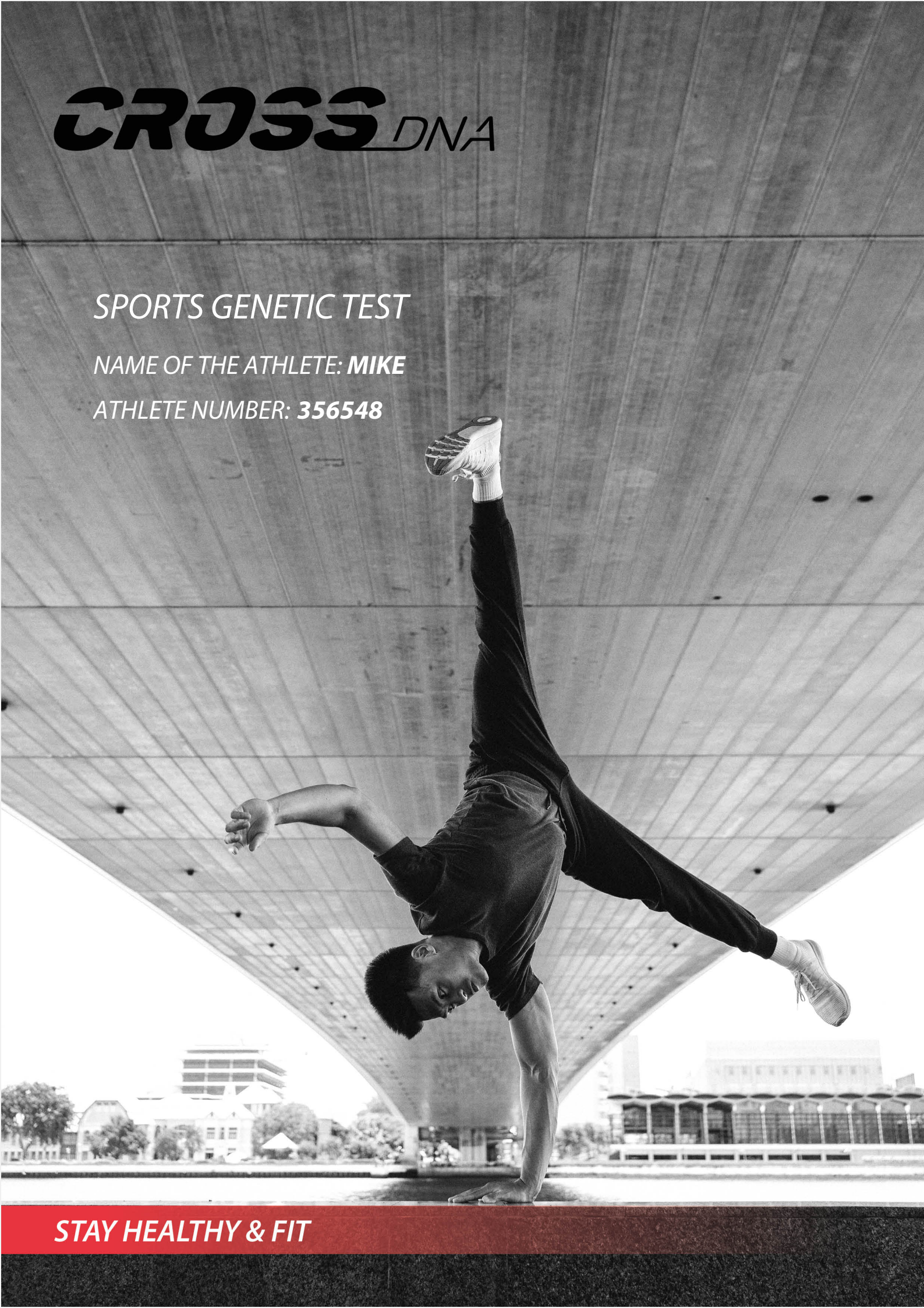
CROSS DNA

SPORTS GENETIC TEST

NAME OF THE ATHLETE: **MIKE**

ATHLETE NUMBER: **356548**



STAY HEALTHY & FIT

Table of Contents

Introduction 4

Frequently Asked Questions 5

Summary of analysed characteristics 7

How to interpret genetic results 10

Breakdown of genetic results 11

Genetics play an important role in your training.

Until now, you were able to know your skills and limitations thanks to your sensations in the sport, physical tests and clinical analyses.

In the 21st century a new variable comes into play: You can learn more about your potential thanks to CrossDNA's sports genetic test.

Discover in this report relevant characteristics about your training skills. So that you can get the best out of yourself, and so that you can discover your "limits".

This report is not valid for clinical or diagnostic use.

CrossDNA. Meet your unlimits.

Introduction

The attached report is an added value for sports training, both amateur and professional. In it you can find your genetic predisposition with respect to multiple variables linked to sports performance, such as the risk of suffering injuries, the capacity to lower pulses or the potential to develop high levels of muscle strength.

But CrossDNA is not just about your sporting traits. We know that sports training encompasses other factors in your physiology. Thanks to the sequencing of your DNA and its subsequent analysis, you will know how your body responds to the intake of nutrients such as fats and carbohydrates, or to the convenience of supplementation with certain vitamins and minerals, which is a great help when it comes to adjusting your training diet. Other factors such as allergies, intolerances, intestinal flora and lifestyle habits also influence your response to food and are not reflected in this report.

In addition, the different talents and personalities of sports people are influenced by a multitude of factors. The experiences that have accompanied us since birth and all kinds of environmental factors have shaped our personality. Therefore, throughout the report you will also find your genetic tendency to different personality traits.

Finally, the report also analyses certain parameters linked to personal health and well-being.

Hereditary diseases are susceptible to being transmitted to your descendants. They are mostly single-genetic diseases. In this group we look for pathogenic mutations, or suspected ones, in the genes involved in these diseases. The mutations we are looking for are those reported in some of the most important genetic databases worldwide, basically OMIM and ClinVar.

***We did not analyze all the genetic information related to each disease,** in particular in this section we managed to analyze on average just under half of the pathogenic markers reported in the databases consulted, so we could have mutations in the other half and not see them in this report.*

It is important to bear in mind that if you need a diagnosis of a particular disease, there are genetic tests that analyse the whole gene or genes involved in that disease that are valid for clinical use. If you have a family history, we recommend that you consult a clinical or geneticist staff to study the need for such a test.

The results of this report are personal, and not applicable to studies on other members of your family.

These reports, as well as the progress of scientific research in the field of genetics, may vary over time. New mutations are continually being discovered and the ones we analyze today are becoming better known. At CrossDNA, we make a great effort to periodically apply consolidated scientific findings to our reports. We remind you that any change you wish to make with respect to your health must be guided by your medical service.

Throughout the report you will find various features in which we use GWAS statistical analysis to calculate your genetic predisposition to have abnormal levels of certain parameters. As a GWAS study, we indicate that you are more predisposed when your predisposition is greater than that of ninety percent of the population, and less so if your predisposition is less than that of ninety percent of the population. Due to the statistical distribution of this analysis, it is normal that several parameters emerge with greater or lesser predisposition.

