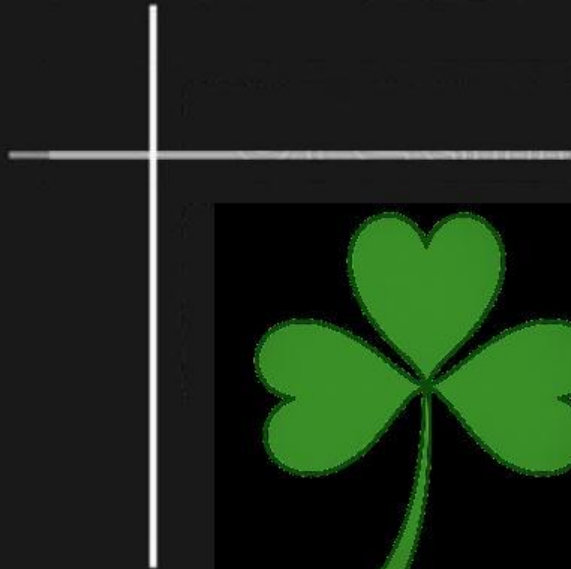


Irish DNA



Blood of the Irish

The blood in Irish veins is Celtic, right? Well, not exactly. Although the history that used to be taught at school said the Irish were a Celtic people who had migrated from central Europe, the latest studies of Irish DNA tell us a very different story.

Research done into the DNA of the Irish has shown that our old understanding of where the population of Ireland originated may have been misguided. The modern Irish population share many genetic similarities with Scottish and Welsh populations, and to a lesser extent the English. At the same time, DNA testing of remains of ancient Irish people suggests that some of the earliest human arrivals on the island originally came from much further afield.

Possible Cultural and Genetic Overlap – MacRaidá and Uí Niall

- Y-DNA studies (e.g., Trinity College Dublin) show that men with surnames like McCready, MacCredie, and MacNiall may carry the M222 subclade, associated with Uí Néill descent.
- This suggests shared genetic heritage, but not direct dynastic descent.
- The name Mac Ríada may reflect parallel Gaelic nobility, possibly ecclesiastical or regional, rather than royal Uí Néill bloodlines.

Early Origins of Irish DNA

The earliest settlers came to Ireland during the Stone Age, around 10,000 years ago. There are still remnants of their presence scattered across the island. Mountsandel in Coleraine in the North of Ireland is the oldest known site of settlement in Ireland—remains of woven huts, stone tools and food such as berries and hazelnuts were discovered at the site in 1972.

Where Did the Early Irish Come From?

For a long time the myth of Irish history has been that the Irish are Celts. Many people still refer to Irish, Scottish, and Welsh as Celtic culture. The assumption has been that they were Celts who migrated from central Europe around 500BCE.

Keltoi was the name given by the Ancient Greeks to a 'barbaric' (in their eyes) people who lived to the north of them in central Europe. While early Irish art shows some similarities of style to central European art of the *Keltoi*, historians have also recognized many significant differences between the two cultures.

Recent research into Irish DNA at the beginning of the twenty-first century suggests that the early inhabitants of Ireland were not directly descended from the *Keltoi* of central Europe. Genome sequencing performed on remains of early settlers in Ireland by researchers at Trinity University in Dublin and Queens University has revealed at least two waves of migration to the island in past millennia. Analysis of the remains of a 5,200 year-old Irish farmer suggested that the population of Ireland at that time was closely genetically related to the modern-day populations of southern Europe, especially Spain and Sardinia. Her ancestors, however, originally migrated from the Middle East, the cradle of agriculture.

Meanwhile, the research team also examined the remains of three 4,000 year-old men from the Bronze Age and revealed that another wave of migration to Ireland had taken place, this time from the edges of Eastern Europe. One third of their ancestry came from the Steppe region of Russia and Ukraine, so their ancestors must have gradually spread west across Europe. These remains, found on Rathlin Island also shared a close genetic affinity with the Scottish, Welsh, and modern Irish, unlike the earlier farmer. This suggests that many people living in Ireland today have genetic links to people who were living on the island at least 4,000 years ago.

