Performance DNA Test

Genotype Report

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GENES UNLOCKED

No two humans are genetically identical. Genetic variants are present throughout the human genome and are key to our understanding of the potential influence that genes may have on athletic performance. Along with environmental factors (training and diet), it is possible that elite athletes possess a blueprint of genetic variants that permit them to succeed at the highest level of competition.

ABOUT YOUR RESULTS

The aim of the myInnerGo Fitness Professional is to provide you with a simple, scientifically robust information about your genetic potential.

MyInnerGo genetic testing service for fitness professionals identifies genetic markers that are associated with certain traits, including response to nutrition and performance abilities. Also identifies health related markers in your DNA that are associated with differences in lifestyle, in order to provide you information about your responsiveness to nutrients or diet.

The personal genetic information contained in this report should be used as an additional factor or data point in your entire decision-making process.

COLLECTING SCIENTIFIC INFORMATION

The information on specific genetic variants is obtained from ***PubMed Central*** *This is the U.S National Institutes of Health (NIH) free digital archives of biomedical and life science journal literature.Additional information included about genetic variants is obtained from* ***OMIM****. OMIM is the Online Mendelian Inheritance in Man database catalog of human genes and genetic disorders.*

GENETIC TENDENCY CALCULATION

A model to calculate the overall genetic tendency in lifestyle traits involves combination of predisposition from multiple variants in the different genetic loci into a single relative value: HIGH-AVERAGE-LOW or HIGH-AVERAGE or AVERAGE-LOW. myInnerGo will provide genetic tendency compared to the general population. The combined genetic tendency from multiple genetic markers relative to the population is calculated as a product of the corresponding score and frequency for individual marker.

YOUR REPORT CONTAINS THE FOLLOWING INFORMATION

1. SPORT PERFORMANCE

1. Endurance
2. Power
3. VO2 max
4. Lean Body Mass
5. Hypertrophy Response
6. Injury Risk
7. Recovery
8. Warrior vs Worrier
9. Anaerobic Threshold

2. MICRONUTRIENTS

1. Vitamin B12
2. Bone Mineral Density and Ca Intake
3. Omega-3
4. Selenium
5. Magnesium
6. Iron
7. Vitamin D
8. Vitamin B9 - Folate
9. Vitamin B6

1. SPORT PERFORMANCE

The gene traits that are linked closely to the physical and psychological attributes of sport performance.

SUMMARY OF GENETIC PROFILE

ENDURANCE	*LOW*	***AVERAGE/GOOD***	*HIGHLY GIFTED*
POWER	*LOW*	***AVERAGE/GOOD***	*HIGHLY GIFTED*
VO2 MAX		***AVERAGE***	*HIGH*
LEAN BODY MASS		***AVERAGE***	*HIGH*
HYPERTROPHY RESPONSE		***NORMAL***	*HIGH*
INJURY RISK		***AVERAGE RISK***	*INCREASED RISK*
RECOVERY		*FAST*	***SLOW***
WARRIOR VS WORRIER	*WORRIER*	***MIXED***	*WARRIOR*
ANAEROBIC THRESHOLD		***AVERAGE***	*HIGH*

1.1 Endurance

Endurance is the ability to perform a physical task over prolonged periods of time with minimal fatigue. Endurance levels are commonly associated with the amount of energy expended during the exercise period. Those with higher endurance affinity will therefore be able to exert higher amounts of energy for prolonged periods.

Genes of interest: ADRB2, COL5A1, ACTN3, PPARA, ACE, ADRB3, PPARGC1A1, VEGF

YOUR RESULT: ***AVERAGE/GOOD***

The genetic data have shown an average affinity towards endurance sports. This means the data have shown a affinity towards endurance activity, but not as high as some gifted individuals. The scope of endurance sports is very large and this genetic profile is probably better suited to mid-range activities; some professional athletes will have this profile.

