



## Mr Smith's Results

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**At last, science can help you answer the compelling questions: Who am I? Where does my genetic path begin?**

GPS Origins™ will uncover your ancestry, specifically the journey of your DNA which shaped who you are today.

Learn about the distinct genetic communities that share your origins, the routes your DNA traveled, and why it settled in particular places. Your DNA reflects exciting events throughout evolutionary history!

GPS Origins unique algorithm, developed by Dr Eran Elhaik and his team at the University of Sheffield, identifies with unprecedented accuracy where and when the key parts of your genetic makeup were formed.

Let's begin your journey.....

## HUMAN ORIGINS : OUR SHARED HISTORY TO YOUR STORY

The questions of who we are and where we come from have been asked for throughout our history. Once we explained our origins with mythology and folklore but now we utilize modern science to answer them.

Genetics help us tell the story of our origins from the beginning, through the formation of the human gene pools and to the last 2000 years of history.

The test results you have just received, along with the following information, will help you understand your personal story, from the shared history of all humans to your unique family story.

### From Sea to Land: Our Shared History

Our origins lie far beyond the first appearance of humans, with an evolutionary story common to many forms of life on earth. About 360 million years ago fish-like creatures ventured out of the Devonian Sea and became the first reptiles. After hundreds of millions years of evolution the mammals emerged after the extinction of the dinosaurs 65 million years ago thrust them into the evolutionary spotlight, and allowed them to expand into the world the dinosaurs left vacant.

Our human story really begins with the origin of primates, which split away from the other mammalian groups between 65 and 80 million years ago. It would be at least another 60 million years before the appearance of the species Ardipithecus, an ape that evolved from the Old World Monkeys and is regarded as the first fossil human ancestor.

Fossil finds from Ardipithecus in Ethiopia date it to between 4 and 6 million years ago.<sup>12</sup> This species could walk on two legs like humans but shared other characteristics with chimpanzees. Ardipithecus further developed into a number of lineages found throughout East Africa and South Africa that are known as the

Over the next 3 million years, many Australopithecine species appeared in Africa but they evolved little; their brains remained roughly the same size as those of chimpanzees and they did not use tools. Around 3 million years ago, the subspecies *Homo habilis*<sup>14</sup> began using stone tools, and by 1.5 million years ago the fire-mastering *Homo erectus* appeared. Fossils reveal that *Homo erectus* had a much bigger brain than its Australopithecine ancestors. This subspecies began spreading across much of Africa, Asia, and the Middle East, while the Australopithecines began to disappear.<sup>15</sup>

Next, a new human subspecies, the Neanderthals, appeared. They evolved from a *Homo erectus* relative outside of Africa and had spread widely throughout Europe and the Middle East 500,000 years ago.<sup>16</sup> Neanderthals had stocky builds and thick limbs and were specially adapted to the Ice Age conditions. There is evidence that Neanderthals buried their dead, a practice once thought exclusive to modern humans,<sup>17,18</sup> which raises questions about the nature of the Neanderthal's genetic contribution to modern humans.<sup>19</sup>

## **Africa: The First Modern Humans**

It is thought that the ancestor of modern humans is one of the *Homo erectus* relatives, which appeared in East Africa sometime between 100,000 to 200,000 years ago.

Many different ancient human species also evolved outside Africa, and persisted for more than a million years of geologic time. Their fossils have been unearthed in Europe, Southeast Asia, and China. Yet this diversity had all but disappeared by 100,000 years ago, and human fossils became remarkably uniform across the globe.<sup>23</sup>

The theory that has become known as the Out of Africa model began with a study in the late 1980s, investigating small changes in the DNA carried by the mitochondria - the DNA passed down by the mother.<sup>24</sup> The study analyzed DNA changes in the mitochondrial genome, and surmised that all humans diverged from a single ancestor living 200,000 years ago in Africa. While this does not indicate that there was just one mother, or 'African Eve', for all humanity, the results suggested that all humans alive today descended from a single population residing in Africa more recently than any of the previously mentioned early human species.

The Out of Africa model has also been applied to research on the Y chromosome.<sup>25,26</sup> This chromosome is found only in male lineages and passed down through the generations, unchanged for the most part. A recent study estimates that the 'African Adam' lived 208,000 years ago.<sup>27</sup>

## **Beyond Africa: Colonizing the Continents**

Mitochondrial and Y chromosomal DNA have been our primary tools for deciphering the human story because each person receives only one copy from each parent. Mitochondrial DNA is passed down from the mother and Y chromosomal DNA from the father, allowing scientists to track the ancestry of both the maternal and paternal lines. Perhaps one of the most interesting stories told by the mitochondrial and Y chromosomal DNA is how humans colonized the world.

The earliest human migrants appear to have reached Southern China some 80,000 years ago<sup>28</sup>, and DNA studies suggest they may have interbred with Neanderthals on their way through the Middle East.<sup>29</sup> They then spread to the rest of Asia along a route that probably tracks south of the Himalayas and into East Asia between 50,000 and 60,000 years ago,<sup>30</sup> possibly interbreeding with another subspecies known as the Denisovians.<sup>31</sup>

Archaeological and genetic evidence indicate that modern humans crossed the ocean from Southeast Asia and reached the islands near the tropical Pacific area of Oceania as far back as 50,000 years ago, probably in

small water craft.<sup>32</sup> At the same time, populations spread to Europe through Turkey and into Central Asia. Some of these Central Asian migrants subsequently moved westward from the Ural Mountains and may be represented today by the peoples of Northern Europe and of the Baltic region, such as the Sami people.

