
24Genetics
Mike, this is your sports test & Nutrition Insight

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1. Introduction

In the following pages, we offer you the sports report obtained from the analysis of your DNA. In addition, you will find information about your genetic predispositions to sports.

Here are some essential aspects to take into account before reading this report.

The process by which we obtain your personalized report

The process we have followed to make your sports report consists of the following:

- **Extracting the DNA** from the saliva sample you sent us.
- Transforming the biological data contained in the DNA into computerized data. This process is called **sequencing.**
- Applying **the algorithms** developed exclusively by 24Genetics to this computer data, which allows us to obtain your personalized report.

As you can see, we combine purely biological processes with computer processes. Without losing an iota of scientific rigour, we can process vast amounts of information and offer you such detailed reports.

What is our algorithm like?

24Genetics algorithms are based on **the analysis and study of thousands of reports** (called "papers" in the scientific environment), contrasted, validated and recognized by the scientific community at an international level and that add value to our reports. In addition, we only apply to each individual the studies related to the population analyzed in them, i.e., we do not use a survey that has been carried out only with an Asian population for a European person, for example.

The most straightforward case, as a differential value of the 24Genetics reports compared to others, is that the first filter applied by our algorithm is sex. We classify genotypes into males and females. In this way, we only use the appropriate studies for each sex, avoiding applying a survey that only analyzed a male population sample to females.

In this way, we gain **accuracy and reliability in our results.**

Methodology

Our genetic reports are obtained based on three types of analysis methodology:

- **GWAS** (Genome-Wide Association Study). It is a study in which the DNA markers in the whole genome (the complete genetic material of a person) of people with a disease or trait are compared with those of people who do not have that disease or feature. It is a statistically based study, which considers a large number of genes associated with a predisposition in a less direct way but whose sum provides a relevant conclusion.
- **Multivariate analysis.** In this case, our algorithm analyzes several genetic variants or mutations of one or several genes, which have a more direct correlation with the predisposition.

- **Monovariate analysis.** In this type of methodology, it is a single variant of a single gene that determines predisposition because of its strong correlation with the genotype.

Each trait analyzed in this report is based on one of these three types of methodology.

The data and conclusions in this report, like the progress of scientific research in genetics, may evolve. New mutations are continually being discovered and we are learning more about the modifications we are analyzing today. At 24Genetics we make a great effort to apply new and consolidated scientific findings to our reports.

What information do we offer you?

The information provided by our reports speaks of **predispositions**. And what do we mean by that? Let's take an example. The possibility of suffering a bone fracture due to stress is influenced by multiple factors, which we could include in 2 groups: **genetic and environmental.** Genetic factors indicate our innate propensity to suffer a bone stress fracture.

On the other hand, environmental factors include elements that also have an effect, such as diet, habits, age, weight, etc. So, whether we ultimately suffer a fracture depends on the combination of both factors. And, even if we have a genetic predisposition, we may never suffer a stress fracture if we eat a diet rich in calcium and vitamin D, maintain a healthy weight, and practice sports with caution and without risks. Or vice versa.

Therefore, what our reports tell you are always genetic predispositions. By controlling environmental factors, we can help prevent these predispositions from developing.

What does this genetic test give me?

In this report, you have a lot of **scientifically validated information** about your predispositions. This lets you know **how your body works** naturally and what aspects you should pay attention to.

At 24Genetics, we recommend that you always consult a health or sports professional who can clarify your doubts, complement this report with your health history and available family history, supervise the follow-up of a personalized sports routine, or prescribe additional diagnostic tests if deemed necessary to confirm the risk of one or more specific predispositions.

A fundamental concept: the genetic variant.

In terms of genetic concepts, we want to share a basic one, which appears in all the features of our reports and is essential for you to understand at least briefly, that of genetic **genetic variant** (also called **variation** or **mutation**). The variant is a permanent change in the DNA sequence that forms a gene and is what marks an individual predisposition. Therefore, in each of the traits in this report, you will see information on the gene or genes affected in that trait. A variant in that gene or genes determines the different predispositions of some people versus others.

1.1. Structure of this report

For ease of understanding, this report is organized into the following categories:

Training and Abilities

Training defines your athletic performance, and choosing a sport based on personal preferences is more than understandable and reasonable. Still, genetics tells you what your natural predispositions are, allowing you to develop training plans to help you exploit your capabilities or improve your deficiencies. In this category, you will be able to check whether you are more likely to perform better in power or endurance sports or what your overall innate strength is according to your DNA.

Risk of injury

Practising sports correctly, safely and with caution will help you avoid physical damage. Still, you can also find out if you have a certain genetic predisposition to suffer specific injuries and thus be able to design sports routines to strengthen those parts of your anatomy. In this category, we tell you about it.

Biomarkers

Cholesterol levels, blood pressure or body mass index (BMI) and their relationship to the sport are influenced by your DNA, which determines your possible tendency to have additional advantages or risks than usual. Knowing yourself is the best tool to control your body. In this category, we inform you about your genetic predispositions so that you can use this information to your advantage.

Heart

The heart is the physiological centre of our organism and deserves special attention. Sport is intrinsically related to this organ, and preventing sudden death due to marks remains a medical challenge. Most causes are related to congenital or acquired cardiovascular diseases with no symptoms observed before the fatal event.

In this category, we include, among other data, information on your genetic predisposition to various cardiac pathologies that could lead to sudden death. However, this study does not analyze many other diseases and potential causes of premature death.

It should be borne in mind that the 24Genetics tests do not sequence the entire genome but analyze just over 700,000 markers of the 3.2 million genetic links that mark variability between individuals (99.9% of the genome is common to the human species). Therefore, not finding any mutation does not mean we are not carriers since the modification can be found in genetic areas not analyzed in our study. Likewise, we did not examine all the genetic information related to each disease studied. Specifically, we explored, on average, slightly less than 50% of the pathogenic markers reported for the pathologies or syndromes analyzed and associated with sudden death in the databases consulted so that mutations could exist in the other half and not be seen in this report. The modifications we are looking for are those reported in some of the most critical genetic databases worldwide, mainly OMIM and ClinVar.

It is essential to consider that, if you need to deepen the study of a specific disease, there are genetic tests that analyze the entire gene or genes involved in that disease and that have clinical validity. If you have a family history, we recommend you consult a physician or geneticist to study the need for such a test.

The information provided in this report is valid only for research, information and educational

purposes. It is not intended for clinical or diagnostic use.

1.2. Frequently Asked Questions

Do my genes determine everything?

Your genes are essential and determine the predisposition of your body's functioning, but many other factors influence it: lifestyle, exercise, and diet. In any case, knowing yourself well helps you to treat your body most appropriately. That is what genetics gives you: information and, consequently, knowledge.

Can there be more traits than those in my report?

Every day, new research is published worldwide, allowing us to expand our knowledge in the genetics field. 24Genetics constantly analyzes this research to incorporate it into our algorithm and improve it, to obtain more relevant information from your DNA data. This means that your report may evolve and offer more data than you currently have, in which case we will contact you to notify you.

Are all sports genetic tests the same?

Not all sports genetic testing is the same. There are not too many biotechnology companies with the capacity to perform these complex analyses, and most give very poor conclusions regarding the number of results. Thanks to our test, with some 700,000 genetic markers and our complex algorithms, we can offer what we believe is, to date, the most comprehensive sports genetic study on the market. The genetic information provided by 24Genetics is valid for research, information and educational uses. In no case is it suitable for clinical use.

What are 24Genetics tests based on?

Our tests are developed based on countless genetic studies with the highest recognition and acceptance by the international scientific community. The scientific studies are published, through prestigious institutions and organizations, in specific databases as long as there is a certain level of consensus. These validated studies are used to create and update our algorithm, which is applied to our clients' genetic data.

If I have a low predisposition to injury, am I sure I won't get injured?

Not having a higher genetic predisposition is not a guarantee of not being injured. Usually, these studies are carried out based on statistical data from a sufficiently large sample of people. The genetic differences between people with a specific pathology and those without are observed. The type of conclusion typically reached is that people with a genetic alteration have a greater predisposition to suffer a particular pathology. However, this does not mean that 100% of people with that alteration will have that pathology. Likewise, it does not mean that 100% of the people who do not have this alteration cannot suffer from this pathology.

Examples of some of the studies that support our sports genetics test

• Collins M et al; The COL1A1 gene and acute soft tissue ruptures; Br J Sports Med; 2010 Jun 11.

• Posthumus M et al; Components of the transforming growth factor-beta family and the pathogenesis of human Achilles tendon pathology–a genetic association study; Rheumatology; 2010 Apr 1.

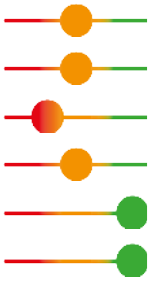
• Posthumus M et al; The COL5A1 gene is associated with increased risk of anterior cruciate ligament ruptures in female participants; Am J Sports Med; 2009 Nov;37(11):2234-40.

• Raleigh SM et al; Variants within the MMP3 gene are associated with Achilles tendinopathy: possible interaction with the COL5A1 gene; Br J Sports Med; 2009 Jul;43(7):514-20.

• September AV et al; Variants within the COL5A1 gene are associated with Achilles tendinopathy in two populations; Br J Sports Med; 2009 May;43(5):357-65.

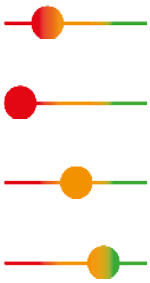
2. Summary

Training and capabilities



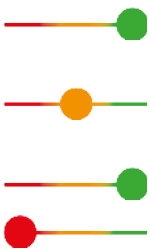
- General strength
- Predisposition to power sports
- Aerobic capacity
- Skeletal muscle development
- Frequency of sport practice
- Rowing
- Flexibility
- Predisposition to endurance sports
- Muscle hypertrophy
- Personal motivation
- Endurance swimming
- Sprinting

Risk of injury



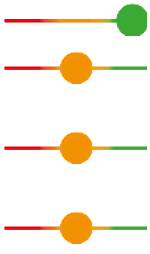
- General risk of muscle injury due to sport
- Risk of meniscus tear
- Sports-related skeletal muscle inflammation
- Cramps
- Risk of a bone stress fracture
- Meniscus recovery after meniscus surgery
- Concussion

Biomarkers



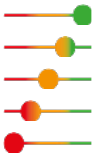
- Influence of sport on body mass index (BMI)
- Power of sport on glucose levels
- Sport and DHEA levels
- Oxidative stress
- Impact of sport on cholesterol levels
- Influence of resistance training on blood pressure
- Sport and testosterone levels

Heart



- Resting heart rate
- Familial hypertrophic cardiomyopathy type I
- Brugada syndrome
- Long QT syndrome
- Alteration of cardiac structures
- Familiar hypertrophic cardiomyopathy type II
- Arrhythmogenic right ventricular dysplasia

