myINNERGO

GENOTYPE REPORT

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FITNESS PROFESSIONAL ONLY |

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. Effect of Resistance Training
6. Injury
7. Exercise and its Effect on Weight
8. Recovery
9. Warrior vs Worrier
10. Anaerobic Threshold

2. *MICRONUTRIENTS*

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

3. *NUTRITION*

1. Response to Carbohydrates
2. Response to Total Fats
3. Weight Regain
4. Response to Proteins
5. Response to Unsaturated Fats
6. Energy expenditure
7. Caffeine Metabolism
8. Response to Calorie Restriction

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	**HIGH**
POWER	**LOW**	AVERAGE	HIGH
VO2 MAX		**AVERAGE**	HIGH
LEAN BODY MASS		**AVERAGE**	HIGH
EFFECT OF RESISTANCE TRAINING		NO RESPONSE	**RESPONSE**
INJURY		**AVERAGE RISK**	INCREASED RISK
EXERCISE AND ITS EFFECT ON WEIGHT		**AVERAGE BENEFIT**	HIGH BENEFIT
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

YOUR RESULT: ***HIGH***

You are gifted! The genetic data have shown potential to excel at endurance sports with a high affinity towards endurance activity. This profile shares genetic variants with professional endurance athletes. However, the scope of endurance sports is very wide and therefore other variables must be taken into consideration.

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: ***LOW***

The genetic data show a decreased affiliation with power-type activities. Power-type activities include many sports, such as powerlifting or 200m sprinting. The genes do not dictate that these sports should be avoided but it is highly probable that a person with this profile would have a much tougher time reaching the same level as a person genetically predisposed to high power activities. There are sports that involve power that would be possible for this profile to excel at, but these are very mixed-type 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)

YOUR RESULT: ***AVERAGE***

The genetic data show 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: LEPR

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 Effect of Resistance Training

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: ***RESPONSE***

You are gifted! In terms of the body's response to resistance activity you will be able to achieve faster and more pronounced muscle hypertrophy; your gene variants link well to utilizing resistance training as part of a program and you will see the most benefit from this.

1.6 Injury

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 Exercise and its Effect on Weight

Exercise in conjunction with an active lifestyle is important for general good health status. However, studies have demonstrated that the benefits of exercise in relation to weight management differ depending on individual genetic variations.

Genes of interest: INSIG2, FTO, LPL, ADRB2

YOUR RESULT: ***AVERAGE BENEFIT***

The genetic variations have shown that you have an average affinity when it comes to weight and exercise. This means that a powerful combination of both nutritional planning and exercise is more likely to be needed to gain the most benefit from a weight management program, and that physical activity may have to be greater to gain the same benefit as those who have the gifted variants.

1.8 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 show 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 utilize short intervals of high intensity followed by periods of general moderate intensity are most affected by this.

1.9 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.

1.10 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

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
MAGNESIUM	AVERAGE RISK	**INCREASED RISK**
IRON	AVERAGE RISK	**INCREASED RISK**
VITAMIN D	AVERAGE RISK	**INCREASED RISK**
VITAMIN A	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, and is well-known to be the sole vitamin that is absent from plant-derived food sources. 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.

Genes of interest: FUT2, TCN2

YOUR RESULT: ***AVERAGE RISK***

Genetically, you have an average risk for vitamin B12 deficiency. You should still pay attention to your regular consumption of animal products or supplementation. It is recommended that you should also check your vitamin B12 status with your doctor as vitamin B12 deficiency is often related to poor intestinal B12 absorption rather than direct dietary deficiency.

2.2 Bone Mineral Density and Ca Intake

Bone Mineral Density (BMD) is a measure of the amount of calcium (Ca) 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, and inadequate dietary calcium is associated with increased risk of a number of diseases.

Genes of interest: VDR, VDR, LRP5

YOUR RESULT: ***AVERAGE RISK***

Genetically, you don't have 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.

2.3 Omega-3

Omega-3 fatty acids are polyunsaturated fatty acids that are essential nutrients for health. We need omega-3 fatty acids for numerous normal body functions, such as controlling blood clotting and building cell membranes in the brain, and, since our bodies cannot make omega-3 fats, we must get them through food. Omega-3 fatty acids are also associated with many health benefits, including protection against heart disease and possibly stroke.

Genes of interest: FADS1, ELOVL2, FADS1

YOUR RESULT: ***AVERAGE RISK***

Your genetic variants show no increased risk for omega-3 fatty acids deficiency. This means that a healthy balanced diet with sufficient omega-3 fatty acids should cover your daily needs and help to keep you fit physically and mentally.

2.4 Magnesium

Magnesium is a required mineral and cofactor for over 300 metabolic reactions in the body. Magnesium is needed in energy production and vital tissue functions (blood, muscle etc.). Magnesium deficiency is widespread in the modern diet. 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.

