myDNAmap
nutrition

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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Knowing your Nutrigenetic profile, you can find out:

- the nutrients you have to increase in your diet..
- your risk of being overweight.
- how to improve appetite control, satiety and emotional eating.
- if you have a predisposition to gluten, lactose or fructose intolerance.
- how you metabolise carbohydrates, minerals, vitamins, fats and caffeine.
- the genetic variability regarding cholesterol, omega-3 and omega-6 fatty acids levels.

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Healthy eating from your genetic map

In general terms, the recommendations for nutrient intake is designed to cover the requirements of 95% of the healthy population.

We know that a large part of food eaten contains thousands of biologically active substances and that many of them can be potentially beneficial for our health. But, in some particular cases, they can be detrimental.

The requirements of distinct nutrients are not the same for everyone; part of this variation is due to differences in body size, age, sex, physical activity, pregnancy or breastfeeding, and the genome of each individual. There is a great deal of research that demonstrates the interaction of diets on certain pathologies and has also enabled various genetics to be characterised, which are very important in order to determine the risks of developing certain diseases.

This is due to the fact that each individual has the same genes with slight variations, which influence food absorption, metabolism, use and tolerance. Nutrigenetics offers the possibility to personalise nutrition according to the individual's make-up.

myDNAmap offers a global test of **more than 100 genetic variations** scientifically related to a particular nutritional profile.

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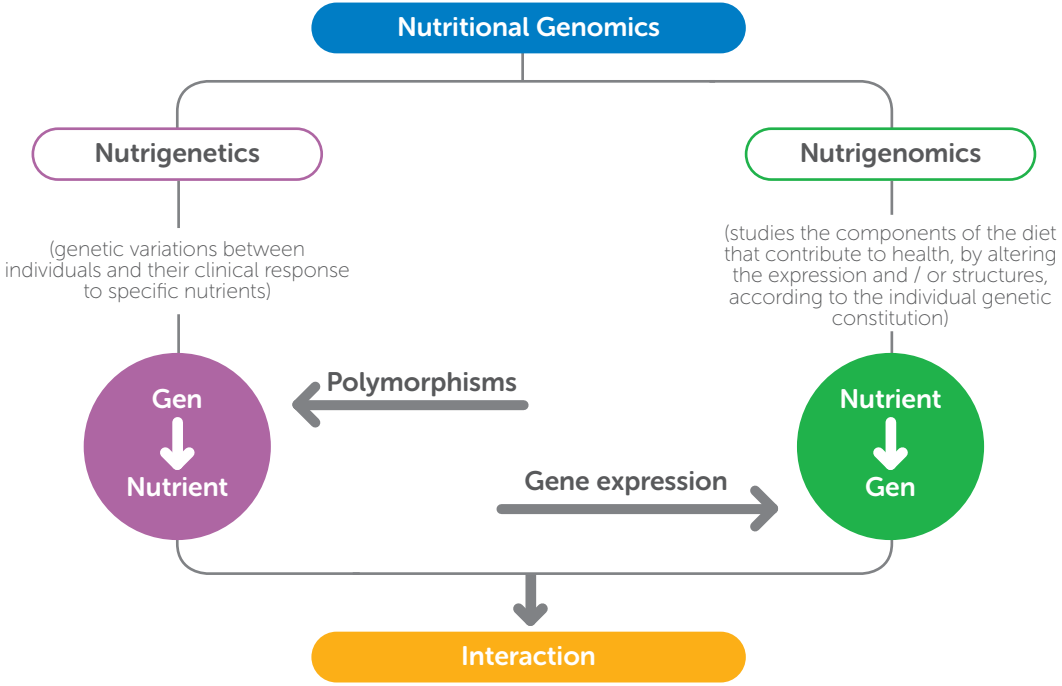
Knowing these variations and their dietary interaction can help you to predict the metabolism of certain nutrients, encouraging the implementation of tailored diets and improving the quality of life in the long-term. The nutrigenetic profile can also be used in the prevention and treatment of food-related diseases.



Nutritional genomics and gene-nutrient

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With the **myDNAmap Nutrition panel**, you can find out:

The nutrients you need to increase in your intake

• Due to our genetic variants we may be predisposed to the difficulty of metabolizing certain vitamins and minerals, so our body will need a larger amount to meet our daily needs.

Your risk of overweight/obesity

• There are genes that predispose to the tendency to gain weight, the difficulty of satiating ourselves and the desire to eat. Not all diets will have the same effect on all individuals.

• Predisposition for the accumulation of abdominal fat, a high body mass index (BMI) or heart rate and weight gain.

The interaction between genes and nutrients

• You can learn about the effect of a diet rich in fat, the consumption of omega-3 and monounsaturated fatty acids, as well as the effect of a diet low in folic acid.

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Appetite control, satiety and emotional eating

Genetic factors influence the regulation of eating behaviours, appetite and satiety. The hypothalamus is the most important area for controlling food consumption signals. Genetic markers associated with emotional eating include variants of leptin, ghrelin and serotonin. Testing genetic markers associated with the regulation of appetite and the satiety system may explain why some people feel hungrier than others, leading them to eat impulsively and having a greater risk of being overweight.