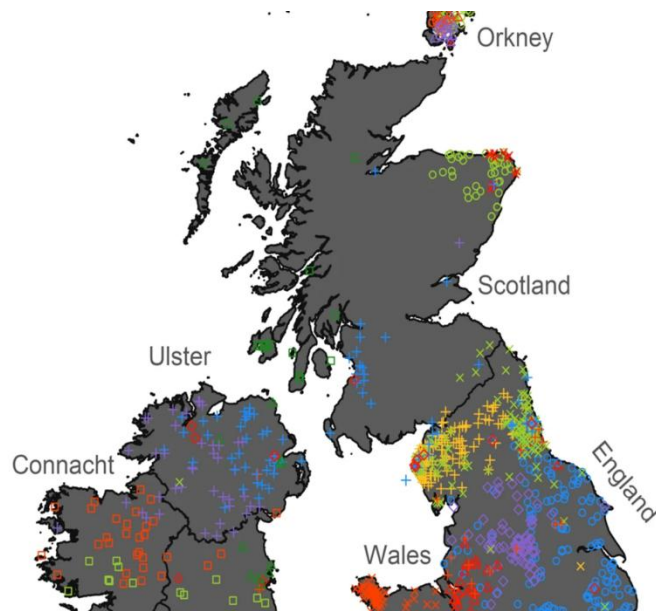
Do Irish Origin Myths Match the Scientific Evidence?

One of the oldest texts composed in Ireland is the *Leabhar Gabhla*, the Book of Invasions. It tells a semi-mythical history of the waves of people who settled in Ireland in earliest times. It says the first settlers to arrive in Ireland were a small dark people called the Fir Bolg, followed by a magical super-race called the Tuatha de Danaan (the people of the goddess Dana).

Most interestingly, the book says that the group which then came to Ireland and fully established itself as rulers of the island were the Milesians—the sons of Mil, a soldier from Spain. Modern DNA research into male Y chromosomes has found that the R1b haplogroup reaches very high concentrations in Western Ireland and the Basque country in northern Spain. While the picture for matrilineal descent (mother to daughter) is more complex, it seems that the northern Spanish and the Irish might have common male ancestors at some point in history.

There are also interesting cultural similarities along the western seaboard of Europe, stretching from Spain up to Ireland - as has been written about by the archeologist Barry Cunliffe. Although it might seem surprising, it is worth remembering that in ancient times the sea was one of the fastest and easiest ways to travel. When the land was covered in thick forest, coastal settlements were common and people travelled around the seaboard of Europe quite freely. Another interesting finding about Irish DNA is that many men in North West Ireland (and their descendants around the world, including about 2% of men in New York today) are descended from a single man who lived in Ireland around 1600-1700 years ago. This coincides with the time of the famous Irish king Niall of the Nine Hostages, who legend says brought St Patrick to Ireland as a slave. The O'Neill family, who claim to descend from Niall, have certainly been a powerful family through the ages in Ireland.

Meanwhile, the latest research in 2018 suggests that the Irish are most closely related to people in Northwest France (Brittany where a Celtic language has traditionally been spoken) and in Western Norway. Interestingly, where earlier studies didn't find much impact of Viking DNA among the modern Irish, a recent study suggests there may have been more influence than previously thought.



This map shows genetic distribution in the British Isles. Most notable is the blue clusters in Ulster and Southwest Scotland that reflect common ancestry. This is a reflection of the Dal Raita. This clustering of ancestry is based solely on genetics. The clusters shown are identified by fineStructure from 2,103 Irish and British individuals. The map shows the geographic origin of Irish individuals from the Peoples of the British Isles (PoBI) cohort, labelled according to fineStructure cluster membership. Individuals are placed at the average latitude and longitude of either their great-grandparental (Atlas) or grandparental (PoBI) birthplaces.

What we can take from all of this is that, although the Irish today feel part of a single group united by cultural and national identity, this culture and identity is ultimately founded on waves of migration connecting the island to the wider world of European peoples and beyond.

Who Are the Closest Genetic Relatives of the Irish?