1.2 Power

Power is the ability to exert a maximal amount of energy over a very short period of time. However, a maximal power activity will depend on maximum energy expenditure. Those with a high affinity to power will be able to produce more energy (force) in a short period of time than those with little affinity.

Genes of interest: AMPD1, IL-6, ACTN3, NOS3, ACE, AGT, PPARA

YOUR RESULT: ***AVERAGE/GOOD***

The genetic data show an average affiliation with power-type activities, which can be described as the most common. A person with this profile has the potential to be good at power-based sports, but not as much as some gifted individuals. It is likely that your genetic code has an affiliation to power-based events or a mixture; this is beneficial for many sports.

1.3 VO2 max

VO2 max is an individual's maximum rate of oxygen consumption, as measured during incremental exercise. It is a fair reflection of the aerobic fitness of a person and is an important factor in aerobic activity needed for sub-maximal endurance-based sport, such as marathons.

Genes of interest: VEGF, ADRB1, NRF2 (GABPB1), ACE, UCP2

YOUR RESULT: ***AVERAGE***

The genetic data shows a small increase in VO2 max as a result of aerobic training. A high VO2 max may indicate an athlete's potential for excellent aerobic endurance, but many other factors can determine the winner of a particular race.

1.4 Lean Body Mass

Lean body mass (LBM) is your total body weight minus fat, and determines whether or not you are more likely to have lower body fat levels and higher muscle mass. Therefore those with higher affinity will have a more beneficial power to weight ratio.

Genes of interest: TRHR

YOUR RESULT: ***AVERAGE***

The genetic variants have shown that genetically your lean body mass is average, although many environmental factors affect this. Those with gifted genes may find it easier to have a more positive lean body mass.

1.5 Hypertrophy Response

Body composition in relation to resistance training is the ability for muscle hypertrophy to occur as a result of resistance exercise or physical activity. Muscle hypertrophy is the increase in muscle size, and, whilst there is a correlation between size and strength the genes that govern power are much more closely associated with strength. Those with better affinity to this aspect of body composition will be able to increase muscle size faster and to achieve more hypertrophy than those with lower affinity.

Genes of interest: LEPR

YOUR RESULT: **NORMAL**

The genetic variations have found that, in terms of your body's response to resistance activity, you are average. Those with gifted genes may have a faster and more pronounced result than you when utilizing resistance training, but you still have the potential to increase muscle size. However, it may take more time, more complex training principles and targeted nutrition to reach elite-level bodybuilding goals.

1.6 Injury Risk

Injuries in sport are due to: damage from overuse; poor technique; or accident. Genetically, injury risk is associated with tendinitis, and therefore those with a genetically higher risk will be more predisposed to this inflammatory condition, commonly caused by overuse and/or lack of appropriate rest.

Genes of interest: GDF5, COL1A1, COL5A1

YOUR RESULT: **AVERAGE RISK**

The genetic data show that there is an average injury risk. Injuries in sport commonly occur to the musculoskeletal system (MSK), and can be simple, involving the muscle, ligament, tendon or bone, or complex, involving more than one aspect of the MSK system and even other parts of the anatomy, such as the integumentary system and other organs.

1.7 Recovery

Recovery works on two levels: the first is the ability to heal from damage caused by physical activity and injury, and the second is the speed with which you recover energy after intense bouts of exercise. Those with higher affinity will be able to recover faster from injury and have more energy post-rest period than those with lower affinity.

Genes of interest: AMPD1, IGF2, IGF2AS

YOUR RESULT: ***SLOW***

The genetic data shows a slow recovery rate. Recovery affects how quickly you can recuperate after intense bouts of exercise. It is a major factor in overuse injuries that occur in sport and daily life, and, therefore, is an important aspect not only to those in sport but everyone who suffers an injury. Recovery also has some bearing upon performance during sport, and sports that utilise short intervals of high intensity followed by periods of general moderate intensity are most affected by this.

