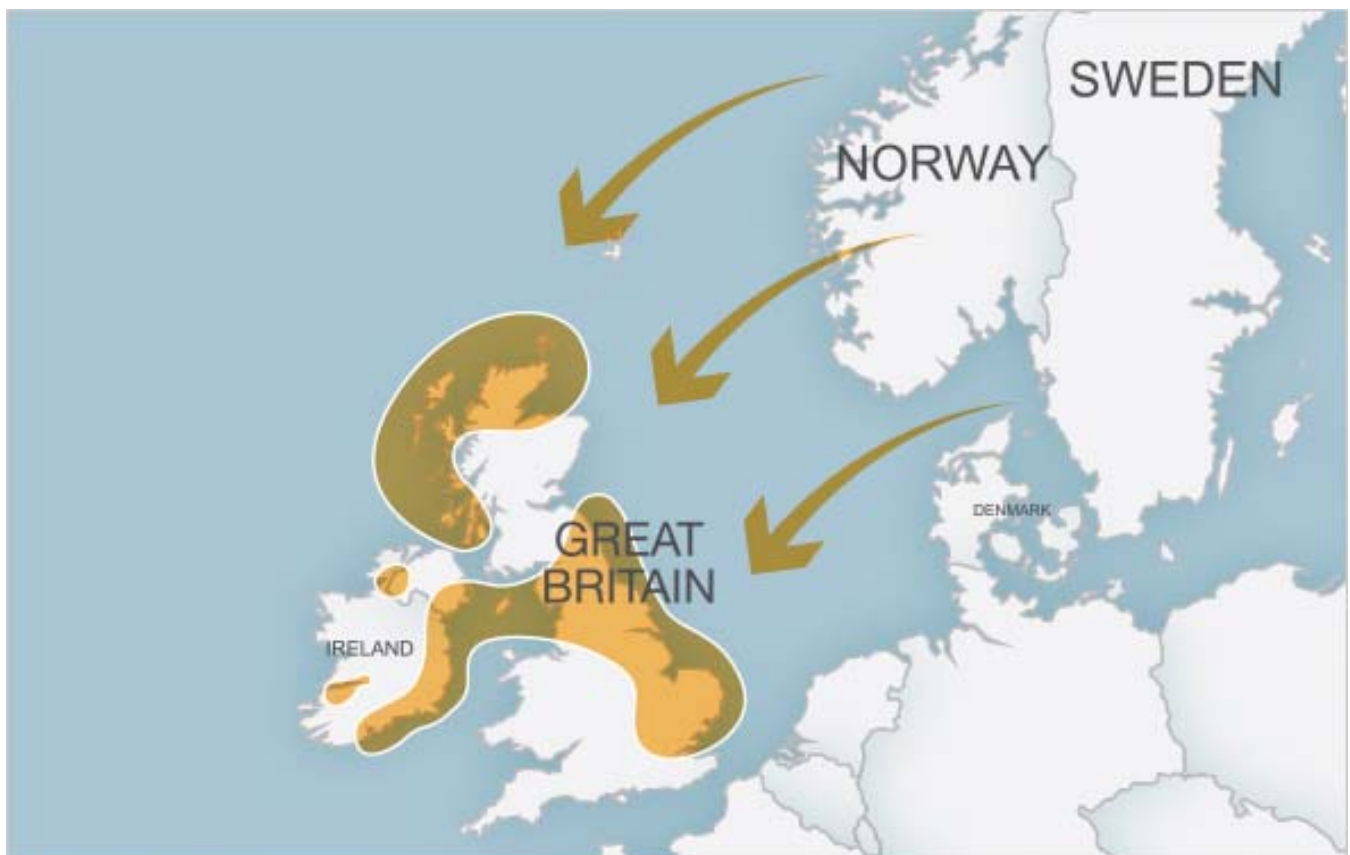
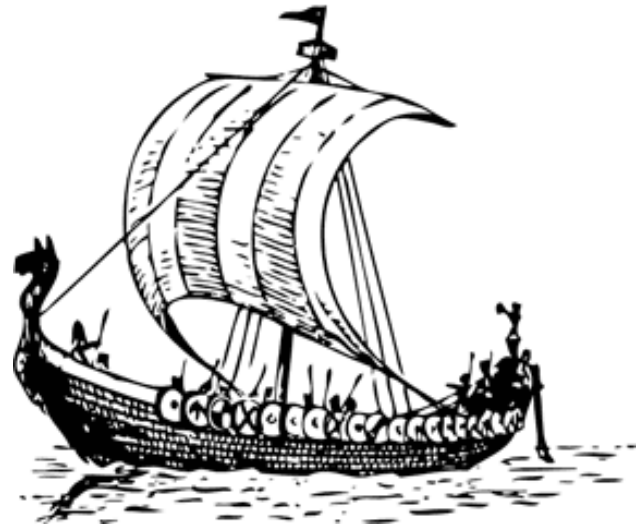
## The Romans

The Romans eventually conquered the Gauls and began an invasion of the British Isles in 43 A.D. Most of southern Britain was conquered and occupied over the course of a few decades. As the Roman Empire advanced, the Celtic tribes were forced to retreat to other areas that remained under Celtic control, chiefly Wales, Ireland, Scotland, the Isle of Man, and Brittany. The Roman presence largely wiped out most traces of Celtic culture in England—even replacing the language. Since the Romans never occupied Ireland or Scotland in any real sense, they are among the few places where Celtic languages have survived to this day.

## The Vikings

Beginning in the late 8th century, Viking raiders began attacking the east coast of England and the northern islands off Scotland. The first recorded Viking raid in Ireland was in 795 A.D. on the island of Lambay, off the coast of Dublin. During the next few centuries, they controlled parts of the islands, exacting tribute, and pillaging villages and monasteries.

During the 9th century, the Vikings established trading ports in Dublin, Cork, Waterford, Wexford, and Limerick. As they settled in Ireland, Vikings intermarried and assimilated with the native population. Today, many Irish surnames such as Loughlin, Doyle, and Cotter are of Viking origin.

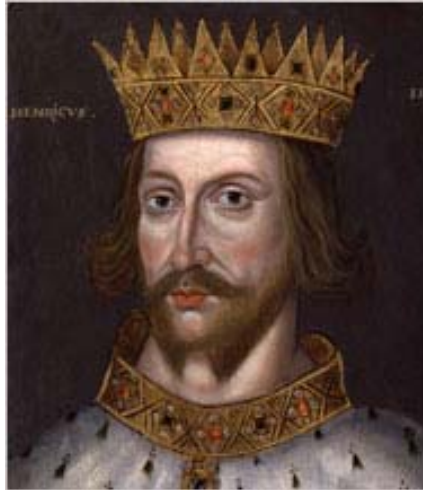


## The Normans

During the 12th century, Ireland consisted of a number of small warring kingdoms, and England was ruled by Norman kings (the Normans originated in Northern France where they gave their name to the region of Normandy). When Diarmait Mac Murchada, the King of Leinster, was deposed by the Irish High King, he turned to Henry II of England for help. Henry sent Norman mercenaries to assist, and Mac Murchada regained control of Leinster, though he died shortly thereafter. Then in 1171, Henry II seized control of Ireland, and with the support of Pope Adrian IV, he took the title “Lord of Ireland,” and the Norman lords established a presence in Ireland.



*Drawing of Diarmait Mac Murchada, from W.R. Wilde's A Descriptive Catalogue of the Antiquities in the Museum of the Royal Irish Academy, Vol. 1 (Dublin & London, 1863), page 310.*



*King Henry II by unknown artist. Nation Portrait Gallery, London.*



*Pope Adrian IV*

The Norman invasion brought many changes to Ireland like walled towns and the building of castles and churches. Like the Vikings before them, the Normans assimilated with the native Irish population. The Norman influence in Ireland lives on in surnames such as Butler, French, Roche, and Burke. Irish surnames beginning with “Fitz” are also Norman. Fitz is the equivalent of the Gaelic “Mac” meaning “son of.” For example, the name Fitzpatrick indicates a descendant of a Patrick.

## English Rule

As Norman influence declined in Ireland, the English monarchs took a more direct role in the governance of Ireland. In 1542 after a failed Irish rebellion, Henry VIII created the Kingdom of Ireland, bringing the area under direct English rule.

Around this time Henry made another decision that had far reaching consequences for Ireland. In 1527 after the Pope refused to annul Henry's marriage to Catherine of Aragon. Henry broke away from the Roman Catholic Church and created the Church of England, with the English monarch as its head. This English Reformation resulted in a rise in Protestantism across England, Scotland, and Wales. Ireland was resistant to Protestantism, and when England attempted to force it upon them—and failed—the Crown replaced Irish landowners with thousands of Protestant colonists from England and Scotland. These colonies became known as the Plantations of Ireland, whose long term effect was to replace the Catholic ruling classes with Protestants. Then in the 1600's Penal Laws were introduced which denied Catholics many land owning and political rights. The repression of Catholics in Ireland

continued up until the 1830s when Daniel O’Connell led the campaign for Catholic Emancipation.

## English Plantations in Ireland

- Established under Mary I (1556)
- Established under Elizabeth I (1586)
- Established under James I (1609)
- Established under James I (1619-20)
- Privately planned



## Irish Emigration

In June 1963, when he visited Ireland, President John F. Kennedy gave a speech in Cork in which he said ‘Most countries send out oil or iron, steel or gold, or some other crop, but Ireland has had only one export and that is its people’.

Ireland has a history of emigration that goes back centuries. Plantations and Penal Laws created harsh conditions for Catholics and Dissenters (Protestants who were separate from the Church of England). For many emigration was the only option for survival. In the 1600s Irish migrated to the Caribbean and Virginia Colony. In the 1700s many Irish Quakers and Presbyterians departed for North America. Although the “Great Famine” of the 1840s is often mentioned as the time of mass migration out of Ireland, the decades after the famine saw even greater numbers of people leaving its shores.

The 20th century saw several waves of Irish emigration. During the 1940s, 1950s, and 1980s a great many Irish left Ireland for a new life abroad. The main destinations for Irish emigrants have been Great Britain, America, and Australia. Today it’s estimated that up to 100 million people around the world can claim Irish heritage.



A famine ship carrying emigrants to America



The Great Irish Famine (Irish 'an Gorta Mór'): Interior of a Peasant's Hut by H. Werdmuller

## Did You Know?

James Watson—a co-discoverer of the structure of DNA—has Irish roots. His maternal great-grandparents came from County Tipperary in the southern part of Ireland. And Watson was inspired to study genetics after reading Erwin Schrödinger's "What is Life?" which was written in Dublin in 1944.

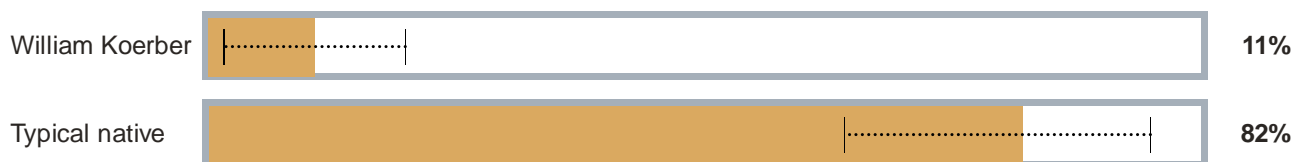
## Europe East

*Primarily located in:* **Poland, Slovakia, Czech Republic, Austria, Russia, Hungary, Slovenia, Romania, Serbia, Ukraine, Belarus, Moldova, Lithuania, Latvia, Bosnia and Herzegovina, Croatia**

*Also found in:* **Germany, Montenegro, Albania, Kosovo, Macedonia, Estonia, Bulgaria**

The Europe East region stretches from the Baltic Sea in the north to the borders of Greece in the south. Throughout history, the region has stood at the crossroads—and often in the crosshairs—of Europe and Central Asia. Despite constant invasions and occupations over the centuries, the hardy inhabitants have, nevertheless, managed to persevere.

## How William Koerber compares to the typical person native to the Europe East region



## Genetic Diversity in the Europe East Region



Individuals from Europe East are admixed, which means that when creating genetic ethnicity estimates for people native to this area, we frequently see similarities to DNA profiles from other nearby regions. We've found that approximately 82% of the typical native's DNA comes from this region.

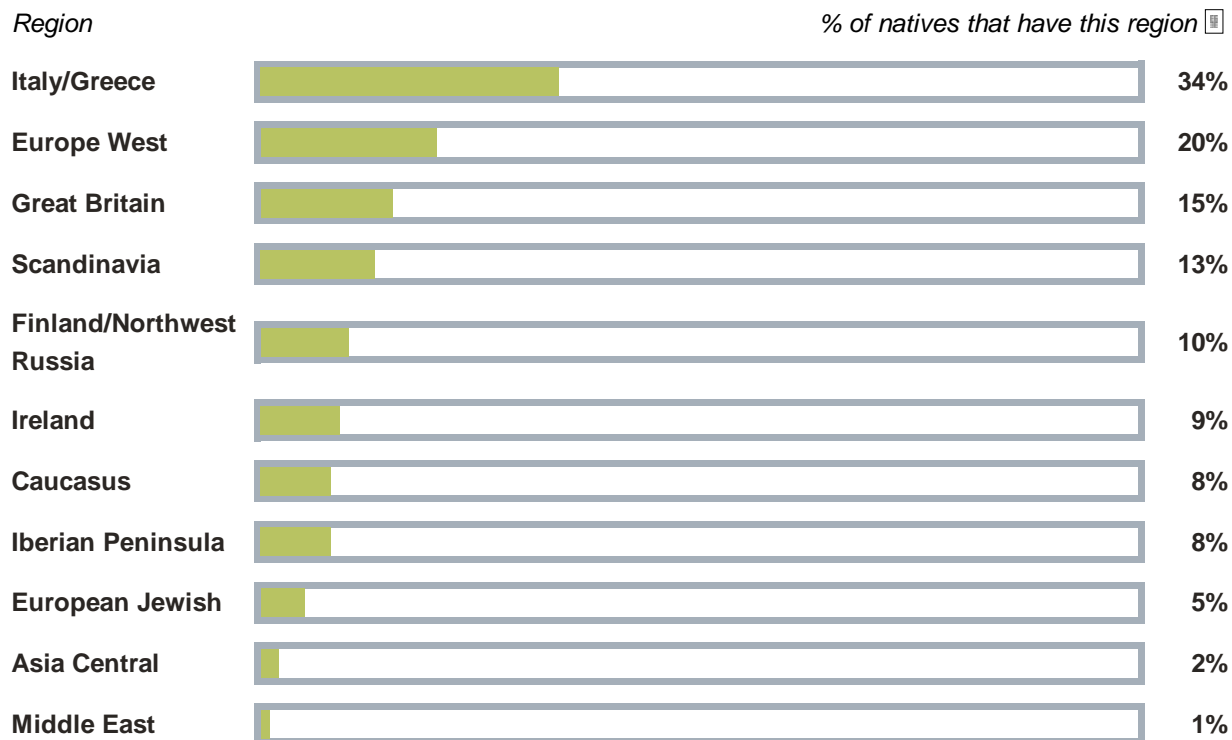
## Examples of people native to the Europe East region

From a collection of 646 people 



## Other regions commonly seen in people native to the Europe East region

From a collection of 646 people



We have used our reference panel to build a genetic profile for Europe East. The blue chart above shows examples of ethnicity estimates for people native to this region. Most natives of Europe East have between 64% and 100% of their DNA showing similarity to this profile. It's also possible, however, to find people whose DNA shows very little

similarity. Since approximately 82% of the typical native's DNA comes from this region, only 18% is more similar to that of other regions, such as Italy/Greece, Europe West, Great Britain and Scandinavia.