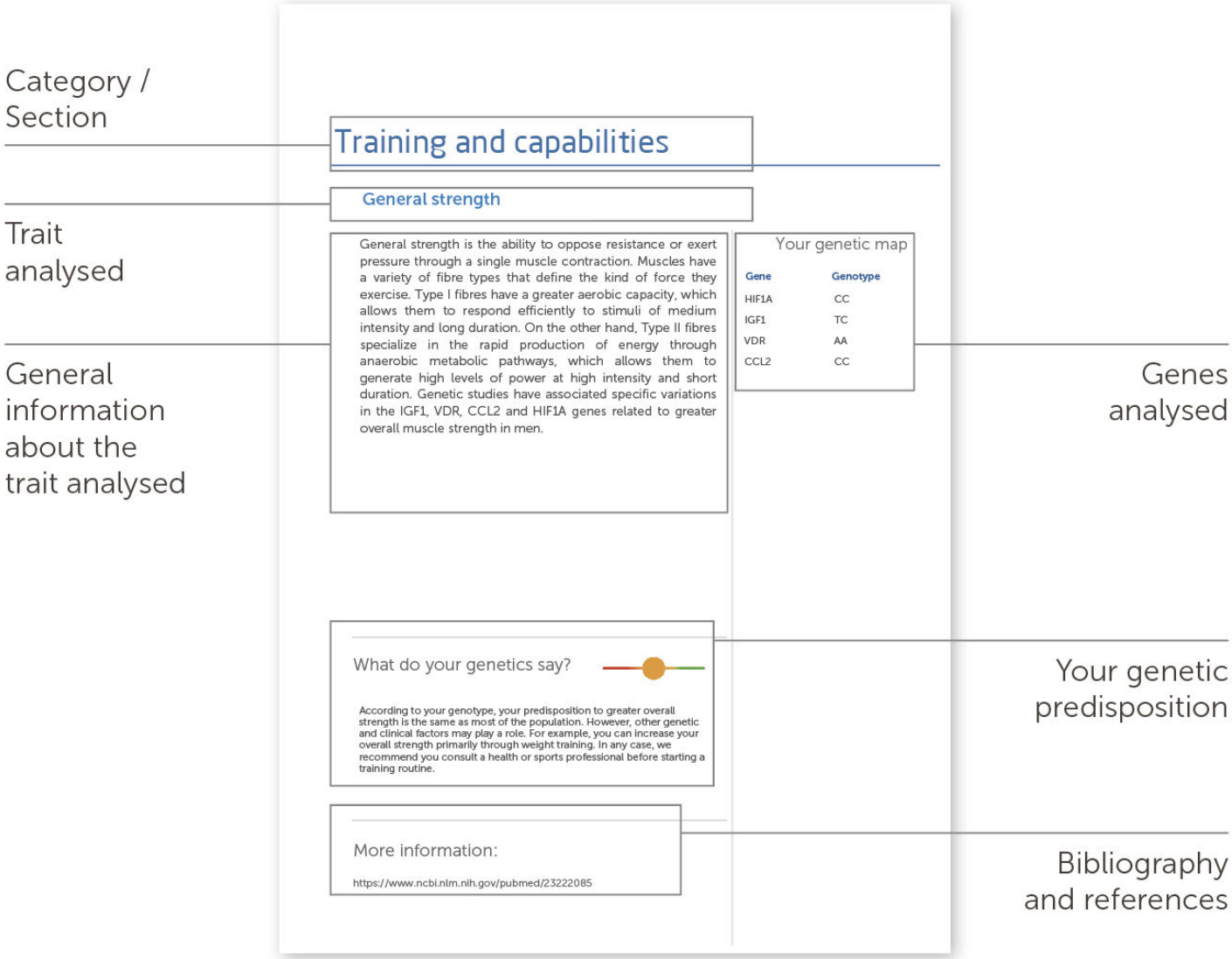
Caption:



- 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.

3. Genetic Results

3.1. What do the results show?



Training and capabilities

General strength

General strength is the ability to oppose resistance or exert pressure through a single muscle contraction. Muscles have a variety of fibre types that define the kind of force they exercise. Type I fibres have a greater aerobic capacity, which allows them to respond efficiently to stimuli of medium intensity and long duration. On the other hand, Type II fibres specialize in the rapid production of energy through anaerobic metabolic pathways, which allows them to generate high levels of power at high intensity and short duration. Genetic studies have associated specific variations in the IGF1, VDR, CCL2 and HIF1A genes related to greater overall muscle strength in men.

Your genetic map

Gene	Genotype
HIF1A	CC
IGF1	TT
VDR	GG
CCL2	TT

What do your genetics say?

According to your genotype, your predisposition to greater overall strength is the same as most of the population. However, other genetic and clinical factors may play a role. For example, you can increase your overall strength primarily through weight training. In any case, we recommend you consult a health or sports professional before starting a training routine.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/23222085

Training and capabilities

Flexibility

Flexibility is the ability of a muscle to passively lengthen through a range of motion and mobility. It could be defined as the ability to actively move a joint through its range of motion. Programs to improve joint mobility and flexibility are standard in clinical and physical sports settings. They generate multiple benefits, such as improved physical performance, reduced risk of injury or joint discomfort, improved posture and lower back pain. In addition, it helps to increase blood and nutrient flow to the tissues and, above all, improves muscle coordination and increases the range of mobility available in the joints.
At the genetic level, several studies show that people with mutations in the COL5A1 and ACTN3 genes tend to have less flexibility than individuals without those mutations.

Your genetic map

Gene	Genotype
COL5A1	TT
ACTN3	TT

What do your genetics say?

According to your genotype, your flexibility tends to be expected. However, other genetic and clinical factors may play a role. Therefore, the flexibility program design should be customized whenever possible, so we recommend you seek the advice of a specialized personal trainer or physiotherapist.

More information:

https://pubmed.ncbi.nlm.nih.gov/21362053/

Training and capabilities

Predisposition to power sports

Power measures the speed at which force is applied. That is, it is an athlete's ability to exert force quickly, as opposed to endurance, which measures the ability to repeat an activity over a long period of time without feeling fatigue. Fast twitch fibers generate a high amount of force in a short time, but fatigue faster. They have a lower capacity to obtain aerobic energy and higher levels of glycogen, so, for muscle contraction, they get points through anaerobic respiration. Several studies have analyzed genetic markers associated with power sports and show that mutations in the AGTR2, MSTN, EPAS1, IGF2BP2AGT, IL6, AMPD1, ACE, VEGFA, ACVR1B and NOS3 genes, among others, correlate with a greater or lesser predisposition to achieve a good performance in power sports in men.

Your genetic map

Gene	Genotype
ACE	GG
ACVR1B	GG
AGT	AG
AGTR2	CC
AMPD1	GG
EPAS1	GG
IGF2BP2	TT
IL6	GC
MSTN	TT
NOS3	TC
VEGFA	GG

What do your genetics say?

According to your genotype, your predisposition to perform well in power sports is normal. However, other genetic and clinical factors may play a role. Regardless of your genetic predisposition, power can be trained with different types of exercise. We recommend you consult a health or sports professional before starting a training routine.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/28666769

Training and capabilities

Predisposition to endurance sports

Endurance measures the ability to repeat an activity without feeling fatigued. Therefore, endurance training is defined as a high or low-intensity activity performed for a prolonged period, as opposed to power training, in which the action is very high intensity for a short period. Endurance is greatly influenced by the proportion of slow twitch fibres in skeletal muscle, known as red fibres because they contain more myoglobin. This protein stores oxygen, obtaining its energy source and allowing it to maintain its strength for longer. In addition, studies have associated a specific variant in the PPARA gene with a predisposition to better performance in endurance sports in men.

Your genetic map

Gene	Genotype
PPARA	GG

What do your genetics say?

According to your genotype, your predisposition to perform well in endurance sports is normal. Other genetic and clinical factors may play a role. Training such as long-distance running at a slow pace, cycling or swimming, yoga, sit-ups, squats or push-ups can improve your endurance. However, we recommend you consult a health or sports professional before starting a training routine.

More information:

https://pubmed.ncbi.nlm.nih.gov/22983821/

Training and capabilities

Aerobic capacity

Maximal aerobic capacity (or maximal volume of oxygen - VO2 max) is the maximum amount of oxygen that the body can absorb, transport and use per unit of time and, consequently, determines a person's aerobic fitness and power during prolonged exercise. Aerobic capacity can be improved through sports training to achieve a higher maximal oxygen volume, leading to low blood pressure, low cholesterol levels, and lower risk of obesity, type 2 diabetes and cardiovascular disease. Conversely, a low flow of oxygen to our cells explains possible shortness of breath, decreased endurance and increased susceptibility to respiratory infections with age. In addition, studies show that mutations in the ACSL1 gene correlate with poorer trainability of aerobic capacity.

Your genetic map

Gene	Genotype
ACSL1	AA

What do your genetics say?

According to your genotype, you have a low predisposition to improve your aerobic capacity through sport. Other genetic and clinical factors may play a role. Cross-training, combining several sports, is an excellent way to train aerobic capacity.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3098655/

Training and capabilities

Muscle hypertrophy

Muscle hypertrophy is the scientific name given to the growth of muscle cell size, which implies an increase in fibre size and thus muscle development. Almost any type of sports training usually involves muscle development to a greater or lesser extent. Still, sometimes hypertrophy is a goal in itself for some athletes, in which case specific routines are designed for that purpose, based mainly on strength training. Some benefits of muscle hypertrophy are increased strength and endurance, joint strengthening, and injury prevention.
One study shows that individuals with mutations in the PPARG gene tend to obtain more significant muscle hypertrophy, i.e., increased muscle development, due to sports training.

Your genetic map

Gene	Genotype
PPARG	CC

What do your genetics say?

According to your genotype, your predisposition to obtain muscular hypertrophy due to the practice of sport is normal. However, other genetic and clinical factors may have an influence. For example, training is usually based on weight lifting to achieve muscle hypertrophy. The so-called "training to failure" system is standard among other routines, combining repetitions and weight until the last repetition cannot be performed entirely.

More information:

https://pubmed.ncbi.nlm.nih.gov/19526109/

Training and capabilities

Skeletal muscle development

There are three types of muscles: skeletal, cardiac and smooth. Skeletal muscles are striated muscles attached to the skeleton, formed by cells or elongated fibres. Their function is to facilitate movement and maintain the bone-joint union through their contraction. The biceps, pectorals or quadriceps are examples of skeletal muscles. Strength is influenced, among other factors, by muscle volume, which can be increased by training through functional exercises, repetitions with weight load and an adequate diet. At the genetic level, a study has found that a genetic variant in the BMP2 gene is associated with a better predisposition to skeletal muscle development due to endurance sports.

Your genetic map

Gene	Genotype
BMP2	AA

What do your genetics say?

According to your genotype, your predisposition to skeletal muscle development through endurance sports is normal. However, other genetic and clinical factors may play a role. For example, a proper diet is essential in addition to sports to achieve muscle growth goals. Therefore, we recommend you share your genetic reports with health and sports professionals (doctor, nutritionist, personal trainer) to reach your maximum potential safely.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4147943/

Training and capabilities

Personal motivation

When we undertake any task or project, there can be two motivations. Rational motivation is the set of objective reasons why it is positive to carry out such a project. On the other hand, personal or intrinsic motivation is the set of psychological forces that lead us to undertake such action. It arises from within the individual and is usually a reliable indicator of our possibilities to carry it out. In sports, both types of motivations have an influence. For example, we can exercise because we are overweight or have high blood pressure, and we can do it because our body asks us to, without any apparent objective reasons.
In the case of personal motivation, genetics has a lot to say. For example, several studies show that variations in the BDNF and VDR genes can influence our motivation to practice sport.

Your genetic map

Gene	Genotype
BDNF	CC
VDR	GG

What do your genetics say?

According to your genotype, you are predisposed to have a greater personal motivation to practice sports. Other genetic and clinical factors may also play a role. Sport is an objectively healthy practice that helps prevent diseases, and taking into account the objective factors that advise us to exercise is a sound reinforcement. In addition, the advice of a personal trainer can provide reinforcement and technical and motivational support.

