mydnamap
ancestry

myDNAmap
the power of your genetics

myDNAmap is a medical genome company that was established with the aim of helping the general public to access all of the information included in their DNA, so they can better care for their health and that of their family.

myDNAmap offers a unique and comprehensive service in the field of preventative medicine. We sequence the whole genome containing all of the genes associated with a person's health and wellbeing. We provide pre- and post-sequencing advice, which will answer any questions and explain the results. We have developed **myDNAapp,** a mobile app where you can consult your results, contact health and science professionals and enter information regarding your health, which helps to personalise your genetic report. Furthermore, **myDNAmap** offers annual updates, which include the most recent discoveries in the field of genetics.

We know that every one of us is unique and individual just like our DNA.

Knowing your genetic profile will help you to take care of your health and that of your family. Today, tomorrow and always.

Always check **mydnamap.com** for the latest updates of our services.

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With myDNAmap Ancestry you can find out:

• genetic combinations within your DNA and how you are connected with the world.

• regions of the world where you have ancestry.

• the extent of variation shared between the genomes of another individual.

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Genetic ancestry is based on understanding the diversity distribution among human populations, which reflects the demographic and evolutionary history of our species. Genetic and archaeological evidence indicates that 100,000 years ago, as the size of the human population was rapidly increasing, humans moved from Eastern Africa to settle in other parts of the world.

Although the magnitude of these migratory events and the exact definition of the routes they used is still being researched, we know that each population has a specific evolutionary history, which is associated at different stages with other populations. It is so much so that native Americas are more genetically similar to East Asians than to Africans or Europeans. Similarly, migratory flows subsequent to the variation of populations means that some have greater affinities with one another. This explains why contemporary American populations are more related to European populations and some African populations than Asian ones.

Bearing in mind the complexity of evolutionary history, which has shaped the genetic diversity of our species, the extent of variation can be measured that is shared between the genomes of individuals. We can estimate where your ancestors came from by identifying how you are related to individuals from a worldwide population reference panel.

In addition to help you learn about your family history generations ago, knowing your genetic ancestry has a great impact in the field of biomedics, as it is essential to clarify your genotype-phenotype map; namely to establish the relationships between variants of your genome.

Genes, chromosomes and DNA: a basic overview

Our body is made up of millions of cells. The majority of cells contain a complete set of genes; a set of instructions that control the growth and functioning of our body. In turn, chromosomes and genes are made up of a chemical molecule called DNA. DNA is divided into nuclear (present in the cell's nucleus) and mitochondrial (present in the cytoplasm) DNA. Mitochondrial DNA is inherited from the mother. In turn, 50% of our genetic information within nuclear DNA is inherited 50% from each parent. Going further back a generation, we have 25% of genetic material from our 4 grandparents and so on.

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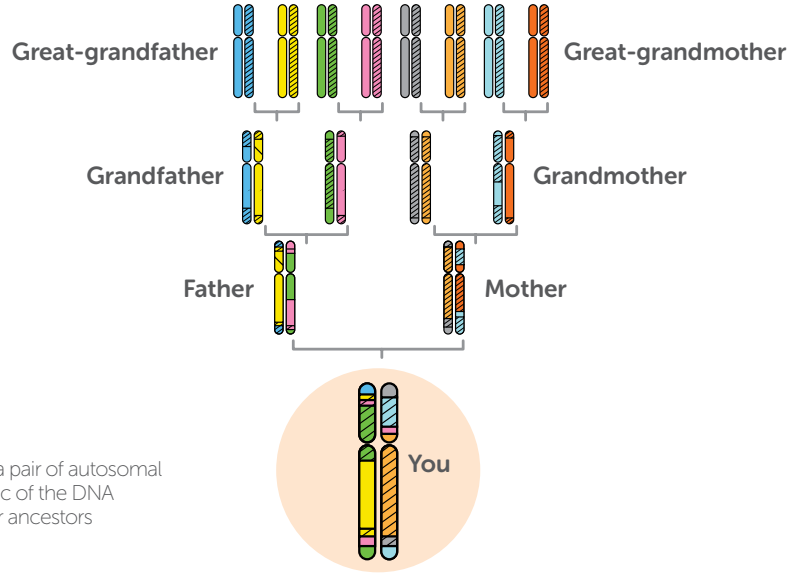
Genes are found in thread-like structures which are called chromosomes. Normally, we have 46 chromosomes, which we inherit from our parents: 23 from our mother and 23 from our father, thus 46 in total (or 23 pairs). The first 22 pairs are call autosomal and are common to men and women. Pair 23 is called the sex chromosomes. The mother has two sex chromosomes (X) and the man has one X chromosome and one Y chromosome.