Climate and geography delayed further migrations of modern humans into other areas of the world. Much of northern Eurasia was extremely cold during the last Ice Age (11,000 to 12,000 years ago) and human populations remained small and isolated. A small group of people from Siberia, however, managed to reach North America around 18,000 years ago<sup>33</sup> by way of a land bridge that existed when sea levels were lower. They moved south, and by 15,000 years ago, began to populate South America.

There were several more migratory waves to the Americas with the most recent being the Inuit, who colonized the Arctic of North America between 4,000 and 6,000 years ago.

Asian migration also continued eastwards to Oceania. The large islands of Oceania that are closest to Asia have been inhabited for at least 30,000 years, while the most isolated islands of Northeastern Oceania remained uninhabited until just 3,500 years ago.<sup>34,35</sup> The people who made the first voyages into this region were Austronesians, a group that emigrated from an area around present day Taiwan and are today known as Polynesians.

But as the last Ice Age came to an end and the climate warmed, a human cultural revolution was about to start, and it began in the Middle East.

## **Agriculture and the Growth of Civilization**

The transition from hunter-gathering to farming occurred in the Middle East between 10,000 and 12,000 years ago,<sup>36</sup> and between 9,000 and 10,000 years ago in China<sup>37</sup> and parts of the Americas.<sup>38,39</sup> By 5,000 years ago agriculture had facilitated the rise of some of the first large civilizations such as Mesopotamia in West Asia,<sup>40</sup> the Maya in Central America,<sup>41</sup> and the earliest Chinese civilizations along the Yangtze.<sup>42</sup>

Early farming cultures then expanded into new areas. Farmers from the Middle East brought agriculture to Europe and rice farming travelled with groups across East Asia. This expansion was accompanied by a genetic reshuffling as different groups came into contact and reproduced. Such reshuffling has been a continuous process over the last 10,000 years.

Genetic research has played a key role in understanding the migrations that took place during this period. Mitochondrial DNA lineages have been used to confirm and enhance archaeological interpretations such as tracing the ancestry of Norse and Gaelic populations, and Y chromosomal studies have been used to track male lineages in studies of Oceania.

## **Genetic Origins (Gene Pools): The Key to Identifying Your Ancestral Communities**

As humans traversed the globe and colonized different continents, each group accumulated small differences in their DNA. Most of these differences or mutations occurred in the X-chromosome and autosomal chromosomes that are inherited from both parents and allows us to follow the particular journeys made by each human group.

Some genetic roads diverged, not meeting again until modern times, while others led back to one another as genetically distinct groups. The accumulations of mutations in people from different areas of the world are what allow us today to distinguish various groups from one another.

DNA mutations may have occurred by the custom of marrying within a tribe, class, or social group, creating a group of people who were more similar to one another genetically than they were to their ancestors and neighboring groups - in other words, creating a new gene pool or genetic origin..

It's hard to know exactly how many gene pools there are because every genetic background includes “gene puddles” where small, isolated groups of people married only within their local group, acquiring and maintaining unique mutations over time. At this time, scientists have identified about forty gene pools from all over the world. Over time, some of these gene pools spilled toward each other, particularly those in Eurasia, whereas other pools remained more constant.

## **Recent History and the Genetic Melting Pot**

As ancient peoples traded, conquered, enslaved and fell in love, they spread their genes, along with their unique mutations, across larger areas at an increasingly rapid pace, interweaving previously distinct parts of the original gene pools. If in the past, human groups diverged from one another and became genetically distinct, populations coming together creating new genetic tapestries out of the original genetic origin. Today, every one of us is the product of these historical genetic exchanges: it is extremely rare to find individuals whose DNA belongs to a single gene pool.

Because the X and autosomal chromosomes contain the accumulated mutations that correspond with different gene pools, they provides a more nuanced picture of historical interactions in the past. Your genetic origin results will show you how your genome is linked to the human story of the populations who lived 60,000-15,000 years ago.

## **Empires, Pandemic and More Migration: Your Story in the Modern World**

The past 2,000 years of human history have seen the rise and fall of empires that spanned entire continents, such as the Persian, Roman, Mongol, Arab Caliphate and most recently, the British Empire.

The expansion of European empires brought European DNA to many different parts of the world such as Australia, Asia and particularly the Americas, where the intermingling of Europeans and native tribes has led to many central and south Americans having mixed ancestry.

Pandemics, such as the Black Death in Europe and smallpox in the Americas caused widespread devastation. Conquests by Viking raiders reshaped entire cultures and identities. All of these events have left their mark in the DNA of present-day populations.

Countries such as the United States, which have experienced large waves of migration from different areas in the last two hundred years have facilitated the further mixing of many different gene pools.

Between the 17th and 19th centuries, slave trade brought as many as 650,000 Africans to the United States along with nearly 4.5 million Irish people who escaped famine and poverty between 1820 and 1930. Other groups to entered the United States between the mid-19th and early 20th centuries which included about 5 million Germans, over 2 million European jews, 4 million Italians, and up to 300,000 Chinese.