## **Population History**

### **Early population origins**

Prior to the Roman Empire's conquests and expansion between 35 B.C. and 400 A.D., the Eastern European region was largely populated by Slavic and Baltic tribes in the north, and Celtic, Thracian and Illyrian tribes in the south. The Roman Empire conquered the Thracians in 46 A.D., but the Balts in the north managed to avoid falling under Rome's sphere of dominance.

The fate of the Illyrians is unclear, but some linguistic scholars believe the Albanian language may be a form of Illyrian or Thracian. Whether that means the Albanians are descended from the ancient Illyrians is a matter of debate. The fact remains that their origins cannot be conclusively determined and their language cannot be definitively classified, except to say that it is Indo-European and predates the Slavic migrations of the medieval period.

### **Post Roman Empire**

Roman control of the East European region was relatively weak, partly because the population was largely rural. After the collapse of the Western Roman Empire, the southern area of the region, namely Bulgaria and Romania, remained part of the Byzantine Empire, while most of the remainder was overrun by invasions of Huns, Alans and other nomadic tribes from the Pontic steppe. Slavic tribes, possibly displaced by the invasions, spread south toward the Balkans.

The Avars and Bulgars, most likely Turkic tribes from Central Asia, arrived in the 7th century. These tribes established kingdoms called Khaganates in the south Balkans, pushing the Byzantine border south, almost to the Aegean Sea. Although subjugated by outsiders, the native Slavic tribes' culture persisted. The invaders were assimilated and "Slavicized," creating new Slavic national identities.



*Map showing the Avar Kingdom, alongside the Slavic and Bulgarian tribes in 650 A.D.*

In the area that now includes Belarus, Ukraine and western Russia, a confederation of Slavic tribes known as the Rus' established a kingdom with its capital in Kiev. Legend has it—though some scholars disagree—that the Rus' were ruled by a small group of Scandinavian warriors called the Varangians. Scandinavian or not, the Rus' were entirely Slavicized by the 10th century. Russia and Belarus are named after this kingdom, and both claim them as cultural ancestors.



*The Invitation of the Varangians by Viktor Vasnetsov: Rurik and his brothers Sineus and Truvor arrive in Staraya Ladoga.*

The Magyar, a Uralic tribe from the northern part of the Asian steppe, settled in the Carpathian Basin around 900 A.D. and established the Kingdom of Hungary. However, unlike the Avars and Bulgars, the Hungarians resisted Slavic influence and maintained their language, which is closely related to Finnish and Estonian.



*Prince Árpád crossing the Carpathians. A detail from The Arrival of the Hungarians by Árpád Feszty's, now displayed at the Ópusztaszer National Memorial Site in Hungary.*

## **Mongol attacks**

Led by two grandsons of Ghengis Khan, the Mongol



raids and invasions of Eastern Europe were violent and fearsome. Medieval European warfare tactics were ill-suited to fight the mounted archers of the invading horde. The kingdoms of Rus' fell to the Mongols, who swept quickly across the steppe and into the Carpathian Mountains. Hungary was the main target of the Mongol campaign in Eastern Europe and was poorly prepared to defend itself after centuries of relative peace. Nearly half of the population was killed. In the terror and panic, refugees fled the Mongol armies in numbers never before seen. The Mongol Empire expanded to include Ukraine, Russia, Poland, Hungary and Bulgaria.



*Mongol Cavalrymen Engage the Enemy, illustration from early 14th-century manuscript. Bibiotheque nationale de France, Paris.*



*Mongol invasion, about 1240 A.D.*

## Baltic crusades

Although the Baltic region wasn't attacked by the Mongols, it was invaded by Germanic crusaders, who introduced Christianity to the local tribes.



*Germanic Crusaders invade and convert the Slavs of the Baltic region*

## The rise of the Ottoman Empire

In the late 1300s, Ottoman Turks vanquished the remains of the Byzantine Empire. They expanded into Eastern Europe, eventually conquering Bulgaria and the Serbian Empire of the south Balkans. The Turks met fierce resistance in Wallachia and Hungary, however. Vlad III (“the Impaler”), the Wallachian prince of “Dracula” fame, was one of the Ottomans' greatest foes at the time and played an important part in preserving the culture of Romania. The Magyars of Hungary, meanwhile, were better prepared to resist the Ottomans, having built heavy fortifications against a feared second Mongol invasion.



*The Ambras Castle portrait of Vlad III, c. 1560, reputedly a copy of an original made during his lifetime*

## **The sixteenth century**

By around 1500 or so, the Europe East region had evolved into three stable, primary groups. In the south, the Balkan region would remain under Ottoman rule for the next 300 years. Hungary aligned with Austria, creating the formidable Austro-Hungarian Empire, which endured until World War I. The Austro-Hungarian Empire became the largest state in Europe (excluding the Russian Empire). In the Baltic region, Lithuania and Poland joined together, forming a commonwealth government.



## Europe East today

Today the Europe East DNA profile is detected most commonly in Poland, Hungary, Romania, Bulgaria, Lithuania and Latvia, but is also detected in smaller portions in many neighboring regions. The regional languages are predominantly Slavic, with the exceptions of Estonian and Hungarian (both Uralic languages), Romanian (a holdover from the days of the Western Roman Empire) and Albanian.

## Did You Know?

In the decades following World War II, the majority of the Eastern European region was known as the Eastern Bloc, which was politically aligned with the former Soviet Union (USSR). Belarus, Ukraine and the Baltic states were absorbed into the USSR, while Poland, Czechoslovakia, Bulgaria, Romania, Hungary and East Germany were members of the Warsaw Pact, a military defense alliance among eight communist states.

## Iberian Peninsula

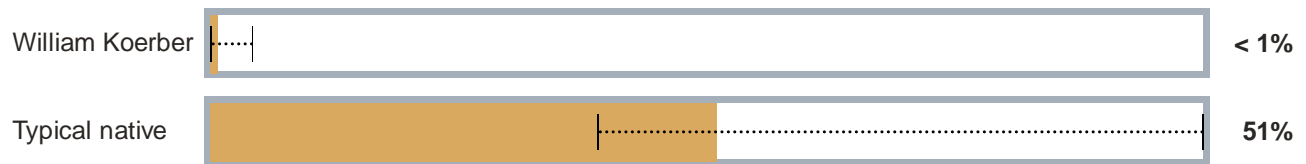
*Primarily located in:* **Spain, Portugal**

*Also found in:* **France, Morocco, Algeria, Italy**

Separated from the rest of continental Europe by the Pyrenees Mountains, the Iberian Peninsula lies between the Mediterranean Sea and the Atlantic Ocean. Gibraltar, at the peninsula's southern tip, is just a little over nine miles from the north coast of Africa. This proximity would play a major part in the history and identity of Spain and Portugal.



## How William Koerber compares to the typical person native to the Iberian Peninsula region

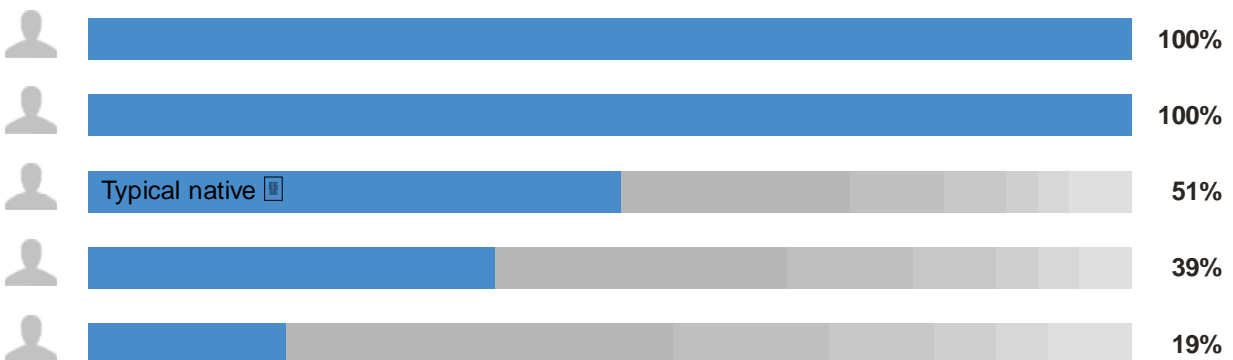


## Genetic Diversity in the Iberian Peninsula Region

The people living in the Iberian Peninsula region are fairly admixed, which means that when creating genetic ethnicity estimates for people native to this area, we see similarities to DNA profiles from other nearby regions. We've found that approximately 51% of the typical native's DNA comes from this region.

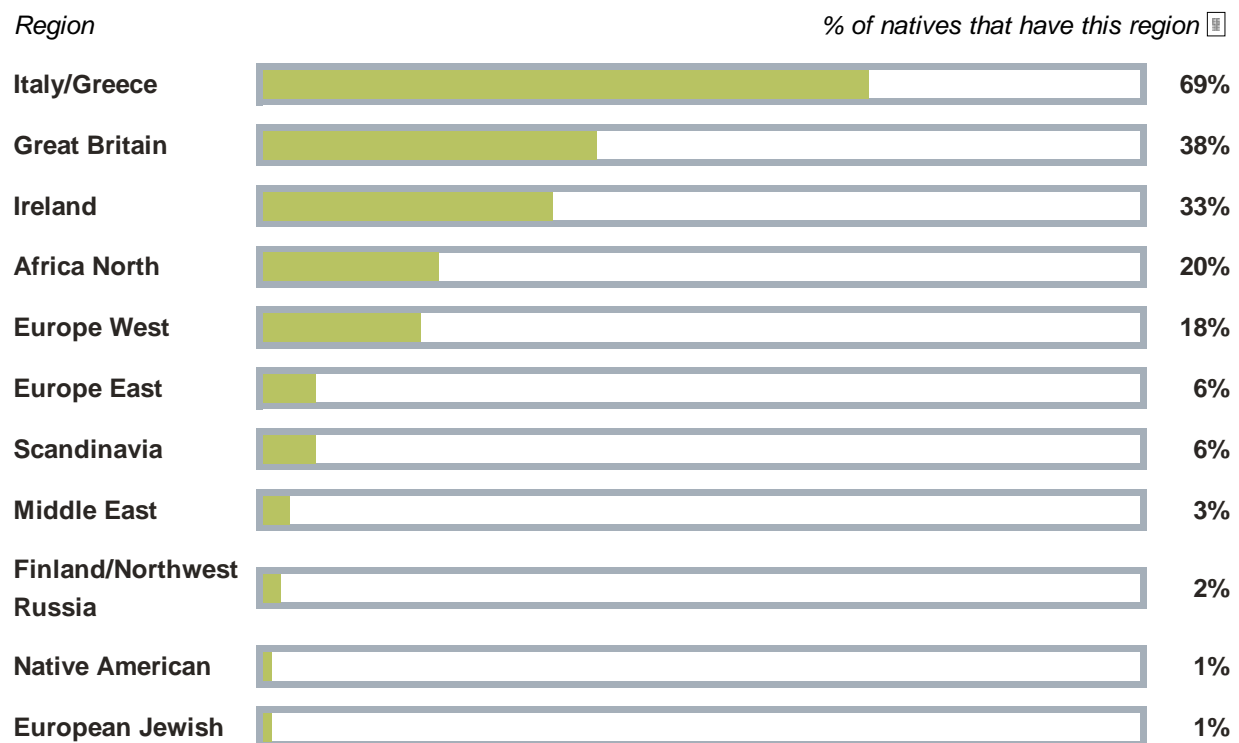
## Examples of people native to the Iberian Peninsula region

From a collection of 125 people



## Other regions commonly seen in people native to the Iberian Peninsula region

From a collection of 125 people



We have used our reference panel to build a genetic profile for the Iberian Peninsula. The blue chart above shows examples of ethnicity estimates for people native to this region. For the Iberian Peninsula, we see a fairly wide range of results. Some natives have only 19% of their DNA showing similarity to this profile, while there is a larger group which shows 100% similarity. Since approximately 51% of the typical native's DNA comes from this region, 49% is more similar to surrounding areas such as the Italy/Greece region (see chart above, in green).

