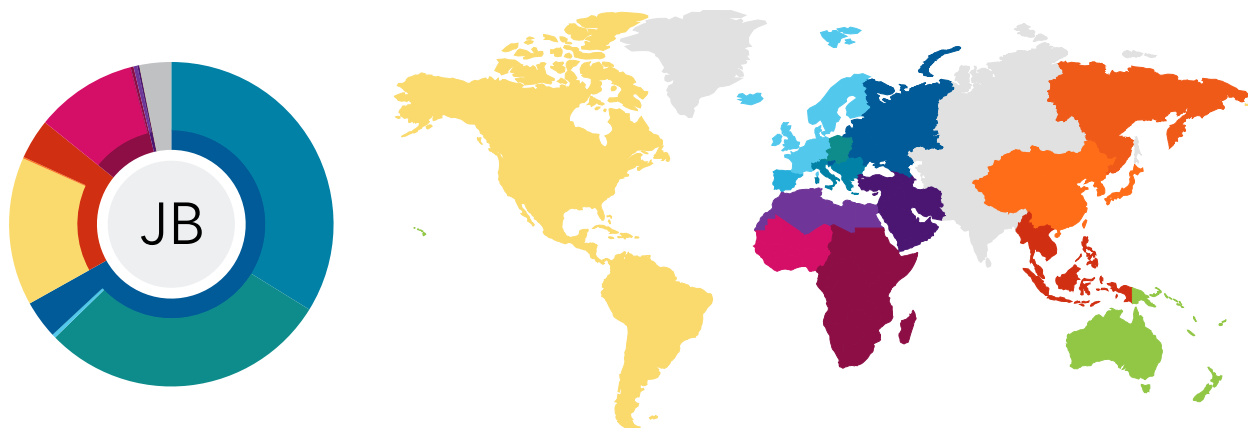




Javier Bernal  
Ancestry Composition

## Ancestry Composition

Ancestry Composition tells you the proportion of your DNA that comes from each of 31 populations worldwide. This analysis considers DNA you received from all of your ancestors on both sides of your family. The results reflect where your ancestors lived 500 years ago before ocean-crossing ships and airplanes came on the scene.



Javier Bernal 100%

### European 66.9%

- Southern European 33.8%
  - Iberian 18.7%
  - Broadly Southern European 15.2%
- Ashkenazi 28.9%
- Northwestern European 0.4%
  - Broadly Northwestern European 0.4%
- Broadly European 3.8%

### East Asian & Native American 18.9%

- Native American 14.8%
- East Asian 0.1%
  - Yakut < 0.1%
  - Broadly East Asian 0.1%
- Broadly East Asian & Native American 4.0%

### Sub-Saharan African 10.4%

- West African 10.2%
- Broadly Sub-Saharan African 0.3%

### Middle Eastern & North African 0.6%

- North African 0.4%
- Broadly Middle Eastern & North African 0.2%

### Oceanian < 0.1%

- Broadly Oceanian < 0.1%

### Unassigned 3.2%

#### Stories of Your Ancestors

##### European

Much of Europe was buried under miles of ice ten thousand years ago. As the glaciers receded over millennia, Neolithic farmers from the Near East joined Paleolithic hunter-gatherers to settle Europe.

**Southern European**

Southern Europe, including the Iberian, Italian, and Balkan peninsulas as well as the island of Sardinia, is a region defined in great part by the Mediterranean Sea. The Mediterranean has provided transportation routes, keeping these regions connected.

**Iberian**

The peninsula of Iberia is represented by the people of Spain and Portugal. Genetically these people have a deep connection to the rest of Europe, but have also been influenced by their proximity to North Africa.

**Ashkenazi**

Ashkenazi Jews are thought to have settled in Central and Eastern Europe about 1,000 years ago. DNA shows clearly the connections among those who consider themselves to be Ashkenazi Jewish: two Ashkenazi Jewish people are very likely to be "genetic cousins", sharing long stretches of identical DNA.

**Northwestern European**

Northwestern Europeans are represented by people from as far west as Ireland, as far north as Norway, as far east as Finland, and as far south as France. These countries rim the North and Baltic Seas, and have been connected throughout much of history by those waters.