Consequently, these migrations merged gene pools that had, thus far, remained largely separate due to geographical barriers. Many Americans and British now share genetic origins with up to a dozen different gene pools, some of which have diverged more than 60,000 years ago, such as the European and Native American gene pools.

Your GPS Origins results reveal your genetic origins and the journey your DNA has made with end-points

recorded each time the DNA has markedly changed through intermarriages.

For example, if you have Scottish ancestry your results could show that you are a descendant of the Viking ancestors who arrived in the Medieval era, but did not mix with Scots and retained their Danish origin. If you are African American, you may learn about connections to the Bantu peoples and the pre-colonial trading kingdoms in West Africa. If you are an Ashkenazic Jew, you might find your path leads to the ancient Ashkenaz in northeastern Turkey.

Ongoing genetic research of archaeological remains could mean that, in the future, you may be able to match your background with a range of individuals - whether that is an ancient Mayan King found in a temple complex in Guatemala, a warrior from a Viking boat burial or a flint-knapping craftsman from Mesolithic Germany. The human story, as told through our genes, is only the beginning.

You are now ready to discover your genetic path.

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## Mr Smith's Gene Pool %'s Complete Results

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### # 1 Sardinia 16.3%

**Origin:** Peaks in Sardinia and declines in weaker in Italy, Greece, Albania, and The Balkans

### # 2 Southern France 11.9%

**Origin:** Peaks in south France and declines in north France, England, Orkney islands, and Scandinavia

### # 3 Basque Country 9.7%

**Origin:** Peaks in France and Spain Basque regions and declines in Spain, France, and Germany

#### # 4 Fennoscandia 9.1%

Origin: Peaks in the Iceland and Norway and declines in Finland, England, and France

#### # 5 Tuva 9.1%

Origin: Peaks in south Siberia (Russians: Tuvinian) and declines in North Mongolia

#### # 6 Northwestern Africa 8.3%

Origin: Peaks in Algeria and declines in Morocco and Tunisia

#### # 7 Western Siberia 7.4%

Origin: Peaks in Krasnoyarsk Krai and declines towards east Russia

#### # 8 Southeastern India 7.3%

Origin: Endemic to south eastern india with residues in Pakistan

#### # 9 Arabia 5.3%

Origin: Peaks in Saudi Arabia and Yemen and declines in Israel, Jordan, Iraq, and Egypt

#### # 10 The Southern Levant 5.1%

Origin: This gene pool is localized to Israel with residues in Syria

#### # 11 Northern India 4%

Origin: Peaks in North India (Dharkars, Kanjars) and declines in Pakistan

#### # 12 Orkney Islands 3.3%

Origin: Peaks in the Orkney islands and declines in England, France, Germany, Belarus, and Poland

#### # 13 Western South America 1.6%

Origin: Peaks in Peru, Mexico, and North America and declines in Eastern Russia

#### # 14 West Africa 1.6%

Origin: Peaks in Senegal and Gambia and declines in Algeria and Mororrco

## Mr Smith's Gene Pool Stories

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# 1.Sardinia Story



For many years the island of Sardinia has fascinated geneticists and anthropologists because of its long history of genetic and geographic isolation. While the people of this island are associated with a characteristically Mediterranean appearance, such as dark hair and eyes, and olive skin, they have a unique history within the Mediterranean region. Natural barriers and the effects of diseases such as malaria<sup>1</sup> have led to the development of separated communities within the island.<sup>2</sup> These communities have become identifiable from each other not only by differences in cultural practices but also by genetic studies.<sup>3-5</sup> Sardinia is of particular fascination for scientists interested in heritable disease risk,<sup>6</sup> as the genetic constraints caused by the small founding population (prior to the advent of farming in the Neolithic period) may have led to high rates of multiple sclerosis amongst Sardinians today.<sup>7</sup>

Evidence for human habitation in Sardinia extends back to the middle Paleolithic period. A stone tool culture that was distinct from neighboring regions had appeared by 15,000 years ago.<sup>8</sup> Deer hunting was a major part of Paleolithic subsistence.<sup>9,10</sup> The arrival of farming is associated with a subsequent rise in population. Complex civilization developed during the Bronze Age between 3,000 and 4,000 years ago, and fortified towers known as Nuraghe began to be built.<sup>11</sup> Bronze Age Sardinia traded within a network of ancient societies that was centered in the Central and Eastern Mediterranean.

Between 2,700 and 2,800 years ago, the Phoenicians of the Eastern Mediterranean brought Sardinia within their trading empire, marking the island's first appearance in historical records. Later, Carthaginians disrupted the Greco-Roman influence and asserted control over all Sardinian trade. There remained, however, little evidence for major migration into Sardinia except for a small number of Carthaginian elites.<sup>12</sup> This period of comparative stability under Carthaginian influence lasted until the Punic Wars in the 3rd century BC, which brought the island under direct control of Rome. This led to a political process that turned the island into a Roman province.<sup>13</sup>

When the Roman Empire split into western and eastern sections, the eastern portion was reformed as a new political entity known as the Byzantine Empire, in which Sardinia was included. The Byzantines faced threats from the Arabs to the south as well as other external raiding groups coming from other areas within Europe. Arab raids on the island that occurred between 807 and 813 AD caused significant disruption of economic activity in Sardinia, although there was no substantive colonization of the island by these invaders.

