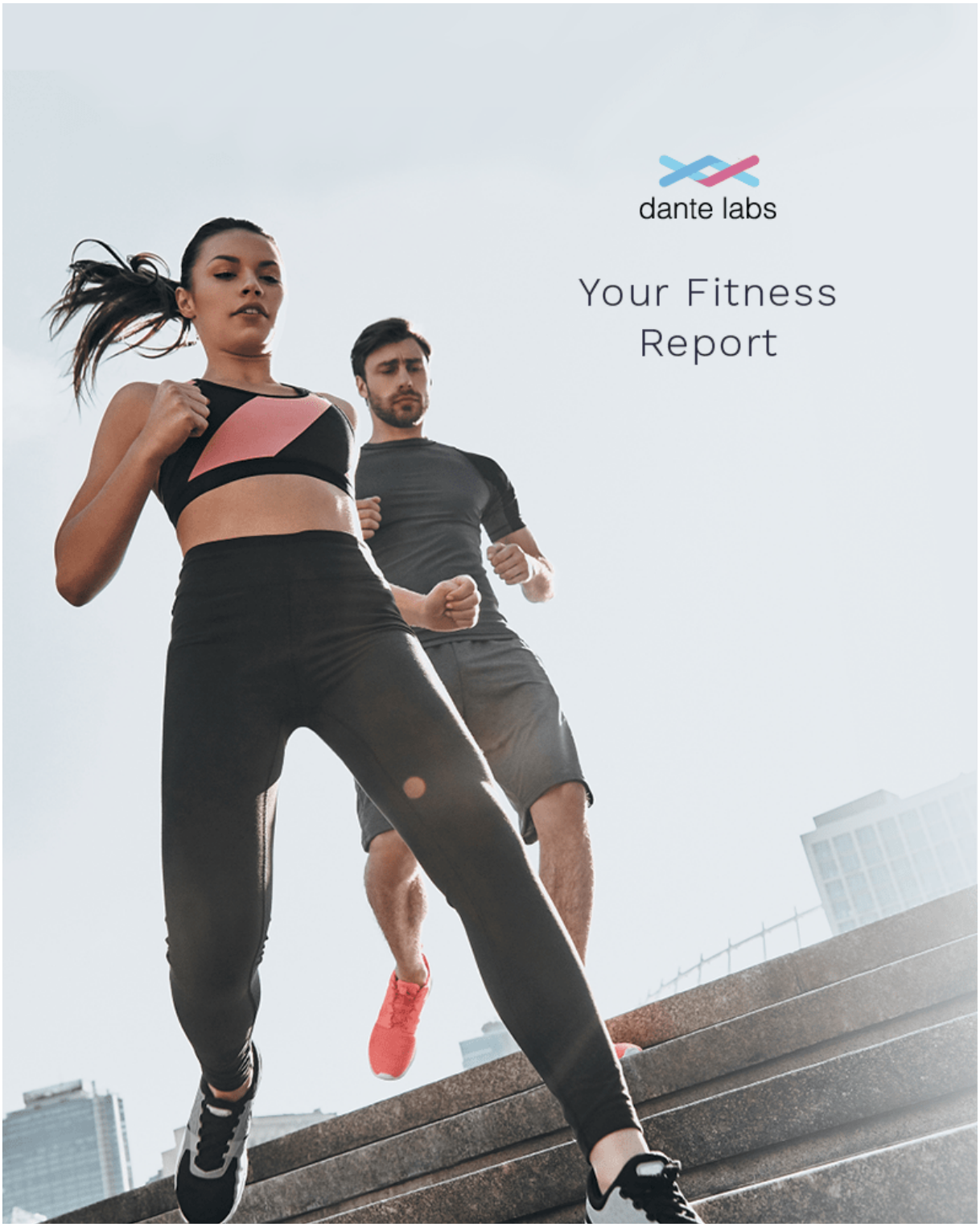

dante labs
Your Fitness Report

YOUR FITNESS REPORT

INTRODUCTION

This is your personal genomic fitness report, providing you with invaluable genetic insights into your personal physical fitness. Topics covered include exercise and heart-rate, strength, recovery, balance, mobility, reflexes, agility, precision, injury risk, BMI, fat, muscle, metabolism, blood pressure, cholesterol, insulin and glucose. On top of that, also shown in the report are personality traits, including optimism, leadership, conscientiousness, extraversion, learning, impulsivity, anger, and even combativeness.