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**East Asian & Native American**

The peoples of East Asia and the Americas have a shared genetic history. Their common ancestors left the Near East as early as 80,000 years ago, migrating across Asia. The ancestors of Native Americans began to cross into the Americas 12,000 to 15,000 years ago.

**Native American**

Native peoples of the Americas have contributed genetically to today's populations in North, Central, and South America. In North America, however, Native American ancestry tends to be five or more generations back, so that little DNA evidence of this ancestry remains.

**East Asian**

Eastern Asia encompasses Japan, Korea, China, Mongolia and the Yakut people of eastern Russia. The people of Northeastern Asia most likely arrived using a different, later route than the settlers of Southeastern Asia. They eventually crossed Beringia 12-15,000 years ago to become the ancestors of Native Americans.

**Yakut**

Yakuts are a Turkic people that live across huge territories of eastern Russia. Originally living around Lake Baikal, Yakuts migrated north along the Lena river during the thirteenth century. Traditionally, Yakuts are hunters, fishermen and herders.

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**Sub-Saharan African**

The genetic diversity of Sub-Saharan Africa reflects both the deep history of humans in the region and the recent migrations that have carried the diversity of western Africa to both southern and eastern Africa.

**West African**

Expanding from Senegal to Nigeria, West Africa composes about a fifth of the African continent. West Africans have a long shared history, and were united by large empires such as the Ghana Empire, dating as far back as the eighth century AD. Other empires later succeeded, making Western Africa a region of strong common heritage.

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**Middle Eastern & North African**

The peoples of Northern Africa and the Middle East have not only genetic but also deep linguistic connections with one another.

### North African

Over the last several millennia the Sahara has been a significant geographic barrier for the people of Africa. Although trade routes between the northern and southern parts of the continent have long existed, Northern Africa has been strongly influenced by people of the Middle East and southern Europe.

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### Oceanian

Oceania, including indigenous peoples of Papua New Guinea and Melanesia, was inhabited tens of thousands of years ago by early seafaring people.

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### Unassigned

Sometimes your DNA cannot be assigned to one of the reference datasets used by our algorithm. You may be interested to know that this means that your DNA is unlike most of what we've observed before! As we collect more data and update our algorithm, less of your ancestry should fall into this category.

### About Report

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## Interpreting Ancestry Composition



#### This report can tell you:

- The location and amount of your DNA that is similar to DNA from other people with known ancestry.
- How your ancestry was likely inherited from your biological parents (if at least one of them is linked to your profile).



#### This report cannot tell you:

- The precise origins of all of your ancestors. The results presented here are **estimates**, which may **change** over time as our algorithm improves.
- Ancestry estimates for populations for which we do not have sufficient data.

### What You Can Do

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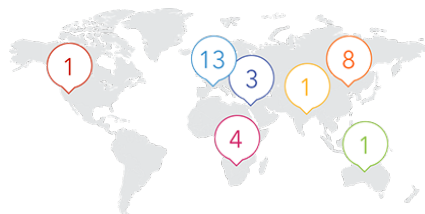
#### Do more with your Ancestry Composition results.

- Contribute to research and help us understand more about how DNA relates to genetics.
- Explore which parts of your DNA are assigned to each of your ancestries.
- Join the discussion with other 23andMe customers interested in Ancestry Composition results.

## Scientific Details

Your Ancestry Composition is determined by comparing your DNA to public and private reference sets.

To determine your ancestry composition we use an algorithm that breaks up your DNA into short, non-overlapping segments. We then compare each segment to reference DNA sequences from **31 populations worldwide**. When the segment matches a specific population with a high degree of certainty, the segment is assigned to that population. Sometimes the segment matches several populations, in which case it is assigned to a broad area (e.g. Northwestern European) rather than a specific population. The results of all of these assignments are then tallied across your genome to determine your ancestry composition.