More information:

https://pubmed.ncbi.nlm.nih.gov/24805993/

Training and capabilities

Frequency of sport practice

By training frequency, we mean the number of sports sessions performed, or the number of times a specific muscle group is exercised, during a given period of time, (usually, a whole week). But, leaving aside technical definitions, we can say that frequency in sport is the periodicity with which we carry out this activity and is directly related to the achievement of the objectives set, together with other factors, such as the type of training, the intensity, the duration of the sessions, etc.
Genetics can influence our predisposition to exercise more frequently. In this regard, a study shows that a mutation in the GCKR gene is directly related to a greater tendency to practice sports more assiduously.

Your genetic map

Gene	Genotype
GCKR	TC

What do your genetics say?

According to your genotype, you are predisposed to practice sports frequently. However, other genetic and clinical factors may play a role. Regardless of your genetic predisposition, we recommend you consult a personal trainer, who can define your personalized routine with the optimal training, intensity, frequency and rest times according to your goals and physical condition.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6722860/pdf/genes-10-00570.pdf

Training and capabilities

Endurance swimming

Swimming is a sport that mainly exercises the latissimus dorsi, pectoralis, deltoid, triceps, biceps, teres major and trapezius muscles, and, secondarily, the abdominals, gluteus, intercostals, and quadriceps. On a cardiorespiratory level, it improves oxygen consumption by up to 10%. In addition, it allows the heart to pump up to 18% more blood, resulting in better circulation and reducing the heart rate. It is also one of the sports that helps to improve coordination. There are four basic swimming styles (crawl, breaststroke, backstroke, and butterfly), each with its specific technique and level of difficulty, as well as its muscular and skeletal indications so that it is a sport that can be adapted to the particular needs of each person.

In genetics, a specific mutation in the NOS3 gene has been correlated with a predisposition to a better performance in endurance swimming.

Your genetic map

Gene	Genotype
NOS3	TC

What do your genetics say?

Depending on your genotype, you are predisposed to perform well in endurance swimming. Other genetic and clinical factors may play a role. We can say that swimming is a sport recommended for almost any type of person, as it generates a little impact on bones and joints, improves flexibility and elasticity, and burns fat. It can also help to manage stress and anxiety.

More information:

https://pubmed.ncbi.nlm.nih.gov/30765915/

Training and capabilities

Rowing

Rowing is a sport discipline that consists of propelling a boat over the water using the muscular strength of one or more rowers, each using one or two oars as levers. At body level, the benefits of rowing are strengthening of the musculature, reduction of joint stiffness, elimination of body fat and improvement of cardiovascular endurance. But, at a mental level, it also helps release endorphins. The muscle groups most exercised with rowing are the cervical musculature, shoulder, back and arm, although indirectly also work the abdomen, buttocks and legs. In general, it helps build muscle and increases strength and endurance simultaneously.
At the genetic level, it has been shown that mutations in the ACTN3 gene are correlated with better rowing performance.

Your genetic map

Gene	Genotype
ACTN3	TT

What do your genetics say?

Depending on your genotype, you are predisposed to perform well in rowing. Other genetic and clinical factors may play a role.

More information:

https://pubmed.ncbi.nlm.nih.gov/25268288/

Training and capabilities

Sprinting

Sport sprinting is the increase in exercise speed over a period of time, usually short. It is also known as doubling, because it is estimated to consist of doubling the energy level during that time interval. It should be noted that, like any form of exercise, it requires prior preparation in which the body becomes accustomed to these changes in intensity. Sprinting has many benefits: it improves reaction capacity and increases bone density and sports performance in general. Studies have associated specific variations in the AMPD1 and ACVR1B genes with the level of sprinting performance.

Your genetic map

Gene	Genotype
AMPD1	GG
ACVR1B	GG

What do your genetics say?

According to your genotype, your predisposition to correct sprint performance is average. However, other genetic and clinical factors may have an influence. Therefore, before you start sprinting, it is advisable to seek the advice of a doctor and a sports specialist to help you define your goals and burst times in a personalized and controlled manner.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/24885427

Risk of injury

General risk of muscle injury due to sport

Sport has numerous health benefits, but any physical activity carries a risk of injury from the activity itself and the possibility of performing the exercises incorrectly. To avoid the latter, having a sports or health professional supervise the correct development of the sports routine is essential. When a muscle is injured, proteins are released into the blood, the concentration of which is evidence of more significant damage to the muscle fibres and a greater likelihood of muscle fatigue. However, some people have a greater predisposition to injury than others, and this, in part, is due to their genetics. Scientific evidence has shown that specific variation in the IL6 gene correlates with the risk of injury.

Your genetic map

Gene	Genotype
IL6	GC

What do your genetics say?

You are predisposed to suffer muscular injuries due to sports according to your genotype. In addition, other genetic and clinical factors may play a role. Therefore, in addition to avoiding falls or using protective equipment, if you do certain activities, such as risky or contact sports, it is advisable to do physical exercise to strengthen and maintain the flexibility of your joints and muscles.

More information:

https://pubmed.ncbi.nlm.nih.gov/18758806/

Risk of injury

Risk of a bone stress fracture

Bone mineral density (BMD), also called bone density or bone mass, is the most widely used indicator to assess the risk of a stress fracture. Stress fractures are small cracks in the bone caused by repetitive application of force, repetitive motion or regular use of a weakened bone. Some people have a greater predisposition to stress fractures associated with lower bone density, with a genetic component of up to 85%. The most advanced case of low bone density is osteoporosis, a disease that affects more in older age and especially women after menopause. In addition, studies have associated specific variations in the FAM210A and C18orf19 genes, among many others, with the risk of bone stress fractures.

What do your genetics say?

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

More information:

www.ncbi.nlm.nih.gov/pubmed/22504420

Your genetic map

Gene	Genotype
FABP3P2	CC
ARHGAP1	TC
AXIN1	TC
TMEM263	TC
RPS3AP2	AG
C17orf53	AC
FAM210A	AG
CCDC170	TC
CPED1	AA
LOC10013328	CC
CPN1	CC
LOC10537704	TC
LOC10798396	AG
DCDC5	TC
RHEBL1 DHH	CC
DNM3	GG
LOC10798450	AA
FOXL1	AA
FUBP3	CC
CSRNP3	GG
GPATCH1	TC
HOXC6	CG
IDUA	AG
LOC10537357	GG
JAG1	CC
KCNMA1	TT
KIAA2018	TG
LOC10536970	TT
LEKR1	TT
RPL37AP7	TC
LRP5	CC

Risk of injury

Risk of meniscus tear

Cartilage is a strong but flexible tissue that cushions between the ends of bones in a joint. The meniscus is a C-shaped piece of cartilage, of which there are two in each knee. A torn meniscus usually causes medial or lateral pain depending on whether it is internal or external, although sometimes it can also cause pain in the back of the knee. In addition to pain, meniscal tears can cause a sensation of the knee giving way, inability to move the knee normally, and increased susceptibility to osteoarthritis in the injured joint. Studies have associated a particular variation in the GDF5 gene with the risk of meniscal tears in men.

Your genetic map

Gene	Genotype
GDF5	AG

What do your genetics say?

According to your genotype, you are predisposed to meniscus tears. Other genetic and clinical factors may play a role. In addition to trying to avoid falls or using protective equipment, if you do certain activities, such as risky or contact sports, it is advisable to do physical exercise to strengthen and maintain the flexibility of your joints and muscles.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/24227118

Risk of injury

Meniscus recovery after meniscus surgery

The treatment of a meniscal tear usually depends on the disability that the injury causes to the patient, among other factors. It is generally conservative in degenerative lesions of this age, but it is often necessary to go to the operating room. Meniscus surgery is usually performed by arthroscopy, using a camera inserted through a small incision in the joint, which allows the problem to be identified and solved from the inside. The most common techniques are meniscal suture and partial removal (partial meniscectomy). The postoperative period depends on many factors, such as the result of the surgery, the previous state of the joint, the patient's physical condition, age, etc. But genetics also has something to say since studies associate a specific variation in the GDF5 gene with better recovery and more excellent knee stability after meniscus surgery.

Your genetic map

Gene	Genotype
GDF5	AG

What do your genetics say?

You are highly predisposed to a good recovery after meniscus surgery, according to your genotype. Other genetic and clinical factors may play a role. A health professional, rehabilitation physician or physiotherapist should always supervise recovery after trauma surgery.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/24227118

Risk of injury

Sports-related skeletal muscle inflammation

There are three types of muscles: skeletal, cardiac and smooth. Skeletal muscles are striated muscles attached to the skeleton, formed by elongated cells or fibres. Their function is to facilitate movement and maintain the bone-joint union through their contraction. Muscle inflammation related to sports can have different causes, such as overexertion, strains, blows, prolonged tension, and sports practice accidents, which are frequently associated with incorrect routines and physical performance. But genetics is also an influential factor, as demonstrated by a study that shows the correlation of a mutation in the IL1B gene with the risk of suffering skeletal muscle inflammation after endurance sports.

Your genetic map

Gene	Genotype
IL1B	AG

What do your genetics say?

Based on your genotype, your predisposition to skeletal muscle inflammation from endurance sports is normal. However, other genetic and clinical factors may play a role. We recommend that you strengthen and maintain flexible joints and muscles. You can also see your genetic predisposition to endurance sports in another feature of this report.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1665272/

Risk of injury

Concussion

A concussion, also called a traumatic brain injury, can occur when the head hits an object or when a moving object strikes the head. This type of injury can cause headaches, changes in alertness, loss of consciousness (rare), or memory loss. It can also affect how the brain functions, and depending on the severity of the trauma, the extent of the injury and its duration, the consequences can be more or less significant. Sports activities are a common cause of concussion, which a physician should diagnose.
Several studies have shown that mutations in the IL6R and APOE genes are correlated with a greater or lesser likelihood of concussion.

Your genetic map

Gene	Genotype
IL6R	AC
APOE	GG

What do your genetics say?

According to your genotype, you have a low predisposition to concussion. Other genetic and clinical factors may play a role. Since a concussion is caused by trauma, it is a complex injury to prevent. Helmets, mouthguards and other safety items can reduce the risk of head injury, especially in high-risk sports where the trauma may be more severe.

More information:

https://bjsm.bmj.com/content/bjsports/52/3/192.full.pdf?ijkey=ZKH90hYIAcypOJa&keytype=ref

Risk of injury

Cramps

Muscle cramps are sudden involuntary contractions or spasms in one or more muscles. They are relatively frequent and usually occur after exercise. The most typical case is muscle cramps in the legs at night. They can be very painful and last from a few seconds to several minutes. Dehydration; low levels of electrolytes, such as magnesium, potassium or calcium; muscles with poor blood supply; pregnancy; or certain medications are some of the causes, although the main reason is usually excessive tension of a specific muscle. If you have a cramp, it is essential to stop exercising, gently stretch the muscle, drink water, walk a little and relieve the pain with ice, if necessary.
On a genetic level, a study shows that people with a particular mutation in the COL5A1 gene are more prone to muscle cramps than people without the modification.

Your genetic map

Gene	Genotype
COL5A1	TT

What do your genetics say?

According to your genotype, you are not particularly predisposed to muscle cramps. However, other genetic and clinical factors may play a role. To avoid cramps, it is recommended to stretch your muscles before exercising and drink plenty of fluids to stay hydrated. If cramps occur at night, it is advisable to stretch before going to bed. If you have frequent cramps, we recommend you visit your doctor or physiotherapist.

More information:

https://pubmed.ncbi.nlm.nih.gov/22894972/

Biomarkers

Influence of sport on body mass index (BMI)

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 healthy weight is considered between 18.5 and 24.9 BMI; overweight corresponds to the range between 25 and 29.9; and over 30 is considered obese, from moderate to severe. Physical activity is beneficial for all people, regardless of their genetics. Still, studies show that a specific variant of the FTO gene has a direct relationship with a more significant benefit of the practice of sport in reducing BMI.