Your fitness report, when presented to your doctor/healthcare professional/qualified personal trainer, could help you with your fitness goals. You may, for example, be interested in using your report to put together a fitness plan to become physically stronger, or to obtain a healthier BMI. Your report could help you to set and manage achievable fitness goals and even maximise the potential of your own personality traits day to day.

Do not modify diets/meal-plans or supplements recommended or prescribed by your doctor/qualified healthcare professional without first consulting them.

If you have any nutrition, diet, or healthcare related questions, please make sure that you promptly consult your doctor/qualified healthcare professional.

Genetic testing identifies and analyses your DNA and can help to rule out suspected genetic disorders and/or help determine your chances of developing or passing on a specific genetic disorder. Huge benefits from genetic testing also include:

1. Useful results for family planning

2. Guidance for your doctor/qualified healthcare professional in diagnosis and suitable treatments/interventions

3. Early interventions when it comes to medical conditions - which can even save a life.

As we all differ so much in their characteristics and traits, so do we in our genetic makeup. Our genetic differences are shown through variations in our DNA: the building blocks of life.

When a family member has a trait for a disease it's wise to have genetic testing and screening to find out if you are a carrier or have the disease yourself.

Some genetic variations can increase our risk of developing certain health conditions, other variations can reduce them, whilst some people will develop a health condition without being at a higher genetic risk. Whichever way, it's wise to find out your own personal genetic composition and where possible, reduce your risk through lifestyle changes.

As a species, we humans are incredibly genetically diverse and complex. We find that there are some genetic variations more pronounced in one ethnicity over another, for example. It's in us identifying our own personal genetic complexities and variations that we can then work towards making constructive changes in our lives to better our health and wellbeing. Put simply, fully understanding your own genetic variations helps to provide a pathway to optimum health and a fruitful life.

Personal, appropriate genetic testing provides valuable insights but also has its limitations (see below).

LIMITATIONS AND OTHER IMPORTANT INFORMATION

Genetic testing provides you with personal information on your own genetic risk(s), based upon the assessment of specific genetic variants. However, it doesn't report on your entire genetic profile. It doesn't report on all of the genetic variants that relate to a specific disease or condition, and if a variant that is tested doesn't show up, that doesn't mean that there aren't any other genetic variants present that could be related. Indeed, other genetic risk tests could identify separate genetic variants that are related to the same disease/condition. In addition, your environment and lifestyle can be contributory risk factors affecting your risk of developing a disease or health condition.

Future versions of this report may include additional polymorphisms to provide a higher degree of accuracy than this SNP alone does.

Remember that testing is not a substitute for visits to your doctor/qualified healthcare professional. Any questions or concerns that you might have about your genetic test results or your current health status must be brought up in an appointment with them.

Lots of people find speaking with a genetic counselor or board-certified clinical geneticist very helpful in their genetic journey.

Genetic counselling can be valuable in helping you with worries and concerns that you might have about your genetic testing (both prior and post-results), and clinical geneticists can prove essential after you've received your results; to analyse them and potentially diagnose you with a condition/disease. You can access genetic counselors via the Genetic Counselor United Arab Emirates website: http://www.geneticcounselor.ae

The results of a genetic test do not provide you with a diagnosis or provide you with information about your current state of health/wellbeing and they mustn't be used by you to make any medical decisions, such as altering any medications that you are taking.

Our genetic testing reports haven't been evaluated by the FDA and by the UAE Ministry of Health & Prevention.Our product isn't intended to diagnose, treat, cure or prevent any medical condition/disease.

INFORMATION FOR HEALTH CARE PROFESSIONALS

Our genetic testing is not intended to diagnose a patient with a disease, to determine suitable medical treatments, or to inform the patient of anything regarding their current or future state of health. Instead, the test is intended to provide patients with personal genetic information to help influence their conversations with clinicians and to help them make constructive lifestyle decisions.

Any decisions regarding patient diagnosis or treatment should be based upon clinical diagnostic testing and/or other information that you consider to be appropriate.

This report is NOT intended for US persons and was not submitted for approval to the US Food and Drug Administration (FDA).

The above information provides an overview of predicted genetic risks to the patient. All information is based solely on genotype data and does not replace a consultation with a doctor/qualified healthcare professional.