Today, people living the north of Spain in the region known as the Basque Country share many DNA traits with the Irish. However, the Irish also share their DNA to a large extent with the people of Britain, especially the Scottish and Welsh.

DNA testing of the male Y chromosome shows that Irish males have the highest incidence of the R1b haplogroup in Europe. While other parts of Europe have integrated continuous waves of new settlers from the east, Ireland's remote geographical

position means the Irish gene-pool is less susceptible to change with the same genes passed down from parents to children for thousands of years. The other region with very high levels of this male chromosome is the Basque region.

This is mirrored in genetic studies which have compared DNA analysis with Irish surnames. Many surnames in Irish are Gaelic surnames, suggesting that the holder of the surname is a descendant of people who lived in Ireland long before the English conquests of the Middle Ages. Men with Gaelic surnames, showed the highest incidences of Haplogroup 1 (or Rb1) gene. This means that those Irish whose ancestors pre-date English conquest of the island are descendants (in the male line) of people who probably migrated west across Europe, as far as Ireland in the north and Spain in the south. Some scholars even argue that the Iberian Peninsula (modern-day Spain and Portugal) was once heavily populated by Celtiberians who spoke a now-extinct Celtic language. They believe some of these people moved northwards along the Atlantic coast bringing Celtic language and culture to Ireland and Britain, as well as France. Although the evidence is not conclusive, the findings on the similarities between Irish and Iberian DNA provides some support for this theory.

However, more recent studies confirm that when a complex picture is taken of Irish DNA, including both male and female lines of descent, the closest similarities are between the Irish and people living in Western Britain. In particular, people in the north of Ireland are close genetic relatives of those living in Western Scotland, probably due to a long history of migration between the two regions.

Irish and British DNA: A Comparison

In Northern Ireland the differences between the Irish and the British can still seem very important. Blood has been spilt over the question of national identity. However, research into both British and Irish DNA suggests that people on the two islands have much genetically in common. Males in both islands have a strong predominance of the Haplogroup 1 gene, meaning that most of us in the British Isles are descended from the same stone age settlers.

The main difference is the degree to which later migrations of people to the islands affected the population's DNA. Parts of Ireland (most notably the western seaboard) have been almost untouched by outside genetic influence since early times. Men there with traditional Irish surnames have the highest incidence of the Haplogroup 1 gene - over 99%.

At the same time London, for example, has been a multi-ethnic city for hundreds of years. Furthermore, England has seen more arrivals of new people from Europe - Anglo-Saxons and Normans - than Ireland. Therefore while the earliest English ancestors were very similar in DNA and culture to the tribes of Ireland, later arrivals to England have created more diversity between the two groups.

Irish and Scottish people share very similar DNA. The obvious similarities of culture, pale skin, tendency to red hair have historically been prescribed to the two people's sharing a common Celtic ancestry. Actually, in my opinion, it seems much more likely that the similarity results from the movement of people from the north of Ireland into Scotland in the centuries 400 - 800 AD. At this time the kingdom of Dalriada, based near Ballymoney in County Antrim extended far into Scotland. The Irish invaders brought Gaelic language and culture, and they also brought their genes.

Irish Characteristics and DNA

The MC1R gene has been identified by researchers as the gene responsible for red hair as well as the accompanying fair skin and tendency towards freckles. According to genetic research, genes for red hair first appeared in human beings about 40,000 to 50,000 years ago.

These genes were then brought to the British Isles by the original settlers, men and women who would have been relatively tall, with little body fat, athletic, fair-skinned and who would have had red hair. So red-heads may well be descended from the earliest ancestors of the Irish and British.

Who Are the "Black Irish"?

The origin of the term "Black Irish" and the people it describes are debated (see the comments below!). The phrase is ambiguous and is mainly used outside of Ireland to describe dark-haired people of Irish origin. The ambiguity comes in when trying to determine whether dark-haired Irish people are genetically distinct from Irish with lighter coloring. Dark hair is common in Ireland, while dark complexions are more rare. One theory about the origins of the term is that it

describes Irish people who descend from survivors of the Spanish Armada. There are other hypotheses, mostly placing Irish ancestors on the Iberian peninsula or among the traders that sailed back and forth between Spain, North Africa, and Ireland, particularly around the Connemara region. Some "Black Irish" are of Irish-African descent, tracing their ancestry back to the slave trade. Many of these people live on Barbados and Montserrat.