The report consists of a general presentation of each section, followed by your personalized analysis. For a better visualization, in the first pages we have specified each concept according to a system of icons that indicate graphically the balance of your results. The genetic information provided in this report is valid only for research, information and educational purposes. In no case is it valid for clinical use.

We remind you that any change you wish to make in your diet or medical treatments should be guided by health professionals. Any doubt you may have about any genetic test should be checked with health

professionals who are experts in Genetic Diagnosis or Specialized Physicians.

Frequently Asked Questions

Should I make any drastic changes in the treatment of my health with the data from this test?

No, any change you want to make in your health should be analyzed by an expert geneticist and with specialized doctors. Any doubts you may have about any genetic test should be checked with expert health personnel in Genetic Diagnosis.

Does everything depend on my genes?

No, our body responds to a lot of conditions. Our genes are undoubtedly an important parameter. Lifestyle, sport, food, and many other circumstances influence our body. Knowing yourself well certainly helps to treat our body in the most suitable way. And this is what genetics brings you today: more knowledge.

Are all the genes analysed in the lists in the sections?

We include only a sample of the genes that we analyze, some of the sections are determined by the analysis of more genes that we did not indicate in the report. Our algorithms combine your genotypes of the analyzed markers.

If the report shows that I have genetic mutations in an inherited disease, does that mean it is safe for me to have it?

No, we look for both pathogenic mutations and mutations that could be pathogenic; if you have any that are qualified in this way your report will indicate that we have detected them. On the other hand, this technology is more than 99% reliable but there is no such thing as 100% reliability in this type of genotyping. If in doubt, consult your doctor or geneticist.

If the report shows that I do NOT have genetic mutations in a hereditary disease, does this mean that it is certain that I do NOT have it?

No, our test does not analyse all the genetic areas where pathogenic mutations may exist and we do not analyse deletions, duplications or many of the existing intergenic areas. We analyse only some markers reported as pathogenic. On average our test covers just under 50% of these markers, so there could be pathogenic markers in the other half and we would not be seeing them. There are diagnostic tests with greater coverage than this test in certain pathologies, and which also have clinical validity. If in doubt, consult your doctor or geneticist.

If I am a carrier of a mutation of a hereditary disease, how does this affect my descendants?

Almost all of us are carriers of some mutations of monogenetic diseases, it is normal to find several significant genetic mutations in a person. However, the risk of our offspring suffering from the disease varies greatly depending on the type of inheritance of the disease: autosomal dominant, autosomal recessive, etc., so we always advise you to consult your doctor or geneticist.

What is this report based on?

This test is based on different internationally consolidated genetic studies accepted by the scientific community. There are certain organisms and scientific databases where studies on which there is a certain level of consensus are published. Our genetic tests are performed by applying these studies to the genotype of our clients. In each section you will see some of the studies on which it is based. There are sections where more studies are used than those listed.
The genetic information provided in this report is valid only for research, information and educational uses. In no case is it valid for clinical use.

What can I do if I have questions?

Our tests are accompanied by a 10-minute telephone genetic counselling consultation per client where you can clarify all your doubts. In the email you received this report you have a link to book an appointment. We recommend that all genetic tests be accompanied by a Genetic Counseling Consultation, and that any changes in your health management be supervised by a doctor.

Summary of analysed characteristics

Diet & Nutrition

- Longevity and the Mediterranean diet
- The effectiveness of a low-carb diet
- LDL cholesterol levels
- Vitamin B9 levels
- Vitamin E - Response to supplementation
- Serum albumin level
- Glycated hemoglobin levels
- Feeling of Satiety
- Iron levels
- Caffeine and addiction
- Predisposition to snacking
- Effectiveness of a low-fat diet
- Triglyceride levels
- Vitamin B6 levels
- Vitamin D levels
- Vitamin K levels
- Bilirubin levels
- Predisposition to emotional eating
- Celiac disease
- Vitamin A - Carotenoid levels
- Phosphorus levels
- Predisposition to overweight

Health & Sport

- General risk of injury
- Skeletal Muscle Performance
- Lung volume
- Sex hormone levels
- Risk of overload fracture
- Cardiomyopathy, Familial Hypertrophic, 1
- Arrhythmogenic Right Ventricular Dysplasia, Familial, 10
- Long Qt Syndrome 1
- Aerobic capacity
- Resilience
- Muscular fatigue
- White blood cell count
- Response of blood pressure to sports
- Cardiomyopathy, Familial Hypertrophic, 2
- Brugada Syndrome 1
- Muscle regeneration capacity

Lifestyle

- Benefits of Exercise in Cholesterol
- Benefit of Exercise in Insulin Sensitivity
- Benefit of exercise in body mass index
- Global benefit of the sport in your body

Inflammation of the skin

Freckles

Caption:

Your analyzed genotype is favorable.

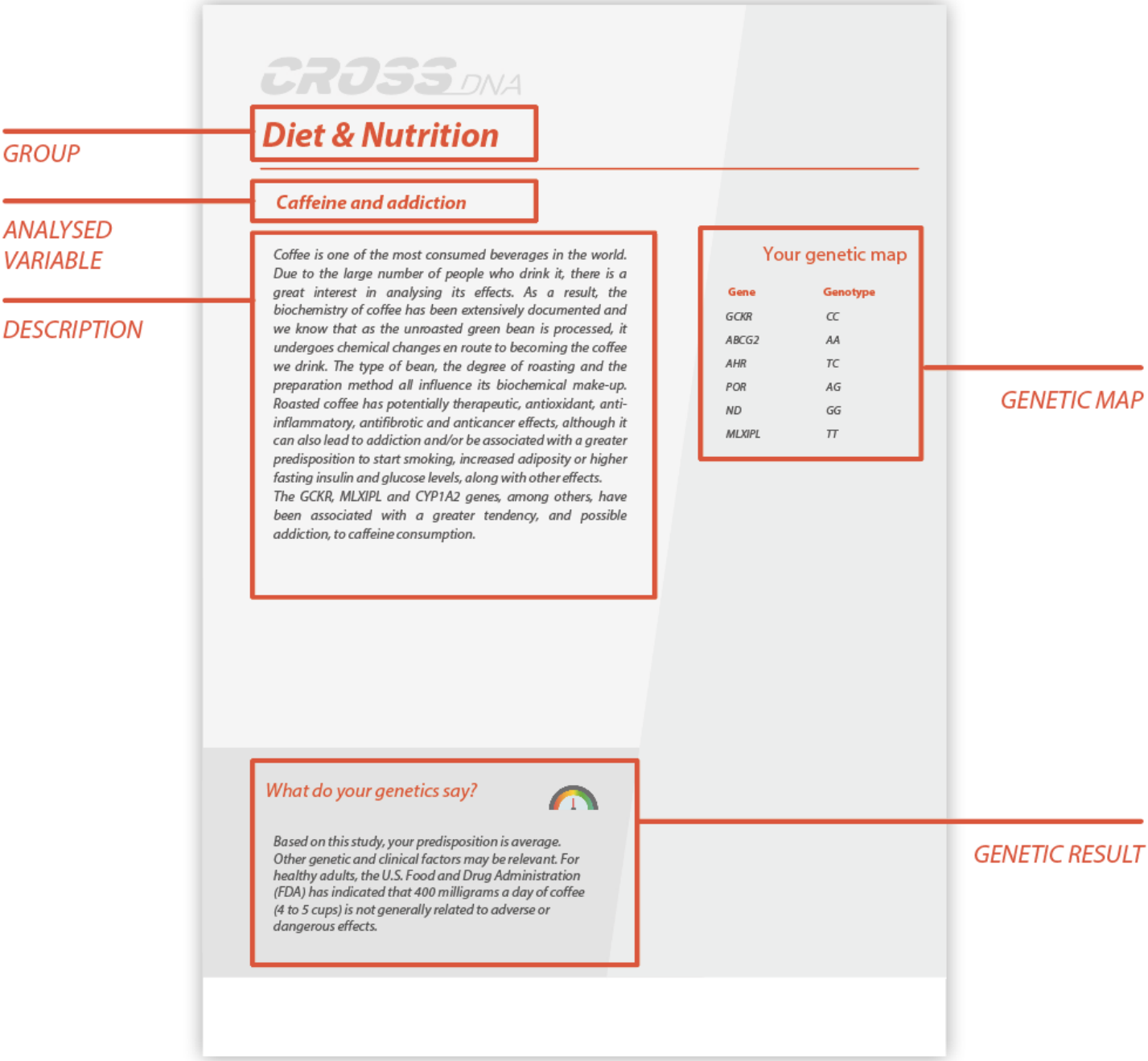
Your analyzed genotype is a little favorable.