Doctors/qualified healthcare professionals should also consider family history, symptoms presented, current medical prescriptions, and other factors prior to making any clinical or therapeutic decisions.

KEY SUMMARY

This colour means that you could have an enhanced beneficial reaction linked to the associated trait

This colour means that you could have an average reaction linked to the associated trait

This colour means that you could have a reduced beneficial reaction linked to the associated trait

QUICK SUMMARY

CARDIO

CONDITION NAME	RESULTS	MAIN MESSAGE
Endurance Workout		People with your genetic profile are likely to receive enhanced health benefits from an endurance workout
Sprint		People with your genetic profile are likely to have an increased ability to sprint
Prepared for speed sports		People with your genetic profile are likely to have high propensity to benefit from speed sports
Predisposition to intense sports		People with your genetic profile are likely to have a high predisposition to benefit from intensive sports
Pace and variability of gait		People with your genetic profile are likely to walk at a higher pace
World-class athletic resistance		People with your genetic profile are likely to have high physical resistance
Respiratory capacity		People with your genetic profile are likely to have a regular respiratory capacity
Aerobic metabolism		People with your genetic profile are likely to have a normal capacity for oxygen consumption

STRENGTH

CONDITION NAME	RESULTS	MAIN MESSAGE
Strength Workout		People with your genetic profile are likely to receive more benefits from a strength workout
Muscle Strength		People with your genetic profile are predisposed to have high muscle strength
Post Exercise Recovery		People with your genetic profile are likely to need longer recovery times post exercise
Hand Grip Strength		People with your genetic profile tend to have an increased grip ability following physical activity
Quadriceps strength		People with your genetic profile are likely to increase quadriceps strength easier during workouts

BALANCE AND FLEXIBILITY

CONDITION NAME	RESULTS	MAIN MESSAGE

BALANCE AND FLEXIBILITY

CONDITION NAME	RESULTS	MAIN MESSAGE
Equilibrium	🟡	People with your genetic profile are likely to have altered equilibrium
Joint mobility	🟡	People with your genetic profile have a lower range of joint motion and less joint laxity and flexibility

OTHER KEY FACTORS

CONDITION NAME	RESULTS	MAIN MESSAGE
Reaction time (reflexes)	🟡	People with your genetic profile are likely to have a low reaction time
Agility	🟢	People with your genetic profile are likely to have good agility
Precision	🟢	People with your genetic profile are likely to have good eyesight precision

BODY COMPOSITION - ADIPOSE

CONDITION NAME	RESULTS	MAIN MESSAGE
Body mass index	🟡	People with your genetic profile are predisposed to have a tendency to gain weight easily
Body mass index (non-smoking vs smokers interaction)	🟡	People with your genetic profile are likely to have an increase in body mass index in response to cigarette smoking
Obesity in the absence of metabolic diseases	🟡	People with your genetic profile have a greater tendency to become obese
Waist circumference adjusted for body mass index	🟢	People with your genetic profile tend to have a smaller waist circumference than average
Waist-hip ratio	🟢	People with your genetic profile are likely to have a greater distribution of body fat
Waist-hip ratio (energy interaction with the diet)	🔵	People with your genetic profile are likely to have a typical distribution of body fat in response to diet
Subcutaneous adipose tissue	🔵	People with your genetic profile are likely to have regular accumulation of subcutaneous adipose tissue
Ratio of visceral vs subcutaneous adipose tissue	🟡	People with your genetic profile are likely to have an unbalance between visceral adipose tissue/subcutaneous adipose tissue.
Taking dietary macronutrients	🟢	People with your genetic profile tend to lose more weight by taking personalised dietary macronutrients
Loss of Body Fat Response to Physical Activity	🔵	People with your genetic profile are likely to not have any enhanced benefits from exercise to lose body fat

BODY COMPOSITION - MUSCULATURE

CONDITION NAME	RESULTS	MAIN MESSAGE
Lean mass	🔵	People with your genetic profile are likely to have a regular lean mass
Growth potential of lean mass	🔵	People with your genetic profile are likely to have a lower growth potential of lean mass
Percentage of fibers that make up the muscle: white	🟡	People with your genetic profile are likely to have a low white muscle fiber percentage
Percentage of fibers that make up the muscle: red	🔵	People with your genetic profile are likely to have an average red muscle fiber percentage

