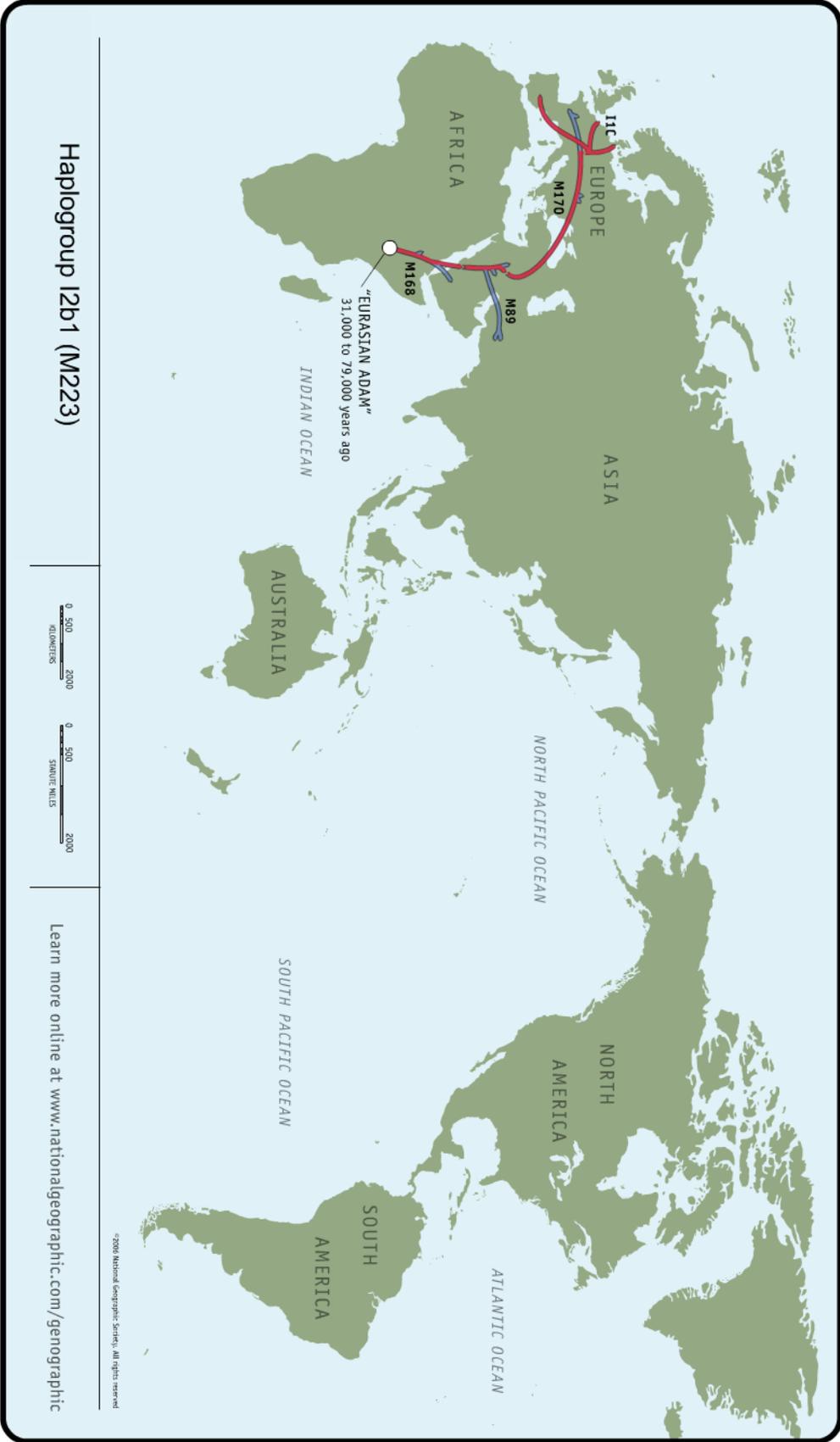


THE GENOGRAPHIC PROJECT

MIGRATION ROUTES: RAMON ARELLANO



Haplogroup I2b1 (M223)



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THE  
GENOGRAPHIC  
PROJECT

## Certificate of Y-chromosome DNA testing

In recognition of your participation in the Genographic Project, we hereby certify that

# RAMON ARELLANO

belongs to:

## Haplogroup I2b1 (M223)

The designations for all twelve loci examined for this purpose are listed here, along with the Short Tandem Repeats (STRs) outcome for each.

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393	19	391	439	389-1	389-2	388	390	426	385a	385b	392
14	16	11	11	13	16	13	23	11	15	15	12

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## Haplogroup I2b1 (M223)

Your Y-chromosome results identify you as a member of **haplogroup I2b1 (M223)**.