1.8 Warrior vs Worrier

The variants in this topic are related to stress response and the ability to deal with stressors, ranging from executive decision-making to pain threshold. The variants are split between those who are "warriors", those who are "worriers" and those who fall in between.

Genes of interest: COMT

YOUR RESULT: ***MIXED***

You have a commonly occurring profile of a relatively normal pain threshold and ability to deal with stress. You are neither impaired nor gifted when it comes to cognitive behavior under executive conditions.

1.9 Anaerobic Threshold

The Anaerobic threshold (AT) is commonly known as the lactate threshold or LT, and is the level at which lactate begins to accumulate within the blood stream during exercise. With increased exercise intensity, lactate in the blood reaches the LT. The LT is a useful measurement for determining exercise intensity during training for a wide variety of sports such as running, rowing, cycling, swimming etc. The usage of interval training, which has been popularized in modern times, uses the principle that the LT can be exceeded for short periods of time, followed by a short recovery period.

Genes of interest: PPARGC1A1, ACTN3, AMPD1

YOUR RESULT: ***AVERAGE***

The gene profile is linked with an average anaerobic threshold - you are neither impaired nor gifted. Exercise intensity can still be high but lactate will cause a decline in performance faster than those with the gifted variants, but not as fast as those with low anaerobic threshold genes.

2. MICRONUTRIENTS

The gene traits that look into potential deficiency risk factors of micronutrients in the diet.

SUMMARY OF GENETIC PROFILE

VITAMIN B12	*AVERAGE RISK*	INCREASED RISK
BONE MINERAL DENSITY AND CA INTAKE	*AVERAGE RISK*	INCREASED RISK
OMEGA-3	AVERAGE RISK	*INCREASED RISK*
SELENIUM	AVERAGE	*HIGH*
MAGNESIUM	*AVERAGE RISK*	INCREASED RISK
IRON	AVERAGE RISK	*INCREASED RISK*
VITAMIN D	AVERAGE RISK	*INCREASED RISK*
VITAMIN B9 - FOLATE	AVERAGE RISK	*INCREASED RISK*
VITAMIN B6	AVERAGE RISK	*INCREASED RISK*

2.1 Vitamin B12

Vitamin B12 is one of the most commonly deficient vitamins, affecting your whole body, from brain to bone. Deficiency in vitamin B12 is often related to poor intestinal B12 absorption, which can be due to lack of stomach acid, rather than direct dietary deficiency. Some people also need a lot more B vitamins than others. In adults, typical deficiency symptoms include loss of energy, tingling, numbness, reduced sensitivity to pain or pressure, blurred vision, abnormal gait, sore tongue, poor memory, confusion, hallucinations and personality changes. Often these symptoms develop gradually over several months to a year before being recognised as being due to B12 deficiency and they are usually reversible on administration of B12. Clinical deficiency of vitamin B12 can cause anemia, dementia, nervous system damage.

Genes of interest: FUT2, TCN2

YOUR RESULT: ***AVERAGE RISK***

Your genetic profile shows no increased risk of vitamin B12 deficiency. This means having a healthy and well balanced diet with vitamin B12 containing foods daily should cover your vitamin B12 needs of around 2,4 mcg daily and ensure you good health. One serving of meat or about 14 sheets of dried purple laver (nori) daily can provide the amount needed.

2.2 Bone Mineral Density and Ca Intake

Bone Mineral Density (BMD) is a measure of the amount of calcium and other minerals in bones. The minerals give the bones strength, making them less likely to break. BMD is clinically used as an indirect indicator of osteoporosis and fracture risk. Calcium is the best known mineral needed for strong bones. Calcium is a mineral found in the body and one of the most abundant, most of it is located in the bones and teeth. Other necessary nutrients for strong bones are vitamin D, magnesium along with many other minerals and vitamins. Low calcium intake has been associated with a multitude of disorders like risk of hypertension, preclampsia, premenstrual syndrome, obesity, polycystic ovary syndrome and hyperparathyroidism. Weight bearing physical activity is also necessary to build strong bones, optimise bone mass and reduce the risk of osteoporosis.