But the inheritance process is complex, as we do not inherit DNA sequences from our parents' chromosomes; they are recombined. We therefore inherit sequences that are a combination of DNA sequence fractions from the father, influenced by DNA sequence fractions from the mother. For these reasons, our genome looks like a mosaic made of pieces of DNA from our ancestors.



Our DNA sequences on a pair of autosomal chromosomes is a mosaic of the DNA sequence fractions of our ancestors

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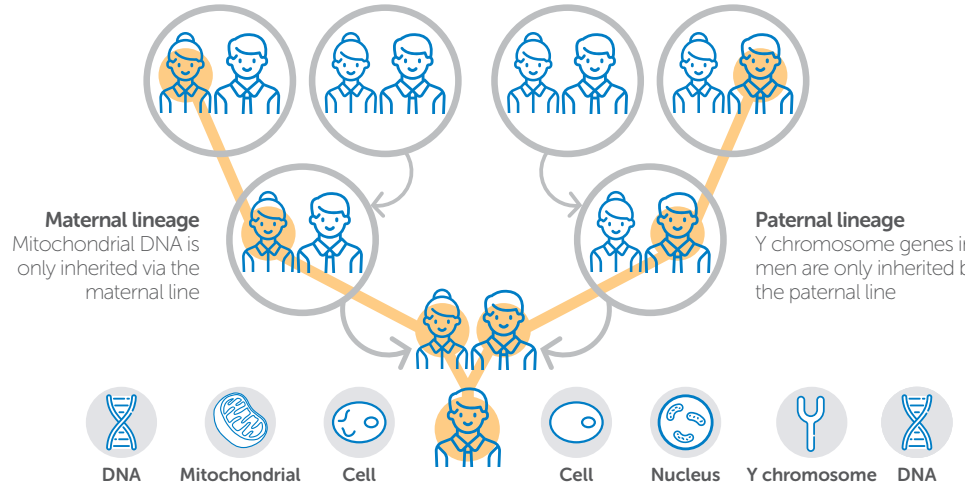
We can distinguish three types of information markers when studying the genetic ancestry of an individual:

- mitochondrial DNA markers (maternal).
- Y chromosome markers (paternal).
- autosomal markers (paternal-maternal).

The paternal lineage, being based on the Y chromosome (only present in men), can only be studied in men. The maternal, on the other hand, can be studied independent of the sex of the person being tested..



The paternal and maternal lineages are inherited by the Y chromosome and mitochondrial DNA, respectively.

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How our ancestry panel works

To undertake the test, we compare the entire sequencing of your mitochondrial DNA (in men, as well as the Y chromosome) with databases of variants described as being specific haplogroups. Haplogroups are groups of genetic variant combinations that have their own geographical spatial distribution patterns. Thus, we can identify in which region of the world your maternal and paternal lineage can be traced respectively.

Thanks to a third type of markers, the autosomal markers, we are able to identify the populations from which your ancestors in your family tree came from, both paternal and maternal. Nevertheless, we cannot distinguish if an origin identified is due to your paternal or maternal family history. In turn, although the information regarding autosomal markers appears to be more exhaustive, the recombination process does not allow us to make certain conclusions like we can with Y chromosome markers and mitochondrial DNA. For this reason, we compile the information provided by these three types of markers so we can get a better picture of your ancestors.

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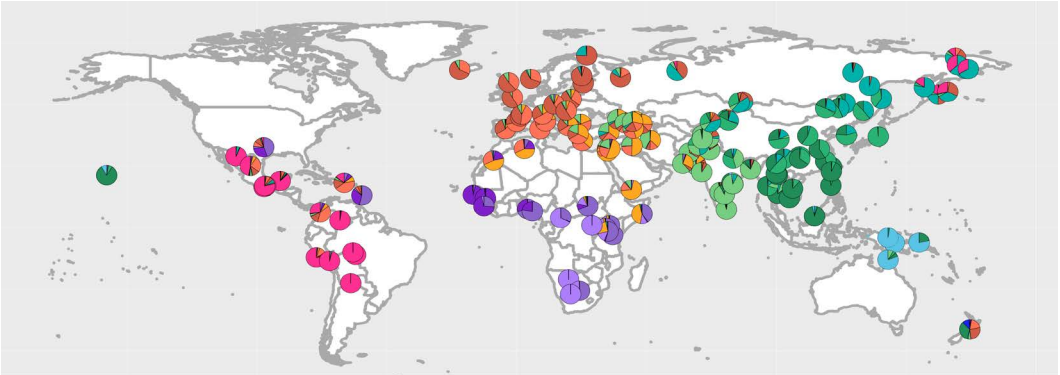
We analysis hundreds of thousands of autosomal markers for a panel of 3531 individuals coming from 142 reference populations from five continents. We select those individuals belonging to populations with their own evolutionary history that are well identified and classed in one of the 12 large groups defined by genetic similarity (see map). We will notify you of your percentage of nuclear DNA that originates from each of these 12 groups.