The genetic markers that define your ancestral history reach back roughly 60,000 years to the first common marker of all non-African men, *M168*, and follow your lineage to present day, ending with *M223*, the defining marker of haplogroup *I2b1*.

If you look at the map highlighting your ancestors' route, you will see that members of haplogroup *I2b1* carry the following Y-chromosome markers:

***M168* > *P143* > *M89* > *L15* > *P123* > *M170* > *P215* > *P214* > *M223***

*(Less is known about some markers than others. What is known about your journey is reflected below.)*

Your own haplogroup, *I2b1*, is most common in Germany. About 11 percent of all German men belong to this genetic lineage.

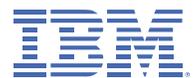
What's a haplogroup, and why do geneticists concentrate on the Y chromosome in their search for markers? For that matter, what's a marker?

Each of us carries DNA that is a combination of genes passed from both our mother and father, giving us traits that range from eye color and height to athleticism and disease susceptibility. One exception is the Y chromosome, which is passed directly from father to son, unchanged, from generation to generation.

Unchanged, that is unless a mutation—a random, naturally occurring, usually harmless change—occurs. The mutation, known as a marker, acts as a beacon; it can be mapped through generations because it will be passed down from the man in whom it occurred to his sons, their sons, and every male in his family for thousands of years.

In some instances there may be more than one mutational event that defines a particular branch on the tree. When geneticists identify such a marker, they try to figure out when it first occurred, and in which geographic region of the world. Each marker is essentially the beginning of a new lineage on the family tree of the human race. Tracking the lineages provides a picture of how small tribes of modern humans in Africa tens of thousands of years ago diversified and spread to populate the world.

A haplogroup is defined by a series of markers that are shared by other men who carry the same random mutations. The markers trace the path your ancestors took as they moved out of Africa. It's difficult to know how many men worldwide belong to any particular haplogroup, or even how many haplogroups there are, because scientists simply don't have enough data yet.



One of the goals of the five-year Genographic Project is to build a large enough database of anthropological genetic data to answer some of these questions. To achieve this, project team members are traveling to all corners of the world to collect more than 100,000 DNA samples from indigenous populations. In addition, we encourage you to contribute your anonymous results to the project database, helping our geneticists reveal more of the answers to our ancient past.

Keep checking these pages; as more information is received, more may be learned about your own genetic history.

## Your Ancestral Journey: What We Know Now

### ***M168*: Your Earliest Ancestor**

#### Fast Facts

Time of Emergence: Roughly 50,000 years ago

Place of Origin: Africa

Climate: Temporary retreat of Ice Age; Africa moves from drought to warmer temperatures and moister conditions

Estimated Number of *Homo sapiens*: Approximately 10,000

Tools and Skills: Stone tools; earliest evidence of art and advanced conceptual skills

Skeletal and archaeological evidence suggest that anatomically modern humans evolved in Africa around 200,000 years ago, and began moving out of Africa to colonize the rest of the world around 60,000 years ago.

The man who gave rise to the first genetic marker in your lineage probably lived in northeast Africa in the region of the Rift Valley, perhaps in present-day Ethiopia, Kenya, or Tanzania, some 31,000 to 79,000 years ago. Scientists put the most likely date for when he lived at around 50,000 years ago. His descendants became the only lineage to survive outside of Africa, making him the common ancestor of every non-African man living today.

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

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



exact route they followed remains to be determined.

In addition to a favorable change in climate, around this same time there was a great leap forward in modern humans' intellectual capacity. Many scientists believe that the emergence of language gave us a huge advantage over other early human species. Improved tools and weapons, the ability to plan ahead and cooperate with one another, and an increased capacity to exploit resources in ways we hadn't been able to earlier, all allowed modern humans to rapidly migrate to new territories, exploit new resources, and replace other hominids.

### **M89: Moving Through the Middle East**

#### Fast Facts

Time of Emergence: 45,000 years ago

Place: Northern Africa or the Middle East

Climate: Middle East: Semiarid grass plains

Estimated Number of *Homo sapiens*: Tens of thousands

Tools and Skills: Stone, ivory, wood tools

The next male ancestor in your ancestral lineage is the man who gave rise to *M89*, a marker found in 90 to 95 percent of all non-Africans. This man was born around 45,000 years ago in northern Africa or the Middle East.

The first people to leave Africa likely followed a coastal route that eventually ended in Australia. Your ancestors followed the expanding grasslands and plentiful game to the Middle East and beyond, and were part of the second great wave of migration out of Africa.