Your analyzed genotype doesn't particularly affect you.

Your analyzed genotype is a little unfavorable.

Your analyzed genotype is unfavorable.

How to interpret the results



Diet & Nutrition

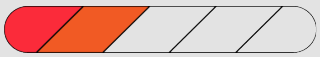
Longevity and the Mediterranean diet

Telomeres (a name of Greek origin meaning "final part") are the ends of chromosomes, akin to the plastic tips of shoelaces, whose main function is to protect the genetic material that carries the rest of the chromosome. As our cells divide in order to multiply and thus regenerate the tissues and organs in the body, telomeres shorten over time. This shortening is thus highly associated with the aging process and, consequently, with the time remaining before death. In other words, the shortening of telomeres has a direct relationship with longevity.
Studies have shown that people with mutations in the PPARG gene get an extra benefit from the Mediterranean diet that protects them against telomere shortening.

Your genetic map

Gene	Genotype
PPARG	CC

What do your genetics say?



Based on your genotype, you have no special predisposition to live longer with the Mediterranean diet. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Effectiveness of a low-fat diet

A low-fat diet is one in which the total fat intake is below 20% of the daily caloric intake, although the WHO considers a fat intake of up to 30% as healthy. In addition, experts recommend reducing the intake of saturated fats, such as pork fat, butter, milk fat, meat, ice cream and cheese, and replacing them with unsaturated fats, such as olive or seed oil, avocados, peanut butter or nuts. One way to distinguish between saturated and unsaturated (healthier) fats is that the former are solid at room temperature, while unsaturated fats only solidify when cooled.
Several large-scale studies on weight loss have shown a correlation between a variant in the IRS1 gene and an enhanced response to a low-fat diet.

Your genetic map

Gene	Genotype
IRS1	*CC*

What do your genetics say?

Based on your genotype, you are predisposed to lose weight with a low-fat diet. Other genetic and clinical factors may be relevant. Regardless of an individual's genetic predisposition to one type of diet being more effective than another, it is important to check with a health care professional before starting any nutritional regimen so that it can be tailored to each person's habits and lifestyle.

Diet & Nutrition

The effectiveness of a low-carb diet

A diet low in carbohydrates limits the intake of this type of macronutrient. Carbohydrates are the main source of energy in a diet and can be classified into two different types. Simple carbs provide immediate energy and are mainly found in sugars, such as those contained in fruits, while complex carbs, found in vegetables, cereals and legumes, provide a sustained source of energy throughout the day.
There are studies that indicate that genetics are, in part, responsible for how easy or hard it is to lose weight. In the specific case of a low-carb diet, it has been shown that variants in the FTO gene correlate with a greater predisposition to lose weight with this type of diet.

Your genetic map

Gene	Genotype
FTO	AT

What do your genetics say?

Based on your genotype, you have no special predisposition to lose weight with a low-carb diet. Other genetic and clinical factors may be relevant. Foods high in carbohydrates are some of the main sources of fibre, and a diet low in this substance can negatively affect intestinal health.

Diet & Nutrition

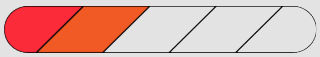
Triglyceride levels

Triglycerides are the most common type of fat in the body. They come from foods such as butter, some oils, and other fats. However, they can also come from the calories we eat through any other type of food, but that the body does not use and stores in fat cells instead. High triglyceride levels are often also associated with conditions such as lack of exercise, excessive consumption of alcohol, tobacco, or refined carbohydrates, and being overweight. Its most common consequence is an increased risk of cardiovascular disease (heart attack, stroke, atherosclerosis) or type II diabetes.
Genetic research has shown a correlation between certain mutations in the APOC1, FADS1, GCKR and other genes and a predisposition to have high levels of triglycerides.

Your genetic map

Gene	Genotype
GCKR	TC
SCARB1	AG
APOC1	GG
FADS1	CC

What do your genetics say?



Based on your genotype, you are more predisposed to high triglyceride levels than the majority of the population. Other genetic and clinical factors may be relevant. To maintain adequate triglyceride levels, you should eat a balanced diet, limit your consumption of fats and carbohydrates, not smoke, limit your consumption of alcohol, and exercise to consume the calories ingested.

Diet & Nutrition

LDL cholesterol levels

LDL cholesterol is a lipoprotein that can be dangerous if present in high levels, and is thus called "bad" cholesterol. LDL cholesterol can form plaque and build up on the walls of the arteries, which can narrow them and make them less flexible, increasing the risk of cardiovascular disease (infarction, atherosclerosis, or angina pectoris).
Genetic variants in the PCSK9, LDLR, APOC1 and other genes have been associated with abnormal levels of LDL cholesterol in the blood.

Your genetic map

Gene	Genotype
ABCG8	*TC*
LDLR	*TG*
LOC102724968	*TT*
APOB	*CC*
APOC1	*GG*
HMGCR	*TT*
LDLR	*TC*
FADS1	*CC*
TIMD4 HAVCR1	*CG*
CELSR2	*GG*
PCSK9	*TT*
SUGP1	*TT*

What do your genetics say?

Based on your genotype, you are predisposed to have average levels of LDL cholesterol. Other genetic and clinical factors may be relevant. To help maintain adequate LDL levels, you should consume skim milk, limit your intake of butter and fatty meats, and avoid lunch meats, fried foods and mass-produced pastries. The most advisable cooking methods are baking, steaming and grilling.