Maintaining bodyweight/being overweight/obesity

The optimum body mass index (BMI) (between 18.5 and 25) depends on the positive balance between calorie intake and energy requirement; both environmental (diet and physical activity) and genetic factors contribute to this. Both can affect your metabolism and eating behaviour. Those with a BMI between 25 and 29.9 are considered as overweight and those with a BMI of between 30 and <50 are described as obese. Scientific research indicates that genetics play a pivotal role in the loss and maintenance of body weight. For this reason, not all diets are good for everyone. To date, more than 400 different genes have been implicated in being overweight and obese. Certain genetic variants are associated with a greater difficulty to lose weight and metabolise lipids. Others are associated with obesity and fat sensitivity. Certain genetic profiles are described as protectors against regaining weight once lost. The myDNAmap Nutrition panel analyses different genetic variants associated with the predisposition to a higher BMI, to being overweight and obese, as well as changes in body composition and energy balance. From the results, we can draft more efficient and customise exercise programs, as well as tailor the diet according to individual genetic characteristics..

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Lactose, fructose and gluten intolerance
Lactose, fructose and gluten intolerance (coeliac disease) have very similar symptoms. Nevertheless, the genetic test result allows us to know the specific predisposition to certain intolerances, to create customised nutritional plans based on scientific evidence, adapt nutritional habits and thus improve our quality of life. This test is specifically indicated for people who have digestive symptoms or have a close family member with these intolerances.

Caffeine metabolism
Caffeine is a chemical component that acts as a stimulant by increasing metabolism and a complex cardiovascular response and is associated with better attention. Caffeine is not only found in coffee, but also in tea, chocolate, soft drinks, energy drinks and bars and various over-the-counter medicines. Genetic variants have been described that influence the form in which the body administers caffeine. Depending on certain genotypes, a better control of your intake is recommended to avoid excessive consumption, since it can have consequences on your biological rhythm (for example sleep rhythm) or a greater risk of developing high blood pressure.

Carbohydrate consumption and metabolism

Carbohydrates play a unique role in providing the body with energy. Main sources of carbohydrates are grains, pulses, root vegetables, nuts, milk, fruit, vegetables and sweets, among others. As a general recommendation, the majority of calories in our diet (45-65%) should come from carbohydrates. Excessive carbohydrate consumption is not healthy as it is associated with being overweight, among other consequences. Certain genetic variants are predisposed to excessive carbohydrate consumption versus a lower protein consumption. In addition, the same variants could be associated with a greater risk in developing type 2 diabetes and obesity.

Cholesterol levels (HDL and LDL)

Cholesterol is involved in numerous metabolic processes. It is an important component of cellular membranes and is the precursor in the synthesis of substances like vitamin D and sex hormones, among others. There are two main types of cholesterol: LDL ("bad" cholesterol) and HDL ("good" cholesterol). High levels of LDL cholesterol are considered less healthy in the body. High levels of HDL cholesterol can be sign of good health. Many factors like lifestyle, diet, exercise and genetics affect blood cholesterol levels.

Certain genetic polymorphisms can influence HDL and LDL plasma levels, both beneficially and detrimentally. Knowing an individual's genetic variation enables us to map out guidelines for fat and antioxidant consumption in the diet. In this category we include the genetic study associated with family hypercholesterolemia; a hereditary form of high cholesterol. In these cases, despite following healthy lifestyle patterns (diet and exercise), certain individuals are unable to efficiently regulate cholesterol levels and may require medical treatment.

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Omega-3 and omega-6 fatty acid levels

Omega-3 and omega-6 fatty acids are classed as polyunsaturated fatty acids (AGPI). AGPI are very important for various physiological functions. They have an anti-inflammatory effect and act as lipid metabolism regulators. For athletes, omega-3 fatty acids are essential for general health as they help to improve muscle recovery and reduce inflammation caused by intense exercise. During infancy, fatty acids are fundamental in the development of the central nervous system and improve immune function. It has been demonstrated that genetic variation is important for the composition of AGPI in human tissues and some genetic variations determine the efficacy in which the AGPI are endogenously processed. Individuals who present a certain genetic predisposition to lower levels of fatty acids can benefit from a greater AGPI intake.

Perception of sweet and bitter flavours

Flavour sensitivity is influenced by genetic factors and can influence food preferences. Genetic variants associated with sweet flavour detection thresholds have been described, which could affect the common sugar intake in the diet. The human being presents an adverse and instinctive rejection response to bitter flavours, which can be found in many beneficial vegetables such as spinach, endives, broccoli, cauliflower etc. Individuals with genetic variations associated with sensitivity to bitter tastes can tend to eat less of these foods, which could affect their nutritional state and health.