With these results we can recount the complexity of your family tree. You will be able to know if your ancestors originate from a same population, various close populations or from very distinct populations, as well as identify the region in which they lived.



Main geographical group

- native american
- middle east-north africa
- south european
- north european
- east african
- west african
- southern african
- central asian
- south-central asian
- eastern asiatic
- southeast asiatic
- oceanic

Geographical distribution of the population in our reference panel for ancestry testing with autosomal markers. For each population the ancestry percentages are represented for the 12 groups we can report to date. This map provides an account of the ancestry groups that are not isolated entities, and which are named per geographical region where they are found with the greatest frequency.

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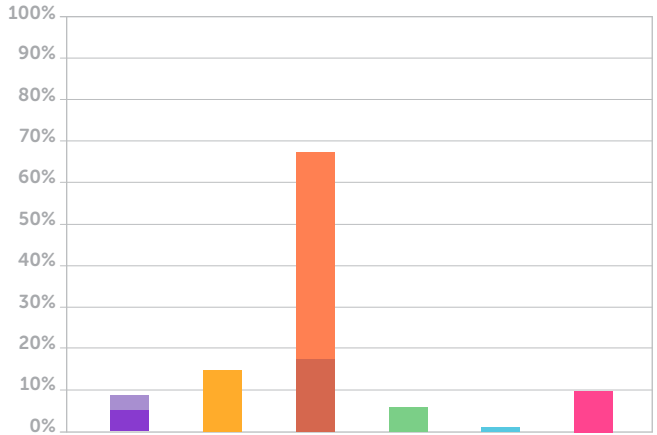
Various studies have demonstrated that many health conditions or resistance to certain pathologies or infectious agents are conditioned by the individual's ancestry. The results mentioned previously are an overall approximation. This means that it gives an account of the general patterns of ancestry in your genome. Nevertheless, the potential effect of ancestry is due to specific variations of the regions of your genome, which play a significant role in the physiology of the traits of interest. For example, mixed race siblings from a European mother and a sub-Saharan African father can have a wide range of skin and hair colours according to variants inherited from each of the parents in the genomic regions associated with melanin production.

We are developing an analytical framework to be able to identify the ancestry of each region of our genome. This information helps us to estimate your genotype-phenotype more precisely.

Your ancestry
sub-saharan african: 8,05%
east african: 0,25%
west african: 3,68%
southern african: 4,12%
european: 64,94%
south european: 47,96%
north european: 16,98%
north african middle east: 11,95%
asian: 5,09%
central asian <0,1%
central-southern asian: 5,09%
eastern asian: <0,1%
southeast asian: <0,1%
native american: 9,97%
oceanian: <0,1%



An example of an ancestry result for an entire genome

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Notes:
Information obtained from our panel is subject to change. The algorithms used to perform this ancestry calculation are calculated based on the number of reference populations. As the diversity and number of populations increases and we integrate them into our reference panel, we will increase the resolution of your ancestral composition.

No paternity reports will be made.

Technology used:
Whole genome sequencing (WGS) using Illumina HiSeq X10 or NovaSeq 6000 systems. Illumina PE150, QQ30 ≥80%, aligned with the human reference genome GRCh37/hg19. The classification and analysis of variants is carried out based on the recommendations of the American College of Medical Genetics and Genomics (ACMG). The variants reported are mentioned based on the recommendations of the Human Genome Variation Society (HGVS).

Our report: is the scientific-technical communication of the results. It is written in a precise yet simple manner, intended for both our users and health professionals. It is provided within the framework of a consultation with one of our genetic counsellors. This can take place via videoconference. During the consultation the specialised professional will explain the details, answer any user queries and clear up any doubts that may occur.

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