Diet & Nutrition

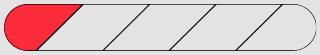
Vitamin B6 levels

Vitamin B6 (pyridoxine) is a water-soluble vitamin that is involved in numerous essential processes, such as protein metabolism, the proper functioning of the nervous system, the production of haemoglobin and maintaining proper homocysteine levels. It is found naturally in foods such as peas, whole grains, meat, eggs, and fish. Most people get enough vitamin B6 with a balanced diet, and vitamin B6 deficiency is rare. However, even slight imbalances in the levels of this vitamin can lead to various symptoms: nerve inflammation, irritability, depression, dermatitis, cracked and painful lips, swollen mouth and tongue, or confusion.
Numerous studies have linked the NBPF3 gene with reduced levels of vitamin B6, possibly due to the increased degradation of this vitamin in the blood.

Your genetic map

Gene	Genotype
NBPF3	*CC*

What do your genetics say?



Based on your genotype, you are predisposed to have low levels of vitamin B6. Other genetic and clinical factors may be relevant. Studies have shown a link between vitamin B6 levels and different genotypes, but this does not mean that your levels are not adequate. Environmental factors, such as the type of food, can compensate for a natural tendency to have levels below what is appropriate.

Diet & Nutrition

Vitamin B9 levels

Vitamin B9 (folate) is a water-soluble vitamin that is essential in processes such as DNA synthesis, cell repair, protein metabolism and proper brain function. It is naturally present in foods such as leafy green vegetables, peas, lentils, fruits, cereals and other foods. Folic acid is an artificial (synthetic) folate contained in supplements and added to fortified foods. Vitamin B9 deficiencies are associated with anaemia, high homocysteine levels, increased risk of heart disease, complications during pregnancy, increased risk of cancer, and cognitive dysfunction in old age.
Genetic studies have shown that the MTHFR gene is associated with low levels of vitamin B9 in the blood and an increase in homocysteine, a substance that, at high levels, is linked to cardiovascular disease.

Your genetic map

Gene	Genotype
MTHFR	*AG*
MTHFR	*TT*

What do your genetics say?

Based on your genotype, you are not predisposed to have a vitamin B9 deficiency. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Vitamin D levels

Vitamin D (calcidiol or calcifediol) is a fat-soluble vitamin that is important in the absorption and use of calcium, for maintaining good bone and muscle health, and for the proper functioning of the immune, endocrine and cardiovascular systems. It is synthesised in the skin after exposure to sunlight, which transforms it to its active form. Recently, an increase in cases of vitamin D deficiency has been identified in developed countries mainly due to lifestyle, the use of sunscreens and environmental conditions (pollution, geographic location). Numerous studies have identified variations in the GC gene related to vitamin D deficiency.

Your genetic map

Gene	Genotype
GC	TT

What do your genetics say?

Based on your genotype, you are not predisposed to vitamin D deficiency. Other genetic and clinical factors may be relevant. Exposure to sunlight is crucial to a person's vitamin D levels because there are few dietary sources of this vitamin.

Diet & Nutrition

Vitamin E - Response to supplementation

Vitamin E (tocopherol) is a fat-soluble vitamin. In addition to being an antioxidant, it is essential for the operation of the immune system and for cardiovascular health, and prevents cataracts, age-related macular degeneration and fatty liver disease. It is also essential for the skin due to its anti-inflammatory and photoprotective properties. Vitamin E deficiency is rare in healthy individuals and is usually caused by diseases in which nutrients are not properly absorbed, such as Crohn's disease, liver diseases or cystic fibrosis. Vitamin E poisoning is also rare, but can cause risk of haemorrhaging, muscle weakness, fatigue, nausea and diarrhoea.
One study has correlated variations in the ZPR1, CYP4F2 and NKAIN3 genes in men with abnormal levels of vitamin E obtained through supplements.

Your genetic map

Gene	Genotype
ZPR1	*CC*
CYP4F2	*CC*
NKAIN3	*TC*

What do your genetics say?

Based on this study, your predisposition to have normal levels is average. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Vitamin K levels

Vitamin K (phytomenadione) is a fat-soluble vitamin. Known as the clotting vitamin, it is essential to ensure proper blood clotting and bone health. In addition, numerous studies have shown that it contributes to longer life. Low levels of vitamin K increase the risk of bleeding, calcification of blood vessels, and bone fracture. This vitamin is obtained from the diet, but a portion is obtained from our own bodies, since the intestinal microbiota is able to synthesise it. The destruction of the microbiota from excess medication, such as antibiotics, or alcoholism, for example, can reduce the amount of vitamin K in the body.
Genetic variations, as with the VKORC1 gene, have been described that are associated with abnormally low levels of vitamin K.

Your genetic map

Gene	Genotype
VKORC1	*CC*

What do your genetics say?

Based on your genotype, your predisposition to have low levels of vitamin K is average. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Serum albumin level

Albumin is a protein produced by the liver that stands out as the most prevalent protein in blood serum. It is vital for regulating osmotic balance, the relationship between the fluids inside the cell (intracellular) and its external environment (extracellular), and for transporting various molecules. A decreased albumin level can be a warning sign of possible kidney or liver disease; low albumin levels usually indicate dehydration. In any case, either too high or too low, abnormal levels are not necessarily associated with a health problem. It has been shown that certain medications can have an impact on albumin levels, and genetics is also an important influencing factor. Specifically, variants in genes, such as FRMD5, have been identified that influence serum albumin concentration.

Your genetic map

Gene	Genotype
MIR22HG	*TT*
ACTBP9	*TC*
RPS11	*GG*
FRMD5	*GG*
TNFRSF13B	*TC*
FKBPL PRRT1	*AG*
LOC107984237	*TT*
HPN AS1	*TT*
CHRNA3	*CC*
ELL2	*CC*

What do your genetics say?

According to this study, your propensity is to have normal levels, in line with the average person.

Diet & Nutrition

Bilirubin levels

Bilirubin is a yellowish pigment produced during the breakdown of red blood cells, passes through the liver, and is eventually excreted from the body. Lower than average levels are not a concern, but abnormally high levels may indicate that the liver is not eliminating bilirubin properly, which may indicate liver disease or damage. It is, therefore, considered an essential indicator for detecting certain conditions. While liver disease is a common factor influencing these levels, genetics also plays a role. Variations in specific genes, such as UGT1A10, play a role in determining bilirubin levels.

Your genetic map

Gene	Genotype
UGT1A10	*GG*
HIST1H1T	*CC*
ARHGEF7	*GG*
SLCO1B1	*TT*

What do your genetics say?

According to this study, your propensity is to have normal levels, in line with the average person.

Diet & Nutrition

Glycated hemoglobin levels

Glycated hemoglobin A1c (HbA1c) is used as a measure of glycemic control, and also as a diagnostic criterion for diabetes.

Your genetic map

Gene	Genotype
SMG5	*AG*
LOC107986647	*TC*
FADS2	*CC*
PIEZO1	*CC*
MYO9B	*TC*
ANK1	*GG*
FN3KRP	*AG*
ABCB11	*CC*
CDKAL1	*TT*
GCK	*CC*
SLC30A8	*TC*

What do your genetics say?