Genes of interest: VDR, VDR, LRP5

YOUR RESULT: ***AVERAGE RISK***

Genetically you don't have an increased risk of low bone mineral density disorders, which means that a healthy and balanced diet should cover your vitamin and mineral needs for healthy and strong bones. Make sure your Calcium intake is at least 1000 mg per day. A cup of yoghurt and a slice of cheese can give you around 50% of your RDA.

2.3 Omega-3

Omega-3 fatty acids are essential for our health. Omega-3 fatty acids include 3 different fatty acids shortened to ALA, EPA and DHA. Our body needs all 3 types and they are all essential, which means, we cannot produce them in our body, but we need to get them from the food we eat. Omega-3 fatty acids are primarily essential for a healthy heart and blood vessels, eyes and the brain. There is evidence that omega-3 fatty acids are useful in the prevention and treatment of heart disease, cognitive function, depression. For that especially EPA and DHA are needed. Deficiencies or imbalances in brain fats are now known to be associated with everything from dyslexia, hyperactivity and depression to schizophrenia and manic depression.

Genes of interest: FADS1, ELOVL2, FADS1

YOUR RESULT: ***INCREASED RISK***

Your genetic variants show an increased risk for omega-3 fatty acids deficiency. This means you probably need more omega-3 fatty acids than the RDA, having 5 g per day to keep levels sufficient and avoid deficiency is recommended. One serving of salmon daily can cover your basic needs, but it is recommended to check your fatty acids status with a doctor. Due to your genetic predisposition you might need to supplement omega-3 fatty acids as well to keep yourself fit physically and mentally.

2.4 Selenium

Selenium has many important functions in body. Selenium is one of the main antioxidants that protect us from disease and ageing. Selenium is also needed to regulate our hormonal balance. Lower levels of selenium in humans have been linked to a higher risk of cancer, heart disease, inflammation, asthma and other diseases. Selenium deficiency increases susceptibility to infection, and has been associated with nearly all type of disease. Dietary intake of selenium is dependent on its content in food and the bioavailability of its chemical forms. The selenium content of foods varies according to the concentration of selenium in the soil. Thus, the same foods may have significant differences in selenium levels depending where they have been grown.

Genes of interest: GPX4, GPX1

YOUR RESULT: ***HIGH***

Your genetic profile shows an increased risk for selenium deficiency. This means you probably need more selenium to keep levels sufficient and avoid deficiency. It is recommend that you pay more attention to your daily diet prioritising selenium containing foods to at least reach the daily recommended level of 300 mcg. 3-4 Brazil nuts can actually cover this daily need. As you might need more, it is also recommended that you check your selenium levels with the doctor. Do not take selenium supplements on your own, because selenium in high doses is toxic!

2.5 Magnesium

Magnesium is a required mineral and cofactor for over 300 metabolic reactions in the body. The body consists of about 25 g of magnesium, with about 50-60% in the bones and the remainder in soft tissue. Magnesium deficiency is widespread in the modern diet. Our fast-paced modern lifestyles and reliance on many refined foods (which tend to have a low magnesium content) mean that many of us are not getting enough magnesium in our diet. Magnesium deficiency may lead to cardiovascular disease, hypertension, metabolic syndrome, and type 2 diabetes. Magnesium is needed in energy production and vital tissue functions (blood, muscle etc.). Low magnesium consumption, particularly against a background of high calcium intakes, worsens the risk of cancer and cardiovascular disease. Optimal calcium-magnesium ratio should be 2:1. Many calcium-rich foods like milk or cheese have calcium-magnesium ratio 10:1 or 30:1, which does not favor calcium or magnesium uptake.

Genes of interest: MUC1, ATP2B1

YOUR RESULT: ***AVERAGE RISK***

Your genetic profile shows no increased risk of magnesium deficiency. This means that a healthy and balanced diet should cover your daily magnesium needs to ensure normal body functions, strong bones and protection against diabetes. An average magnesium intake should be at least 300-400 mg per day. One handful of pumpkin seeds can give you about 1/3 of this amount.