The island became isolated during this period of instability.<sup>12</sup>

Between the 8th and 10th centuries, Sardinia became increasingly autonomous and a local system known as the Giudicati or 'judges' developed on the island. In subsequent centuries there was an increasing frequency of interactions with Italy and papal influences, resulting in the establishment of monastic orders. Rivalry among the Italian states of Pisa, Genoa and the Catalonian Crown of Aragon led to the formation of a Kingdom of Sardinia. After this period, the Kingdom of Sardinia was subsumed into the unified Italian state in which it remains to the present day.<sup>14</sup> Sardinians began to migrate from the islands to the Americas during the late 19th and early 20th centuries to both South America and the United States.<sup>15</sup>

Sardinia is unique within Europe in that there has been relatively little documented migration to the island from surrounding areas since the beginning of the Bronze Age. Despite such genetic isolation, Sardinia has a long history of interaction with its Mediterranean neighbors in terms of both trade and political union, particularly Italy and the Eastern Mediterranean. This has made the region extremely attractive for geneticists, and many studies have looked at the various populations on the island.

Recent genetic investigations described Sardinians in the central-southern and mountain areas as a heterogeneous population. Today's Sardinians are known to exhibit unique genetic signatures that indicate their village of origin.<sup>16</sup>

Future genetic tests may be able to place an individual's ancestry within the many distinct parts of the island. For example, these genetic tests may be able to link Eastern Mediterraneans to ancient trade with Phoenicians, Greeks, and Romans or Arabic raiders from coastal areas.

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## 2.Southern France Story



Southern France was a major crossroads of Europe with multiple waves of human migration. The people of Southern France today appear to share many common features in appearance with their Mediterranean neighbors. At the same time, the region's position within Europe to the west of the Alps made it easier for people to move between north and south.

Southern France and much of the surrounding area was inhabited by Neanderthals during the Paleolithic era, who became extinct upon the arrival of modern humans between 35,000 to 50,000 years ago.<sup>1</sup> The area was situated at the edge of the Paleolithic ice sheets and was a refuge for people pushed back by worsening climate conditions further north, creating constant movement in and out of the region. The earliest modern humans that arrived in Southern France were Ice Age hunter-gatherers. These people are famous for producing some of the earliest cave paintings known to exist - in the limestone caves of the Pyrenees.<sup>2</sup>

Hunter-gatherer migration persisted for thousands of years and population density remained low. The development of agriculture in the Middle East and its spread into Europe - which started about 12,000 years ago<sup>3</sup> - brought major changes to the region, as large-scale migration of people occurred along the southern corridor of the Alps. These people brought with them their languages, which are believed to be part of the Indo-European language family which exists all over Europe today.<sup>4,5</sup> Nearly all of the currently spoken languages in Europe are thought to relate to this expansion of early farmers. In Southern Europe, this migration south of the Alps links the Latin languages of Italy, Spain, and France, while Germanic languages are found north of the Alps.<sup>6</sup> This suggests that the early farming cultures that arrived in France came through the south and proceeded north.

A Bronze Age culture developed by 1000 BC,<sup>7,8</sup> with settlements throughout Southern France. Over the next thousand years, Iron Age societies began to appear throughout all of France, and became unified as a culture known as the Celts.<sup>9</sup> These Celtic societies formed strong links throughout France and into other parts of Northern Europe. These societies were eventually overwhelmed by the Romans who conquered all of present day France, turning it into the Roman province of Gaul.<sup>10</sup> After the breakup of the Roman Empire, the southern area of France has generally remained within the borders of the Kingdom of France, with economic practices firmly rooted in the cultures of the Mediterranean.

The diversity of languages in the region may hint at populations that were ethnically and culturally distinct from one another. Catalan, Aragonese, and Gascon are Indo-European languages related to the French that are spoken in other areas of the Pyrenees today.<sup>11</sup> Aragonese and Gascon have been in decline in recent