BODY COMPOSITION - METABOLISM

CONDITION NAME	RESULTS	MAIN MESSAGE
Body energy expenditure (24 hours)	🟢	People with your genetic profile are likely to have an enhanced metabolic rate

BODY COMPOSITION - METABOLISM

CONDITION NAME	RESULTS	MAIN MESSAGE
Metabolism at rest	●	People with your genetic profile are likely to have regular catalytic rate at rest
Energy expenditure	●	People with your genetic profile are likely to have a higher consumption of energy

EXERCISE AND HEALTH

CONDITION NAME	RESULTS	MAIN MESSAGE
Physical Activity in Weight Loss	●	People with your genetic profile are predisposed to being overweight

RESPONSE TO PHYSICAL ACTIVITY

CONDITION NAME	RESULTS	MAIN MESSAGE
Blood Pressure Response to Physical Activity	●	People with your genetic profile have an increased likelihood of elevated blood pressure
Interaction between LDL cholesterol levels and physical activity	●	People with your genetic profile are likely to have a stronger reduction of LDL levels in response to physical activity
HDL (good) Cholesterol Response to Physical Activity	●	People with your genetic profile are likely to have an enhanced benefit in their HDL levels through exercise
Insulin Sensitivity Response	●	People with your genetic profile are likely to have an enhanced insulin sensitivity in response to exercise
Increase of glucose uptake in response to exercise	●	People with your genetic profile are likely to have a regular glucose uptake in muscle fiber in response to exercise
Increased heart rate in response to exercise	●	People with your genetic profile are susceptible to an excessive increase in heart rate following physical activity
Heart rate response to post-recovery exercise	●	People with your genetic profile are likely to have a regular heart rate reduction during recovery
Athletic difficulties due to reduced heart rate	●	People with your genetic profile are likely to have a lower heart rate
Cognitive Benefits (high motor coordination)	●	People with your genetic profile are likely to receive cognitive benefits for motor coordination from physical activity
Predisposition to moderate to vigorous physical activity levels	●	People with your genetic profile are likely to have a low predisposition to benefit from vigorous physical activity levels
Muscle response to resistance training	●	People with your genetic profile are likely to have low muscle response to resistance training
Creatine kinase	●	People with your genetic profile are likely to have a costant creatine kinase level after racing

INJURY RISK

CONDITION NAME	RESULTS	MAIN MESSAGE
Sport Injury Risk	●	People with your genetic profile are likely to have a lower tendency to incur sport injuries
Tendinopathy	●	People with your genetic profile have an increased likelihood of getting tendonitis
Predisposition to tendinopathies	●	People with your genetic profile are likely to have a high predisposition to tendonitis and other tendinopathies

JOINTS

CONDITION NAME	RESULTS	MAIN MESSAGE
Joint fragility	●	People with your genetic profile are likely to have an increased chance of joint fragility
Shoulder dislocation	●	People with your genetic profile are likely to have a lower tendency to dislocate their shoulder

JOINTS

CONDITION NAME	RESULTS	MAIN MESSAGE
Rotator cuff disease	🟡	People with your genetic profile are likely to have a higher susceptibility to rotator cuff disease
Cruciate ligament/anterior Cruciate ligament injuries	🟡	People with your genetic profile likely have a high risk factor for anterior cruciate ligament injuries
Ankle injury	🔵	People with your genetic profile are likely to not have an increased risk to develop Ankle injury

MUSCLES

CONDITION NAME	RESULTS	MAIN MESSAGE
Muscle Cramps	🟢	People with your genetic profile are likely to have a decreased risk factor to develop muscle cramps after intense workouts
Propensity to the development of muscle pain	🔵	People with your genetic profile are likely to have a low propensity to feel muscle pain
Risk of suffering muscle damage	🔵	People with your genetic profile are likely to have a regular risk of suffering muscle damage
Exercise-induced myopathy	🟢	People with your genetic profile are likely to have a low tendency to experience myopathy
Slow muscle repair	🟢	People with your genetic profile are likely to have a good muscle repair ability
Predisposition to the development of inguinal stress hernias	🟢	People with your genetic profile are likely to have a low predisposition for inguinal stress hernias

STRESS FRACTURE

CONDITION NAME	RESULTS	MAIN MESSAGE
Stress fracture period prevalence	🟢	People with your genetic profile are likely to have a lower tendency to develop stress fractures
Stress fracture	🔵	People with your genetic profile are likely to have a regular tendency to get stress fractures