Genes of interest: MUC1, ATP2B1

YOUR RESULT: ***INCREASED RISK***

Your genetic profile shows increased risk of magnesium deficiency. This means you probably need more magnesium to keep the levels sufficient and avoid deficiency. It is important to pay more attention to your daily magnesium intake, which should be over 250 mg to ensure normal body functions, strong bones and protection against diabetes. One handful of pumpkin seeds can give you about half of this amount.

2.5 Iron

Iron is an essential nutrient required by every human cell. One of the main functions of iron is oxygen transport to our cells and tissues for 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 increased risk for iron deficiency. This means you probably need more iron to keep the levels sufficient and avoid deficiency. It is recommended that you consume iron-rich foods and check iron levels and storage parameters with your doctor.

2.6 Vitamin D

Vitamin D is needed for strong bones, by helping the body absorb calcium. 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***

The genetic variants show an increased risk for vitamin D deficiency. This means you should pay attention to your non-genetic factors, including nutritional availability of vitamin D, skin color and time spent in direct sunlight without protection, to maintain your vitamin D level.

2.7 Vitamin A

Vitamin A is a fat-soluble compound essential for the function of retinal pigments for vision, and for growth and differentiation of cells and tissues, such as mucosa and immune cells. Limited intake of vitamin A sources causes absorptive disorders of the intestines, and inflammatory diseases.

Genes of interest: BCMO1, BCMO1

YOUR RESULT: ***INCREASED RISK***

Your genetic profile shows reduced conversion of beta-carotene to vitamin A. This means you probably need more carotene and vitamin A to keep your levels sufficient and avoid deficiency.

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. Folate 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 by keeping homocysteine levels low.

Genes of interest: SCLC19A1, MTHFR, MTRR, MTHFR

YOUR RESULT: ***AVERAGE RISK***

Your genetic profile shows no increased risk for folate deficiency. To ensure harmless homocysteine levels for your health, please also check your vitamin B12 risks as, in addition to folate, homocysteine levels are also directly dependent on vitamin B12 levels.

2.9 Vitamin B6

Vitamin B6 is a water-soluble essential nutrient and must be obtained from the diet because humans cannot synthesize it. Vitamin B6 is an important vitamin for: red blood cell production; carbohydrate metabolism for good energy levels throughout the day; neurotransmitter production for healthy nerves, brain health and good mood; and to support liver functions.

Genes of interest: ALPL

YOUR RESULT: ***INCREASED RISK***

Your genetic variant shows increased risk for vitamin B6 deficiency. This means you probably need more of this vitamin 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.

3. NUTRITION

The gene traits that are associated with metabolic characteristics influencing body composition via nutritional aspects.

SUMMARY OF GENETIC PROFILE

RESPONSE TO CARBOHYDRATES		AVERAGE RISK	**INCREASED RISK**
RESPONSE TO TOTAL FATS	LOW RISK	**AVERAGE RISK**	INCREASED RISK
WEIGHT REGAIN		AVERAGE RISK	**INCREASED RISK**
RESPONSE TO PROTEINS	HIGH BENEFIT	**AVERAGE BENEFIT**	
RESPONSE TO UNSATURATED FATS	**HIGH BENEFIT**	AVERAGE BENEFIT	NO BENEFIT
ENERGY EXPENDITURE		**LOW**	AVERAGE
CAFFEINE METABOLISM		**FAST**	SLOW
RESPONSE TO CALORIE RESTRICTION	**LOW**	AVERAGE	

3.1 Response to Carbohydrates

Carbohydrates provide the main source of energy for the body - they are used first, ahead of other nutrients such as protein and fat, providing fuel for the muscles. They are also the preferred fuel source for the brain, nervous system and heart. Each gram of carbohydrate povides 4 calories. The recommended daily amount (RDA) is approximately 45-60% of our total food intake. Carbohydrates are important for maintaining good health, but nutrigenetic studies have shown that for some people with a particular genetic profile, over-consumption of these macronutrients can increase the risk of gaining weight.

Genes of interest: PLIN1, PPARG, ADRB2

YOUR RESULT: ***INCREASED RISK***

Your genetic profile is associated with a higher risk of weight gain from over-consumption of carbohydrates. Carbohydrates should make up less than half of your daily energy intake for effective weight management.

3.2 Response to Total Fats

Fats can be found in almost all foods, and are the most energy rich macronutrient, containing 9kcals/g (twice as much as protein and carbohydrate). Animals use fats as the most economical way to store their energy. However, due to its high calorific value, too much fat can have a poor effect on health. Studies have shown that excess consumption of different fats can increase your risk of weight gain, depending on your genotype.

Genes of interest: TFAP2B, TCF7L2, APOA5, FTO, PPARG

YOUR RESULT: ***AVERAGE RISK***

Your genetic profile is associated with an average risk of weight gain from over-consumption of fats. This profile is similar to over 50% of the population. Be mindful of your fat consumption; choose unsaturated fats in favor of saturated fats.