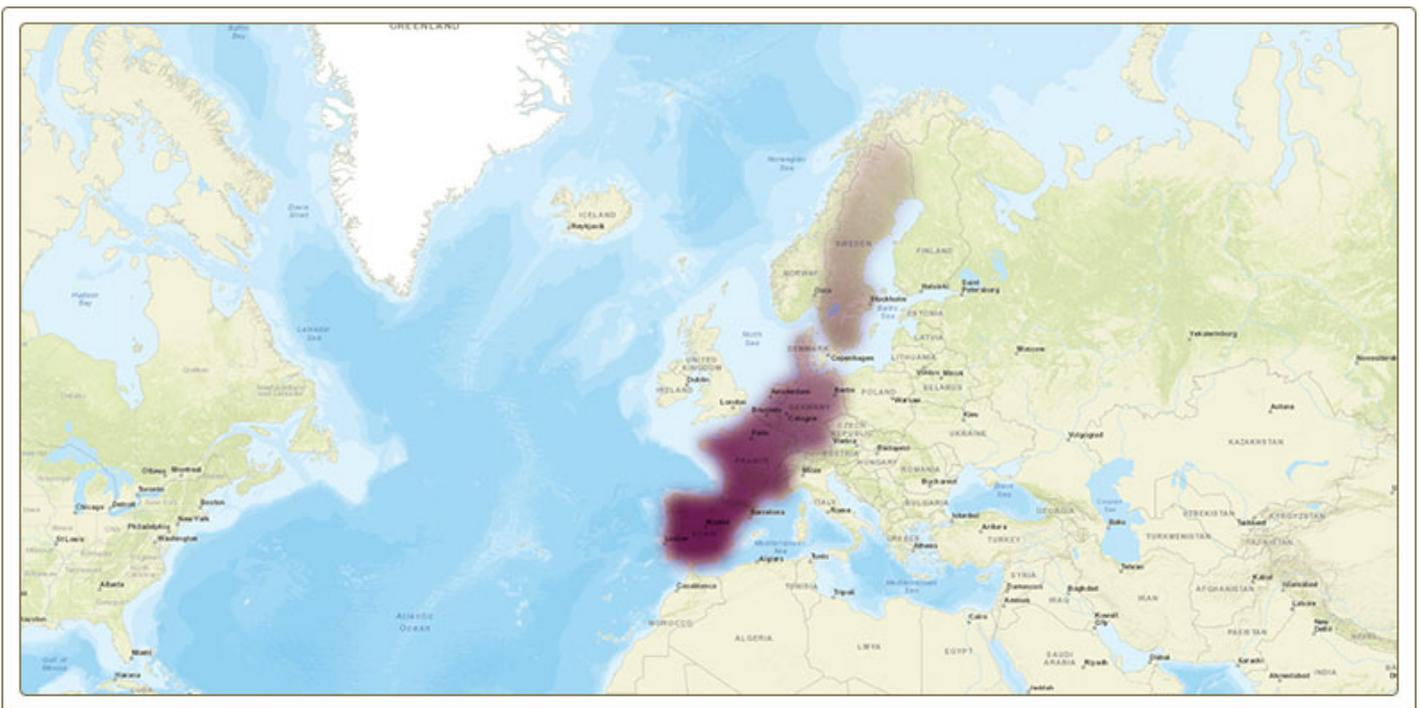
centuries. While it may not be possible to link these populations back to the earliest societies in the area, they do provide some grounds for investigating local genetic ancestry.

Future genetic testing may be able to distinguish between early hunter-gatherer influences and later agriculturalists. There have been some studies that have found links between Southern France and its Mediterranean neighbors.<sup>12</sup> Research has also found genetic contributions from other Semitic and North African migration events. In the future, we may be able to distinguish these genes as well. It may also be possible to determine which specific Southern France groups (Catalan, Aragonese, or Gascon) an individual may be related to and what languages their ancestors used to speak.

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## 3. Basque Country Story



At first glance the Basque appear to be similar to their surrounding neighbors in the Western Mediterranean,

but they hold a unique position within Europe. Their language, history, and importantly, their genes, indicate that they descend from the pre-agricultural societies that existed when hunter-gatherers roamed Europe.<sup>1</sup>

Europe was populated in multiple waves of migration. The first modern humans to arrive in the Basque Country - an area in the Western Pyrenees along the Atlantic coast that spans the border of modern-day France and Spain - were hunter-gatherers from Africa that appeared during the Paleolithic period about 50,000 years ago. Being at the southern boundary of the ice sheets, the area acted as a refuge for people pushed south during particularly cold periods.<sup>2-5</sup>

Agriculture in Europe developed after the end of the last Ice Age. Farming cultures then spread into Europe between 7000 and 3000 years ago, with southern and eastern areas adopting agriculture first and northwestern areas, such as Britain, last.

The European languages that we know today are classified as Indo-European languages, and are attributed to these early farmers whose cultural relationships have been discovered across large parts of Eurasia, as far afield as India.

A small number of the languages in Europe have their origins outside of the Indo-European family, such as the Finno-Ugric languages in Scandinavia. The Basque language is another isolated and ancient non Indo-European language.

The area known as Basque Country today has been inhabited since the Paleolithic period. Archaeologists have identified specific cultures such as the Magdalenian and Azilian, which were prevalent throughout the region.<sup>2</sup> These people made cave paintings and created some of the earliest identified art. The transition to early farming practices occurred in the Neolithic period from 10,200 BC to 2000 BC. Evidence indicates that there is a cultural continuity between the periods before and after the adoption of farming practices,<sup>9</sup> a pattern not typical elsewhere in Europe.

Evidence from the periods after the adoption of farming show the people of the Basque region participating in many of the customs observed elsewhere in Europe, with stone monuments such as dolmen (a type of single-chamber megalithic tomb) appearing.<sup>10</sup>

The Basque were first identified in recorded history by the Romans<sup>11</sup> and maintained their separate identity within the Roman Empire. However, they were not averse to learning from the Romans or fighting as part of their armies. Basque military units could be found as far away as Northumberland in England.<sup>12</sup>

The Basque region maintained a level of cultural individuality beyond the end of the Roman era and into the Middle Ages. A nominally Basque political entity originally known as the Kingdom of Pamplona and later as the Kingdom of Navarre appeared in the late 1st millennium AD.<sup>11</sup> This was a Christian Kingdom during a time of Muslim influence in Spain. The Kingdom of Navarre was ultimately incorporated into the Spanish state in the 16th century, with some areas becoming part of France, where some Basque still live today.