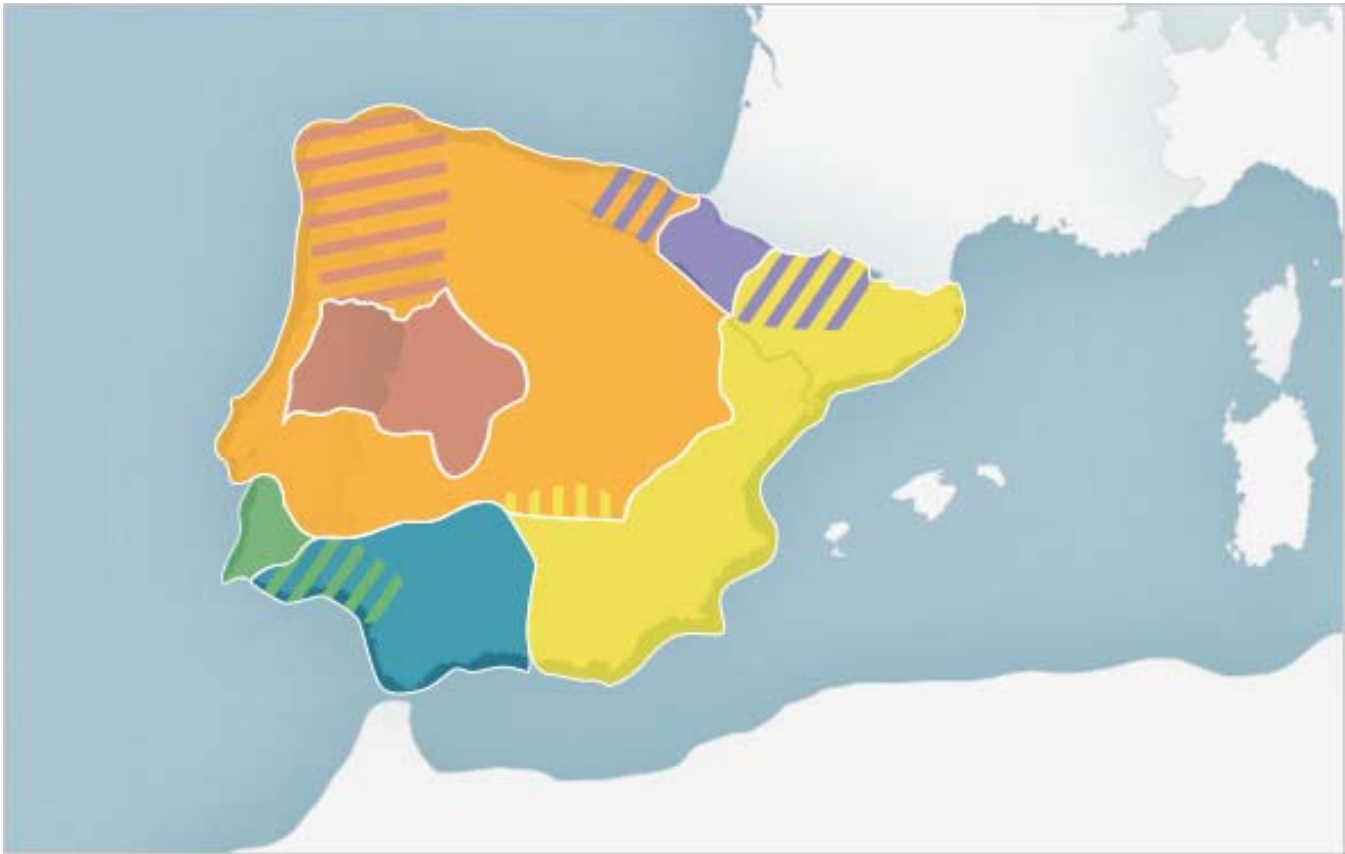
## Population History

### People of Prehistoric Iberia

The Iberian Peninsula has been inhabited for more than a million years, from the Paleolithic Cro-Magnon and Neanderthals to modern Homo sapiens. A number of Iberian civilizations had developed by the Bronze Age and were trading with other Mediterranean communities. Celtic tribes arrived from central Europe and settled in the northern and western parts of the peninsula, intermixing with the local populations. Phoenician colonies (later controlled by the powerful Carthaginians) dotted the Mediterranean coast. The Greeks named the region "Iberia," after the Ebro River.



Iberian Peninsula



Bronze Age Iberia, showing Celtic and Iberian tribes

- Tartessian (residual)
- Turdetanian
- Celtic
- Aquitanian

## Romanization

The Carthaginians were the naval superpower of their day, controlling most of the maritime trade in the western Mediterranean. They ran afoul of the growing Roman Empire in the 3rd century B.C., however. Local disputes between city-states in Sicily escalated into a broader conflict between the two empires, triggering the Punic Wars (264 B.C. to 146 B.C.).

Iberia was a major source of manpower and revenue for the Carthaginian military, which relied heavily on mercenary soldiers. The great Carthaginian general Hannibal led the Iberian forces in a surprise assault on northern Italy—and even Rome itself—by marching his armies, including several dozen war elephants, over the Alps. Although Hannibal was a brilliant strategist and won several victories against the Romans, his invasion ultimately failed. He was forced to retreat to Carthage, and the Iberian colonies and territories that had been controlled by Carthage became a province of the Roman Empire known as Hispania.



*Hannibal's Elephants by French artist Nicolas Poussin*

Rome launched a number of campaigns to conquer the remainder of the peninsula, bringing most of the region under Roman rule. Latin replaced almost all of the locally spoken languages and eventually evolved into modern Spanish and Portuguese. One exception is the Basque language, which survived in the remote foothills of the Pyrenees. Many scholars believe Basque pre-dates the arrival of the Indo-European languages, brought by the Celtic and Iberian tribes during the Bronze Age.

## Germanic Visigoth Kingdom



The Migration Period, or *Völkerwanderung*, was a vast movement of primarily Germanic tribes throughout Europe, beginning around 400 A.D. These wandering tribes completely transformed central and western Europe, conquering and displacing populations over the course of centuries. The Roman Empire had already been divided into two parts, with the emperor ruling from the new eastern capital in Byzantium. The Western Empire, including Rome itself, was overrun by successive waves of Germanic invaders, including the Visigoths and the Vandals. The Visigoths continued west from Italy and established the Visigoth Kingdom, which occupied the majority of the Iberian Peninsula. They converted to Catholicism around 589 A.D. and were completely assimilated by the indigenous Hispano-Roman population, as evidenced by the loss of the Gothic language and a lack of any substantial genetic difference between the groups.



*Visigoth Kingdom, 600 A.D.*

## **Islamic rule**

North Africa remained part of the Roman and Byzantine Empires for centuries after the defeat of Carthage. But in the late 7th century, the region was conquered by the Umayyad Caliphate, a vast Muslim empire based in Syria. The North African Muslims consisted mostly of indigenous Berbers and an Arab minority, collectively called "Moors" by the Europeans.

In 711 A.D., the Moors crossed the Strait of Gibraltar and conquered the Visigoth Kingdom and most of Iberia, forcing the Christian Visigoths to retreat to the northern part of the peninsula. Iberia became a province of the Umayyad Caliphate called Al-Andalus. While many

converted to Islam and adopted the Arabic language, the majority of the population remained Christian and spoke Latin.



*Illustration of Tariq ibn Ziyad, a Muslim general who led the Islamic conquest of Visigothic Hispania in 711-718 A.D. He is considered one of the most important military commanders in Iberian history.*

The duration of Muslim rule varied, lasting only a few decades in the north and nearly 800 years in the south. Al-Andalus broke away from the Caliphate after the overthrow of the Umayyads in Syria and became an independent emirate ruled by a succession of Muslim dynasties. From 722 to 1492, the Christian kingdoms of the north fought to regain control of the peninsula in a campaign called “the Reconquista” (or re-conquest), but they made limited headway until the 13th century. By then, Muslim rule had fractured into a number of smaller, competing emirates, which made them more vulnerable.

## **Age of Discovery**

In 1469, the Christian kingdoms of Leon, Castile, and Aragon were brought together by the marriage of Queen Isabella and King Ferdinand II. Although the thrones technically remained separate, their royal union created a new political entity, España, laying the foundation for the modern kingdom of Spain. Portugal was also established as a distinct country at this time, and the boundaries between the two nations have remained virtually unchanged since then.

The year 1492 was especially busy for Ferdinand and Isabella. They issued the “Alhambra Decree,” which expelled all Jews from Spain, scattering them throughout the Mediterranean, Europe, and the Middle East. They also defeated the last Muslim stronghold at Granada, bringing an end to the Reconquista. In addition, Ferdinand and Isabella financed the first voyage of Christopher Columbus to the New World, beginning a period of exploration, colonization, and exploitation of the Americas. Called the Age of Discovery, it led to immense wealth and power for Spain, as they became an unmatched maritime power and extracted gold, silver, and other resources from their colonies across the Atlantic. To this day, Spanish remains the second-most widely spoken language in the world. Portugal kept pace with its neighbors, establishing the first trade route around the southern tip of Africa, as well as numerous colonies, including Brazil.



*Columbus Before the Queen by Emanuel Gottlieb Leutze*

## Did You Know?

The Portuguese explorer Bartholomew Dias was the first European to sail around the southern tip of Africa. He named it the "Cape of Storms," but it is now called the Cape of Good Hope.

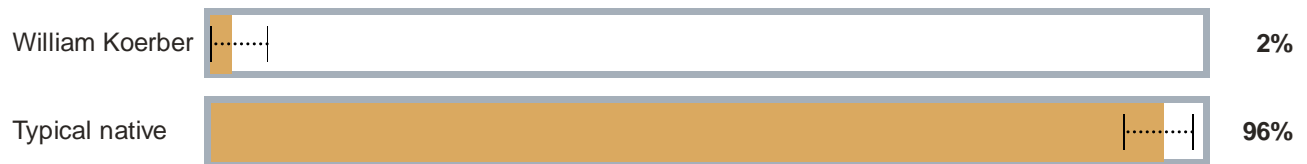
## European Jewish

*Primarily located in:* **Poland, Belarus, Ukraine, Russia, Hungary, Israel**

*Also found in:* **Germany, France, Lithuania, Latvia, Slovakia, Czech Republic, Romania, Bosnia, Serbia, Estonia**

The European Jewish region is not geographically defined in the same way as most other ethnic regions. The historic dispersal of the Jewish population from its origin in the Levant on the east coast of the Mediterranean resulted in insular communities scattered throughout Europe, North Africa, Central Asia and the Middle East. Although some Jewish communities enjoyed positions of relative peace and prosperity, many more were segregated from mainstream society by law, custom and prejudice, experiencing sustained persecution and discrimination. Jewish populations from northern and eastern Europe are often known as "Ashkenazi." "Sephardic" refers to Jews who were expelled from Spain during the Inquisition and mostly settled in North Africa and southeastern Europe.


## How William Koerber compares to the typical person native to the European Jewish region



## Genetic Diversity in the European Jewish Region

The people living in the European Jewish region are much less admixed than most other regions, which means that when creating ethnicity estimates for people native to this area, we rarely see similarities to DNA profiles from other nearby regions. We've found that approximately 96% of the typical native's DNA comes from this region.

## Examples of people native to the European Jewish region

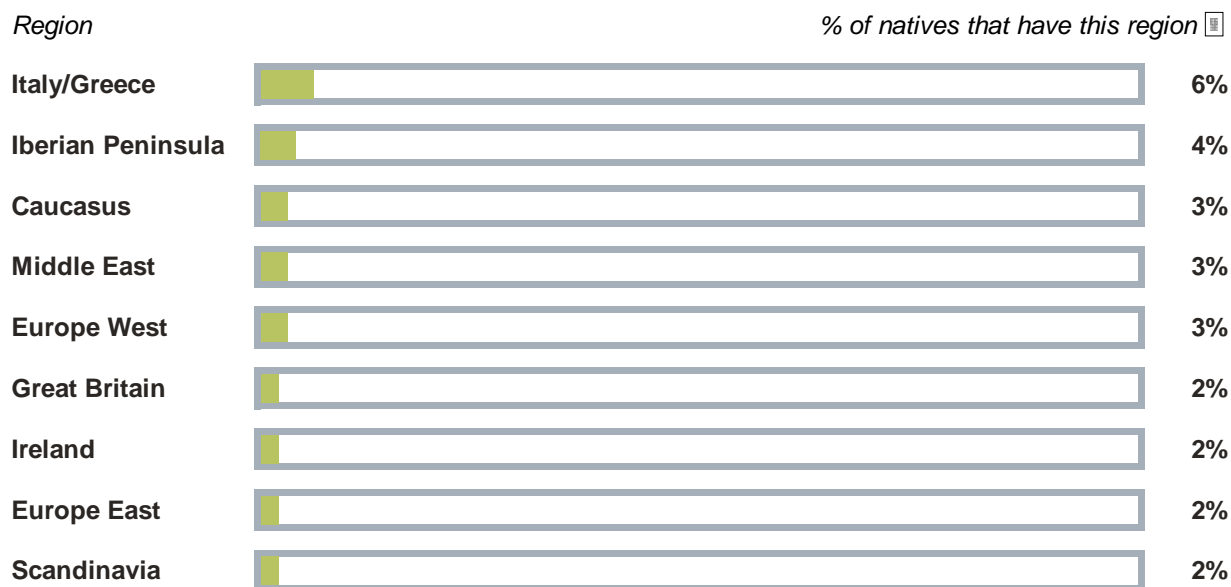
From a collection of 195 people 



## Other regions commonly seen in people native to the European Jewish region

From a collection of 195 people





We have used our reference panel to build a European Jewish genetic profile. The blue chart above shows examples of ethnicity estimates for people native to this region. For European Jewish, there is very little (if any) DNA shared with neighboring regions. However, there are some exceptions—a small minority of people’s DNA shows only 65% similarity to this profile. Since approximately 96% of the typical native’s DNA comes from this region, 4% is similar to other regions, such as the Italy/Greece region. (See chart above, in green.)

## Population History

### Origin of the Jews

Much of what is known about the early history of the Jews is taken from the Hebrew Bible. While there is some archaeological evidence to support certain details of the Biblical account, often it remains the only source and is given varying amounts of credence by different scholars. According to this source, the Jews are descended from Abraham, a Sumerian who traveled west from Mesopotamia to the land of Canaan, which lay along the eastern coast of the Mediterranean. Around 1020 B.C., the separate Hebrew tribes were united under King Saul, creating the first Kingdom of Israel.



*The Kingdom of Israel in 1020 B.C.*

## Babylonian exile

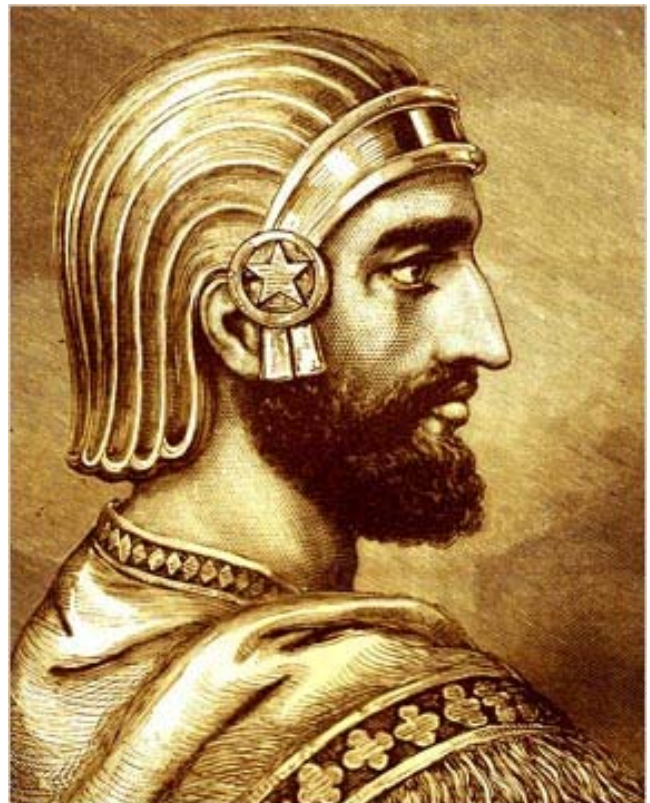
After the reigns of David and his son Solomon, the kingdom split into the Northern (or Israelite) Kingdom and the Kingdom of Judah (Jewish Kingdom) in the south. The Assyrians conquered and deported many of the inhabitants of the Northern Kingdom in the 7th century B.C.