PERSONALITY TRAITS

CONDITION NAME	RESULTS	MAIN MESSAGE
Optimism	🟢	People with your genetic profile are predisposed to have a high sense of optimism
Leadership	🟢	People with your genetic profile are likely to have higher leadership abilities
Conscientiousness	🔵	People with your genetic profile are likely to have a less conscientious personality.
Extraversion	🟢	People with your genetic profile are likely to be more extraverted.
Insufficiency of experiential learning	🟢	People with your genetic profile are likely to have a good ability for experiential learning
Impulsivity	🟢	People with your genetic profile are likely to have a lower tendency to act impulsively
Response to Anger	🟢	People with your genetic profile are likely to have a good ability to handle feelings of anger
Combative personality	🟢	People with your genetic profile are likely to have a higher tendency to have a combative personality

ENDURANCE WORKOUT

RESULTS

Endurance workouts are a type of intensive workout that helps improve stamina and build cardiovascular aerobic fitness. Examples include running, sprinting, swimming, and biking [1]. Rs2016520 is a specific genetic polymorphism that is linked to endurance in a person's athletic performance. The Rs2016520 polymorphism is a variation of the PPARD gene which can help to increase a person's endurance and strength [2].

People with your genetic profile are likely to receive enhanced health benefits from an endurance workout

SCIENTIFIC DETAILS

Gene	rsID	Genotype
PPARD	rs2016520	CT

REFERENCES

[1] Morici, G., Gruttad'Auria, C. I., Baiamonte, P., Mazzuca, E., Castrogiovanni, A., & Bonsignore, M. R. (2016). Endurance training: is it bad for you?. Breathe (Sheffield, England), 12(2), 140–147.

[2] Is there an interaction between PPARD T294C and PPARGC1A Gly482Ser polymorphisms and human endurance performance? Nir Eynon, Yoav Meckel, Alberto Jorge Alves, Chen Yamin, Michael Sagiv, Ehud Goldhammer, Moran Sagiv.

SPRINT

RESULTS

Sprinting is when a person runs as quickly as they can [1]. The ACE and ACTN3 genes influence elite power and a person's sprint performance, polymorphism of rs1867785 present in EPAS1 gene is also highly present in sprinters. It indicates a high percentage of fast-twitch muscles that which positively affect a person's sprinting speed [2].

People with your genetic profile are likely to have an increased ability to sprint

SCIENTIFIC DETAILS

Gene	rsID	Genotype
EPAS1	rs1867785	AG

REFERENCES

[1] P. E. di Prampero, S. Fusi, L. Sepulcri, J. B. Morin, A. Belli, G. Antonutto; Sprint running: a new energetic approach. J Exp Biol 15 July 2005; 208 (14): 2809–2816.

[2] Voisin S, Cieszczyk P, et al. EPAS1 gene variants are associated with sprint/power athletic performance in two cohorts of European athletes. BMC Genomics. 2014; 15(1): 382. Published online 2014 May 18. doi: 10.1186/1471-2164-15-382.

PREPARED FOR SPEED SPORTS

RESULTS

High intensity sports such as sprinting, marathon running, football, and netball, require high speed and endurance that needs to be fueled effectively with sufficient energy and metabolic activity. The ACTN3 gene (prominently known as the gene for speed) synthesizes the αactinin-3 protein, and the RR genotype of the ACTN3 gene's R577X variant is key for vigorous skeletal muscle contraction (which affects a person's speed). When it comes to track and field athletes, the PPARD T294C polymorphism is linked with endurance and speed sports. Studies suggest that as a response to speed sports, PPARD is activated, and it increases oxidative enzymes and produces type I fiber contractile proteins. This is advantageous to sports people engaged in speed dependent sports [1].

People with your genetic profile are likely to have high propensity to benefit from speed sports

SCIENTIFIC DETAILS

Gene	rsID	Genotype
NOS3	rs2070744	CT

REFERENCES

[1] B.Z. Sigal,E.Alon, N.Dan, M.Yoav. Genetic Variability Among Power Athletes: The Stronger vs. the Faster, Journal of Strength and Conditioning Research: June 2019 - Volume 33 - Issue 6 - p 1505-1511

PREDISPOSITION TO INTENSE SPORTS

RESULTS

Intense sports require high intensity and speed endurance training, each of which help to slow down fatigue and preserve energy and muscle oxidative capacity [1]. However, intense training induces oxidative stress and the inflammatory cytokine response. Based on scientific research, after an intense sport activity, genes (mainly the L17B, IL2RB, TXLNA and IL18R1 genes) became inflamed and regulated twice as much as other genes. A balanced pro-inflammatory and anti-inflammatory expression, and an immune response is vital in maintaining a hemostatic state in skeletal muscles, and in improving endurance training [2].

