



# ***CROSS***DNA

## *SPORTS GENETIC TEST*

*NAME OF THE ATHLETE: **MIKE***

*ATHLETE NUMBER: **356548***

***STAY HEALTHY***

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*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.**

# CRO

# Introduction

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*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



Predisposition to emotional eating



Caffeine and addiction



Phosphorus levels



Effectiveness of a low-fat diet



Triglyceride levels



Vitamin B6 levels



Vitamin D levels



Vitamin K levels



Bilirubin levels



Pecking



Feeling of Satiety



Vitamin A - Carotenoid levels

## Lifestyle



Response of blood pressure to sports



Benefit of exercise in body mass index



Global benefit of the sport in your body



Photo-aging



Benefits of Exercise in Cholesterol



Benefit of Exercise in Insulin Sensitivity



General risk of injury

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

GROUP

## Diet & Nutrition

ANALYSED  
VARIABLE

### Caffeine and addiction

DESCRIPTION

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, MLXIPL and CYP1A2 genes, among others, have been associated with a greater tendency, and possible addiction, to caffeine consumption.

### Your genetic map

Gene	Genotype
GCKR	CC
ABCG2	AA
AHR	TC
POR	AG
ND	GG
MLXIPL	TT

GENETIC MAP

### 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.

GENETIC RESULT

## 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

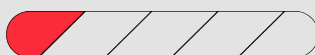
### Vitamin B6 levels

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 NBP3 gene with reduced levels of vitamin B6, possibly due to the increased degradation of this vitamin in the blood.

### Your genetic map

Gene	Genotype
NBP3	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 (caldiol 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
FKBP1 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

### Pecking

Snacking can be a healthy or unhealthy behaviour. Small portions of balanced foods containing unsaturated fats, proteins, fibre, and low-glycaemic carbohydrates can help quench hunger and reduce total calorie intake, while junk food can have negative effects on health.

Genetic markers associated with pecking include leptin receptor variants, an essential hormone in the regulation of food intake. Some people feel hungry more often than others, which leads them to eat impulsively, and renders them more likely to be overweight.

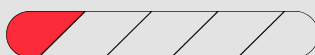
**Variations in the *LEPR* (leptin receptor) and *FTO* gene have been associated with a greater tendency to eat between meals.**

*This association has not been studied in men. **This section is only valid for women.***

### Your genetic map

Gene	Genotype
LEPR	AA
FTO	TC

### What do your genetics say?



Your genotype indicates that you are more prone to eating between meals. Choose low-calorie foods to limit your total caloric intake and avoid excess weight.

## 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.

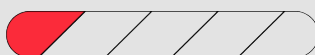
**People with genetic variations in some genes, like FTO, are more likely to eat more without feeling full and satisfied.**

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

### 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

### 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

### 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.

## Lifestyle

### 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.

## 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.

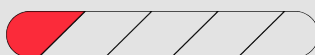
Research has shown that exercise stimulates enzymes that help move bad cholesterol from the blood to the liver, allowing it to be excreted with bile. It has also been stipulated that exercise increases the size of protein particles that carry cholesterol through the blood, reducing the possibility that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

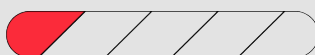
People with a certain variant in the genetic marker of the FTO gene are more likely to be overweight, have an increased Body Mass Index, and waist circumference. However, a large-scale study has shown that genetic susceptibility to obesity-induced variants in the FTO gene can be changed by adopting an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

### 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.

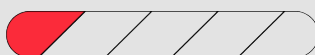
Scientific evidence has shown that certain genetic variations can affect vulnerability to injury. People at increased risk should adjust their training plans.

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.

## Lifestyle

### Photo-aging

Photoageing is defined as the premature ageing of the skin due to sun exposure. It is one of the harmful effects of prolonged and daily exposure to UV radiation, which causes DNA damage, oxidative stress and alterations to the normal architecture of the skin's connective tissue, impairing its function.

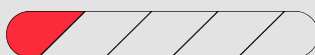
Most premature ageing is caused by exposure to the sun. Photoageing is responsible for uneven pigmentation, fine wrinkles, sagging skin, freckles, age spots, spider veins on the face, and rough skin. It is, therefore, crucial to protect the face and body against the negative effects of UVA and UVB rays.

Numerous studies suggest that photoageing has a genetic basis. Variations in the genes LOC105374069, STXBP5L and FBXO40 have been associated with an overall photoageing score that combines factors such as irregularities in pigmentation, wrinkles and sagging skin.

### Your genetic map

Gene	Genotype
FBXO40	AA
STXBP5L	GG
LOC105374069	TC

### What do your genetics say?



Your genotype indicates an increased risk of severe photoaging. Consuming fruits and vegetables rich in antioxidants is a fundamental step to prevent ageing. Creams with arbutin, kojic acid, L-ascorbic acid, licorice extract, retinol and Vitamin B3 can help you avert the signs of premature photoaging.

***CROSS***<sub>DNA</sub>

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