Irish Ancestry Surprises Revealed by New DNA Map

A new "DNA atlas" of Ireland is revealing some of the surprising ways historic kingdoms have influenced populations on the island—and it offers the first genetic evidence that Vikings intermingled with ancient Irish peoples. A team led by Gianpiero Cavalleri at the Royal College of Surgeons in Dublin pieced together the new map using the genetics of 536 Irish individuals. The work, published in *Scientific Reports*, built on the People of the British Isles project, which previously looked at genetics in rural England, Scotland, and Wales. The thinking was that by putting together a separate and finely detailed genetic landscape of Ireland, regional distinctions would emerge. Here's what the team found out about Irish genetics dating back to the Bronze Age, around 3,500 years ago.

What kinds of DNA-based differences did they discover across Ireland?

One big finding was the distribution of people prone to complex genetic disorders. In both the United Kingdom and Ireland, for example, prevalence of multiple sclerosis increases the farther north you go. And compared with the rest of Europe, the Irish have higher rates of cystic fibrosis, celiac disease, and galactosemia, a serious metabolic disorder that prevents the breakdown of sugars in dairy, legumes, and organ meats.

How can they even tell all that?

Scientists look for variations along contiguous portions of DNA. Longer sections that are similar between groups mean those genes entered the genome more recently. The shorter the segments, the older they are. It's kind of like cake batter made with cocoa powder, oil, and eggs. Give it a stir—one generation—and you can still see the distinct layers of each ingredient. But 50 swirls later and it's all blended together, requiring a much closer look to separate out the differences.

What about regional populations within Ireland?

Researchers expected to see differences from south to north and from east to west, similar to how lineages are organized in Europe and the U.K. more broadly. But in Ireland, genetic signatures are clustered very strongly with the four ancient kingdoms of Connacht, Leinster, Munster, and Ulster. The Ulster genetic signature is different from those across the rest of Ireland. That's probably a result of the Ulster Plantation settlements of the 1600s—a time when Irish Catholics were being forced off the land by the English monarchy—and more frequent travel between Scotland and northern Ireland over time.

Researchers also found genetic signatures all over Ireland from Norse Vikings.

Plenty of clues already showed that Vikings had been to Ireland, including ruins, artifacts, and Norwegian family names. But this map provided the very first DNA evidence of the Irish and the Norse intermingling. The signatures that turned up in Ireland are most similar to those from the north and west coasts of Norway, where Vikings were most active.

What other ancestors are hiding out in Irish genes?

The team did compare the modern group with two ancient genomes from Ireland. One came from a person who lived near Belfast during the Neolithic, around 5,000 years ago. The other was from a person who lived on Rathlin Island in the late Bronze Age, from 2000 to 1500 B.C. The scientists were hopeful they'd find genetic affinity, or relatedness, between the Bronze Age genome and modern inhabitants of the region where those bones had been found. No dice. The ancient genomes mainly served as a nice background reference to highlight variances between the modern groups.

Being able to link genetic information to geographic origins helps medical researchers design studies that consider how and why a person, or a group of people, may be affected by certain genetic diseases. It's not good enough just to know you're Irish; it could be useful for the researcher to know that your DNA has been influenced by a unique genetic subgroup from one part of Ulster.

What does all this mean for people who don't live in Ireland?

Considering that something like 20 to 30 percent of North Americans can claim Irish ancestry, the new work affects plenty of people outside of the region. And if you need an organ transplant or skin graft, it could make a difference in how well your body accepts the tissue: The more genetically different you are from the donor, the shorter the life of the transplant—rejections are lower when the recipient's genome and the donor's have fewer differences.

What's next for the researchers?

The Irish DNA Atlas is a live study and the team is still accepting donations of DNA. To participate, all eight of your great-grandparents have to have lived within about 30 miles of each other in Ireland.