Your genetic map

Gene	Genotype
FTO	AA
FTO	CC

What do your genetics say?

According to your genotype, you are highly predisposed to reduce your BMI by practising sports. However, other genetic and clinical factors may have an influence. In addition to a correct sports routine, a balanced diet can help you reduce your weight and improve your health and well-being, always under the supervision of a health professional. You can also see your predisposition to the greater or lesser effectiveness of different types of diet in our nutrigenetic report.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/19553294

Biomarkers

Impact of sport on cholesterol levels

Cholesterol is a waxy, fat-like substance found in every cell in our bodies. It is needed to produce hormones, vitamin D and substances that help digest food, but abnormally high levels can lead to an increased risk of heart disease, stroke and other problems. Research shows that one benefit of exercise is improving cholesterol levels by increasing the size of the protein particles that carry cholesterol through the blood, reducing the chance of smaller protein particles clogging arteries. It also stimulates enzymes that help move lousy cholesterol from the blood to the liver, allowing it to be excreted. In addition, specific variants in the LIPC gene have been correlated with better regulation of cholesterol levels by sports training in men.

Your genetic map

Gene	Genotype
LIPC	TC

What do your genetics say?

According to your genotype, your predisposition to better regulate cholesterol levels through sport is normal. However, other genetic and clinical factors may have an influence. In addition to practising sports, it is advisable to consume skimmed dairy products, replace butter with olive oil, fatty meats with lean meats, and avoid consuming cold meats, fried foods and industrial pastries. Baking, steaming, grilling or broiling are the most advisable.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/15983229

Biomarkers

Power of sport on glucose levels

Insulin is a hormone generated by the pancreas, which controls glucose levels in two ways: by using it as a source of energy, mainly by the muscle and by regulating its production by the liver. This function is "insulin sensitivity". When insulin does not perform this function well, it is called "insulin resistance", and glucose accumulates in the blood, producing hyperglycemia, which can lead to obesity and type II diabetes. Sport involves increased energy expenditure, which positively influences glucose levels. According to genetics, specific variants of the HNF4A and LIPC genes show a predisposition to obtain adequate insulin and glucose levels, thanks to the practice of sports regularly.

Your genetic map

Gene	Genotype
HNF4A	GG
LIPC	TC

What do your genetics say?

According to your genotype, your predisposition to obtain adequate insulin and glucose levels through regular sports practice is expected. Other genetic and clinical factors may play a role. A decrease in weight, under the supervision of a physician or nutritionist, with particular emphasis on reducing the consumption of sweets, bread, pasta and other carbohydrates, may help to achieve better insulin control.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/19406499

Biomarkers

Influence of resistance training on blood pressure

Blood pressure is the force exerted by the blood against the walls of the blood vessels throughout the circulatory system. Arterial hypertension is a chronic condition in which the blood vessels have persistently high blood pressure, which can damage them. It is estimated that most of the population will have hypertension at some point. The practice of endurance sports (running, swimming, cycling, prolonged sessions on the elliptical bike or rowing machine, among others) can help reduce blood pressure. Still, this influence depends very much on the individual, and genetics plays an important role. Several studies have associated specific variations in the NOS3 gene with an antihypertensive effect in particular genotypes.

Your genetic map

Gene	Genotype
NOS3	GG

What do your genetics say?

According to your genotype, endurance training predisposes you to lower blood pressure. Other genetic and clinical factors may play a role. Apart from sports, healthy lifestyle habits to prevent hypertension are well known to the population: maintaining an appropriate BMI, reducing sodium in our diet, limiting alcohol, tobacco and caffeine consumption, and reducing stress levels.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2714087/

Biomarkers

Sport and DHEA levels

Dehydroepiandrosterone (DHEA) is an endogenous prohormone naturally secreted by the adrenal glands, which helps produce other hormones, including androgens and estrogens. DHEA strengthens muscles and positively affects bones and joints; stimulates neurological and immune function; helps reduce body fat and preserve muscle mass; increases daily energy and improves sexual appetite. Natural levels of DHEA peak in early adulthood and slowly decline as one age. This hormone can also be produced artificially (anabolic steroids), and some athletes use it to obtain better results, although its consumption is prohibited within the world of sports competition.
A study shows that people with mutations in the intergenic zone LOC146253 and other genes tend to have abnormal DHEA levels.

Your genetic map

Gene	Genotype
ZNF789	CC
LOC146253	AA
LOC10537660	TT
ANO2	CC
ZKSCAN5	GG
SLC22A24	CC
SULT2A1	GG
LOC10272340	CC

What do your genetics say?

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

More information:

www.ncbi.nlm.nih.gov/pubmed/26014426

Biomarkers

Sport and testosterone levels

Testosterone is the primary sex hormone in men. During puberty, it causes body hair growth, muscle development, and deepening of the voice. In adult men, it controls sexual desire, helps produce sperm and maintains muscle mass. As for the relationship of testosterone with sport, it is worth noting that it has an essential role in regulating metabolism, whose proper functioning is vital for weight control, maintaining sufficient energy levels throughout the day, or having a good mood, among other functions. In particular, testosterone plays a significant role in making muscle fibres grow and become stronger. And since muscle is the most energy-consuming tissue in our body, metabolic activity improves when testosterone levels are adequate.
A study shows that mutations in the SHBG gene are correlated with the tendency to have low testosterone levels.

Your genetic map

Gene	Genotype
SHBG	TG
SHBG	CC

What do your genetics say?

According to this study, you have a predisposition similar to most of the population to have low levels. Other genetic and clinical factors may play a role. To maintain adequate testosterone levels, it is advisable to maintain a healthy weight; practice sports regularly; do not consume too much caffeine, tobacco or alcohol; sleep well; and avoid stress. A doctor can prescribe vitamin supplements or particular medication if deemed necessary.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3188559/

Biomarkers

Oxidative stress

Oxidative stress is the process by which our body's cells become oxidized, resulting in damage that affects their functions. It occurs due to an excess of free radicals and oxygen and a lack of antioxidants to counteract it. Environmental pollution, active and passive smoking, excessive sunbathing, and consuming drugs or too much alcohol are some leading causes. But during the practice of sport, free radicals and the consequent oxidative stress are also increased, which can be damaging in the case of a weakened antioxidant defence system. Its consequences are usually excessive muscle pain and fatigue after training.
Genetics is an influential factor in this regard, and a study shows that a particular variant of the SOD2 gene reduces the efficiency of the organism in its defence against oxidative stress caused by sport, which could be unfavourable in the practice of sports, especially high-intensity sports.

Your genetic map

Gene	Genotype
SOD2	AA

What do your genetics say?

According to your genotype, you are predisposed to oxidative stress due to sports. Other genetic and clinical factors may also play a role. Broccoli, blueberries, carrots, tomatoes, cocoa, peppers, almonds, green tea, red wine in moderation, and some vegetable oils, such as olive oil, are antioxidant foods. Other micronutrients, such as selenium, beta-carotene, and vitamins C and D, also have this effect.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/24865797?dopt=Abstract

Heart

Resting heart rate

The adult heart usually beats between 60 and 100 times per minute at rest. When the heart beats below 60 times per minute, it is bradycardia, which can be a severe problem if the heart rate is too slow and the heart cannot pump enough oxygen-rich blood to the body. A heart rate above 100 beats/min at rest is called tachycardia and is associated with an increased risk of cardiovascular disease. In terms of sports practice, cardiovascular or aerobic exercises such as running, swimming or cycling increase heart rate to a greater extent. In contrast, isometric activities, such as weight lifting, induce a minor increase in heart rate. Several studies have associated specific variations in the FADS1 and CD46 genes, among many others, with abnormal heart rates in particular genotypes.

What do your genetics say?

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

More information:

www.ncbi.nlm.nih.gov/pubmed/23583979

Your genetic map

Gene	Genotype
TFPI	GG
LOC10537540	AA
RNU3P3	TC
SYT10	CC
LOC10536969	AG
CD46	TT
MYH6	AA
LOC10537797	TT
ACHE	AA
FADS1	GG
SLC35F1	TC
KIAA1755	TC
CCDC141	GG
GNB4	GG
CHRM2	TT
NKX2 5	GG
LOC10537392	AC
FNDC3B	CG
RFX4	AT
CPNE8	TT
RBFOX1	GG
SLC10A7	GG
RNU4 35P	TC
LOC10798525	AA
HMGN2P29	GG
LOC10192800	AA

Heart

Alteration of cardiac structures

The left ventricle's morphological structure and the aortic root's size are inherited traits that, if altered, can cause cardiovascular disease. The practice of endurance sports entails an overload of pressure and volume on all cardiac structures. During exercise, the left ventricle increases its contractile capacity in proportion to the demand for cardiac output, increasing cardiovascular risk in the case of altered structures. It is, therefore, essential to take echocardiographic measurements into account. Possible complications may include heart failure, heart attack, stroke, or aneurysm. Studies show that mutations in the SMG6 and LOXL1 genes, among many others, correlate with a greater predisposition to suffer alterations in cardiac structures.

Your genetic map

Gene	Genotype
SLC35F1	GG
TMEM232	CC
SMG6	TG
PRDM6	AG
HMGA2	TT
LOC1005063	AA
LOXL1	AG

What do your genetics say?

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

More information:

www.ncbi.nlm.nih.gov/pubmed/19584346

Heart

Familial hypertrophic cardiomyopathy type I

Familial hypertrophic cardiomyopathy type I is an inherited coronary artery disease characterized by a thickening of the heart muscle, which typically occurs in the anterior part of the wall separating the left and right ventricle (interventricular septum). This thickening is called left ventricular hypertrophy (LVH). The clinical manifestations of this disease range from asymptomatic LVH to sudden cardiac death, including arrhythmias or atrial fibrillation, and it develops mainly during adolescence or adulthood. However, it can also occur in childhood and senescence. Studies show that mutations in the MYH7 and MYBPC3 genes correlate with an increased predisposition to familial hypertrophic type I heart disease.

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.

More information:

https://www.omim.org/entry/192600

Heart

Familiar hypertrophic cardiomyopathy type II

Type II familial hypertrophic heart disease is an inherited coronary artery disease characterized by a thickening of the heart muscle, which typically occurs in the wall that separates the left and right ventricle (interventricular septum). The difference with type I is morphological since type II affects the entire interventricular septum and not only the anterior part. This thickening is called left ventricular hypertrophy (LVH). The clinical manifestations of this disease range from asymptomatic LVH to sudden cardiac death, including arrhythmias or atrial fibrillation, and it develops mainly during adolescence or adulthood. However, it can also occur in childhood and senescence. Studies show that mutations in the TNNT2 gene correlate with an increased predisposition to type I familial hypertrophic heart disease.

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.

More information:

https://www.omim.org/entry/115195

Heart

Brugada syndrome

Brugada syndrome is a disease of the heart muscle characterized by ventricular arrhythmias. It is caused by right ventricular myocardial dystrophy and can lead to palpitations, ventricular tachycardia or syncope, and even sudden death. It is a rare but potentially fatal pathology and is sometimes inheritable. Studies show that mutations in the SCN5A gene correlate with a greater predisposition to Brugada syndrome.

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.

More information:

https://www.omim.org/entry/601144

Heart

Arrhythmogenic right ventricular dysplasia

Arrhythmogenic right ventricular dysplasia or cardiomyopathy is a disease of the heart muscle of genetic origin. There is a progressive dystrophy mainly of the ventricular myocardium, which is replaced by fibro adipose tissue. Clinically it is characterized by ventricular arrhythmias and is one of the most common causes of sudden death in young adults. Studies show that mutations in the DSG2 gene correlate with an increased predisposition to arrhythmogenic right ventricular dysplasia.