3.3 Weight Regain

In the case of overweight and obesity risk, successful weight management consists of two main components: 1) initial weight loss, and 2) weight maintenance. Some individuals find weight loss easy, but it's the maintenance phase that is the long-term challenge. Some genetic profiles are associated with a greater propensity for regaining weight.

Genes of interest: PPARG, ADIPQ, IL-6

YOUR RESULT: ***INCREASED RISK***

Your genetic profile is associated with increased risk for regaining weight. You may need on-going professional support to minimise your risk and maintain your weight.

3.4 Response to Proteins

Proteins are the essential nutrients for the human body. As a fuel, proteins contain 4kcal/g, just like carbohydrates. However, unlike carbohydrates and fat, the body does not store protein; so it is important to eat a variety of dietary protein every day. Studies suggest that a high-protein diet may be more beneficial for weight loss and improvement of body composition and fat distribution in individuals with a certain genotype.

Genes of interest: TFAP2B, FTO, BDNF

YOUR RESULT: ***AVERAGE BENEFIT***

Your genetic profile suggests that a dietary intake higher in proteins would have no beneficial effect on your body weight.

3.5 Response to Unsaturated Fats

Unsaturated fats should make up the greater part of your total intake of fats as they have a more beneficial effect on your health. However, beware of the calorie content per gram, as it is generally the same for both saturated and unsaturated fats. With certain genetic profiles, it has been found that an increased intake of unsaturated fats can have a beneficial effect on body weight as well as help lower your blood cholesterol.

Genes of interest: APOA5, ADIPQ, PPARG, FTO

YOUR RESULT: ***HIGH BENEFIT***

Your genetic profile has shown your risk to be low in response to unsaturated fats. This means that a diet high in unsaturated fat can have a beneficial effect on your weight management.

3.6 Energy expenditure

The basal metabolic rate (BMR) is the rate of energy used by the body at rest. The release and use of energy in this state is sufficient to maintain vital organ function, respiration and repair. Basal metabolism is typically the largest component of our total energy expenditure (approximately 60%). BMR is individual and is affected by height, weight, age, gender and activity levels but it can also be affected by our genes.

Genes of interest: IL-6, UCP1

YOUR RESULT: ***LOW***

The genetic variants show that you have a lower energy expenditure at rest than others may do. This is a two-sided coin: it may be beneficial to those trying to consume a high calorie diet to build muscle (bodybuilding, weight lifters etc.) as fewer of these calories will be used up in metabolism; however, for others where this is not the case, extra physical activity may be needed for effective weight management, as resting energy expenditure is low.

3.7 Caffeine Metabolism

Caffeine, a naturally-occurring central nervous system stimulant, is the most widely used psychoactive drug in the world. Caffeine is found in various seeds, leaves, nuts, and berries such as the seeds of the coffee plant, the leaves of the tea bush, kola nuts, yerba mate, guarana berries, guayusa and yaupon holly. Coffee contains the highest concentrations of caffeine. The metabolism of caffeine is affected by a number of factors including gender, exercise, diet and genetics.

Genes of interest: CYP1A2, CYP1A1/CYP1A2

YOUR RESULT: ***FAST***

Your genetic profile shows fast metabolism of caffeine. Your body can metabolize and excrete caffeine quickly, so it has less time in your body to produce stimulating effects. This also means you probably need and can tolerate larger amounts of caffeine.

3.8 Response to Calorie Restriction

The traditional method of weight loss is to restrict calorie intake. A popular method used by health professionals is to restrict the total number of calories consumed by 500 – 1000 kcal/day to achieve a loss of 0.5-1kg/week. However, the rate of weight loss will differ between individuals based on their genetic profile. Genetic variations determine the individual response to calorie restriction.

Genes of interest: ADRB3, PPARG, ADIPOQ

YOUR RESULT: ***LOW***

Genetic data have shown that calorie restriction has a minimal effect on weight loss. As a result, weight loss may be not be so easy for you!

Disclaimer

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1.1 myInnerGo utilises a robust evidence-based approach, the information provided is based on a small subset of genetic markers and as a result is only one part of a much larger picture. There could be other genes, environmental influences, lifestyle varieties and unidentified genetic variants/expressions that are more important predictors.

1.2) Please pursue the advice of your GP, Doctor, or/and Physician with any questions you may have regarding your physical or/and psychological health and wellbeing. Prior to making any variations to your training, diet or lifestyle practices you must first consult a qualified health care provider, GP or relevant Doctor.

1.3) You as the receiver of the myInnerGo report are solely responsible for the way the information is interpreted, acted upon and be aware that any recommendations you follow you do so at your own risk. In no way will myInnerGo or any persons associated with myInnerGo be held accountable for any injuries, ailment or ill health that might occur because of the use of information provided by myInnerGo or the advice contained within your report or given out during a consultation. If you feel you may require emergency services, you must contact your doctor or the relevant ambulance, police or fire service.

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