In about 589 B.C., Babylonian King Nebuchadnezzar II destroyed the Kingdom of Judah, sacking Jerusalem and destroying the First Temple built by Solomon. A large number of Jews were expelled from their former kingdom and forced to resettle in Babylon. Many historians mark this event as the beginning of the Jewish diaspora, which refers to the scattering of the population.

When Cyrus the Great conquered Babylon in 540 B.C., the Jewish people were permitted to return and rebuild Jerusalem. The former Kingdom of Judah, renamed Judea, was made a province of the Persian Empire—although its size was significantly reduced. The Jews' Second Temple, built on the site of the First Temple, was completed by about 518 B.C. Many Jews returned to Jerusalem, but many more stayed in Babylon, where Talmudic scholarship (study of the central text of Judaism) was founded. Over time, prominent Jewish communities were established in Alexandria, Rome and Greece.



*King Nebuchadnezzar II*



*Cyrus the Great*

Alexander the Great conquered the Persian Empire, capturing the Levant in 333 B.C. When his territories were divided after his death, Judea became part of the Seleucid Empire. The Judeans were commanded to accept Greek polytheism, leading to rebellion. Fighting for years under Judas Maccabee, the Judeans won the right to rededicate the Temple, an event commemorated by the holiday of Hanukkah.

## The Roman period

The collapse of the Seleucid Empire led to a second period of self-rule for the Jews, from 140 B.C. to 63 B.C. When King Herod assumed power with the help of the Romans, however, Judea became a client state of the Roman



Republic. Judea was officially absorbed into the Roman Empire as the Judaea Province in 92 A.D.

There were three major Jewish revolts against the Romans in Judaea, the first of which began in 66 A.D. It was quelled in the year 70 when Titus sacked Jerusalem. The city was burned and most of the Jews were killed or sold into slavery throughout the Roman Empire. The second revolt, called the Kitos War, lasted from 115 to 117. At the end of the Bar Kokhba revolt (132-135), the Romans completely razed Jerusalem. Once again, they sold the majority of the survivors into slavery, this time placing severe restrictions on those who remained.



*Destruction of the Temple in Jerusalem by Francesco Hayez depicts the destruction of the Second Temple by Roman soldiers.*

By the 2nd century, Jews were located throughout the Roman Empire. By the 5th century, there were scattered communities from Spain in the west to the Byzantine Empire in the east. Because Jews were usually restricted by law from owning land, they turned toward occupations in commerce, education and medicine.

## **Ashkenazi Jews**

Large communities of Jews settled in France and Germany after the fall of Rome, the Arab conquests in the Middle East, and the expulsions from Spain. The Jews who settled in Germany (called Ashkenazi) spoke Yiddish, a mixture of German, Hebrew and Aramaic.

Over the centuries, the Jews settled where they could throughout western Europe, enduring frequent discrimination and periodic expulsions from various countries. Facing increasing persecution in the west during the 11th and 12th centuries, many of the Ashkenazi Jews moved from England, France and Germany to eastern Europe, where Poland and Lithuania encouraged Jewish settlement. Historically, Ashkenazi Jews lived in separate towns known as shtetls. In 1500, approximately 500,000 Jews lived in Poland. By the middle of the 17th century, there were more than 1

million. It is estimated that, prior to World War II, more than 90% of all Jews in the world were descended from the Ashkenazi Jews.

## **Jews today**

During the late 19th century, government-condoned persecution of the Jews in Russia, called pogroms, forced many to move to the United States and to Palestine. In 1897 Theodor Herzl, an Austro-Hungarian journalist, established the Zionist Organization and became the charismatic figurehead of the growing modern Zionist movement. He and his supporters continually lobbied foreign governments for help in the establishment of a Jewish state.

After the Ottoman Empire was defeated in World War I, its territories, including Palestine, were divided into mandates administered by the British and French. The British government, with its Balfour Declaration in 1917, announced its support of establishing Palestine as a national home for the Jews. After World War II, during which an estimated 6 million Jews were killed in the Holocaust, the United Nations divided Palestine in two, effectively creating a new Jewish state, Israel.

As of today, about 42% of all Jews worldwide live in the modern state of Israel. A small number of Jews have lived in this region for generations, tracing their ancestors back thousands of years, with the majority returning in the last century.

## **Did You Know?**

The Western Wall in Jerusalem, also called the Wailing Wall, is one of the holiest sites of Judaism. It is the only remaining part of the Second Temple, destroyed by the Romans in 70 A.D.



*Dome of the Rock and Wailing Wall by Peter Mulligan*



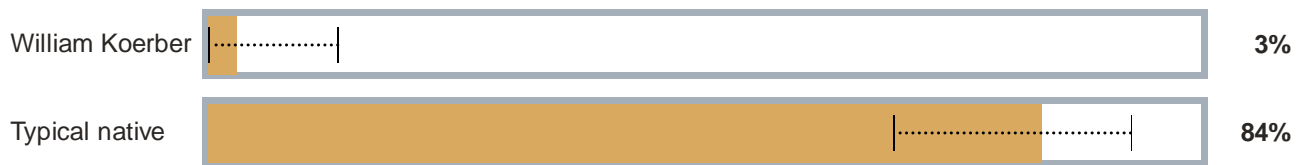
# Scandinavia

Primarily located in: **Sweden, Norway, Denmark**

Also found in: **Great Britain, France, Germany, Netherlands, Belgium, the Baltic States, Finland**

Scandinavia is perched atop northern Europe, its natives referred to throughout history as “North Men.” Separated from the main European continent by the Baltic Sea, the Scandinavians have historically been renowned seafarers. Their adventures brought them into contact with much of the rest of Europe, sometimes as feared raiders and other times as well-traveled merchants and tradesmen.

## How William Koerber compares to the typical person native to the Scandinavia region



## Genetic Diversity in the Scandinavia Region

The people living in the Scandinavia region today are slightly admixed, which means that when creating genetic ethnicity estimates for people native to this area, we see some similarities to DNA profiles from other nearby regions. We've found that approximately 84% of the typical native's DNA comes from this region.

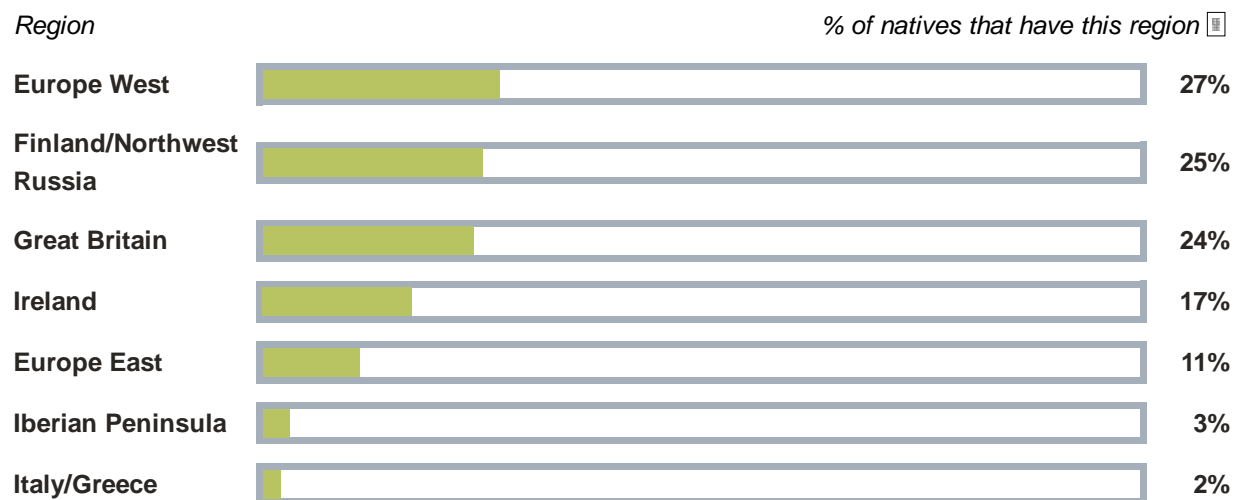
## Examples of people native to the Scandinavia region

From a collection of 272 people



## Other regions commonly seen in people native to the Scandinavia region

From a collection of 272 people



We have used our reference panel to build a genetic profile for Scandinavia. The blue chart above shows examples of ethnicity estimates for people native to this region. For Scandinavia we see a fairly narrow range—most natives have between 69% and 100% of their DNA showing similarity to this profile. It's also possible, however, to find people whose DNA shows little similarity (25%). Since approximately 84% of the typical native's DNA comes from this region, 16% is more similar to other regions, such as the neighboring Europe West (see chart above, in green).

## Population History

As the glaciers retreated from northern Europe, roaming groups of hunter-gatherers from southern Europe followed reindeer herds inland and marine resources along the Scandinavian coast. Neolithic farmers eventually settled the region beginning about 6,000 years ago.

The Goths, originally from southern Sweden, wandered south around the 1st century B.C., crossed the Baltic Sea, and settled in what is now eastern Germany and Poland. In 410 A.D., forced west by the invading Huns, the Goths sacked Rome, contributing to the decline and fall of the Western Roman Empire.

## Age of Vikings

While the Vikings were feared by the coastal towns of medieval Europe as seaborne raiders and violent pillagers, they were also well-traveled merchants and ambitious explorers. Their longships allowed them to travel over open oceans, as well as navigate shallow rivers, and they were light enough to be carried across land, if necessary.

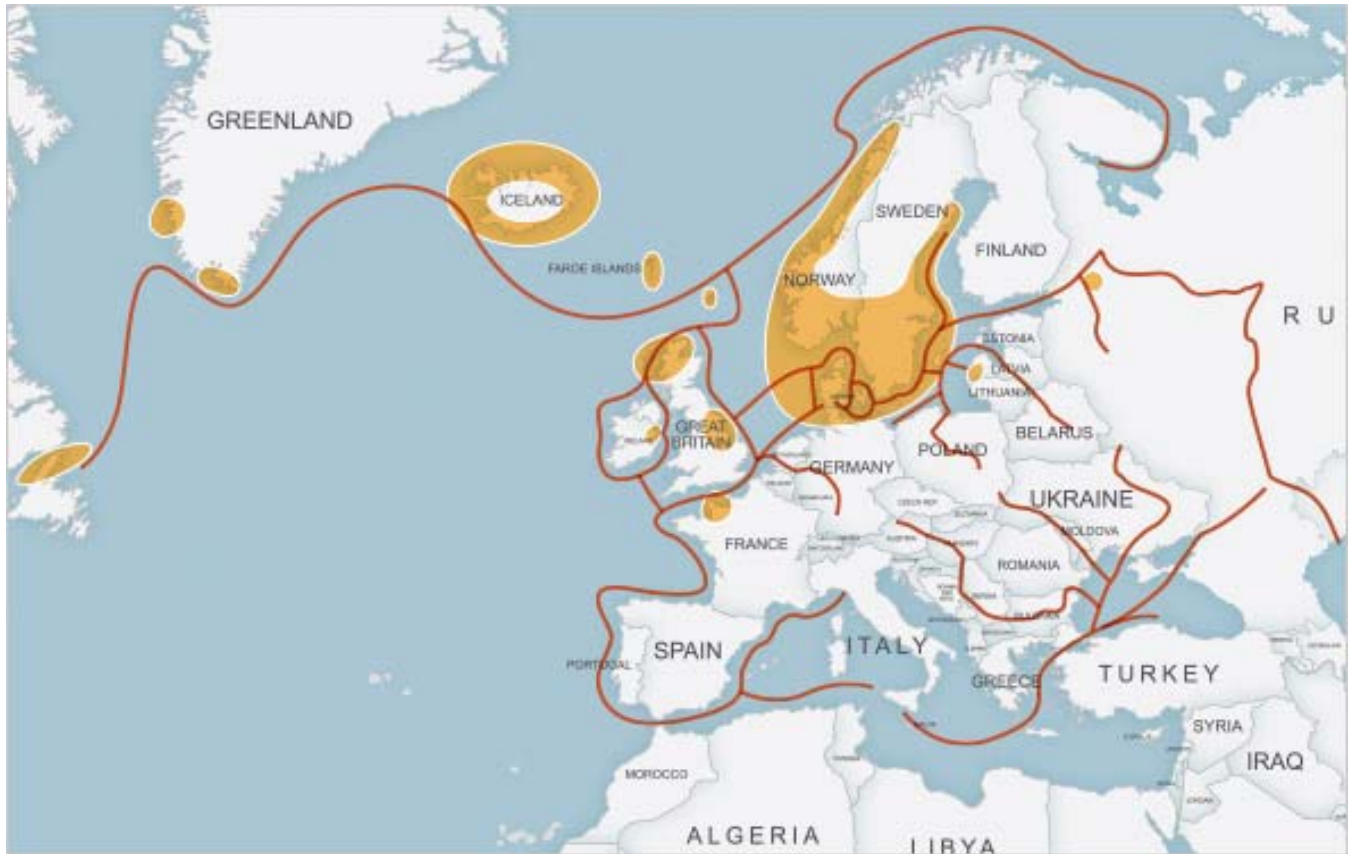


*Viking longships*

The first waves of Vikings appeared along coastal cities and rivers, where they attacked villages, churches, monasteries, and abbeys. They would strike without warning and then quickly disappear, carrying their loot back to Scandinavia.

From 793 A.D. until 1066 the Vikings explored, settled, plundered and traded with much of Europe, Africa's Mediterranean coast, Iceland, Greenland, and the northern part of North America (Vinland).

They set up trading posts along the Volga River, and are known to have engaged in trade as far away as Baghdad. They established settlements as far south as the Black Sea and served as mercenaries in Byzantium.