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.

More information:

https://www.omim.org/entry/610193

Heart

Long QT syndrome

Cardiac waves are the different upward or downward curvatures that form the tracing of an electrocardiogram. They are the product of the force produced by the heart's activity and are repeated from beat to beat unless altered. The different parts of the wave are represented by the letters P, Q, R, S and T. By observing the wave's shape, it is possible to determine how long it takes for the ventricles to activate and deactivate, and this is called the QT interval. Prolonged QT syndrome (LQTS) is a condition that can cause the heart to beat rapidly and chaotically, and, as a result, fainting, seizures, arrhythmias or even sudden death can occur. Studies show that mutations in the KCNQ1 gene correlate with an increased predisposition to long QT syndrome.

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.

More information:

https://www.omim.org/entry/192500

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Table of Contents

1. Introduction

The following pages contain your nutrigenetic report based on an analysis of your DNA. In it you will find information on your genetic predispositions involving nutrition.

Below are some basic aspects to keep in mind before reading this report:

Process we use to obtain your personal report

The process we followed to compile your nutrition report involves:

- **Extracting** your DNA from the saliva sample you sent us.

- Transforming the biological data contained in the DNA into computer data. This process is called **sequencing**.

- Applying the **algorithms** developed exclusively by 24Genetics to this computer data, which yields your personal report. As you can see, we combine purely biological processes with computer processes in order to handle huge amounts of information with the utmost scientific rigour and offer these highly detailed reports.

As you can see, we combine purely biological processes with computer processes, so that, without losing an iota of scientific rigor, we can process huge amounts of information and offer you such detailed reports.

What's our algorithm like?

The 24Genetics algorithm relies on **analysing and studying thousands of publications** (called papers in the cientific community) that have been tested, validated and recognised by scientists internationally and that add value to our reports. Thanks to the reliability of our ancestry test, the first step in our genetic analysis is to **identify the gender and ancestry** of each individual. **We then apply only those studies that are suitable for each profile.** To obtain the genetic report for a European woman, for example, we do not use studies whose analysis population was exclusively male or Asian. At this point, we could apply a single study, but what we do is **combine a multitude of validated publications**. This way, we can apply all the available scientific knowledge to calculate different genetic predispositions.

By doing so, our results are **more accurate and reliable.**

Methodology

Our genetic reports are obtained based on three types of analysis methodologies:

- **GWAS** (Genome Wide Association Study). This is a type of study that compares DNA markers across

the genome (complete genetic material of a person) of people with a disease or trait with those of people who do not have that disease or trait. It is a statistical study that takes into account a large number of genes that are not so directly associated with a predisposition but that, as a whole, offers a relevant conclusion.

- **Multivariate analysis**. In this case, our algorithm analyses a number of genetic variants or mutations of one or more genes that are more directly correlated with the predisposition.

- **Univariate analysis**. In this type of methodology, a single variant in a single gene determines predisposition due to its solid correlation with the genotype.

Each of the traits analysed in this report is based on one of these three methodologies.

The data and conclusions in this report, as well as the progress of scientific research in the field of genetics, may evolve over time. New mutations are constantly being discovered, and we are learning more about the ones we analyse here. At 24Genetics, we make a great effort to apply newly consolidated scientific discoveries to our reports.

What information do we offer?

The information in our reports involves **predispositions**. What do we mean by this? Let's consider an example. The likelihood of having high blood pressure depends on multiple factors, which can be grouped into two categories: **genetic and environmental.** Genetic factors indicate the propensity we have to suffer from hypertension. Then there are the so-called environmental factors, which include other relevant aspects such as diet, habits, stress level, where we live, climate, age, etc. Whether or not we eventually develop hypertension depends on a combination of both types of factors. And even if we have a genetic predisposition to suffer from it, if we maintain a healthy weight, control our salt intake, keep stress under control, exercise and so on, we may never develop it. Or vice versa.

Therefore, what our reports tell you are always genetic predispositions. By controlling environmental factors, you can help to prevent these predispositions from materialising.

What do you get from this genetic report?

This report contains a wealth of scientifically validated information about your predispositions, which tells you how your body works naturally and what aspects you should possibly pay attention to.

At 24Genetics, we always recommend you check with a health professional, doctor or nutritionist, who will use all his/her knowledge and experience to answer your questions, supplement this report with your health history and available family records, track the progress of a personalised diet, or prescribe additional diagnostic tests if deemed necessary to confirm the risk of one or more specific predispositions.

A basic concept: genetic variant.

In terms of genetic concepts, we want to share a basic one with you that appears in all the traits of our reports and that it is important for you to have at least a basic understanding of: genetic variant (also

called a variation or mutation). A variant is a permanent change in the DNA sequence that comprises a gene, and is what defines an individual predisposition.

Therefore, in each of the features of this report, you will see information on the gene or genes affected in that trait. It is a variant in that gene or genes that determines certain people's different predispositions compared to others.

For example, in the case of the Longevity and Mediterranean Diet trait, it is the rs1801282 variant of the PPARG gene that can determine a predisposition to a longer life with the Mediterranean diet.

1.1. Structure of this report

In order to help you understand its contents, this report is organised into the following categories:

Diet and weight

It is normal for some people to lose weight while others do not despite having a similar diet and sports routine. For decades, genetics have been studying how our DNA influences the effectiveness of different types of diets, so this report will help you choose the best one for you. You will also find invaluable information on other aspects, such as your predisposition to emotional eating, to consuming sweets or snacking, and more. The goal is to make it easier for you to reach a healthy weight.

Pathologies and intolerances

We analyse a series of intolerances and pathologies related to food, and tell you if you have a genetic predisposition to suffer from them. This way, with help from a health professional, you can take the right steps to try to avoid them and enjoy better health.

Vitamins and minerals

The micronutrients that our body needs may be at abnormal levels, even with a healthy and balanced diet. Whether too high or too low, improper levels of vitamins and minerals have potential consequences, so by knowing your predispositions, you will know what you need to pay special attention to, and whether you need to confirm your levels through testing. This category contains detailed information on multiple vitamins and minerals and your genetic predisposition to have proper levels.

There are three related but different **biological processes** that can affect vitamin and mineral levels:

1.- **Absorption**: the body's capacity to extract micronutrients from the foods that contain them.

2.- **Storage**: refers to the ability to accumulate micronutrients in certain organs of the body.

3.- **Circulation**: also called circulating or blood level, that is, the amount of vitamins or minerals that travel in the bloodstream.

Biomarkers

Some physiological parameters, such as cholesterol or triglyceride levels, are influenced by your DNA, which determines your potential tendency to have abnormal levels. In this category, we inform you of your genetic predisposition and the possible consequences of having inadequate figures, so you can take appropriate measures under the supervision of a health professional (doctor or nutritionist)

Other

This category includes other traits, such as anxiety or addiction caused by caffeine, among others.

*** The information provided in this report is only valid for research, information, and educational purposes. Under no circumstances is it valid for clinical or diagnostic use.**

1.2. Frequently Asked Questions

What is nutrigenetics?

Nutrigenetics is the discipline that analyses the genetic variants in your DNA and that directly impact how you metabolise different molecules, as well as how you will respond to different diets. The best way to eat is by knowing your genetic tendencies to cholesterol, triglycerides, overweight, etc. Other data you can see in your report includes how well you absorb vitamins B12 or E.

What is this test based on?

Once a high level of consensus is reached, the most relevant scientific studies are published by international institutions and organisations. The complex algorithm developed by 24Genetics incorporates thousands of these genetic studies that have been recognised and accepted by the global scientific community. As a result, our reports are of the highest quality.

Based on my test results, should I make significant changes to my diet on my own?

You should not make any significant changes to your routine without first talking to a nutritionist, an expert geneticist or your doctor, who will have access to much more of your medical history. Our tests analyse part, but not all, of your body's genetic markers, so they offer informative, not diagnostic, results. They provide very valuable data on genetic predispositions, but there are many other factors that influence your health and nutrition. We thus always recommend that you consult with nutrition or health specialists or genetics professionals.

Are my genes the only thing that matters?

Our genes largely define who we are, but we and the environment can have a considerable effect on these genetic predispositions. Lifestyle, sport, diet and many other circumstances influence our body. Therefore, while genes are very important, their influence on your health, well-being and life in general is shared with many other factors.

Is a nutrigenetics test the same as a food intolerance test?

No, a genetic test has nothing to do with a food intolerance test, nor is it the same as a food allergy test. They are separate tests that provide different information. Genetic tests are much more complex and expensive than the tests mentioned above, and the genetic information they provide cannot be obtained in any other way.

2. Summary

Diet and weight


Effectiveness of the Mediterranean diet


Effectiveness of a low-fat diet


Predisposition to overweight


Ease of weight loss


Predisposition to emotional eating


Predisposition to consume sweets


Predisposition to fat intake


Appetite and a high-protein diet


The effectiveness of a low-carb diet


Effectiveness of a high-protein diet


Predisposition to early onset obesity in adults


Ease of weight loss in response to monounsaturated fats


Predisposition to snacking


Predisposition to carbohydrate intake


Appetite and hypocaloric diet

Pathologies and intolerances


Lactose intolerance


DAO deficiency and migraines


Type 2 diabetes


Hypertension due to salt consumption


Cavities


Coeliac disease


Type 1 diabetes


Hypothyroidism


Iron deficiency anaemia

Vitamins and minerals


Vitamin A - Carotenoid levels


Vitamin B6 levels


Vitamin B12 levels


Vitamin C levels


Vitamin K levels


Phosphorus levels


Magnesium levels


Vitamin A - Retinol levels


Vitamin B9 levels


Homocysteine levels


Vitamin D levels


Calcium levels


Iron levels


Zinc levels

Biomarkers


HDL cholesterol levels


Triglyceride levels

Omega-6 levels

LDL cholesterol levels

Triglyceride levels and the Mediterranean Diet

Other


Longevity and the Mediterranean diet


Caffeine and addiction


Caffeine and anxiety

Caption:


Your analyzed genotype is favorable.


Your analyzed genotype is a little favorable.