According to this study, your propensity is to have normal levels, in line with the average person.

Diet & Nutrition

Predisposition to emotional eating

Emotional eating, or uncontrolled eating, is the tendency to eat more than normal as a result of certain emotions, such as stress, anxiety, anger, or certain social situations that create insecurity or discomfort. Sometimes, emotional eating can be brought about by the taste of the food or the pleasure caused by the act of eating itself.
Some studies indicate that certain variations in the TAS2R38 gene may cause some people, especially women, to be more likely to eat excessively when in a certain frame of mind.

Your genetic map

Gene	Genotype
TAS2R38	*AG*
MC4R	*TT*

What do your genetics say?

Based on your genotype, you are not predisposed to emotional eating. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Feeling of Satiety

Satiety refers to the physical sensation of feeling full after eating. When satiety is normal, the brain receives a signal that the body has eaten enough, and hunger subsides.

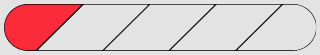
People with genetic variations in some genes, like FTO, are more likely to eat more without feeling full and satisfied.

The FTO gene is an important factor that predisposes one to having a healthy vs. an unhealthy weight. There is also a correlation between low satiety and weight gain. People with low levels of satiety tend to eat more and consume foods rich in sugar and fat. To improve satiety, you can increase your intake of dietary fibre and eat balanced and healthy foods throughout the day. Examples of high-fibre foods include whole wheat bread, oats, barley, lentils, black beans, artichokes, raspberries and peas.

Your genetic map

Gene	Genotype
FTO	*AT*

What do your genetics say?



Your genotype indicates that you are prone to reduced satiety compared to those with other genetic variants. Increase your consumption of foods rich in fibre, and eat frequently throughout the day (foods low in calories) to avoid gaining weight.

Diet & Nutrition

Celiac disease

Celiac disease is an immune disease in which people cannot eat gluten because it damages their small intestine. If you have celiac disease and eat foods with gluten, your immune system responds by damaging the small intestine. Gluten is a protein found in wheat, rye, and barley. It may also be found in other products, like vitamins and supplements, hair and skin products, toothpastes, and lip balm. Celiac disease affects each person differently. Symptoms may occur in the digestive system, or in other parts of the body. One person might have diarrhea and abdominal pain, while another may be irritable or depressed. Irritability is one of the most common symptoms in children. Some people have no symptoms.

What do your genetics say?

According to this study, you are less likely to suffer from this disease than most of the population.

Your genetic map

Gene	Genotype
LOC105371664	*AA*
PUS10	*AA*
IL18R1 IL1RL1	*TT*
LINC01934	*AA*
ICOS	*CC*
CCRL2 CCR5	*CC*
IL12A AS1	*AA*
LPP	*CC*
BLTP1	*AA*
HLA DQA1	*CC*
TNFAIP3	*AA*
ATXN2	*TT*
PTPN2	*AA*
MMEL1	*AA*
RUNX3	*AG*
MROH3P	*CC*
PLEK	*TC*
ARHGAP31	*TT*
BACH2	*AC*
THEMIS PTPRK	*AA*
Intergenic	*AA*
ZMIZ1	*AG*

Diet & Nutrition

Iron levels

Iron is an essential mineral for many bodily functions. For example, it is a basic component in the proper functioning of antioxidant enzymes. The absorption, transport and storage of iron are closely regulated by metabolism, because it is an essential but potentially toxic element. Iron deficiency is the most common nutritional dysfunction in the world. Symptoms include fatigue, rapid heart rate and palpitations. Children, women of childbearing age and vegetarians or vegans are at high risk of iron deficiency.
It has been found that the TF gene affects the level of iron in blood in men.

Your genetic map

Gene	Genotype
TF	*AA*
TMPRSS6	*GG*

What do your genetics say?

Based on your genotype, you are not predisposed to have low levels of iron. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Vitamin A - Carotenoid levels

Carotenoids, also called tetraterpenoids, are vitamin A provitamins in the form of yellow, orange, and red organic pigments, and are produced by plants, algae, and various bacteria and fungi. They have an antioxidant and anti-inflammatory function, are fat-soluble and are stored in the fatty tissues of animals.
Studies have shown that PKD1L2 gene, among others, is directly related to circulating carotenoid levels.

Your genetic map

Gene	Genotype
PKD1L2	GG
PKD1L2	TT
ND	TG

What do your genetics say?

Based on this study, your predisposition to have normal levels is above average. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Caffeine and addiction

Coffee is one of the most consumed beverages in the world. Due to the large number of people who drink it, there is a great interest in analysing its effects. As a result, the biochemistry of coffee has been extensively documented and we know that as the unroasted green bean is processed, it undergoes chemical changes en route to becoming the coffee we drink. The type of bean, the degree of roasting and the preparation method all influence its biochemical make-up. Roasted coffee has potentially therapeutic, antioxidant, anti-inflammatory, antifibrotic and anticancer effects, although it can also lead to addiction and/or be associated with a greater predisposition to start smoking, increased adiposity or higher fasting insulin and glucose levels, along with other effects.
The GCKR and LOC101927609 genes, among others, have been associated with a greater tendency, and possible addiction, to caffeine consumption.

Your genetic map

Gene	Genotype
GCKR	TC
ABCG2	AA
LOC101927609	CC
POR	AG
ND	GG
CYP1A2 CYP1A1	CC
EFCAB5	GG
MLXIPL	TT

What do your genetics say?

Based on this study, your predisposition is average. Other genetic and clinical factors may be relevant. For healthy adults, the U.S. Food and Drug Administration (FDA) has indicated that 400 milligrams a day of coffee (4 to 5 cups) is not generally related to adverse or dangerous effects.

Diet & Nutrition

Phosphorus levels

Phosphorus is a mineral that is found in our body's cells and plays an important role in how the body metabolises carbohydrates and fats. The main function of phosphorus is in bone and tooth formation, but it is also needed to produce proteins to grow, maintain and repair cells and tissues. Phosphorus is found in foods such as sardines, yogurt, meat and others. Low levels of this mineral usually do not produce symptoms, unless the deficit is very severe, in which case it may cause respiratory problems, confusion, irritability or coma. On the other hand, high levels may be indicative of kidney disease or hypoparathyroidism.
Multiple studies have shown a relationship between the FERRY3, PDE7B and IP6K3 genes to the predisposition to have abnormal levels of phosphorus in the blood.

Your genetic map

Gene	Genotype
NBPF3 ALPL	*CC*
CSTA	*AG*
IP6K3	*CC*
PDE7B	*TT*
FERRY3	*TT*

What do your genetics say?

Based on this study, your predisposition to have normal levels is average. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Predisposition to snacking

Snacking is the impulsive need to eat certain amounts of food at frequent intervals. Snacking can be healthy or not, depending on the amount and type of food that is consumed. The tendency to snack is highly influenced by leptin, a hormone that affects the operation of the hypothalamus, which regulates appetite, satiety and energy use.
It has been shown that people with genetic variations in some genes, such as MC4R, have a greater tendency to eat more without feeling satiated, and consequently to snack more frequently between meals.