*Territories and voyages of the Vikings, 793 A.D. – 1066 A.D.*

## Viking settlements

Not all Vikings were transient raiders, pillaging and moving on. They founded many permanent settlements and colonies, laying the groundwork for new cultures and major historical events.

By 859 A.D., Swedish Vikings, called Rus', had settled in eastern Europe along the Volga River for trade purposes. Legend has it that one of the Rus', Prince Rurik, was elected ruler of the local Slavic population. Over time, the Vikings were assimilated into the Slavic culture and expanded their domain from their capital in Kiev. Their nation came to be known as Kievan Rus', from which modern-day Russia draws its name.

In 851, a group of Vikings began settling on the coast of northern France. In 911, the French king granted them control of their own territory on the condition that they help protect France from additional Viking raids. The region became known as Normandy, named for the Viking "North Men" who lived there. William the Conqueror, a descendant of those settlers, asserted control over all of Normandy by 1050. He became the first Norman king of England after crossing the English Channel and defeating Harold Godwinson at the Battle of Hastings in 1066.





*Rurik, Grand Prince of Novgorod 862-879 A.D.*

During the 9th century, Vikings established a trade port at Dublin in western Ireland. They controlled this area of Ireland for much of the next 300 years.

Danish Vikings invaded and settled northern and eastern England beginning in 876, and managed to control a third of Britain (the Danelaw) for nearly 80 years. The Danish prince, Cnut the Great, was king of England from 1016 to 1035. He also ruled Denmark and parts of Norway and Sweden.



*The Danelaw*



*Areas ruled by Cnut the Great*

Norwegian Vikings colonized northern Scotland, the Orkneys, the Hebrides, the Isle of Man, the Faroe Islands, Iceland and Greenland during the 9th and 10th centuries. Viking control of northern Scotland ended in 1231.

## **Later colonization**

In the 17th and 18th centuries, Denmark established colonies in the Gold Coast of West Africa and the Caribbean (St. Thomas and St. John), as well as many small colonies in India.

Between 1560 and 1660 Sweden expanded its borders to several Baltic States (Estland, Livonia, Ingria and Karelia).

Approximately 80,000 Norwegians emigrated to the Netherlands during the 17th and 18th centuries. Many young men worked on Dutch merchant ships or joined the Dutch navy, while young women moved to Amsterdam to work as maids.

## **Did You Know?**

The Norse sailor Leif Ericson is credited with being the first European to travel to North America—500 years before Christopher Columbus's first voyage in 1492.



Leif Eriksson Discovers America by Hans Dahl

## Italy/Greece

Primarily located in: **Italy, Greece**

Also found in: **France, Switzerland, Portugal, Spain, Serbia, Hungary, Bulgaria, Austria, Croatia, Bosnia, Romania, Turkey, Slovenia, Algeria, Tunisia, Montenegro, Albania, Macedonia, Kosovo**

Located in the south of Europe, against the Mediterranean Sea, this region gave rise to some of the most iconic and powerful cultures the Western world has known. The Greeks were first, with their pantheon of gods, legendary heroes, philosophers and artists. They subsequently influenced the Romans, whose vast empire spread its ideas and language across Europe.


### How William Koerber compares to the typical person native to the Italy/Greece region

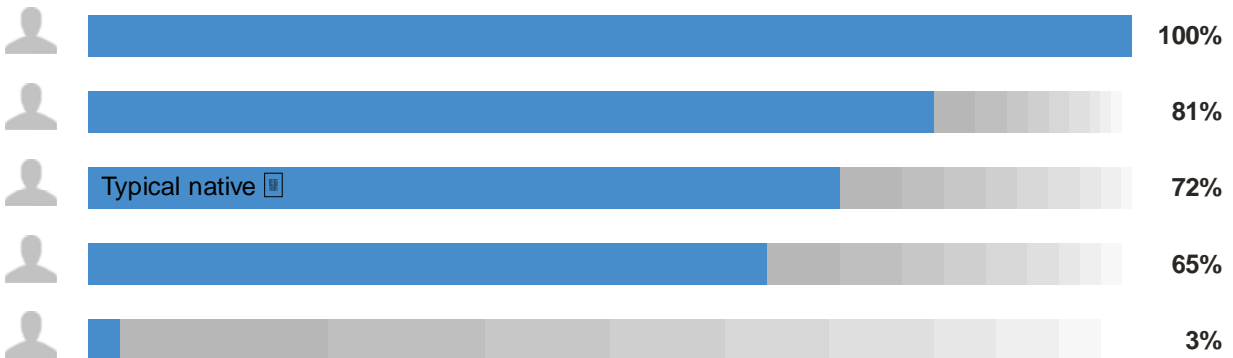


## Genetic Diversity in the Italy/Greece Region

The people living in the Italy/Greece region are admixed, which means that when creating genetic ethnicity estimates for individuals native to this area, we frequently see some similarities to DNA profiles from other nearby regions. We've found that approximately 72% of the typical native's DNA comes from this region.

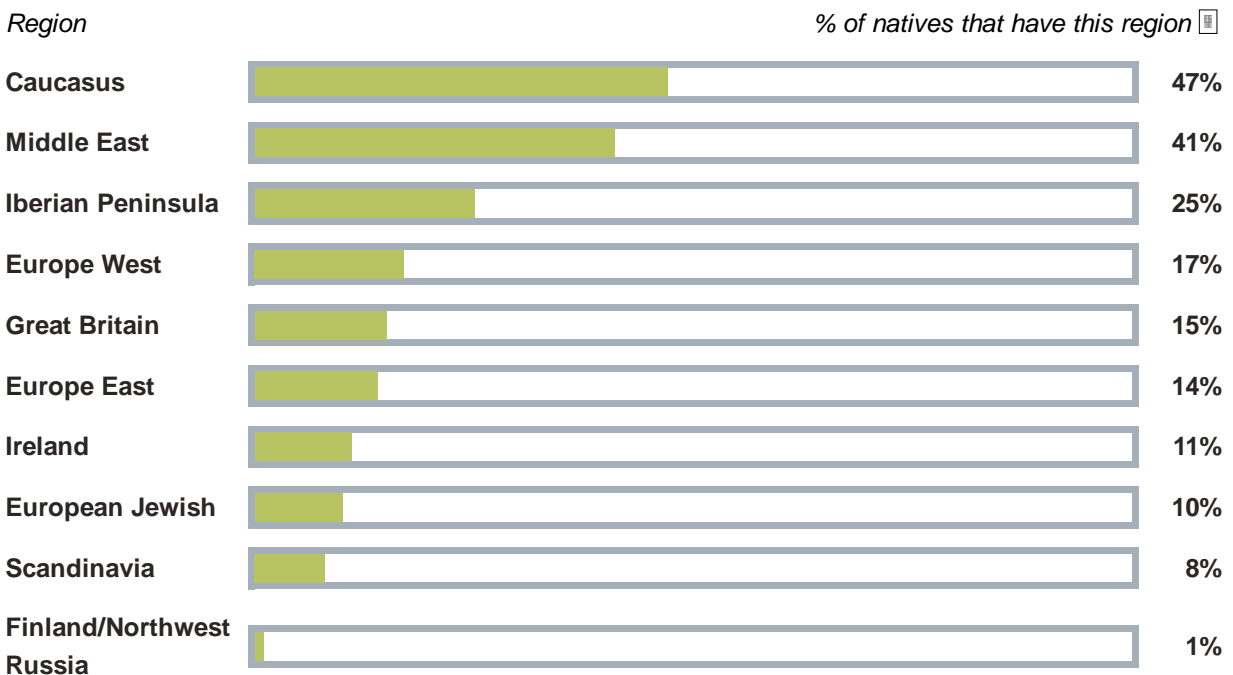
### Examples of people native to the Italy/Greece region

From a collection of 205 people 



### Other regions commonly seen in people native to the Italy/Greece region

From a collection of 205 people



We have used our reference panel to build a genetic profile for Italy/Greece. The blue chart above shows examples of ethnicity estimates for people native to this region. Most Italy/Greece natives have between 65% and 100% of their



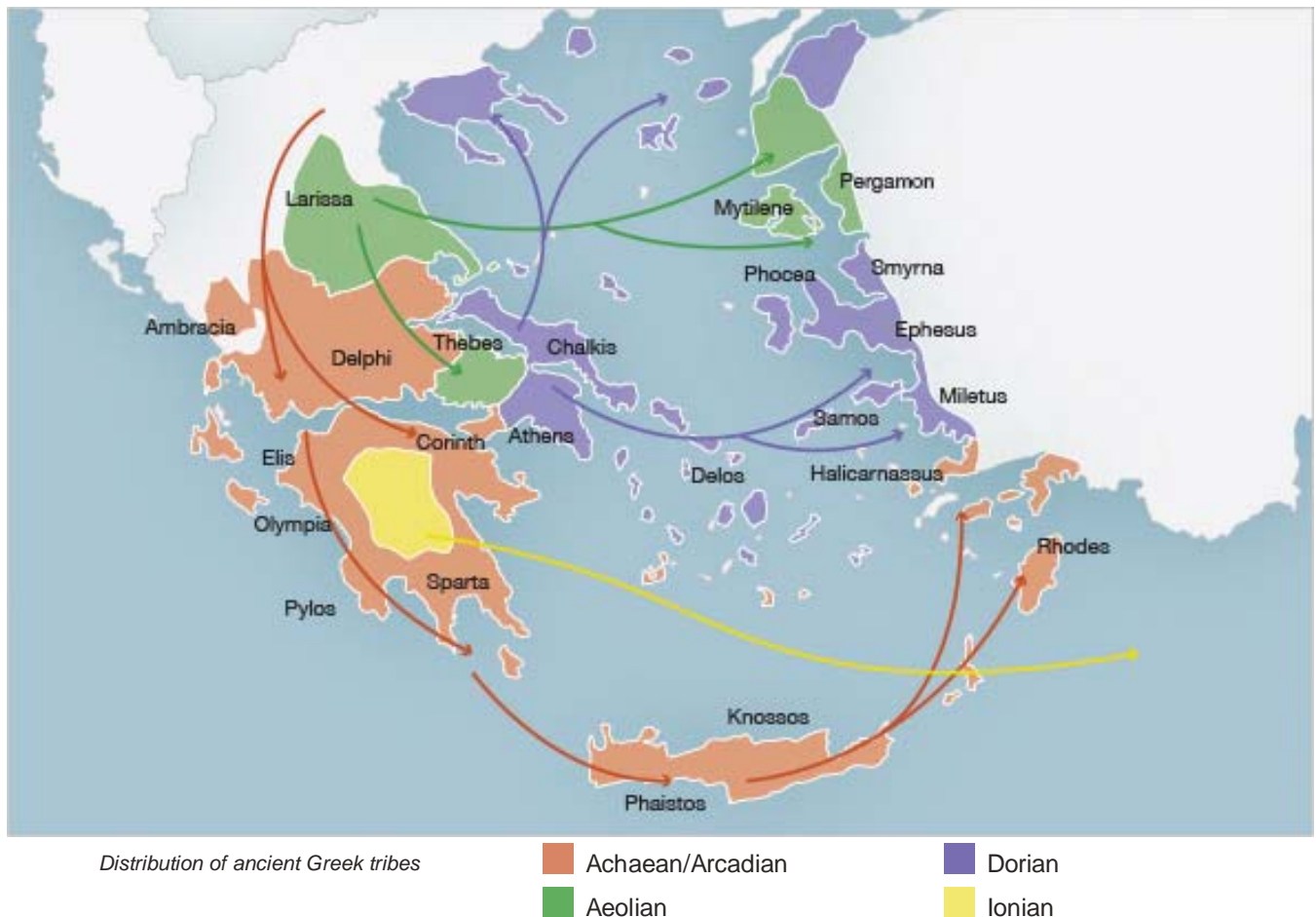
DNA showing similarity to this profile. It's also possible, however, to find people whose DNA shows very little similarity. Since approximately 72% of the typical native's DNA comes from this region, 28% of his or her DNA is more similar to other regions, such as the Caucasus, Middle East, Iberian Peninsula, and Europe West.

## Population History

### Prehistoric Italy/Greece

The history of this region is dominated by two titans: the Greeks and the Romans. During the height of the Classical Era, the Greeks introduced cultural, civic and philosophical ideas and innovations that heavily influenced the Roman Empire and, in turn, laid the foundations of Western civilization.

Ancient Greece was settled by four different Greek-speaking groups. During the Bronze Age, Mycenaean Greece of Homer's epics consisted of the Achaeans, Aeolians and Ionians. It was one of the great powers of its time. The remaining group, the Dorians, rose to prominence around 1100 B.C. when the Mycenaean civilization collapsed. The influence of these groups spread beyond mainland Greece to the western coastline of modern Turkey and the islands of the Aegean Sea.



The Greeks also founded colonies in southern Italy and Sicily. Called Magna Graecia in Latin, these settlements existed alongside the native tribes of the Italian peninsula, including the Etruscans, Umbrians and Latins. The Latins would later build their capital in Rome, drawing heavily on the culture of their Greek neighbors.

### Colonies of Italy/Greece

Besides Sicily and southern Italy, the Greeks established many more colonies around the Mediterranean, from approximately 750 B.C. until 500 B.C. Established as small city-states, most of these colonies were trading outposts. Others were created by refugees when Greek cities were overrun and the displaced inhabitants looked for new land. More than 90 Greek colonies were established, from Ukraine and Russia to the north, Turkey to the east, southern Spain in the west, and Egypt and Libya in the south.

The Classical Age of Greece began around the 5th century B.C. It was the era of Athens, Sparta, the birth of democracy, and many of Greece's famous playwrights and philosophers. After two bloody wars with the Persian Empire, Athens and Sparta went to war with each other, leading to the eventual decline of both. The Macedonian king, Philip II, united the Greek city-states in 338 B.C. After Philip's assassination, his son, Alexander the Great, became king of Macedonia and carried out his father's plans to invade Persia. Alexander led his armies in conquest of the Middle East, part of India, and Egypt, spreading the Greek language and culture throughout much of the ancient world.



*Phillip II, king of Macedonia. The Granger Collection, New York.*



*Alexander the Great. Detail of The Alexander Mosaic.*

His triumph was short-lived, however; he died on his campaign and his conquered territories were divided among his generals. But many important Greek cities and colonies were established and remained under Greek rule, including Seleucia, Antioch and Alexandria.