Reference Set Populations	23andMe Set	Public Set*	Total
<b>East Asian and Native American</b> Native American (Colombian, Karitiana, Maya, Pima, Surui), East Asian, Japanese, Korean (South Korean), Yakut, Mongolian (Daur, Hezhen, Mongolian, Oroqen, Tu, Xibo), Chinese (Chinese, Han, Hong Kongese, Taiwanese), Southeast Asian (Burmese, Cambodian, Indonesian, Lao, Malaysian, Filipino, Thai, Vietnamese)	808	560	1368
<b>European</b> Southern European, Italian (Italian, Northern Italian, Tuscan), Balkan (Albanian, Bosnian and Herzegovinian, Bulgarian, Croatian, Greek, Macedonian, Maltese, Montenegrin, Romanian, Serbian), Sardinian, Iberian (France Basque, Portuguese, Spanish), Northwestern European, British and Irish (Irish, United Kingdom), French and German (Austrian, French, German, Belgian, Dutch, Swiss), Scandinavian (Danish, Norwegian, Swedish), Finnish, Ashkenazi, Eastern European (Belarusians, Czechs, Hungarians, Polish, Russian, Slovak, Slovene, Ukrainian)	6421	421	6842
<b>Middle Eastern and North African</b> Middle Eastern (Armenian, Azerbaijani, Cypriot, Georgian, Cruze, Iranian, Iraqi, Lebanese, Turkish, Syrian), North African (Algerian, Bahrani, Bedouin, Egyptian, Jordanian, Kuwaiti, Moroccan, Mozabite, Palestinian, Saudi Arabian, Tunisian, Emirati, Yemeni)	550	176	726
<b>Oceanian</b> Broadly Oceanian (Nan Melanesian, Palauan, Tongan)	3	36	39
<b>South Asian</b> Broadly South Asian (Afghan, Balochi, Bangladeshi, Brahui, Burusho, Hazara, Indian, Kalash, Makrani, Nepalese, Pakistani, Pathan, Sindhi, Sri Lankan, Uygur)	207	615	822
<b>Sub-Saharan African</b> West African (Bantu, Cameroonian, Ghanian, Ivorian, Liberian, Luhya, Mandenka, Nigerian, Sierra Leonean, Yoruba), East African (Eritrean, Ethiopian, Maasai, Somali), Central and South African (Biaka Pygmies, Mbuti Pygmies, San)	228	393	621

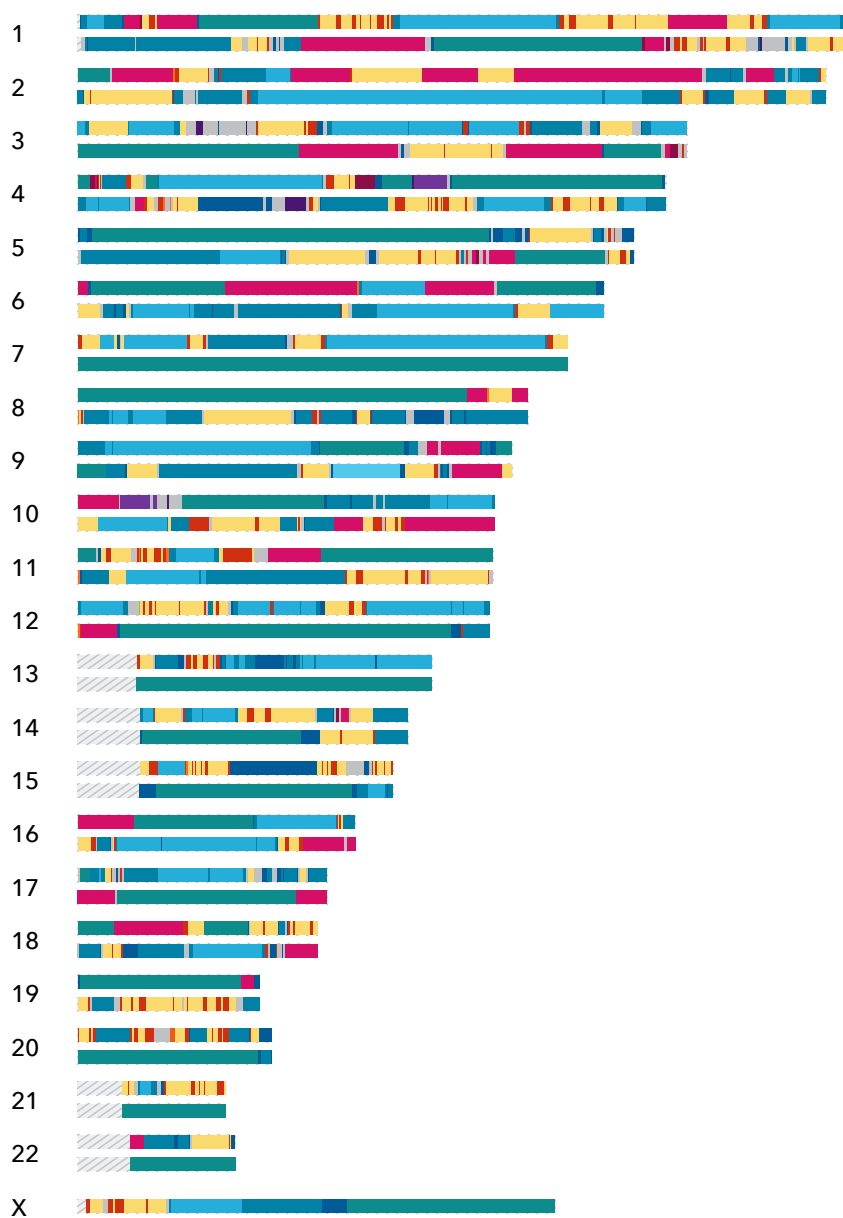
\* Public Reference Set includes HGDP, 1000 Genomes, HapMap3