The geography of the Basque Country contradicts many of the regions in Europe because it has a good climate and geography for agriculture. Even today, the Basque people retain a strong individual sense of their cultural identity as separate to those of their neighbors in France and Spain. Although the Basque areas are no longer culturally homogeneous, an area of the Basque region was established as a local, autonomous region within Spain in 1978.

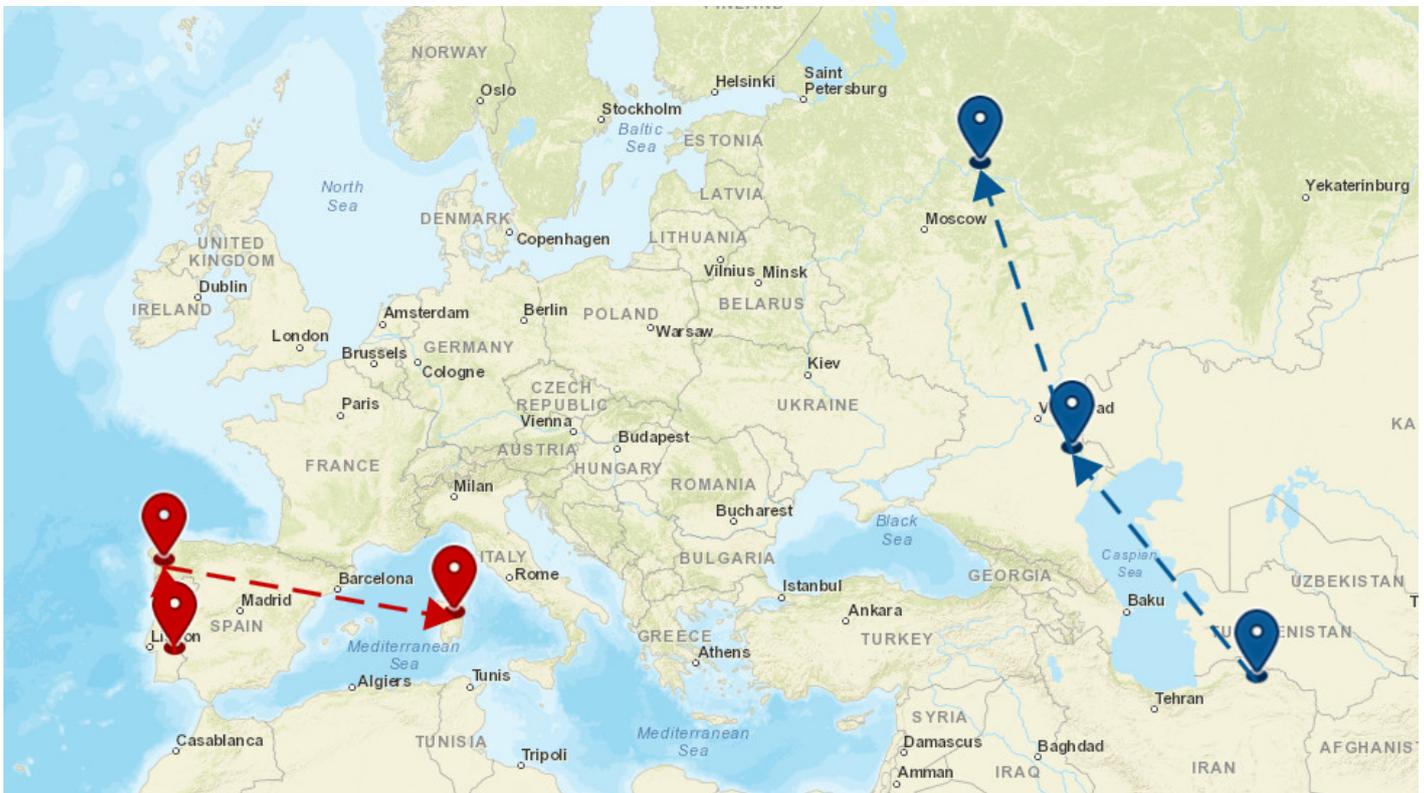
It is likely that along with further archaeological evidence, new lines of genetic research will yield answers to some of the key questions that remain about the origins of the Basques and how they fit within the spectrum of the European gene pools.

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## Mr Smith's DNA Migration Routes



### Migration Story A

Date: -1306 BC - 962 AD

Radius: 52.2258miles

Latitude: 38.34

Longitude: -7.683

## **Ancient ancestry in Portugal**

Your ancestors came from Portugal prior to 1238 AD, so let's take a look at what was going on in Portugal up to this point:

### ***The Visigothic Kingdom***

Between 410 AD and 710 AD, Portugal was ruled by local leaders in a period known as the Migration period. In the 5th century many Germanic tribes, such as the Suebi, the Visigoths and the Vandals reached Portugal. The Suebi established a kingdom encompassing much of the north of the country and the Visigoths, who later went on to dominate the whole region, the south. Both tribes picked up Catholicism from local inhabitants and gradually an ecclesiastical noble class emerged. People migrated from Germany, Poland, and the Czech Republic and Central Europe to Portugal as the Huns in the east displaced many European groups, sparking the western migration of many Germanic people.