People with your genetic profile are likely to have a high predisposition to benefit from intensive sports

SCIENTIFIC DETAILS

Gene	rsID	Genotype
CCL2	rs2857656	CC

REFERENCES

[1] Bangsbo, J. (2015), Performance in sports – With specific emphasis on the effect of intensified training. Scand J Med Sci Sports, 25: 88-99.
[2] Kimsa, M. C., Strzalka-Mrozik, B., Kimsa, M. W., Gola, J., Kochanska-Dziurowicz, A., Zebrowska, A., & Mazurek, U. (2014). Differential expression of inflammation-related genes after intense exercise. Prague medical report, 115(1-2), 24–32.

PACE AND VARIABILITY OF GAIT

RESULTS

Gait refers to the pattern of our limb movements, involving joint and muscle actions. This could be walking on the ground, or cycling; which involves swing movements [1]. Gait is key when it comes to fitness and health and gait speed is vital for high endurance athletes. Variations in genes that control neurological and cardiovascular functions affect a person's gait speed.

People with your genetic profile are likely to walk at a higher pace

SCIENTIFIC DETAILS

Gene	rsID	Genotype
PRKG1	rs10823991	AT

REFERENCES

[1] Hughes, J., & Jacobs, N. (1979). Normal human locomotion. Prosthetics and Orthotics International, 3(1), 4–12.

WORLD-CLASS ATHLETIC RESISTANCE

RESULTS

Resistance training is a type of physical exercise used to increase muscle mass, skeletal muscle capability, and muscle strength. Having stronger muscles can help professionals to improve their performance at a world-class level. Studies on resistance training have shown that it builds up an athlete's strength and plays a key part in enabling them to perform at an above-average level. Although resistance training might not improve sports ability, evidence indicates that it indirectly improves sport performance by reducing the likelihood of a person incurring an injury [1].

People with your genetic profile are likely to have high physical resistance

SCIENTIFIC DETAILS

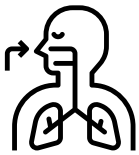
Gene	rsID	Genotype
CKM	rs8111989	CC

REFERENCES

[1] Buckner, S. L., Jessee, M. B., Dankel, S. J., Mattocks, K. T., Abe, T., & Loenneke, J. P. (2018). Resistance exercise and sports performance: The minority report. Medical hypotheses, 113, 1–5.

RESPIRATORY CAPACITY

RESULTS



A person's respiratory capacity (also known as their pulmonary capacity) is the collective term used when it comes to lung function tests, which are measured through the spirometry test. Lung capacities differ according to several things, including age, gender, weight, height, and ethnicity [1]. A person's tidal volume (the amount of air that moves in or out of their lungs with each time they breathe in and out) increases considerably during physical exercise. In physiological conditions, their prostaglandins (lipids that help deal with injury/illness) perform numerous important tasks for a person's body, including widening and narrowing of the blood vessels, and expansion and constriction of the bronchial air passages. Variations in the GSTCD gene can affect prostaglandins and therefore their respiratory capacity [2].

People with your genetic profile are likely to have a regular respiratory capacity

SCIENTIFIC DETAILS

Gene	rsID	Genotype
GSTCD	rs10516526	AA

REFERENCES

[1] Lutfi M. F. (2017). The physiological basis and clinical significance of lung volume measurements. Multidisciplinary respiratory medicine, 12, 3.

[2] GSTCD and INTS12 Regulation and Expression in the Human Lung Maèn Obeidat ,Suzanne Miller ,Kelly Probert,Charlotte K. Billington,Amanda P. Henry,Emily Hodge,Carl P. Nelson,Ceri E. Stewart,Caroline Swan,Louise V. Wain,María Soler Artigas,Erik Melén,Kevin Ushey,Ian P. Hall. Published: September 18, 2013https://doi.org/10.1371/journal.pone.0074630

AEROBIC METABOLISM

RESULTS

Measuring a person's maximum oxygen uptake (known as VO2max) is widely used to identify their cardiorespiratory fitness. VO2max is defined as the full volume of oxygen per unit of time that a person uses when putting in their at maximum effort [1]. A person's baseline VO2max level may change depending on their age, gender, medical history, current health, and their level of physical activity. However, anyone can increase their fitness level and VO2max through resistance training. In a study of 303 Spanish and British men, Single-Nucleotide Polymorphism (SNP) rs8192678 in the PPARGC1A gene, was a key regulator of their energy metabolisms and were associated with their baseline VO2max (L / min). This association has not yet been studied in women [2].