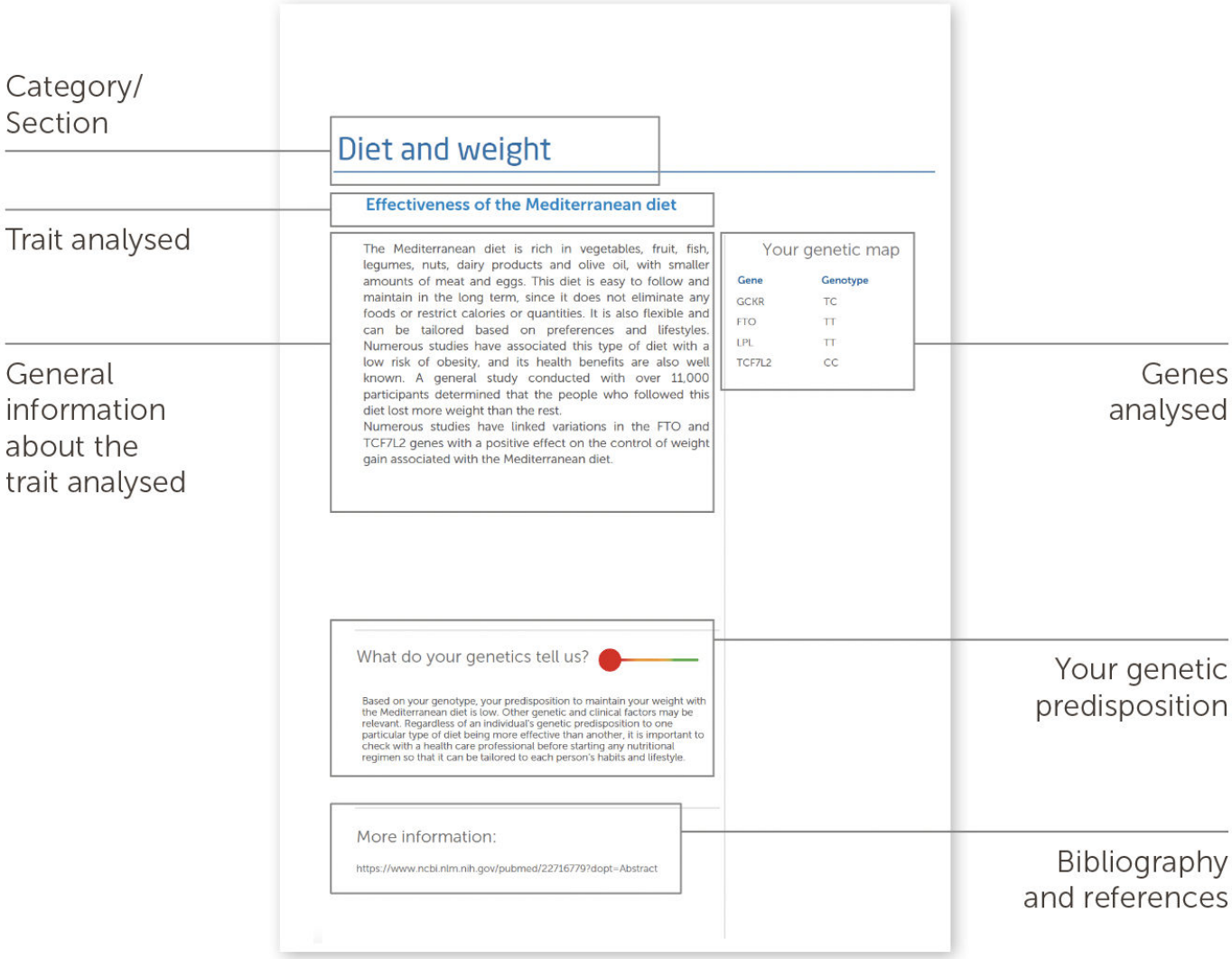

Your analyzed genotype doesn't particularly affect you.


Your analyzed genotype is a little unfavorable.


Your analyzed genotype is unfavorable.

3. Genetic Results

3.1. What do the results show?



Diet and weight

Effectiveness of the Mediterranean diet

The Mediterranean diet is rich in vegetables, fruit, fish, legumes, nuts, dairy products and olive oil, with smaller amounts of meat and eggs. This diet is easy to follow and maintain in the long term, since it does not eliminate any foods or restrict calories or quantities. It is also flexible and can be tailored based on preferences and lifestyles. Numerous studies have associated this type of diet with a low risk of obesity, and its health benefits are also well known. A general study conducted with over 11,000 participants determined that the people who followed this diet lost more weight than the rest.
Numerous studies have linked variations in the FTO and TCF7L2 genes with a positive effect on the control of weight gain associated with the Mediterranean diet.

Your genetic map

Gene	Genotype
GCKR	TC
FTO	AT
LPL	TC
TCF7L2	TT

What do your genetics say?

Based on your genotype, your predisposition to maintain your weight with the Mediterranean diet is average. Other genetic and clinical factors may be relevant. Regardless of an individual's genetic predisposition to one particular 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.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/22716779?dopt=Abstract

Diet and weight

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.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/19726594?dopt=Abstract

Diet and weight

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.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3171189/

Diet and weight

Effectiveness of a high-protein diet

A high-protein diet is based on the increased consumption of protein-rich foods, such as meat and eggs. Eating more protein helps to increase the feeling of satiety, as it affects the levels of ghrelin and other hormones that are responsible for regulating appetite. It is a very effective diet in terms of weight loss while minimising the loss of muscle mass, although it can cause a rebound effect, produce ketosis and have serious health consequences.
Not all metabolisms respond the same to a high-protein diet, and the FTO gene has been linked to its effectiveness.

Your genetic map

Gene	Genotype
FTO	TT

What do your genetics say?

Based on your genotype, your predisposition to respond well to a protein-rich diet is average. 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.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3478519/

Diet and weight

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.

Your genetic map

Gene	Genotype
FTO	CC

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.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/18535549?dopt=Abstract

Diet and weight

Predisposition to early onset obesity in adults

As we saw earlier, the 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 sometimes develops early in adults, and this has a genetic component.
Several studies have correlated the FTO gene with the predisposition to suffer from early onset obesity.

Your genetic map

Gene	Genotype
FTO	AT

What do your genetics say?

Based on your genotype, your predisposition to early onset obesity 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.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/22842737?dopt=Abstract

Diet and weight

Ease of weight loss

Weight loss is a goal for an ever-growing part of the population. Diet and physical activity obviously play a key role in achieving the goal of losing weight, but we often notice that other people achieve better results than us when following the same diet and exercise routine. Genetics has a lot to say about that. We know that between 40 and 70% of the tendency to obesity can be inherited, but genetics also influence how easy or hard it is to lose weight.
Several studies have shown that the LOC10536919, CLOCK, PPARG and TCF7L2 genes influence how easy or hard it is for someone to lose weight.

Your genetic map

Gene	Genotype
TCF7L2	TT
PPARG	CC
CLOCK	AG
LOC10536919	TC

What do your genetics say?

Based on your genotype, your predisposition to weight loss is average. Other genetic and clinical factors may be relevant. Some diseases can make it harder to lose weight. Always consult with a health care professional before starting a diet. And remember that you can also see your predisposition to the effectiveness of different types of diets in other parts of this report.

More information:

http://ajcn.nutrition.org/content/100/4/1188.long#F2

Diet and weight

Ease of weight loss in response to monounsaturated fats

Fats are an important part of a diet, and not all are bad. Monounsaturated fats are considered healthy dietary fats and are known for their anti-inflammatory properties and ability to reduce triglycerides and blood pressure. They are also healthy for the heart and beneficial for the skin, as they help to keep the epidermis properly hydrated. They can also facilitate weight loss and fat balance in some individuals, depending on their genetics. Monounsaturated fats are present in foods such as avocados, olives, nuts, olive oil and almonds.
Genetic variants in the PPARG gene have been associated with a lower weight in women who consume more than 13% of their daily calories in the form of monounsaturated fats.

Your genetic map

Gene	Genotype
PPARG	CC

What do your genetics say?

Based on your genotype, you are predisposed to lose weight by consuming monounsaturated fats. 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 see your predisposition to the effectiveness of different diets in other parts of this report.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/14506127

Diet and weight

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	GG
MC4R	TC

What do your genetics say?

Based on your genotype, you are predisposed to emotional eating. Other genetic and clinical factors may be relevant. Doing relaxation and breathing exercises can help to bring emotional eating under control, although you may also require psychological assistance to identify the situation that causes that impulse and treat the root problem.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2938875/

Diet and weight

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, and specifically the FTO gene in women, have a greater tendency to eat more without feeling satiated, and consequently to snack more frequently between meals.

Your genetic map

Gene	Genotype
MC4R	TC
FTO	TC

What do your genetics say?

Based on your genotype, you are predisposed to snacking. Other genetic and clinical factors may be relevant. Balanced foods that contain unsaturated fats, proteins, fibre and carbohydrates with a low glycaemic index, in small portions, can help satiate hunger and reduce total caloric intake, while junk food can have negative effects on health.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/19153581?dopt=Abstract

Diet and weight

Predisposition to consume sweets

The sweet taste is mainly detected in the taste buds at the tip of the tongue, and the desire to eat sweet foods is usually influenced by culinary culture, habits and age. Foods with a high content of simple carbohydrates are perceived as sweet, but their excessive intake can lead to a risk of overweight, diabetes and cardiovascular disease.
However, genetics may also influence the desire to eat sweets, and changes in the FGF21/FUT1 intergenic region have been shown to predispose people to increased consumption.

Your genetic map

Gene	Genotype
FGF21 FUT1	GG

What do your genetics say?

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

More information:

https://www.ncbi.nlm.nih.gov/pubmed/28467924?dopt=Abstract

Diet and weight

Predisposition to carbohydrate intake

Carbohydrates are sugars, starches and fibres, whose main purpose is to provide an instant source of energy for the proper development of brain activity, digestion and muscle movement. Natural sugars are found in natural fruits and juices, and starches are found in cereals and vegetables. All these products also contain fibre. By contrast, refined sugars, which have negative effects on health, are present in soft drinks, bottled juices, desserts, sweets, ice cream, sauces and ultra-processed foods. Excessively indulging in carbohydrates, especially refined sugars, is unhealthy because it can lead to weight gain and a risk of developing type 2 diabetes.
Several large-scale studies have found that people with certain variations in genes such as FGF21 and FTO have a greater urge for carbohydrates.

Your genetic map

Gene	Genotype
FTO	TC
NR	GG
NR	AG
FGF21	AA

What do your genetics say?

Based on this study, your predisposition is average. Other genetic and clinical factors may be relevant. Many foods, such as brown rice, quinoa, whole grain oats, carrots, broccoli, and others contain healthy carbohydrates without the negative effects of refined sugars.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3652928/

Diet and weight

Predisposition to fat intake

Fat is a great source of energy that the body uses to produce nerve tissue and hormones, and to absorb fat-soluble vitamins, such as D, E or K, which are metabolised in the body in the same way as the lipids in the diet. However, excessive fat intake increases the risk of overweight, and therefore of cardiovascular disease.
Genetics are related to the tendency to consume fat in excess, and it has been specifically shown that carriers of mutations in the FGF21/FUT1 intergenic region exhibit a lower predisposition to consume fat.

Your genetic map

Gene	Genotype
FGF21 FUT1	GG

What do your genetics say?

Based on your genotype, your predisposition to fat consumption is average. Other genetic and clinical factors may be relevant. It is essential to eat the right balance of fats. As a rule, saturated fats (butter, cheese, whole milk, cream, ice cream or fatty meats) should be replaced with unsaturated fats (olive or sunflower oil, oily fish, avocados and nuts).

More information:

https://www.ncbi.nlm.nih.gov/pubmed/28467924?dopt=Abstract

Diet and weight

Appetite and hypocaloric diet

Appetite is the psychological desire to eat. It differs from hunger, which is the physiological need to eat food. In other words, appetite has more of an emotional component, whereas hunger is more physical. Appetite regulation is a very complex mechanism in which the brain, digestive system, fat deposits, genetic, environmental and psychological factors, and food characteristics are all involved. A low-calorie diet is one that relies on daily calorie restriction, or the reduction of amounts in general, and not on restricting specific types of food.
A genetic study has demonstrated a correlation between a variant in the FTO gene and the decreased appetite associated with a hypocaloric diet.

Your genetic map

Gene	Genotype
FTO	AT

What do your genetics say?

Based on your genotype, a low-calorie diet has no influence on your appetite level. Other genetic and clinical factors may be relevant. Before starting any weight loss plan, we recommend you consult a health professional, who can supplement this report with diagnostic tests and a medical evaluation to design your personalised diet.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3985215/pdf/ajcn9951126.pdf

Diet and weight

Appetite and a high-protein diet

Appetite is the psychological desire to eat. It differs from hunger, which is the physiological need to eat food. In other words, appetite has more of an emotional component, whereas hunger is more physical. Appetite regulation is a very complex mechanism in which the brain, digestive system, fat deposits, genetic, environmental and psychological factors, and food characteristics are all involved. A high-protein diet, also called a hyperproteic diet, is based on increasing the proportion of protein-rich foods such as meat and eggs.
A genetic study has demonstrated a correlation between a variant in the FTO gene and the decreased appetite associated with a high-protein diet.