Your genetic map

Gene	Genotype
MC4R	*TT*

What do your genetics say?

Based on your genotype, you have a low predisposition to snacking. Other genetic and clinical factors may be relevant.

Diet & Nutrition

Predisposition to overweight

The body mass index (BMI) is a number that is calculated based on a person's weight and height and is used to identify weight ranges that can lead to health problems. A BMI between 18.5 and 24.9 indicates a healthy weight, the overweight range is from 25 to 29.9, and 30 and above indicates obesity, from moderate to very severe. The tendency to overweight is a clear case of a combination of genetic and environmental factors. The environmental factors include mainly the type of diet and physical activity, but approximately 40 to 70% of the predisposition to overweight is inherited.
Several studies have correlated the FTO gene with a predisposition to have a higher BMI. In addition, in men, the MC4R gene is associated with a higher overall excess weight and a higher level of abdominal fat.

Your genetic map

Gene	Genotype
FTO	*AC*
MC4R	*GG*

What do your genetics say?

Based on your genotype, your predisposition to overweight is average. Other genetic and clinical factors may be relevant. Since genetics cannot be changed, to maintain a healthy BMI it is important to follow proper habits under the supervision of a health professional. And remember that you can also see your predisposition to the effectiveness of different types of diets in other parts of this report.

Health & Sport

General risk of injury

Exercise has numerous health benefits, but we must be careful to avoid injuries that occur when we perform exercises incorrectly. Although injury is always a risk when we engage in any exercise, some people are more likely to injure themselves than others, in part due to their genetics.

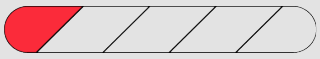
Scientific evidence has shown that certain genetic variations can affect vulnerability to injury. People at increased risk should adjust their training plans.

The genetic risk of injury is calculated taking into account variations in the genes related to general inflammation, as when suffering from soft tissue injuries, inflammation levels may affect recovery. This information allows you to get recommendations about which exercises to do and which to avoid.

Your genetic map

Gene	Genotype
GDF5	AA
COL1A1	CC
IL6	CC
CRP	CC

What do your genetics say?



You are at a high risk of injury to your tendons, ligaments and muscles.

Health & Sport

Aerobic capacity

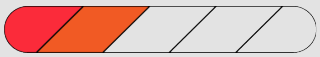
Maximum aerobic capacity (or maximum volume of oxygen, VO2max) is the maximum volume of oxygen a athlete's muscles can use for one minute to produce maximum physical effort. This measure reflects the person's aerobic physical condition and determines their power during prolonged exercise. The benefits of having good aerobic fitness are low pressure, low cholesterol, and reduced risk of obesity, type-2 diabetes and cardiovascular disease. VO2max is measured in L/min, but is more commonly expressed in mL of O2/kg/min in order to equitably compare athletes whose body masses are different. Absolute VO2max figures are usually 40-60% higher in men than in women.

Beginning at age 30 lung capacity begins to decline, and at age 50 may be half of what it was. This decrease means that less oxygen enters our cells, leading to reduced respiration and endurance, and increased susceptibility to respiratory diseases with age. Numerous genetic variants have been associated with aerobic capacity.

Your genetic map

Gene	Genotype
NFIA AS2	GG
RGS18	GG
ACSL1	GG

What do your genetics say?



Your genotype does not tend to endow you with an enhanced lung capacity, but you can improve it, so your muscles can convert oxygen into energy more efficiently. Perform intense exercise, increasing your heart rate to 70-85%.

Health & Sport

Skeletal Muscle Performance

Muscles such as biceps, pectorals and quadriceps are skeletal muscles that are attached to the skeleton to generate movement. Skeletal muscle is composed of elongated, thin cells, which include all the organelles necessary for cellular functions. More than 90% of the total volume of skeletal muscle cells is composed of muscle proteins, including actin and myosin contractile proteins.

When a muscle cell is activated by a nerve impulse, the interaction between actin and myosin generates a contraction. The total force depends on the sum of all the contractions that occur simultaneously in a muscle cell. Skeletal muscle is one of the three main types of muscles, the others being the heart and smooth muscle. The UCP2 and UCP3 proteins can negatively regulate mitochondrial ATP synthesis (energy that muscles use), thereby influencing physical performance. One study has found that genetic variants in these genes are associated with improved skeletal muscle performance through training.

Your genetic map

Gene	Genotype
UCP2	*TT*

What do your genetics say?

You present an increase in the efficiency of muscle contraction through training.

Health & Sport

Resilience

Prolonged exercise involves muscle lengthening and may result in structural muscle disruption, deterioration of the excitation-contraction process, inflammation, and the breakdown of muscle proteins.

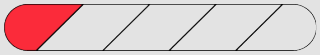
This process is known as exercise-induced muscle damage, and although a certain amount of muscle damage is required for adaptation to occur, excessive damage or inadequate recovery from muscle damage may increase the risk of injury.

After performing physical exercise, some people recover quickly and are ready to make a physical effort again after a brief rest. Other people do not recover as quickly, and need more rest time. Research has shown that certain genetic variants are associated with slower recovery after hard exercise. People with these markers should take special care with their training plan.

Your genetic map

Gene	Genotype
IL6	*CC*
CRP	*CC*
SOD2	*GG*

What do your genetics say?



Your genotype is associated with high levels of inflammation and low levels of antioxidants, which predisposes you to slower recovery after exercise.

Health & Sport

Lung volume

Lung volume is an essential factor influencing our respiratory function. It is measured by forced vital capacity (FVC), which indicates the maximum volume of air exhaled at maximum possible effort, starting from a maximal inspiration. It is expressed as volume (in ml). Low levels of this indicator may indicate lung obstruction. The analysis tool used is spirometry, which is used to diagnose and monitor respiratory diseases such as asthma and COPD (chronic obstructive pulmonary disease), among others. Environmental factors such as smoking and pollution exposure can influence the results, but genetics also plays a significant role. It has been found that specific variants in genes, such as BMP6, can affect a person's forced vital capacity.

Your genetic map

Gene	Genotype
EFEMP1	*AT*
BMP6	*TT*
MIR129 2	*GG*
PRDM11	*AA*
WWOX	*AA*

What do your genetics say?

According to this study, you have a propensity similar to that of most of the population.

Health & Sport

Muscular fatigue

Muscle fatigue occurs when muscles cannot exert normal strength, or when it takes more effort than normal to achieve a desired level of strength. Late-onset muscle pain describes a phenomenon of muscle pain or stiffness that is felt 12-48 h after exercise, particularly when starting a new training program, after a change in sports activity, or after a considerable increase in the duration or intensity of exercise.

The proteins of an injured muscle are released into the blood. A higher concentration of these proteins means greater damage to muscle fibres and a greater likelihood of muscle fatigue.

In addition to exercise, genetic condition is another cause of muscle fatigue. There are studies that relate certain genetic variants with enhanced resistance to muscular fatigue.