### ***The Brief Muslim Invasion***

Between 711 AD and 740 AD, Portugal was ruled by local leaders in a period known as al-Andalus. In the space of a few years, Spain and Portugal were conquered by an Arab-Berber army from North Africa and were included in the Umayyad Caliphate. Northern Portugal managed to evade Muslim rule and remained autonomous until the late 9th century. With the Reconquista under way, Portugal became part of a structure of powers alongside its neighboring Christian kingdoms. People migrated from North Africa and Spain to Portugal as the Muslim army, having conquered Spain, turned its attention to Portugal.

### ***The First King of Portugal***

Between 741 AD and 1249 AD, Portugal was ruled by local leaders in a period known as Early Middle Ages Portugal. In 741 the County of Portugal was established and, over the following century, garnered greater territory, influence and independence. The first king of Portugal was crowned in 1128 and, shortly after, Portugal gained independence and recaptured the remainder of its lands from Muslim rule. People migrated from Denmark, Tunisia, and Morocco and Algeria to Portugal due to Danish Vikings raiding the Portuguese coast and the arrival of an Islamic Arab army from North Africa. At the same time, populations moved from Portugal to places like Lebanon, Israel and Palestine, and Jordan and Syria as many Christian peasants left Portugal to join the Crusades in the Middle East.

## **Migration Story A**

Date: -2405 BC - 739 AD

Radius: 19.627miles

Latitude: 42.44

Longitude: -8.32

## **Movement from Portugal to Spain**

At some point before 1238 AD your ancestors moved to Spain. These are the events your ancestors would have lived through in Spain.

### ***Roman Prosperity***

Between 18 BC and 409 AD, Spain was ruled by local leaders in a period known as Roman Hispania. From 18 BC, the old Celtiberian inhabitants of Spain were culturally Romanized and, under Roman rule, saw greatly improved infrastructure and economic prosperity. Spain had a thriving trade in food, wine and metal with the Romans, and several notable Roman emperors were born in the country.

### ***The Visigothic Kingdom***

Between 410 AD and 710 AD, Spain was ruled by local leaders in a period known as Gothic Hispania. As the western Roman Empire fell, Europe saw a large migration of Germanic tribes into the west, some crossed the Pyrenees Mountains and reached Spain. The Visigoths, a tribe who had previously provided warriors to the Roman army, eventually came to dominate the whole of Spain. The Visigothic kingdom assimilated the pre-existing Roman culture and ruled until the 8th century. People migrated from Central Europe (especially Germany, France, and Italy and Switzerland) and England to Spain in a wave of Germanic tribal migrations across Europe and the settling of many Britons fleeing the Anglo-Saxon occupation of England.

### ***The Muslim Invasion***

Between 711 AD and 1249 AD, Spain was ruled by local leaders in a period known as the Islamic al-Andalus. In 711 Spain was captured by a Muslim Arab army and became a province of the Umayyad Caliphate, known as al-Andalus. Despite continued borderland warfare between the Caliphate and the Christian Reconquista, overall this was a time of great cooperation, scholarship and cultural exchange between religious groups and major scientific advances. Muslim power began to decline in the region with the fall of the Caliphate in the 11th century. People migrated from Saudi Arabia, the Middle East, and North Africa and Denmark to Spain because an Arab army conquered Spain. Muslims, especially from North Africa, began to settle across the country. Meanwhile the coast fell prey to a series of Danish Viking raids.

## **Migration Story A**

Date: 1238 AD - 1575 AD

Radius: 3.1835miles

Latitude: 40.034

Longitude: 9.208

## **Movement from Spain to Italy**

At some point after 1238 AD your ancestors moved to around Italy and once they reached there this is what they would have experienced:

### ***The Lombard Kingdom***

Between 568 AD and 774 AD, Italy was ruled by local leaders in a period known as the Byzantine era. The Lombards established their kingdom in the north and center of Italy, often adopting the pre-existing Roman culture. In the 8th century, they finally seized the last remnants of Byzantine-ruled northern Italy, including the Papacy. The Pope immediately called for aid from the Frankish King Charlemagne, who promptly defeated the Lombards, taking their crown and creating from their kingdom the Papal States. People migrated from Slovenia and Czech Republic and the Slavic countries of Eastern Europe to Italy as a result of Lombard migration to Italy and subsequent Slavic raids.

### ***The Rise of the City States***

Between 775 AD and 960 AD, Italy was ruled by local leaders in a period known as the Early Middle Ages. During this period the Frankish Kingdom, united under Charlemagne, rapidly disintegrated upon his death. Northern Italy continued to be ruled by Carolingian kings as part of the Holy Roman Empire, but there was extensive disunity and political fragmentation among the rulers. Independent city-states rose to prominence and the Byzantine south came under attack from an Arab-Muslim army extending the Umayyad Caliphate. People migrated from North Africa, Greece, and Turkey and the Arabian peninsula to Italy as the Arab-Muslim army invaded the Iberian Peninsula and conquered Sicily and Greeks were resettled in the region.