Your genetic map

Gene	Genotype
FTO	AT

What do your genetics say?

Based on your genotype, a high-protein diet has no influence on your appetite level. Other genetic and clinical factors may be relevant. Before starting any weight loss plan, we recommend you consult a health professional, who can supplement this report with diagnostic tests and a medical evaluation to design your personalised diet.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3985215/pdf/ajcn9951126.pdf

Pathologies and intolerances

Lactose intolerance

Lactose is the main naturally-occurring sugar in milk and dairy products. It consists of a glucose molecule and a galactose molecule, two simple sugars that the body uses to produce energy. The enzyme lactase is essential for breaking down lactose into glucose and galactose, a key step in certain immune and neuronal processes. Some people cannot produce enough lactase; as a result, they do not digest lactose, which ferments in the intestine, generating gas, digestive distress, abdominal distension, and/or diarrhoea.
There are genetic factors that play an important role in lactose absorption, such as the MCM6 gene, which is directly related to this process.

Your genetic map

Gene	Genotype
MCM6	AA

What do your genetics say?

Based on your genotype, your predisposition to metabolise lactose properly is average. Other genetic and clinical factors may be relevant.

More information:

https://onlinelibrary.wiley.com/doi/full/10.1002/jbmr.83

Pathologies and intolerances

Coeliac disease

Coeliac disease is a systemic autoimmune disorder in which the body reacts to the presence of gluten, which is a protein found in wheat, rye, and barley, and, to a lesser extent, in other cereals. Over time, this reaction can damage the lining of the small intestine, preventing it from absorbing some nutrients and causing diarrhoea, fatigue, weight loss, swelling and anaemia.
Genetics influence this disease, as shown by the IL12A gene.

What do your genetics say?

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

More information:

www.ncbi.nlm.nih.gov/pubmed/20190752

Your genetic map

Gene	Genotype
RGS1	AA
AHSA2 REL	AG
IL18R1 IL1RL1	CC
ITGA4	GG
ICOS CTLA4	TC
CCRL2 CCR5	CC
IL12A	AA
LPP	AC
IL2 IL21	AA
HLA DQB1	TT
TNFAIP3	AG
SH2B3	CC
PTPN2	AA
MMEL1	AG
RUNX3	AG
Intergenic	TC
PLEK	TC
CD80 KTELC1	TG
MAP3K7	AC
THEMIS	AA
Intergenic	AA
ZMIZ1	AG
ETS1	TC
CLEC16A	CC
ICOSLG	TT
CD247	AA
TNFSF18	CC
FRMD4B	CC
Intergenic	CC
ELMO1	GG
Intergenic	TT

Pathologies and intolerances

DAO deficiency and migraines

Diamine oxidase (DAO) is the enzyme responsible for reducing histamine, which is a molecule the body uses to respond to substances it considers harmful. With a DAO deficiency, histamine builds up, causing allergies and bothersome symptoms, which can be worsened by eating foods that contain high levels of histamine, such as tomatoes, fish preserves, processed sauces, dairy products and other foods. One of the best-known consequences of DAO deficiency is migraines, but dizziness, irritable bowel syndrome, Crohn's disease, stomach pain, nausea and/or vomiting, abnormal blood pressure and arrhythmias can also occur.
The AOC1 gene is responsible for producing the DAO enzyme, and several studies confirm that mutations in this gene create a propensity for this process to malfunction, with the consequent generation of reduced levels of DAO.

Your genetic map

Gene	Genotype
AOC1	GG
AOC1	CC

What do your genetics say?

Based on your genotype, your predisposition to have reduced DAO enzyme activity is average. Other genetic and clinical factors may be relevant.

More information:

https://pubmed.ncbi.nlm.nih.gov/21488903/

Pathologies and intolerances

Type 1 diabetes

Diabetes means your blood glucose, or blood sugar, levels are too high. With type-1 diabetes, your pancreas does not make insulin. Insulin is a hormone that helps your cells get energy from glucose. Without insulin, too much glucose remains in your blood. Over time, high blood glucose can lead to serious problems with your heart, eyes, kidneys, nerves, and gums and teeth.

Type-1 diabetes happens most often in children and young adults, but can appear at any age.

Your genetic map

Gene	Genotype
BACH2	GG
PRKCQ	AA
CTSH	TC
C1QTNF6	AA
PTPN22	CC
CTLA4	AA
IL2RA	CC
C12orf30	AA
ERBB3	GG
CLEC16A	AA
PTPN2	TT

What do your genetics say?

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

More information:

www.ncbi.nlm.nih.gov/pubmed/18978792

Pathologies and intolerances

Type 2 diabetes

Type 2 diabetes mellitus (DM2), or type 2 diabetes, is a chronic autoimmune disease that is characterized by the body's resistance to metabolise insulin and/or by the incorrect functioning of the pancreas, which secretes less insulin than the body needs. Since insulin is the hormone that regulates blood glucose levels, this pathology leads to hyperglycaemia, which can cause serious health complications, such as blindness, myocardial infarction, stroke, kidney failure or partial amputations. The classic symptoms are constant hunger, excessive thirst, and frequent urination.
Genetics influence the predisposition to this disease, as shown by the FAF1 and LPP genes, which are directly correlated with it, although the interaction of environmental factors is also required. Obesity is thought to be one of its main causes.

What do your genetics say?

Based on this study, your predisposition to this disease is similar to that of the majority of the population. Other genetic and clinical factors may be relevant.

More information:

www.ncbi.nlm.nih.gov/pubmed/24509480

Your genetic map

Gene	Genotype
RREB1 SSR1	TT
FAF1	GG
TCF19	CC
LPP	TC
ARL15	AA
MPHOSPH9	GG
PLEKHA1	TC
TMEM75	TC
VEGFA	CC
ETV1	AG
C6orf173	AA
TCF7L2	TT
CDKAL1	AG
GRB14	AA
TLE4	AA
CDC123	TC
CENTD2	AC
KCNQ1	GG
JAZF1	AG
KCNJ11	TT
ST64GAL1	TC
MTNR1B	CC
HNF4A	AG
HMGA2	CC
SPRY2	AG
AP3S2	AC
FTO	TT
GLIS3	GG
IGF2BP2	TT
PPARG	CC
HNF1B	AG

Pathologies and intolerances

Hypothyroidism

The thyroid is an endocrine gland in the shape of a butterfly that is located in the neck. It produces hormones that control the rhythm of many bodily activities, such as how fast you burn calories or how fast your heart beats. Hypothyroidism is a dysfunction in which the thyroid does not produce enough of its hormones to satisfy the body's needs. The best known consequence of this pathology is weight gain due to a slower metabolism, but other common symptoms include fatigue, intolerance to cold, depression, decreased memory and ability to concentrate, dry skin, dry and brittle hair, pale skin, persistent constipation and excessive drowsiness.
Studies have shown a relationship between the PTPN22 and SH2B3 genes and an increased risk of hypothyroidism.

Your genetic map

Gene	Genotype
INSR	TG
TRNAH GUG	AA
TNFRSF19	GG
HLA C	AG
MTF1	TT
PDE8B	AG
ZBTB10	TC
ZNF804B	TT
KRT18P13	TT
VAV3	TT
SH2B3	CC
PTPN22	CC
HLA DQA2	CC

What do your genetics say?

Based on this study, your predisposition to this disease is similar to that of the majority of the population. Other genetic and clinical factors may be relevant.

More information:

www.ncbi.nlm.nih.gov/pubmed/22493691

Pathologies and intolerances

Hypertension due to salt consumption

Blood pressure is the force that the blood exerts against the walls of the blood vessels along the circulatory system. Hypertension is a chronic condition in which the pressure in blood vessels is persistently high, which can damage them. Sodium, the main component of salt, is directly related to the risk of hypertension, although other factors such as age, physical activity and fat consumption also influence it. The most common consequence of hypertension, along with other pathologies, is the greater propensity to suffer from cardiovascular diseases, such as heart attack or stroke.
At the genetic level, hypertension caused by salt consumption has a high heritability index. Several studies have shown that the ADD1, AGT and AGTR1 genes are related to an increased risk of this pathology, while the SLC4A5 gene has a protective effect.

Your genetic map

Gene	Genotype
AGT	AG
AGTR1	AA
ADD1	TG
SLC4A5	CC

What do your genetics say?

Based on your genotype, your predisposition to hypertension as a result of salt intake is average. Other genetic and clinical factors may be relevant. The habits to prevent hypertension are well known: keep an adequate BMI, exercise, lower your salt intake, limit alcohol, tobacco, and caffeine, and reduce stress. However, it is important to have a health professional keep track of it.

More information:

https://link.springer.com/article/10.1007%2Fs11010-020-03983-5

Pathologies and intolerances

Iron deficiency anaemia

Anaemia is a condition in which the body does not have enough healthy red blood cells needed to carry nutrients to the body's tissues. Iron plays an important role in the production of red blood cells, and not having the right levels can cause anaemia, called iron deficiency anaemia, which is in fact the most common type. However, it should be noted that having low levels of iron does not necessarily lead to anaemia.
Certain genes have been linked to the development of anaemia; specifically, the HFE, HBS1L-MYB and HIST1H2BJ genes have a protective effect against this disease in women.

Your genetic map

Gene	Genotype
LOC10537801	AG
HFE	AG
HIST1H2BJ	CC

What do your genetics say?

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

More information:

https://www.ncbi.nlm.nih.gov/pubmed/26460247?dopt=Abstract

Pathologies and intolerances

Cavities

Tooth decay is one of the most widespread dental diseases in the world, which led the World Health Organization (WHO) to declare its care and prevention as a priority for this millennium. Cavities are damaged areas on the surface of teeth that develop into openings or holes, and occur when certain bacteria secrete acids that attack the enamel. This damage can range from small holes to tooth loss. Their causes can range from eating processed foods or sugary beverages, to improper dental hygiene.
Recent studies have correlated the TAS1R2 gene with a greater predisposition to tooth decay.

Your genetic map

Gene	Genotype
TAS1R2	GG

What do your genetics say?

Based on your genotype, your predisposition to tooth decay is average. Other genetic and clinical factors may be relevant. As we all know, brushing your teeth after meals, eating fruits and vegetables, and limiting foods high in sugar all help to maintain dental health. In addition, you should visit a dentist for periodic check-ups and professional cleanings.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4534477/

Vitamins and minerals

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	AG
PKD1L2	TG
ND	TG

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. Pumpkins, carrots, corn, tomatoes, salmon, lobster and prawns are all rich in carotenoids, hence their characteristic colour. Their consumption increases the levels of this provitamin.

More information:

www.ncbi.nlm.nih.gov/pubmed/19185284

Vitamins and minerals

Vitamin A - Retinol levels

Retinol, a compound popularly known for its application in the world of cosmetics, is a precursor of vitamin A. It plays an important role in storing this vitamin, which has multiple functions: it is important for growth and development, for maintaining the immune system and for good vision. It behaves like a hormone and is an important growth factor for epithelial and other cells.
Genetic factors, such as those involved in the TTR gene, play an essential role in the circulation of vitamin A in the blood.

Your genetic map

Gene	Genotype
TTR	AC
RBP4	CC

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. Retinol and, by extension, all retinoids, are found in foods of animal origin: meat, fish, seafood, dairy products, eggs, and others.