Your genetic map

Gene	Genotype
HNF4A	*GG*
NAT2	*AA*

What do your genetics say?

The likelihood of your muscles suffering damage and fatigue is average.

Health & Sport

Sex hormone levels

Genetic factors contribute strongly to sex hormone levels, yet knowledge of the regulatory mechanisms remains incomplete.

Your genetic map

Gene	Genotype
ZNF789	*CC*
LOC146253	*AA*
LOC105376607	*TT*
ANO2	*CC*
ZKSCAN5	*GG*
SLC22A24	*CC*
SULT2A1 SNAR	*GG*
LOC102723403	*CC*

What do your genetics say?

According to this study, you are more prone than the average person to having normal levels.

Health & Sport

White blood cell count

White blood cells are a type of blood cell that is produced in the bone marrow and found in blood and lymphatic tissues. White blood cells are part of the body's immune system. These help the body fight infections and other diseases. The types of white blood cells are granulocytes (neutrophils, eosinophils, and basophils), monocytes, and lymphocytes (T cells and B cells).

White blood cell count is a common clinical measurement of whole blood count tests, and varies widely among healthy individuals.

Your genetic map

Gene	Genotype
LINC01565	*AA*
EPS15L1	*AG*
LOC101927156	*TC*
LINC01565	*GC*
CCDC26	*GG*
LOC105376219	*TC*
PSMD3 CSF3	*TT*
HCG22 C6orf15	*TT*
PSMD3 CSF3	*TC*

What do your genetics say?

According to this study, your propensity is to have normal levels, in line with the average person.

Health & Sport

Risk of overload fracture

Overload fractures are small cracks in the bone caused by repetitive force or repetitive movements, such as running long distances or jumping repeatedly. They can also be caused by normal use of a weakened bone.

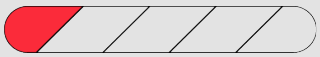
Anyone can suffer an overload fracture, but some people have a greater predisposition, which is associated with lower bone density. Overload fractured are a common injury in athletes, and affect up to 20% of athletes, particularly women. The main factor affecting one's risk to overload fractures is bone density, which has a genetic component (up to 85% of the variability is explained by genetic variations).

Using information from various genetic variants, the risk of overload fractures is estimated. Some variations increase risk while playing a protective role.

Your genetic map

Gene	Genotype
FUBP3	*AG*
RIN3	*CC*
HROB	*AA*
MEPE	*GG*
ZBTB40	*GG*

What do your genetics say?



Your predisposition to suffering stress fractures is very great.

Health & Sport

Response of blood pressure to sports

High blood pressure, known as hypertension, is a common health issue. It is estimated that most people will have hypertension at some point in their lives.

Exercise has been shown to lower blood pressure. In fact, aerobic training is generally recommended as a therapy to prevent, treat, and control hypertension. An hour and a half of low-intensity aerobic exercise per week helps to lower blood pressure. There is great variability in the inter-individual response to the antihypertensive effects of exercise, and much of this variation is explained by genetic predisposition.

People more prone to controlling their hypertension see their blood pressure drop more quickly than the average person. For these people the benefits of 30 minutes of exercise a day are more noticeable than for the general population.

Your genetic map

Gene	Genotype
EDN1	GG
NOS3	AG
GNAS	TT
ADD1	GG

What do your genetics say?

The likelihood that your blood pressure will decrease thanks to regular exercise is average.

Health & Sport

Cardiomyopathy, Familial Hypertrophic, 1

Hypertrophic Cardiomyopathy (HCM) is typically defined by the presence of Left Ventricular Hypertrophy (LVH). SUCH LVH occurs in a non-dilated ventricle in the absence of other cardiac or systemic diseases capable of producing the observed magnitude of increased LV wall thickness, such as pressure overload (e.g., long-standing hypertension, aortic stenosis) or storage/infiltrative disorders (e.g., Fabry Disease, amyloidosis). The clinical manifestations of HCM range from asymptomatic LVH, to progressive heart failure, to Sudden Cardiac Death (SCD), and vary from individual to individual, even within the same family. Common symptoms include shortness of breath (particularly with exertion), chest pain, palpitations, orthostasis, presyncope, and syncope. Most often the LVH of HCM becomes apparent during adolescence or young adulthood, although it may also develop late in life, or in childhood.

Your genetic map

Gene	Genotype
MYBPC3	*DD*
MYBPC3	*CC*
MYH7	*CC*
MYH7	*GG*
MYH7	*II*
MYH7	*TT*
MYH7	*AA*
MYBPC3	*GG*

What do your genetics say?

We have not detected any pathogenic mutations, but you might have some in non-analysed genetic regions.

Health & Sport

Cardiomyopathy, Familial Hypertrophic, 2

Hypertrophic Cardiomyopathy (HCM) is typically defined by the presence of Left Ventricular Hypertrophy (LVH). SUCH LVH occurs in a non-dilated ventricle in the absence of other cardiac or systemic diseases capable of producing the observed magnitude of increased LV wall thickness, such as pressure overload (e.g., long-standing hypertension, aortic stenosis) or storage/infiltrative disorders (e.g., Fabry Disease, amyloidosis). The clinical manifestations of HCM range from asymptomatic LVH, to progressive heart failure, to Sudden Cardiac Death (SCD), and vary from individual to individual, even within the same family. Common symptoms include shortness of breath (particularly with exertion), chest pain, palpitations, orthostasis, presyncope, and syncope. Most often the LVH of HCM becomes apparent during adolescence or young adulthood, although it may also develop late in life, or in childhood.

Your genetic map

Gene	Genotype
TNNT2	*GG*
TNNT2	*CC*
TNNT2	*II*

What do your genetics say?

We have not detected any pathogenic mutations, but you might have some in non-analysed genetic regions.

Health & Sport

Arrhythmogenic Right Ventricular Dysplasia, Familial, 10

Familial Isolated Arrhythmogenic Right Ventricular Dysplasia (ARVC) is the familial autosomal dominant form of ARVC, a heart muscle disease characterised by life-threatening ventricular arrhythmias with Left Bundle Branch Block Configuration (LBBBC), which may manifest with palpitations, ventricular tachycardia, syncope and sudden, fatal attacks. It is due to dystrophy and fibro-fatty replacement of the right ventricular myocardium, which may lead to right ventricular aneurysms.

Your genetic map

Gene	Genotype
DSG2	GG
DSG2	TT
DSG2	AA

What do your genetics say?

We have not detected any pathogenic mutations, but you might have some in non-analysed genetic regions.

Health & Sport

Brugada Syndrome 1

Brugada Syndrome (BrS) manifests with ST segment elevation in right precordial leads (V1 to V3), incomplete or complete Right Bundle Branch Block, and susceptibility to ventricular tachyarrhythmia and sudden death. BrS is an electrical disorder without overt myocardial abnormalities. As the aberrant ECG pattern is often intermittent and shows a distinct regionality, it is difficult to estimate the prevalence of the disease. The largest cohorts in Far East countries indicate a prevalence of 1/700-1/800. Its prevalence in Europe and the United States is lower: 1/3,300 to 1/10,000. An analysis of worldwide literature suggests a prevalence of the Type 1 (diagnostic) ECG pattern of 1/1000.