### ***The Pope Clashes with the Holy Roman Emperor***

Between 961 AD and 1299 AD, Italy was ruled by local leaders in a period known as the High Middle Ages. At the turn of the millennium, Italy remained in political turmoil but, over the following centuries, began to recover its economy. In the north the Papacy regained its authority and clashed with the Holy Roman Emperor, while merchant republics and city-states began to emerge and grow in power. Southern Italy was conquered by the Normans and, for the first time, united into one kingdom. People migrated from France and Greece and Turkey to Italy due to the Norman conquest of Sicily. As the Byzantine Empire began to decline many Byzantine Greek scholars emigrated to Southern Italy. At the same time, populations moved from Italy to places like Greece, Macedonia, Montenegro, Turkey, Georgia, and Cyprus and the Middle East as Venetian merchants settled in key trading centers across Europe and many Italian peasants and soldiers enlisted to fight in the Crusades. From 1122 Georgia hired mercenaries from Italy and Roman Catholics settled in Cyprus.

## **Migration Story B**

Date: 1279 AD - 1622 AD

Radius: 26.896miles

Latitude: 36.99

Longitude: 57.652

### **Ancient ancestry in Iran**

Your ancestors came from Iran prior to 225 AD, so let's take a look at what was going on in Iran up to this point:

#### ***The Parthian Empire***

Between 247 BC and 223 AD, Iran was ruled by local leaders in a period known as late antiquity . In the 3rd century BC, a semi-nomadic tribe, the Parni, managed to gain control of Seleucid Parthia (Iran) and establish the Parthian kingdom under the Arsacid dynasty. Over the subsequent centuries, the Parthian kingdom

underwent vast territorial expansion, consistently rivaling the neighboring power of the Roman Empire. The Parthians were strongly influenced by Greek culture during this time and the Scythian language was replaced with Greek. People migrated from India, Pakistan, Afghanistan, Uzbekistan, and Turkmenistan and Azerbaijan to Iran in order to exploit trade opportunities in Iran. At the same time, populations moved from Iran to places like countries across the Parthian Empire to trade or take up official positions.

### *The Sāsānian Empire*

Between 224 AD and 650 AD, Iran was ruled by local leaders in a period known as the Sāsānian period. In 224 AD the Persian Sāsānians, who had been a vassal to the Parthians, defeated the last Parthian king and established the Sāsānian Empire. They continued to vie with the Roman, and then Byzantine, Empires for territory and influence in the Middle East. The Sāsānians had a highly centralized authority and introduced strict dynastic legacy. Under their rule, Iran became ethnically diverse, with merchants arriving from the east and west, with significant groups of Zoroastrians, Manicheans and Christians. People migrated from India and Pakistan and across the Sāsānian Empire to Iran in order to engage in commerce and trade. At the same time, populations moved from Iran to places like India, Pakistan, Afghanistan, and Iran and across Western Asia fleeing Sāsānian rule and as part of the 15 year Iranian occupation of Jordan, Palestine and Syria.

## **Migration Story B**

Date: 723 AD - 1566 AD

Radius: 154miles

Latitude: 47.274

Longitude: 46.492

### **Movement from Iran to Russia**

At some point before 225 AD your ancestors moved to Russia. These are the events your ancestors would have lived through in Russia.

### *The Gothic Kingdom of Oium*

Between 100 AD and 300 AD, Russia was ruled by local leaders in a period known as the Gothic Age. In 100 AD Gothic tribes migrated from Scandinavia and allegedly established the Gothic Kingdom Oium in southern Russia. The area was likely also home to Slavs and other groups, such as the Turkic Khazars, who had gradually arrived in the country since the end of the Ice Age. Oium collapsed when it was overrun by Huns. People migrated from Belarus, Ukraine, Moldova, and Eastern Europe and Central Asia to Russia as part of the migration of different tribal groups around Europe searching for new land and opportunities. At the same time, populations moved from Russia to places like Scandinavia, Georgia, Armenia, Azerbaijan, and Ukraine and the Baltic states during the movement of early tribes from Russia through to the Baltic region and Scandinavia. The Bulgarians from Siberia moved down into the Eurasian Steppe and the plains between the Caspian and Black Seas.

## **Migration Story B**

Date: 225 AD - 1268 AD

Radius: 124.8312miles

Latitude: 57.755

Longitude: 40.951

## **Movement from Iran to Russia**

At some point before 225 AD your ancestors moved to Russia. These are the events your ancestors would have lived through in Russia.

### ***The Gothic Kingdom of Oium***

Between 100 AD and 300 AD, Russia was ruled by local leaders in a period known as the Gothic Age. In 100 AD Gothic tribes migrated from Scandinavia and allegedly established the Gothic Kingdom Oium in southern Russia. The area was likely also home to Slavs and other groups, such as the Turkic Khazars, who had gradually arrived in the country since the end of the Ice Age. Oium collapsed when it was overrun by Huns. People migrated from Belarus, Ukraine, Moldova, and Eastern Europe and Central Asia to Russia as part of the migration of different tribal groups around Europe searching for new land and opportunities. At the same time, populations moved from Russia to places like Scandinavia, Georgia, Armenia, Azerbaijan, and Ukraine and the Baltic states during the movement of early tribes from Russia through to the Baltic region and Scandinavia. The Bulgarians from Siberia moved down into the Eurasian Steppe and the plains between the Caspian and Black Seas.