Division of Alexander's Empire

- Ptolemaic Kingdom
- Kingdom of Pergamon
- Epirus

- Seleucid Empire
- Macedonia

Other Territories

- Roman Republic
- Carthaginian Republic
- Epirus-controlled territory

While Greece spread its influence eastward, the small city of Rome was growing into a regional power in Italy. As the Roman Republic expanded, it established colonies of Roman citizens to maintain control of newly conquered lands. By the time Julius Caesar seized power from the Senate, the Roman war machine was nearly unstoppable. Soldiers who served for years in the military were rewarded with land in Roman colonies throughout the empire, which stretched from Turkey and the Middle East to Spain and northern France.

### Invasion of the barbarians

During the late Roman Empire, Constantine the Great established Constantinople as the eastern capital of the Roman Empire. The Empire was divided and, as the focus of power shifted away from Rome, the Western Empire was left vulnerable to a series of invasions by Goths, Huns, Visigoths and Heruli. In 476 A.D. a Germanic soldier, Odoacer, deposed the last Western Roman emperor, Romulus Augustulus, signaling the fall of the old Roman Empire. The Eastern Empire continued to flourish, becoming known as the Byzantine Empire. Odoacer was soon murdered by the Ostrogoth ruler Theodoric. Although the barbarians had seized Rome,



they never established a major settlement in Italy.



*Romulus Augustulus resigns the Crown before Odoacer. Project Gutenberg's Young Folks' History of Rome by Charlotte Mary Yonge.*

From around 610 A.D. to 867 A.D., the Byzantine Empire was attacked by numerous groups, including the Persians, Lombards, Avars, Slavs, Arabs, Normans, Franks, Goths and Bulgars. During the 8th and 9th centuries, the empire slowly freed Greece from these invaders. The Slavs had the most success at establishing permanent settlements in Greece, although they, too, were eventually defeated and banished from the Greek peninsula.

During this time, Greek-speaking people from Sicily and Asia Minor migrated to Greece, and a large number of Sephardic Jews emigrated from Spain to Greece, as well.

## **Ottoman Empire**

The Ottoman Empire conquered the Byzantine Empire, expanding through Greece and capturing Athens in 1458. Many of the Greek scholars fled and migrated to Christian Western Europe. Ottoman colonies were established in several areas in Greece, and held on until Greek independence was declared in 1821.





*The Battle of Maniaki during the Greek War of Independence from the Ottoman Empire*

## **Italy in the Middle Ages**

During the 12th and 13th centuries, the city-states of Italy developed trading and banking institutions. They established a wealth of trading relationships with the Byzantine Empire and the Islamic powers, all around the Mediterranean. The escalation in trade led to a resurgence of financial power in Italy, allowing it to create Italian colonies as far away as the Black Sea.

## **Did You Know?**

Togas weren't worn by everyone in ancient Rome. After the 2nd century B.C., only freeborn Roman men were allowed to wear them as a symbol of their citizenship.

The Greeks were the first to develop an alphabet with vowels and it has been used to write the Greek language since 800 B.C.



An inscription showing the Greek alphabet

## Europe West

Primarily located in: **Belgium, France, Germany, Netherlands, Switzerland, Luxembourg, Liechtenstein**

Also found in: **England, Denmark, Italy, Slovenia, Czech Republic**

The Europe West region is a broad expanse stretching from Amsterdam's sea-level metropolis to the majestic peaks of the Alps. Geographically dominated by France in the west and Germany in the east, it includes several nations with distinct cultural identities. From the boisterous beer gardens of Munich to the sun-soaked vineyards of Bordeaux and the alpine dairy farms of Switzerland, it is a region of charming cultural diversity.

### How William Koerber compares to the typical person native to the Europe West region

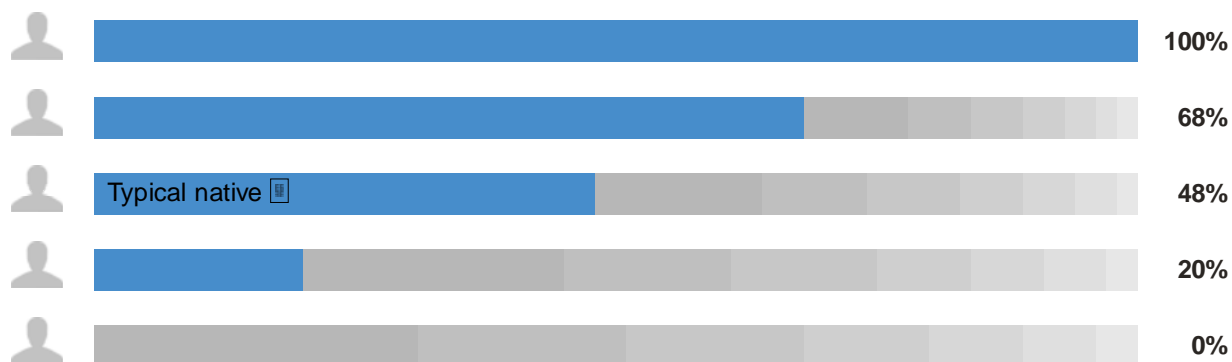


### Genetic Diversity in the Europe West Region

The people living in the Europe West region are among the most admixed of all our regions, which means that when creating genetic ethnicity estimates for people native to this area, we often see similarities to DNA profiles from other nearby regions. We've found that approximately 48% of the typical native's DNA comes from this region.

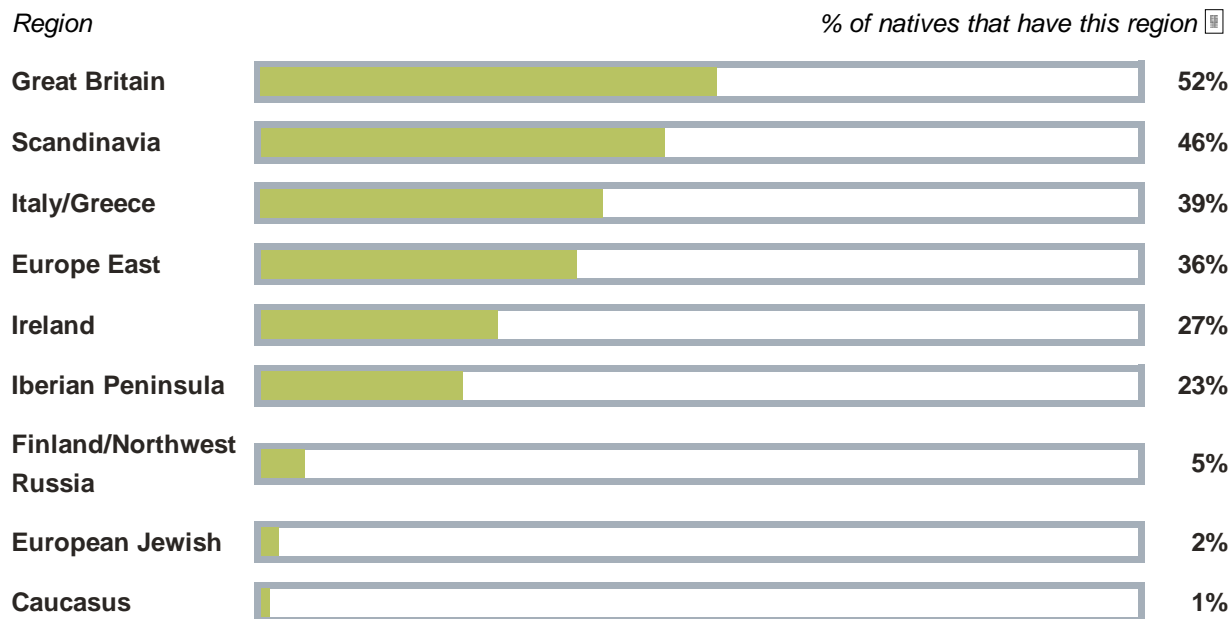
## Examples of people native to the Europe West region

From a collection of 416 people 



## Other regions commonly seen in people native to the Europe West region

From a collection of 416 people



We have used our reference panel to build a genetic profile for Europe West. The blue chart above shows examples of ethnicity estimates for people native to this region. For Europe West we see an extremely wide range—most natives have between 20% and 68% of their DNA showing similarity to this region's profile. Some individuals show 100% similarity, but it's also possible to find people whose DNA shows little or no similarity. This is most likely due to the fact that this area has not experienced any long-term periods of isolation. Since only 48% of the typical native's DNA comes from this region, there are major genetic influences from other regions, such as Great Britain,



Scandinavia, Italy/Greece, Europe East and more (see chart above, in green).

## Population History

### Prehistoric Western Europe

Due to its location and geography, Western Europe has seen many successive waves of immigrants throughout its history. Both peaceful intermingling and violent invasions of newcomers have resulted in a greater diversity in the genetics of the population, compared with neighboring regions.

The first major migration into Western Europe is arguably the Neolithic expansion of farmers who came from the Middle East. From about 8,000 to 6,000 years ago these farmers filtered in through Turkey and brought with them wheat, cows and pigs. It is possible, too, that these people could have been the megalithic cultures who erected enormous stone monuments like the famous menhirs of Stonehenge. There were dozens, if not hundreds, of monuments scattered throughout prehistoric Europe, some serving as tombs, others possibly having astronomical significance.



*Photograph of Stonehenge taken in July 1877 by Philip Rupert Acott. Owned by Tamsin Titcomb.*

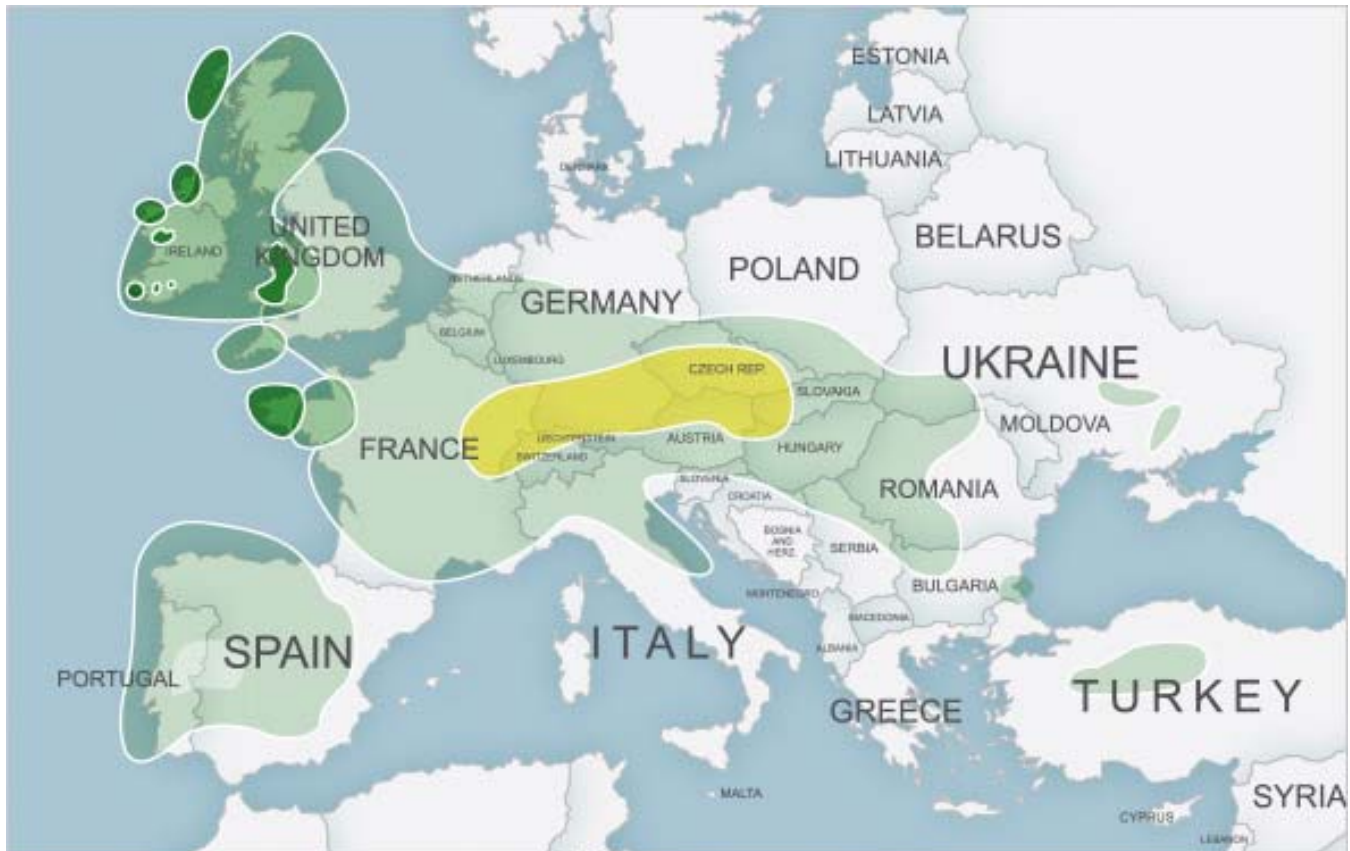
### Celtic and Germanic tribes

Although “Celtic” is often associated with the people of Ireland and Scotland, the Celts emerged as a unique culture in central Europe more than 2,500 years ago. From an epicenter in what is now Austria, they spread and settled in the areas of today’s western Germany and eastern France, generally near the Rhine and Danube Rivers. By 450 B.C., their influence and Celtic languages had spread across most of western Europe, including the areas that are now France, the Iberian Peninsula and the British Isles. The Celts either conquered or assimilated the previous inhabitants of the area, and almost all languages and cultural and religious customs were replaced. The only exception, most scholars believe, is the Basque language, which managed to persist in the Pyrenees of southern France and northern Spain.



In the early 4th century B.C., Celtic tribes in northern Italy invaded and sacked Rome, setting the stage for centuries of conflict.

In the 5th century B.C., Germanic peoples began moving south, from Sweden, Denmark and northern Germany, displacing the Celts as they went. It is unclear what prompted their movement, but it may have been climate related, as they sought warmer weather and more fertile farmland. The Germanic tribes' expansion was checked by the generals, Gaius Marius and Julius Caesar, as they approached the Roman provinces around 100 B.C.