Your genetic map

Gene	Genotype
SCN5A	GG
SCN5A	CC

What do your genetics say?

We have not detected any pathogenic mutations, but you might have some in non-analysed genetic regions.

Health & Sport

Long Qt Syndrome 1

Congenital Long QT Syndrome (LQTS) is a hereditary cardiac disease characterised by a prolongation of the QT interval at basal ECG and by a high risk of life-threatening arrhythmias. The disease's prevalence is estimated at close to 1 in 2,500 live births.

Your genetic map

Gene	Genotype
KCNQ1	*CC*
KCNQ1	*GG*

What do your genetics say?

We have not detected any pathogenic mutations, but you might have some in non-analysed genetic regions.

Health & Sport

Muscle regeneration capacity

Muscles are important for exercise and, after it, need between 24 and 48 hours to repair and rebuild. Making them work again too soon simply leads to tissue breakdown.

Are you one of those people who needs a lot of time to recover after muscle damage? Prolonged and tiring exercise, such as high-intensity training, activates inflammatory factors. Genetic variations in several genes improve the inflammatory response that allows for the slow repair of muscle damage after exercise.

A person with a high predisposition to inflammation will benefit from less frequent exercise and longer recovery periods. If the body is not fully recovered, it can suffer damage due to overexertion and excessive training. This is particularly important for high-intensity athletes and bodybuilders.

Your genetic map

Gene	Genotype
IL1B	*AG*

What do your genetics say?

Your muscles recover more easily, according to your genetic results.

Lifestyle

Benefits of Exercise in Cholesterol

One of the benefits of exercise is improved cholesterol levels. HDL cholesterol is known as good cholesterol, and having high levels of HDL is beneficial. Many people can improve their HDL levels through exercise.

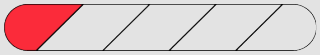
Research has shown that exercise stimulates enzymes that help move bad cholesterol from the blood to the liver, allowing it to be excreted with bile. It has also been stipulated that exercise increases the size of protein particles that carry cholesterol through the blood, reducing the possibility that small particles clog arteries.

Individuals with certain genetic variants will do well to increase their good cholesterol levels while exercising, while carriers of other genetic variants are less likely to lower their bad cholesterol levels through exercise alone.

Your genetic map

Gene	Genotype
CETP	*CC*
PPARD	*TT*

What do your genetics say?



Your genotype is not associated with a greater capacity to regulate your cholesterol levels through exercise.

Lifestyle

Benefit of exercise in body mass index

Exercise is part of weight loss plans, and is a crucial tool for maintaining a healthy weight. Physical activity is beneficial for all people, regardless of their genetics, but exercise is especially recommended for people at increased risk of being overweight.

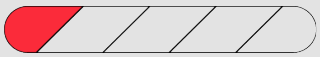
People with a certain variant in the genetic marker of the FTO gene are more likely to be overweight, have an increased Body Mass Index, and waist circumference. However, a large-scale study has shown that genetic susceptibility to obesity-induced variants in the FTO gene can be changed by adopting an active lifestyle.

In fact, people who are more susceptible to obesity experience greater weight loss by exercising at moderate intensities.

Your genetic map

Gene	Genotype
FTO	GG
FTO	AC

What do your genetics say?



Your genotype is not associated with easier weight loss through exercise.

Lifestyle

Benefit of Exercise in Insulin Sensitivity

Insulin helps control changes in glucose levels (commonly known as sugar) in the body. Insulin sensitivity refers to the body's ability to respond to these changes.

Having a greater sensitivity to insulin means that the body is better able to process glucose. Insulin resistance, on the other hand, is an alteration that impedes the proper regulation of glucose, and is associated with obesity and type-2 diabetes. Many people can benefit from exercise to increase insulin sensitivity.

According to one study, people with the beneficial genotype in a marker of the LIPC gene benefit more in the form of increased insulin sensitivity.

Your genetic map

Gene	Genotype
LIPC	*CC*

What do your genetics say?

You enjoy increased benefits from exercise in the form of better insulin sensitivity. This is especially important if you are diabetic, are overweight, or have a metabolic syndrome.

Lifestyle

Global benefit of the sport in your body

The benefits of exercise and regular physical activity are well known, and all people, regardless of age, sex or physical ability can notice its benefits. Exercise can prevent weight gain and help prevent many health problems, such as heart attacks, metabolic syndrome, type-2 diabetes, depression, various cancers, and arthritis.

Exercise releases oxygen and nutrients to tissues and helps the cardiovascular system work more efficiently. When the heart and lungs are healthier, the body has more energy.

Some people experience the benefits of exercise more quickly than others, but may also require dietary changes. People with certain genetic variants experience rapid results, such as lower cholesterol, triglycerides and blood pressure.

Your genetic map

Gene	Genotype
CETP	CC
BDNF	TC

What do your genetics say?

Based on your genotype, to note the benefits of regular exercise you should also make changes in your diet.

Lifestyle

Inflammation of the skin

Skin inflammation occurs when skin cells have a hyperreactive response to allergens or toxins. Acute inflammation is a natural reaction to repair the skin after being exposed to environmental infections or toxins, and usually lasts a few days. While it is a useful short-term response, if inflammation continues it can play a negative role. When the inflammation is chronic it begins to be destructive and damages the skin.

There are numerous stimuli that induce chronic inflammation: UV rays, stress, toxins, tobacco, alcohol, pathogen infections, excess free radicals. While inflammation is the skin's first line of defence, excessive inflammatory response causes premature ageing of the skin.

Signs include dermal tenderness, redness, and irritation. Genetic variations in various proinflammatory and antiinflammatory genes are associated with an increased risk of chronic skin inflammation.

Your genetic map

Gene	Genotype
IL18	*CG*
IL6	*AA*
IFNG	*AG*
ADAD1	*GG*
IL10	*AG*
IL6	*CC*

What do your genetics say?

Your genetics predispose you to a lower risk of excessive inflammatory responses on your skin.

Lifestyle

Freckles

Freckles, also known as ephelides, are hyperpigmented spots that often appear on the face, neck, thorax, and arms. They are the result of an increase in the production of melanin in the skin. They usually appear in childhood, but decrease with age, and darken with sun exposure.

Freckles are common among the Caucasian population and more frequent in light-skinned and red-haired people, who tend not to tan, are more likely to suffer sunburn and sun spots, and are at an increased risk for malignant melanoma and skin cancers.

Freckles are associated with genetic variations in the LOC105374875, IRF4 and MC1R genes. The MC1R gene contributes the most to red hair and fair skin. The number of parts depends on the number of variants of the MC1R gene.

Your genetic map

Gene	Genotype
LOC105374875	*CC*
Intergenic	*GG*
IRF4	*CC*
TYR	*AC*
TYR	*GG*
MC1R	*CC*

What do your genetics say?

Your genotype is the most favourable, so you are at a very low risk of freckles.

CROSS DNA