2.6 Iron

Iron is an essential nutrient required by every human cell. The main iron function is oxygen transport to our cells and tissues and energy production. Iron deficiency is the most common nutritional disorder in the world and the leading cause of anaemia. Iron deficiency without anaemia is associated with inefficient energy metabolism and reduced muscle strength and endurance.

Genes of interest: TMPRSS6, TMPRSS6, TF, TF

YOUR RESULT: ***INCREASED RISK***

Your genetic profile shows an increased risk for iron deficiency. This means you probably need more iron to keep your levels sufficient and avoid deficiency. It is recommended that you consume iron rich foods to definitely reach the average recommended levels of 8-18 mg. One serving of red meat can provide you about 2 mg and a cup of lentils provide 7 mg of iron. As you might need more, check iron levels and storage parameters (Ferritin) with your doctor.

2.7 Vitamin D

Vitamin D is needed for strong bones as it brings calcium into bones. It has other roles in the body, including modulation of cell growth, neuromuscular and immune function, and reduction of inflammation. Vitamin D deficiency is a widespread problem in developed countries. Environmental factors such as diet, intake of vitamin D supplements and exposure to sunlight are known to influence serum vitamin D concentrations.

Genes of interest: CYP2R1, DHCR7, GC

YOUR RESULT: ***INCREASED RISK***

Your genetic variants show an increased risk for vitamin D deficiency. Vitamin D is poorly absorbed from food, most of it is synthesised in our skin and liver with the help of sunshine. It is recommended that you spend more time in the sunlight and to check your vitamin D level (calcidiol) in the blood. For your overall good health it is important to reach the level of 30-40 ng/ml at least! For you it probably means you also need to supplement with vitamin D.

2.8 Vitamin B9 - Folate

Folic acid, also called folate or folacin, is a B-complex vitamin which is most well known in the prevention of pregnancy defects. Folic acid is a crucial nutrient that supports important physiological functions such as DNA synthesis, cell division and substrate methylation. Adequate folate intake is also helpful in lowering the risk of some forms of cancer, especially in genetically susceptible individuals, and may lower the risk of cardiovascular diseases with keeping homocysteine levels low.

Genes of interest: SCLC19A1, MTHFR, MTRR, MTHFR

YOUR RESULT: ***INCREASED RISK***

Your genetic profile shows an increased risk for folate deficiency, which might be connected to a risk for increased homocysteine level and heart problems. The daily average recommended folate intake level is 400 mcg. A cup of lentils or half a cup of spinach/broccoli can provide you with the needed amount. Due to your genetic predisposition you might need more. Check it with your doctor and look for folate supplements with a special active form of folate called 5-methyl tetrahydrofolicacid.

2.9 Vitamin B6

Vitamin B6is a water-soluble essential nutrient and must be obtained from the diet because humans cannot synthesise it. Vitamin B6 has a number of functions. Vitamin B6 with other nutrients like folate and vitamin B12 is involved in keeping homocysteine levels low, which decreases cardiovascular risks. Vitamin B6 is an important vitamin for red blood cell production and carbohydrate metabolism providing good energy levels throughout the day, for neurotransmitter production leading to healthy nerves, brain and mood and to support liver functions. There is a wide variety of foods that act as good sources of vitamin B6 and it is probably easy to reach the recommended level of daily intake if you are eating a variety of healthy, fresh food every day.

Genes of interest: ALPL

YOUR RESULT: ***INCREASED RISK***

Your genetic variants show an increased risk for vitamin B6 deficiency. This means you probably need more than the average recommendation of 1,3 mg to keep the levels sufficient and avoid deficiency. You should pay special attention to eating a well-balanced diet with plenty of whole foods every day. A can of tuna or a cup of chickpeas can provide you with the average daily need, but due to your genetic predisposition you might need more.

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