*This map shows the expansion of Celtic tribes by 275 A.D. (in light green) from their presumed origin, the Bronze Age Hallstatt culture (in yellow). Dark green areas show regions where Celtic languages are still spoken today.*

## The Romans

After Rome defeated Carthage in the Punic Wars, the Republic had extended its borders to include the entire Italian Peninsula, Carthage's territories in North Africa, most of the Iberian Peninsula, Greece and parts of Anatolia. It began turning its attention northwest toward the Celtic-dominated region known as Gaul, which more or less covered the area of modern-day France. Part of Rome's motivation was to secure its frontier, as conflict with the Celts was a chronic problem. Julius Caesar led the campaign to conquer Gaul. A Celtic chieftain, Vercingetorix, assembled a confederation of tribes and mounted a resistance, but was defeated at the Battle of Alesia in 52 B.C. The battle effectively ended Celtic resistance. The Gauls were absorbed into the Roman Republic and became thoroughly assimilated into Roman culture, adopting the language, customs, governance and religion of the Empire. Many generals and even emperors were born in Gaul or came from Gallic families.



*Vercingetorix Throws Down His Arms at the Feet of Julius Caesar by Lionel Royer.*

For the most part, by 400 A.D., Western Europe was split between the Roman Empire and the restless Germanic tribes to the northeast. Celtic culture and influence still held sway in parts of the British Isles, and the Basque language continued to survive in the Pyrenees. It is interesting to note that the Basque share genetic similarities to the Celts of Ireland and Scotland, despite being culturally and linguistically dissimilar and geographically separated. While the exact relationship of the groups is difficult to determine, this does highlight the interesting interplay between genetic origin and ethno-linguistic identity.

## **The Migration Period**

By 400 A.D., the Roman Empire had been split into pieces. Rome was no longer the heart of the Empire, as the seat of power had been moved to Byzantium in the east. The Romans had begun to adopt Greek customs and language as well as Christianity, which had become the official state religion. Control of the provinces in the west had waned, and Rome itself was militarily weakened.

About this time, there was a period of intensified human migration throughout Europe, called the Migration Period, or the *Völkerwanderung* ("migration of peoples" in German). Many of the groups involved were Germanic tribes, whose expansion had previously been held in check by the Romans.

To some degree, the earlier Germanic tribes of the Migration Period, notably the Goths and Vandals, were being pushed west and south by invasions from the



Middle East and Central Asia. The Huns swept across eastern Europe, followed by the Avars, Slavs, Bulgars and Alans. These successive attacks may have been a factor in several waves of population displacement and resettlement.

Seven large German-speaking tribes—the Visigoths, Ostrogoths, Vandals, Burgundians, Lombards, Saxons and Franks—began pressing aggressively west into the Roman provinces and, in 410, the Visigoths attacked and sacked Rome. The western part of the Roman Empire was rapidly overrun as the invaders swept in, eventually dividing the remainder of the Roman provinces into new, Germanic kingdoms.



*An anachronistic 15th-century miniature depicting the sack of 410.*

## The Frankish Kingdom

The Franks conquered northern Gaul in 486 A.D. and established an empire under the Merovingian kings, subjugating many of the other Germanic tribes. Over the course of almost four centuries, a succession of Frankish kings, including Clovis, Clothar, Pepin and Charlemagne, led campaigns that greatly expanded Frankish control over Western Europe.

Charlemagne's kingdom covered almost all of France, most of today's Germany, Austria and northern Italy. On Christmas Day, 800, Pope Leo III crowned Charlemagne "Emperor of the Romans." This upset the Byzantine emperor, who saw himself as the sole ruler of the Roman Empire, but by 812, he was forced to accept Charlemagne as co-emperor.

In 843, Charlemagne's grandsons divided the Frankish empire into three parts—one for each of them. Charles the Bald received the western portion, which later became France. Lothair received the central portion of the empire, called Middle Francia, which stretched from the North Sea to northern Italy. It included parts of eastern France, western Germany and the Low Countries. Louis the German received the eastern portion, which eventually became the high medieval Kingdom of Germany, the largest component of the Holy Roman Empire.



*Statue of Charlemagne, by Agostino Cornacchini (1725). Located at St. Peter's Basilica, Vatican.*



*Division of the Frankish Empire Among Charlemagne's Grandsons, 843 A.D.*

Charles the Bald      Lothair  
Louis the German

## Additional cultures of note

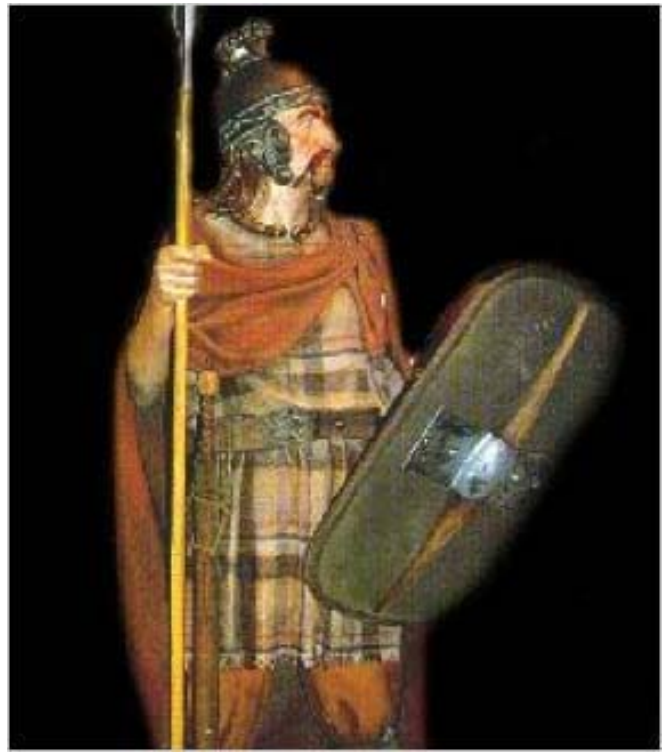
In addition to the Basque in the area of the Pyrenees in southern France, there are a number of other cultures with unique ethnic or linguistic identities in Western Europe. Among them are the Normans of northern France. Descended from Viking settlers who arrived sometime during the rule of the Frankish kings, the Normans controlled a powerful region known as Normandy. Their territories were subject to the French crown, which countenanced them in exchange for protecting the northern coast against other Viking raids.

Just to the west of Normandy was Brittany, named after the Celtic Britons who arrived there from the British Isles in the 5th century. Some scholars believe that the migration may have been due to the Anglo-Saxon invasion of England after the collapse of the Western Roman Empire. Brittany resisted the Frankish kings and remained independent until 1532. It is one of the few places where Celtic languages are still spoken.





*Basque-American girl*



*Celtic warrior*

## Did You Know?

Many people think that Henry Ford invented the modern automobile, but it was two German engineers, Karl Benz and Gottlieb Daimler, who each independently came up with the concept around the same time. Teaming up with a French partner, Emile Roger, Benz was selling cars in Germany and France by 1888.

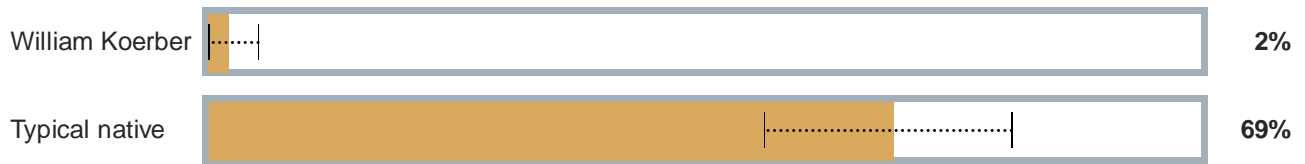
## Middle East

*Primarily located in:* **Syria, Iraq, Saudi Arabia, Jordan, Oman, Yemen, United Arab Emirates (UAE), Lebanon, Israel**

*Also found in:* **Iran, Pakistan**

Geography and human history have kept this region perpetually in the spotlight. It sits between Eurasia and Africa and is home to some of the world's earliest civilizations. It is also the birthplace of three of the world's major religions—Judaism, Christianity and Islam—with the most holy places of those faiths scattered from Jerusalem to Mecca. Since it was first inhabited, this vital region has been a natural center of learning, trade, culture—and conflict.

## How William Koerber compares to the typical person native to the Middle East region

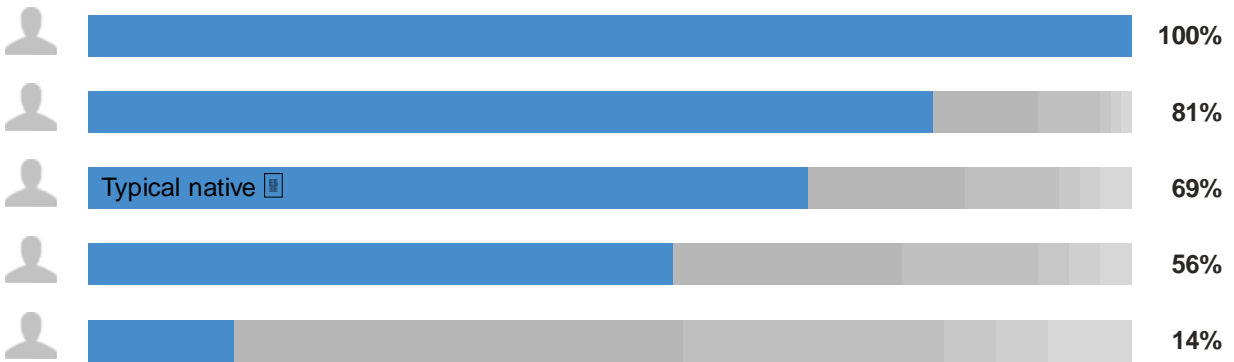


## Genetic Diversity in the Middle East Region

People living in the Middle East region today are admixed, which means that when creating genetic ethnicity estimates for people native to this area, we frequently see similarities to DNA profiles from other regions. We've found that approximately 69% of the typical Middle East native's DNA comes from this region.

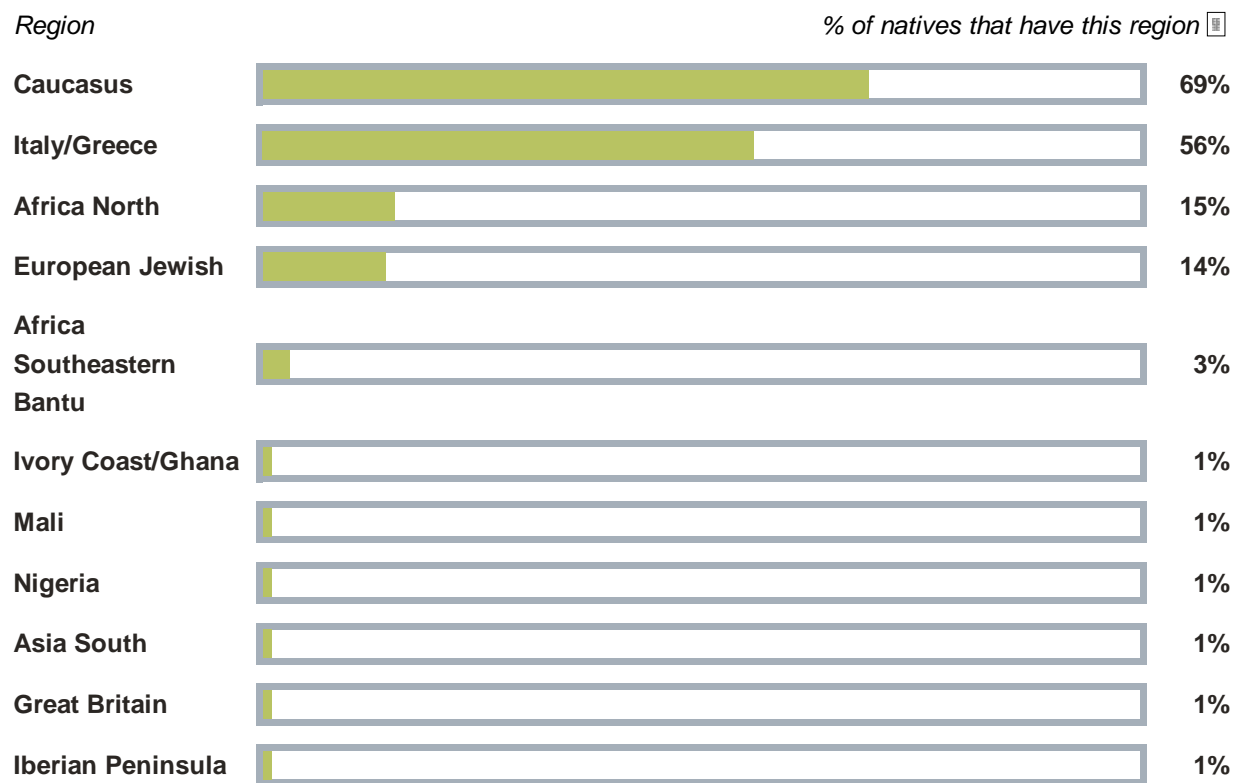
## Examples of people native to the Middle East region

From a collection of 153 people



## Other regions commonly seen in people native to the Middle East region

From a collection of 153 people



We have used our reference panel to build a genetic profile for the Middle East region. The blue chart above shows examples of ethnicity estimates for people native to this region. For the Middle East region, we see a very wide range. While 69% of a typical native's DNA comes from this region, some have as little as 14% or as much as 100% of their DNA that looks similar to the Middle East profile. For people with DNA similar to other regions, the most common is the neighboring Caucasus region, followed by Italy/Greece. (See the green chart above.)

## Population History

The Middle East region includes the eastern Mediterranean coast (also known as the Levant), the Arabian Peninsula and Iraq. Because of its unique geography and long history of habitation, the area has seen plenty of different rulers. These include the Sumerians and Akkadians, among the earliest civilizations in the world, and the mighty Persian Empire, which fought the ancient Greeks at Thermopylae and Marathon. Foreign conquerors, such as Alexander the Great and the seemingly ubiquitous Romans, also dominated the area in their day. The modern cultural landscape began to take shape with the rise of Islam and the great Muslim conquests of the 7th century A.D.