More information:

www.ncbi.nlm.nih.gov/pubmed/21878437

Vitamins and minerals

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	TC

What do your genetics say?

Based on your genotype, you are predisposed to have adequate levels of vitamin B6. Other genetic and clinical factors may be relevant.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2667971/

Vitamins and minerals

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.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/17115185

Vitamins and minerals

Vitamin B12 levels

Vitamin B12 (cobalamin) is a water-soluble vitamin that plays an important role in the functioning of the brain, the nervous system and the digestive system, and it is an essential component in the synthesis and regulation of DNA and for the metabolism of fatty acids and amino acids. It is produced by bacteria and is found naturally in foods of animal origin: meat, fish, eggs and dairy products. Excess vitamin B12 can cause blurred vision, vomiting, diarrhoea and gastric disorders, blood clots, and damage to the liver and kidneys.
Various genetic studies have identified that the MTHFR gene is associated with excess blood concentrations of vitamin B12 in women.

Your genetic map

Gene	Genotype
FUT2	AG
MTHFR	TT

What do your genetics say?

Based on your genotype, you are predisposed to have excess levels of vitamin B12. Other genetic and clinical factors may be relevant.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/18776911?dopt=Abstract

Vitamins and minerals

Homocysteine levels

Homocysteine is an amino acid present in the body whose metabolism is linked to that of some B vitamins, mainly B6, B9 and B12. When there is a deficiency in any of these vitamins, the levels of homocysteine in the blood increase, which can result in cardiovascular diseases, such as myocardial infarction or stroke. It has also been shown that people with high levels of homocysteine in the blood often have other associated risk factors, such as hypertension or high cholesterol.
Several studies have shown a link between the MTHFR gene and the propensity to have abnormal levels of homocysteine.

Your genetic map

Gene	Genotype
MTHFR	TT
MTHFR	AG

What do your genetics say?

Based on your genotype, you are predisposed to have normal levels of homocysteine. Other genetic and clinical factors may be relevant.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/22890010?dopt=Abstract

Vitamins and minerals

Vitamin C levels

Vitamin C (ascorbic acid) is a water-soluble vitamin that is critical for life processes, such as the functioning of the immune system, the production of red blood cells, and the maintenance of connective tissue, blood vessels, bones, teeth and gums. It is a powerful antioxidant and is involved in iron absorption. A severe deficiency can cause scurvy, which leads to anaemia, bleeding gums, bruising and poor wound healing. Some foods rich in vitamin C include kiwis, lemons, oranges, red pepper, watermelon, strawberries, broccoli and other vegetables.
A recent study in about 15,000 people found that a variant of the SLC23A1 gene is associated with low levels of vitamin C in the blood.

Your genetic map

Gene	Genotype
SLC23A1	CC

What do your genetics say?

Based on your genotype, you are not predisposed to have low levels of vitamin C. Other genetic and clinical factors may be relevant. The best way to maintain adequate levels of vitamin C is to eat a balanced diet that contains a variety of foods. Smokers and pregnant or breastfeeding women may need to increase their daily intake of vitamin C.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3605792/

Vitamins and minerals

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	TC
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.

More information:

https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0065716/

Vitamins and minerals

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	TC

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.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/19436136?dopt=Abstract

Vitamins and minerals

Calcium levels

Calcium is the most abundant mineral in the human body and a fundamental element in the development of bones and teeth, blood clotting, sending and receiving nerve signals, muscle contraction and relaxation and regulating heart rate. The human body does not produce calcium, so it must be ingested through foods such as milk, yogurt, cheese, broccoli, kale or fish. Very high calcium levels can affect kidney function, lead to nervous system problems, disorientation, dementia, or even coma. By contrast, the main consequence of calcium deficiency is the loss of bone mass and the risk of osteoporosis, but it can also cause cramps in the back and legs, cause confusion, lack of memory, delirium, depression and hallucinations.
Studies have shown that the CYP24A1 and CASR genes are related to the level of calcium in blood.

Your genetic map

Gene	Genotype
CASR	GG
DGKD	GG
GCKR	TC
LOC10192827	TC
CARS	AG
LOC10537017	AG
CYP24A1	AA
WDR81	CC

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.

More information:

www.ncbi.nlm.nih.gov/pubmed/24068962

Vitamins and minerals

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 PDE7B and IP6K3 genes to the predisposition to have abnormal levels of phosphorus in the blood.

Your genetic map

Gene	Genotype
NBPF3 ALPL	TT
CSTA	AA
IP6K3	CC
PDE7B	TT
C12orf4	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.

More information:

www.ncbi.nlm.nih.gov/pubmed/20558539

Vitamins and minerals

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 proven that the TMPRSS6 gene affects the correct function of iron storage in women.

Your genetic map

Gene	Genotype
TMPRSS6	AA
TF	AG

What do your genetics say?

Based on your genotype, you are predisposed to have low levels of iron. Other genetic and clinical factors may be relevant. The recommended amounts of iron can be obtained by consuming a variety of foods, such as lean meats, seafood, poultry, cereals, some legumes, spinach, nuts, and seeds, such as chia.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5839608/

Vitamins and minerals

Magnesium levels

Magnesium is an essential mineral in human nutrition. It is very important in many bodily processes, such as the regulation of blood sugar levels, the control of blood pressure or the proper functioning of the muscles and nervous system. In short, magnesium is needed for more than 300 biochemical reactions in the body. It is found in nuts, seeds such as pumpkin or chia, beans, green vegetables, cocoa and dark chocolate, and oily fish. Excess magnesium in the blood can cause stomach upset, nausea, vomiting, and diarrhoea. Conversely, a deficit could bring about mood swings, anxiety, depression, or intestinal symptoms, such as constipation.
Numerous studies have linked the MUC1 and SHROOM genes with a predisposition to have altered levels of magnesium in the blood.

Your genetic map

Gene	Genotype
MUC1	TC
SHROOM3	GG
LOC10798454	AA
LOC10192833	TT
HOXD9	GG
MECOM	AG

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.

More information:

www.ncbi.nlm.nih.gov/pubmed/20700443

Vitamins and minerals

Zinc levels

Zinc is a fundamental trace element in the body in the right concentration. Not having the minimum level is harmful, but very high levels can be toxic. Low levels of zinc can slow the growth rate of infants and children, slow sexual development in adolescents, and cause impotence in men. Other symptoms such as diarrhoea, nausea, vomiting, and loss of appetite are associated with zinc levels that are either too high or too low. Zinc is obtained mainly through the diet, from foods such as red meats, poultry, oysters and other seafood, nuts, whole grains, dairy products, and others.
However, genetics also play a role in blood zinc levels. Specifically, the CA1 gene has been shown to influence zinc levels.

Your genetic map

Gene	Genotype
CA1	AG
ND	TT
PPCDC	TT
NBDY	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.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/23720494

Biomarkers

HDL cholesterol levels

Cholesterol is a waxy, fat-like substance found in every cell in the body. HDL cholesterol is a lipoprotein (lipids need to bind to proteins in order to move in the blood), which is usually called "good" cholesterol because it carries cholesterol from other organs to the liver, which removes it from the body. Low HDL levels are directly related to the risk of coronary heart disease.
Variants in the LOC144233, FADS2, SCARB1, and many other genes have been correlated with abnormally high or low levels of HDL in the blood.

Your genetic map

Gene	Genotype
ZPR1	GC
LOC144233	AG
SCARB1	AG
LIPG	TC
GALNT2	GG
TTC39B	TC
APOC1	AA
RAB11B	TT
NUTF2	GG
LIPC	GG
ABCA1	CC
LOC10192863	TC
CETP	CC
FADS2	AG
LPL	AG
LOC10192863	CC

What do your genetics say?

Based on your genotype, you are predisposed to have normal levels of HDL cholesterol. Other genetic and clinical factors may be relevant. Several factors help to raise good cholesterol, such as physical activity and increased consumption of monounsaturated fats (olives or nuts) and polyunsaturated fats (tuna, mackerel, salmon and sardines; or vegetable products, such as olive, soybean, canola, flaxseed and chia oils).

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2794863/

Biomarkers

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	CC
LDLR	TG
LOC10272496	CC
APOB	CC
APOC1	AA
HMGCR	TC
LDLR	CC
FADS1	TT
TIMD4	CG
CELSR2	GG
PCSK9	TC
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.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2794863/

Biomarkers

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	AA
FADS1	TT

What do your genetics say?

Based on your genotype, your predisposition to high triglyceride levels is similar to that of 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 burn off the calories ingested.

More information:

https://www.ncbi.nlm.nih.gov/pubmed/20352598?dopt=Abstract

Biomarkers

Triglyceride levels and the Mediterranean Diet

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. The most common consequence of high triglycerides is an increased risk of cardiovascular disease (heart attack, stroke, atherosclerosis) or type II diabetes.
Genetic research has shown a correlation between certain genetic mutations, such as in the LPL gene, and the predisposition that the Mediterranean diet will influence triglyceride levels.

Your genetic map

Gene	Genotype
LPL	TC

What do your genetics say?

Based on your genotype, you are not predisposed to have abnormal triglyceride levels with the Mediterranean diet. 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.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4848687/

Biomarkers

Omega-6 levels

Omega-6 are essential fatty acids that are crucial for certain bodily functions, but the body does not generate them, meaning it must obtain them through diet. They play a crucial role in brain function and normal growth and development. They also help to stimulate hair and skin growth, maintain bone health, regulate metabolism and maintain the reproductive system. They are found mainly in nuts, cereals, vegetable oils, avocados and eggs. Excess omega-6 in the blood can contribute to the onset of inflammatory diseases, while low levels can cause dermal disorders, such as eczema or hair loss, liver dysfunctions or kidney disorders.
Large-scale studies have shown that certain variants of the ELOVL2 gene cause people who carry that variant to have abnormal levels of omega-6.

Your genetic map

Gene	Genotype
PDXDC1	AA
TMEM258	TC
IL23R	TT
C10orf128	GG
FADS1	TC
FADS2	CC
PDXDC1	GG
FTLP19 RNU6	CC
FADS1	TT
PDXDC1	AG
TMEM39A	CC
PDXDC1	GC
ELOVL2	CC

What do your genetics say?

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

More information:

www.ncbi.nlm.nih.gov/pubmed/24823311

Other

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 are predisposed to live longer with the Mediterranean diet. Other genetic and clinical factors may be relevant.

More information:

https://www.ahajournals.org/doi/full/10.1161/circgenetics.114.000635

Other

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, 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	TC
ABCG2	AA
AHR	CC
POR	AG
ND	AG
CYP1A2	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.

More information:

http://www.ncbi.nlm.nih.gov/pubmed/25288136

Other

Caffeine and anxiety

Caffeine is an alkaloid of the xanthine group. This solid, crystalline, white and bitter-tasting substance acts as a psychoactive drug to stimulate the central nervous system.
In addition to this and other effects, caffeine is also related to anxiety, which is described as a feeling of restlessness, nervousness, worry, fear, or panic about what may happen. This process is triggered by neuronal receptors, called adenosine receptors, that are located in the brain and are closely related to activities such as sleep and neuronal activity.
Recent studies have discovered a relationship between a genetic variant in the ADORA2A gene and caffeine-induced anxiety.

Your genetic map

Gene	Genotype
ADORA2A	CC

What do your genetics say?

Based on your genotype, your predisposition to caffeine-influenced anxiety is average. Other genetic and clinical factors may be relevant. Even though, as noted earlier, caffeine is related to anxiety, sometimes increased caffeine consumption seems to dampen this effect on anxiety as the individual becomes accustomed to its components.

More information:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3055635/pdf/npp201071a.pdf

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