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Salt sensitivity
Common salt contains sodium; a very important element for metabolism. This demonstrates the direct relationship between a greater salt consumption and increased blood pressure values.

myDNAmap Nutrition studies certain genetic markers associated with a greater predisposition to salt sensitivity, which results in water retention, weight gain and hypertension.

Some facts regarding genetics and food
It is important to bear in mind that although genetics influence the metabolism of certain nutrients, appetite and BMI (among other factors), the best diet for each person depends on many factors, such as age, physical activity, environment, psychological profile etc. For this reason, at **myDNAmap** we have collected data associated with lifestyle habits, by means of a questionnaire created by our health professionals, which includes all relevant information for a comprehensive assessment.

Vitamins, iron and calcium

Vitamins are micronutrients the body requires in order to function correctly and to remain healthy. Each vitamin is involved in a specific biological body process and deficiency or hypervitaminosis may have dangerous consequences on health. There are 13 essential vitamins required for the good functioning of the body: vitamin A, C, D, E, K, B1, B2, B3, B5, B7, B6, B12 and B9 (folic acid). The majority of vitamins, with the exception of D, K, B1, B2 and folic acid, cannot be synthesised by the body and require a varied and balanced diet in order to do so. Nevertheless, some genotypes determine a predisposition to lower levels of certain vitamins due to deterioration or bad absorption. People with these characteristics may require additional supplements.

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Salt minerals (potassium, sodium, magnesium, iron and calcium) are inorganic chemical elements, as well as vitamins, which are involved in human metabolism.

Iron is an important mineral. It is involved in the synthesis of haemoglobin (red blood cells) and myoglobin (muscles). Certain genotypes are associated with an iron supplement requirement in their diet, as they have a reduced ability to absorb this mineral.

Calcium is the most abundant mineral in the human body, and it is vital for the formation, maintenance and mineralisation of bones and teeth. These requirements vary in distinct age groups, depending on the physiological requirements during development.

Changes to calcium levels in the blood can cause significant clinical changes. Calcium deficiency (hypocalcaemia) can be caused by inadequate dietary intake, vitamin D deficiency or a low calcium/phosphorus ratio in the diet. A long-term deficiency my lead to a loss of bone mass and osteoporosis. Excess calcium consumption (hypercalcaemia) does not usually come from food but can occur when taking supplements.

Its consequences are bone weakening, kidney stone formation and heart and brain function interference.

Using our test, you can estimate the influence of your individual genetic composition with regard to calcium levels, metabolism of other minerals like potassium, sodium and magnesium, as well as those variants with reduced ability to absorb iron and vitamins.

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Genes studied

ACE, ACE2, ADCY5, ADD1, ADH1B, ADIPOQ, ADORA2A, ADRA2A, ADRB2, ADRB3, AGT, AGTR1, AHR, ALDH1A1, ALDH2, ALDOB, AMY1A, APOA1, APOA2, APOA5, APOB, APOE, BCO1, CARS, CASR, CBS, CD48, CETP, CHDH, CHKA, CLCNKA, CLOCK, COL1A1, COMT, CRP, CRY1, CRY2, CYP19A1, CYP1A2, CYP24A1, CYP26B1, CYP2R1, CYP1A1, DGAT2, DGKD, DGKD, DHCR7, DRD2, EDN1 , FABP2, FADS1, FGF21, FTO, FUT2, G6PC2, G6PD, GC, GCK, GCKR, GHRL, GIPR, GLIS3, GRB14, GRK4, GSTP1, HFE, HLA-DQA1, HSD11B1, HSD11B2, IL6, LEP, LEPR, LIPC, LPL, LRS1, MADD, MC4R, MCM6, MMAB, MTHFD1, MTHFR, MTNR1B, MTR, MTRR, NBPF3, NOS3, NR1D1, OPRM1, PCSK1, PEMT, PER2, PLIN1 , PLIN1 , PPARA, PPARD, PPARG, PPARGC1A, PPARGC1A, PROX1, RENBP, RPL6 (L&), SI, SIRT1, SLC23A1, SLC23A2, SLC2A2, SLC2A2, SLC30A8, SLC44A1, SLC4A5, SUOX, TAS1R2, TAS1R3, TAS2R38, TCF7L2, TFAM, TFAP2B, TMPRSS6, UCP1, UCP2, UCP3, WDR81,

Related panels

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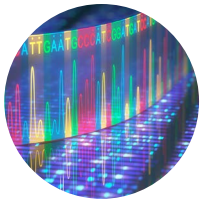

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The **myDNAmap** report given to you by our genetic counselors includes the result of the analysis of 10 genetic panels covering the areas of: sport, nutrition, cardiology, fertility, cancer, genetic compatibility, ancestry, pharmacology, addictions and neurology.

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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.

Note: the detection of genetic variants only provides a predisposition or potential, but never provides a certainty of developing diseases. Under no circumstances is the genetic information provided valid for diagnostic use. It does not imply the potential to determine the age you will be when it starts nor the type or severity of the disease(s); nor does it allow us to rule out the existence of clinical or genetic heterogeneity.

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