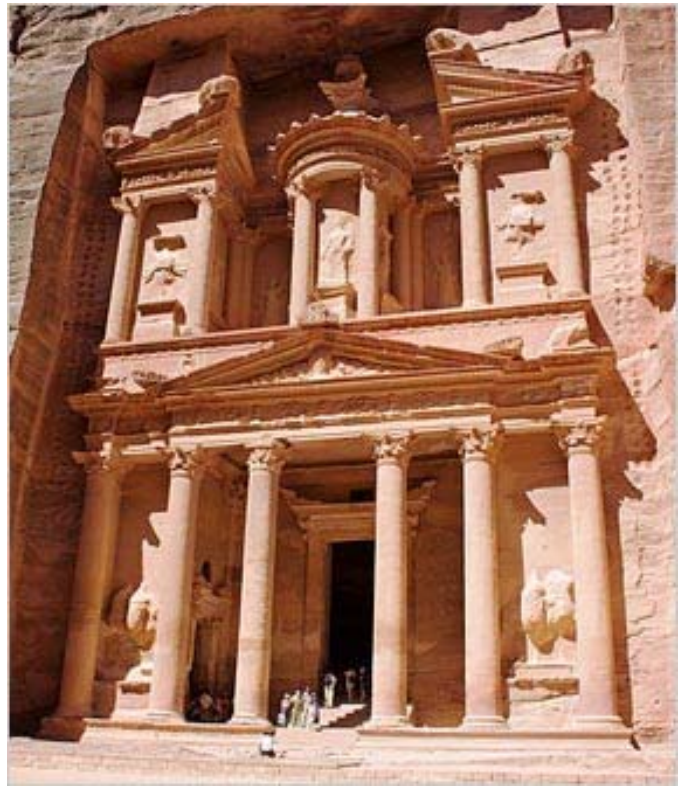
As Islam spread outward from the Arabian Peninsula, so did the Arabic language, by far the most widely spoken language in the region. But "Arab" as an identity is a broad term that encompasses many diverse ethnic groups: the historically nomadic Bedouin of the Arabian Desert and the Palestinians, Syrians and Druze of the Levant are only a few. Although the vast majority of Arabs are Muslim, there is a significant Arab Christian minority, as well.

Today, 42% of all Jews live in the State of Israel. According to the Hebrew Bible, the Jews, or Israelites, are descended from Abraham. A Sumerian, Abraham traveled west to the land of Canaan (Palestine), which lay along the eastern coast of the Mediterranean. For much of their history, the Israelites were ruled by other empires, including the Babylonians, Persians, Assyrians, Romans and Ottoman Turks. But there were two periods of self-rule as well, including the reigns of David and his son Solomon.

During World War I, the Arabs helped the British defeat the Ottoman Empire, and the region was divided into French



*Alexander the Great. Detail of The Alexander Mosaic.*



*Petra's Treasury (al-Khazneh) in southern Jordan. Petra was one of the first cities to fall to Muslim armies in the 7th century. Photo by David Bjorgen.*

and British Mandates, which more or less defined the current national boundaries. After World War II, the British withdrew from the Palestinian Mandate, leaving the United Nations to divide the region into two states: one Arab and one for the Jewish Diaspora. The division ignited decades of fighting that still influence global politics to this day. The discovery of oil in the mid-1900s transformed the nations of the Arabian Peninsula and the Persian Gulf, catapulting them from among the poorest in the world to some of the richest.





*Soldiers in the Arab Army, circa 1916*

## **Migrations into this region**

About 60,000 years ago, modern humans began a dramatic population expansion out of Africa. The first stop on this journey was the Middle East. For thousands of years, the Arabian Peninsula and the Levant were likely continually occupied, resulting in a broad pool of genetic diversity in this region. Additionally, The Middle East was a waypoint for people moving to and from North Africa, Central Asia and Europe.

## **Migrations from this region**

The southern Arabian Peninsula is thought to be the source of a dramatic migration, some 50,000 years ago, along the coasts of the Indian Ocean. Following this southern coastal route, these early people likely exploited marine resources and migrated from Arabia into India and southeastern Asia, eventually reaching Australia. The Middle East has also significantly influenced European populations, being the basis of the occupation of Europe by modern humans 45,000 years ago. After the invention of agriculture, Neolithic farmers spread into and throughout Europe, contributing to a rise of genetic similarity between the two regions.

The dispersal of Jewish populations from the Middle East is thought to have begun 2,500 years ago. Although some Jewish populations remained in this region, others eventually dispersed to North Africa, Europe, Central Asia and even India.



The Jewish Diaspora

■ Migrations

## Did You Know?

While this area is better known for deserts or the Mediterranean climate along the coasts, you can actually ski at six different resorts in Lebanon.

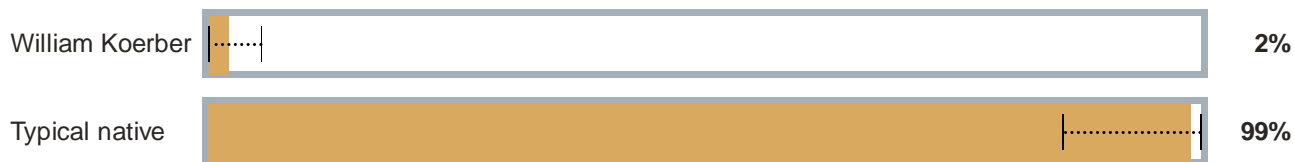
## Finland/Northwest Russia

*Primarily located in:* **Finland, Russia (northwest)**

*Also found in:* **Estonia, Latvia, Sweden, Lithuania**

Finland is one of the Nordic nations, straddling the Arctic Circle north of continental Europe. Although it shares long borders with the Scandinavian nations of Sweden and Norway, Finland stands apart in both language and ethnic identity. Politically controlled by its neighbors Sweden and Russia through much of its history, Finland today is a strong, independent nation with a unique, ancient heritage.

## How William Koerber compares to the typical person native to the Finland/Northwest Russia region



## Genetic Diversity in the Finland/Northwest Russia Region

Individuals from the Finland/Northwest Russia region are less admixed, which means that when creating genetic ethnicity estimates for people native to this area, we sometimes see similarities to DNA profiles from other nearby regions. We've found that approximately 99% of the typical native's DNA comes from this region.

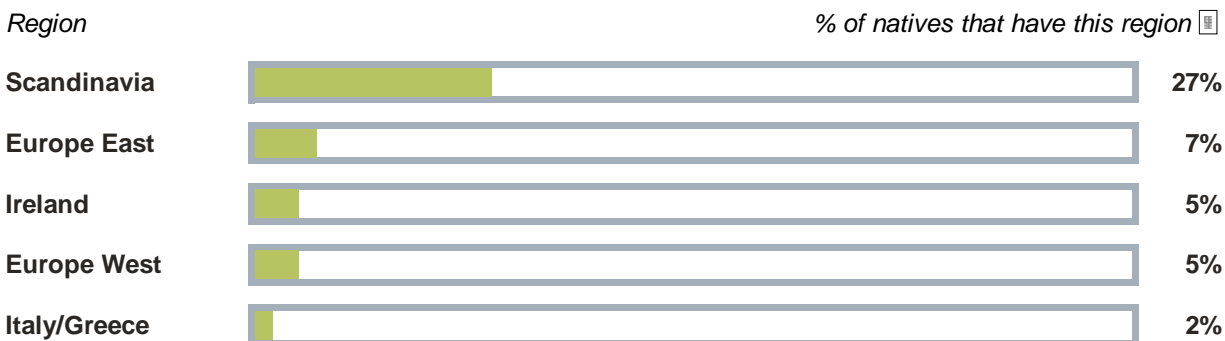
## Examples of people native to the Finland/Northwest Russia region

From a collection of 59 people



## Other regions commonly seen in people native to the Finland/Northwest Russia region

From a collection of 59 people



We have used our reference panel to build a genetic profile for Finland/Northwest Russia. The blue chart above shows examples of ethnicity estimates for people native to this region. Most natives of Finland/Northwest Russia have very little (if any) DNA shared with neighboring regions. However, there are some exceptions—a small minority of

people's DNA shows only 59% similarity to this profile. In addition, about 27% of individuals from this region have at least some DNA similar to Scandinavia (chart in green).

## Population History

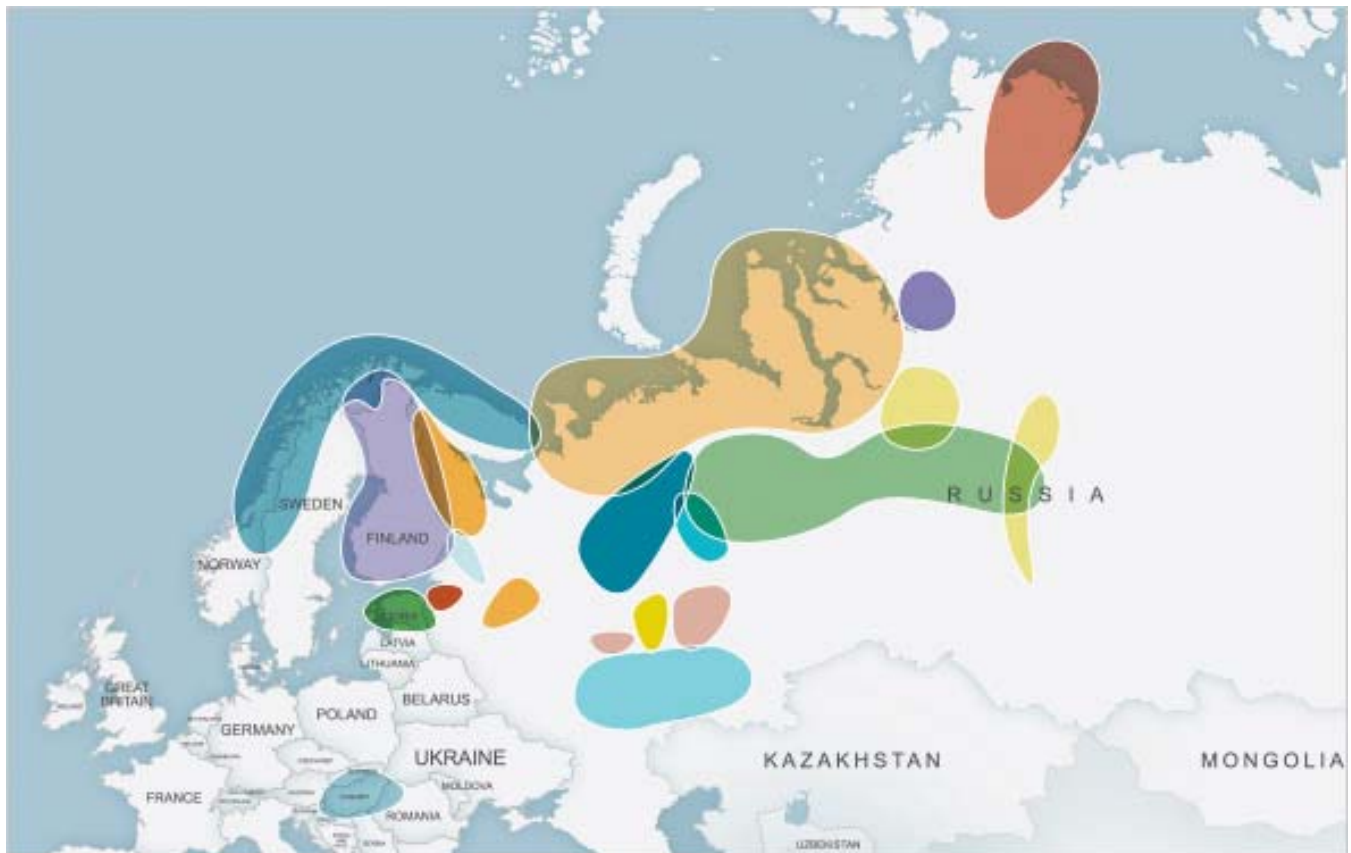
### The people

The Finnish region (Suomi) includes modern-day Finland and northwestern Russia. The majority of the people of the region today speak Finnish, which is completely unrelated to its Germanic and Slavic neighbors. It is more closely related to languages such as Estonian, Hungarian, Sami and Mordvinic (Erzya and Moksha), which are part of a common Uralic language group.

### Prehistoric Finland

The Proto-Uralic peoples are thought to have inhabited the central Ural Mountains east of modern Finland, from around 5000 B.C. to 8000 B.C. The Finnic and Ugric tribes that spread west into eastern and northern Europe were descended from the Proto-Uralic people. Linguistic experts believe that one of those tribes, the Sami people, inhabited modern-day Finland before the Finns. Considered the indigenous population of Finland, the Sami were forced farther north as the Finns later expanded into the region from modern-day Estonia.

**A map showing the location of Uralic languages today:**



- |            |                    |           |            |
|------------|--------------------|-----------|------------|
| ■ Sami     | ■ Enets            | ■ Vepsian | ■ Erzya    |
| ■ Finnish  | ■ Ingrian & Votian | ■ Khanty  | ■ Mari     |
| ■ Estonian | ■ Komi             | ■ Nenets  | ■ Nganasan |



■ Karelian  
■ Mansi

■ Udmurt

■ Selkup

■ Hungarian

## The medieval and modern eras

Finland was politically controlled by Sweden from the 12th century and throughout its medieval period. After 1581, the kings of Sweden regularly bestowed the title of “Duke of Finland” upon members of the Swedish royal family. The Finnish War between Sweden and Russia resulted in the Russian Emperor becoming the Duke of the Grand Duchy of Finland, an autonomous part of the Russian Empire from 1809 to 1917. Since December 1917 Finland has been an independent country.



*Naval battle in southeast Finland in 1790 during the Russo-Swedish War. Painting by Johan Tietrich Schoultz.*

## Other groups in the Finland area

Extended Swedish rule and immigration along the coast resulted in a significant population of Swedish speakers in the southwestern parts of Finland and intermixing of these ethnic groups. The northwestern corner of Russia bordering Finland is home to a subgroup of ethnic Finns referred to as Karelians. The Karelian language is closely related to the Finnish language and is considered by some to be a Finnish dialect. Others view Karelian as a distinct language.

Modern Finland is mostly homogeneous, ethnically, with the major ethnicity being Finns. The population of Finland in 2012 was 5.4 million. **The map (right) shows the location of the small Sami minority in the north and the Swedish minority in the southwest.**

Interestingly, a DNA study in 2008 showed no significant differences between the Swedish- speakers in the Ostrobothnia region of Finland (where 40% of all Swedish speakers in Finland live) and the adjacent Finnish-speaking populations.



*A Sami man and child, circa 1900. National Library of Norway.*

**Finland today**

Like the other Nordic countries, Finland has a highly egalitarian society with strong state-run social programs, including a comprehensive welfare system, education and health care. Finland is often rated among the world's best in education, economy and quality of life. Finland is the only Nordic country to have joined the eurozone, replacing their previous currency, the markka, with the euro.

## **Did You Know?**

The area north of the Arctic Circle is often referred to as the Land of the Midnight Sun. In June and July, the sun shines all day and all night in the northern-most parts of this region.