Beginning about 40,000 years ago, the climate shifted once again and became colder and more arid. Drought hit Africa and the grasslands reverted to desert, and for the next 20,000 years, the Saharan Gateway was effectively closed. With the desert impassable, your ancestors had two options: remain in the Middle East, or move on. Retreat back to the home continent was not an option.

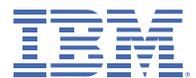
While many of the descendants of *M89* remained in the Middle East, others continued to follow the great herds of buffalo, antelope, woolly mammoths, and other game through what is now modern-day Iran to the vast steppes of Central Asia.

These semiarid grass-covered plains formed an ancient "superhighway" stretching from eastern France to Korea. Your ancestors, having migrated north out of Africa into the Middle East, then traveled both east and west along this Central Asian superhighway. A smaller group continued moving north from the Middle East to Anatolia and the Balkans, trading familiar grasslands for forests and high country.

### **M170: Occupying the Balkans**



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## **M170: Occupying the Balkans**

### Fast Facts

Time of Emergence: 20,000 years ago

Place of Origin: Southeastern Europe

Climate: Height of the Ice Age

Estimated Number of *Homo sapiens*: Hundreds of thousands

Tools and Skills: Gravettian culture of the Upper Paleolithic

Your ancestors were part of the *M89* Middle Eastern Clan that continued to migrate northwest into the Balkans and eventually spread into central Europe. These people may have been responsible for the expansion of the prosperous Gravettian culture, which spread through northern Europe from about 21,000 to 28,000 years ago.

The Gravettian culture represents the second technological phase to sweep through prehistoric Western Europe. It is named after a site in La Gravette, France, where a set of tools different from the preceding era (Aurignacian culture) was found. The Gravettian stone tool kit included a distinctive small pointed blade used for hunting big game.

The Gravettian culture is also known for their voluptuous carvings of big-bellied females often dubbed "Venus" figures. The small, frequently hand-sized sculptures appear to be of pregnant women—obesity not being a problem for hunter-gatherers—and may have served as fertility icons or as emblems conferring protection of some sort. Alternatively, they may have represented goddesses.

These early European ancestors of yours used communal hunting techniques, created shell jewelry, and used mammoth bones to build their homes. Recent findings suggest that the Gravettians may have discovered how to weave clothing using natural fibers as early as 25,000 years ago. Earlier estimates had placed weaving at about the same time as the emergence of agriculture, around 10,000 years ago.

The man who gave rise to marker *M170*, was born about 20,000 years ago and was heir to this heritage. He was probably born in one of the isolated refuge areas people were forced to occupy during the last blast of the Ice Age, possibly in the Balkans. As the ice sheets covering much of Europe began to retreat around 15,000 years ago, his descendants likely played a central role in repopulating northern Europe.

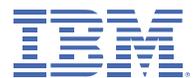
It's possible that the Vikings descended from this line. The Viking raids on the British Isles might explain why the lineage can be found in populations in southern France and among some Celtic populations.

## **M223: Reclaiming Europe From Ice**

### Fast Facts



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**M223: Reclaiming Europe From Ice**

## Fast Facts

Time of Emergence: 14,000 to 18,000 years ago

Place of origin: Europe

Climate: Ice sheets in retreat in the years soon after Last Glacial Maximum

Tools and Skills: Cooperative hunting, dependence on herd animals

The M223 lineage originated some 14,000 to 18,000 years ago with a genetic mutation in a single man who lived in what is now southern France. This period was one of tremendous climactic change. Europe was experiencing a temperate rebirth as the world's frozen expanses of ice began to retreat at the end of the Last Glacial Maximum.

Some tribes of ancient European hunters pressed northward with the retreating ice, pursuing herds. By "following the food," these descendents of the original M223 went on to populate much of northern Europe.

The members of this ancient lineage were effective hunters who used teamwork to harvest large herds of wild horses and other game. Their descendents founded the widespread Gravettian culture, which developed exceptional art in the form of voluptuous female statues called Venus figures. These statues most likely had religious overtones as well and may have represented ancient fertility rites.

Today about 25 percent of all northwest European men are members of this haplogroup. The lineage has three primary sub-clades, and each one is prominent in a different geographic location.

M253 is found at highest frequency in Scandinavia, where it occurs in some 35 percent of the male population. Fifteen percent of British men carry marker *M253*.

*P37.2* is most common in the Balkans and Eastern Europe.

Your own haplogroup, I2b1, is most common in Germany. About 11 percent of all German men belong to this genetic lineage.

This is where your genetic trail, as we know it today, ends. However, be sure to revisit these pages. As additional data are collected and analyzed, more will be learned about your place in the history of the men and women who first populated the Earth. We will be updating these stories throughout the life of the project.