## Your Genotype

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### Explore which parts of your DNA are assigned to each of your ancestries.

We can determine which of your DNA segments are linked to your different ancestries. Our default setting requires at least 50% certainty in an assignment.



Javier Bernal 100%

<b>European</b>	<b>66.9%</b>
Southern European	33.8%
Iberian	18.7%
Broadly Southern European	15.2%
Ashkenazi	28.9%
Northwestern European	0.4%
Broadly Northwestern European	0.4%
Broadly European	3.8%
<b>East Asian &amp; Native American</b>	<b>18.9%</b>
Native American	14.8%
East Asian	0.1%
Yakut	< 0.1%
Broadly East Asian	0.1%
Broadly East Asian & Native American	4.0%
<b>Sub-Saharan African</b>	<b>10.4%</b>
West African	10.2%
Broadly Sub-Saharan African	0.3%
<b>Middle Eastern &amp; North African</b>	<b>0.6%</b>
North African	0.4%
Broadly Middle Eastern & North African	0.2%
<b>Oceanian</b>	<b>&lt; 0.1%</b>
Broadly Oceanian	< 0.1%
<b>Unassigned</b>	<b>3.2%</b>
<b>No Data Available</b>	<b>--</b>

Genotype data is not available for these regions because their genetic sequence is highly repetitive, and therefore not readily tested via current genotyping technology.

Broad regional assignments: Sometimes a piece of DNA matches a regional population but cannot be assigned to a more specific population. In such a case we assign the DNA "broadly" to that regional population rather than a specific one.

## About Inheritance

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### How did you inherit your ancestral populations?

In this analysis we provide you an estimate of whether a particular ancestry comes from one parent or from two parents.

How do we know if an ancestry came from one parent or both?

- If you carry only one segment of an ancestry, you inherited it from one parent.
- If you have large overlapping segments of the same ancestry on both sides of a chromosome, you inherited it from both parents.
- If you have short overlapping segments or multiple segments that don't overlap, we calculate the likelihood of inheriting this ancestry from two parents.

## Change Log

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Your report may occasionally be updated based on new information. This Change Log describes updates and revisions to this report.

Date	Change
Oct. 25, 2016	Your genetic results were first available from 23andMe.
Oct. 21, 2015	Ancestry Composition report created.

Javier Bernal's Report, printed on 2016-10-27 UTC



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