People with your genetic profile are likely to have a normal capacity for oxygen consumption

SCIENTIFIC DETAILS

Gene	rsID	Genotype
PPARGC1A	rs8192678	CC

REFERENCES

[1] Swanwick, E. (2018). Energy Systems: A New Look at Aerobic Metabolism in Stressful Exercise. MOJ sports medicine, 2 (1).
[2] The Role of Peroxisome Proliferator-Activated Receptors and Their Transcriptional Coactivators Gene Variations in Human Trainability: A Systematic Review Miroslav Petr 1, Petr Stastny 2, Adam Zajac 3, James J Tufano 4, Agnieszka Maciejewska-Skrendo 5

STRENGTH WORKOUT

RESULTS

A strength workout is one in which a person applies resistant force against their muscles and then works their muscles against that force. When done regularly, this workout increases the strength, size, anaerobic endurance, and tone of the specific muscular region of the body. It increases levels of the positive HDL cholesterol and helps to maintain a positive general metabolism - which provides both long and short-term health benefits. An abundance of the HDL Apolipoprotein (ApoAI) is needed in order to biosynthesise a person's HDL cholesterol (HDL-C), but when a person has a defect in their MIM 604091 gene they may not have the ApoAI protein at all, causing them to have a low level of HDL-C. Low serum levels of HDL-C are a key risk factor for Coronary Artery Disease (CAD) [1,2].

People with your genetic profile are likely to receive more benefits from a strength workout

SCIENTIFIC DETAILS

Gene	rsID	Genotype
INSIG2	rs7566605	GG

REFERENCES

[1] Sundell, J. (2011). Resistance Training Is an Effective Tool against Metabolic and Frailty Syndromes. Advances in preventive medicine, 2011, s. 1–7.

[2] Weissglas-Volkov, D., & Pajukanta, P. (2010). Genetic causes of high and low serum HDL-cholesterol. Journal of lipid research, 51(8), 2032–2057.

MUSCLE STRENGTH

RESULTS

Muscular strength and endurance are measured by looking at the maximum amount of force and number of contractions that a muscle group can exert within a certain time frame without leading to any muscular injury [1]. 30-85% of muscle strength and 50-80% of lean muscle mass are heritable traits, meaning that specific genes are associated with potential muscle strength. Studies suggest that a variation of the Gremlin1 gene is associated with lean mass and that the less frequently occurring variation in the CNTF gene (an A/A genotype) influences someone's muscle strength. Although the significance is not clear, some studies have suggested that variations of the ACTN3 gene affect skeletal muscle strength [2].

People with your genetic profile are predisposed to have high muscle strength

SCIENTIFIC DETAILS

Gene	rsID	Genotype
ACTN3	rs1815739	CC

REFERENCES

[1] Kell, R. T., Bell, G., & Quinney, A. (2001). Musculoskeletal fitness, health outcomes and quality of life. Sports medicine (Auckland, N.Z.), 31(12), 863–873.
[2] Eynon N, Hanson ED, Lucia A, Houweling PJ, Garton F, et al. (2013) Genes for elite power and sprint performance: ACTN3 leads the way. Sports Med 43: 803–817. 10.1007/s40279-013-0059-4

POST EXERCISE RECOVERY

RESULTS

Post-exercise recovery time is the number of hours between when a person finishes exercising and their cardiovascular system returns to its "resting state" and it accounts for the physiological processes taking place in the body following exercise activity [1]. Muscle recovery is the vital mechanism that takes place during a post exercise recovery period, and certain genetic variations affect that process.

People with your genetic profile are likely to need longer recovery times post exercise

SCIENTIFIC DETAILS

Gene	rsID	Genotype
CRP	rs1205	CC

REFERENCES

[1] Romero, S. A., Minson, C. T., & Halliwill, J. R. (2017). The cardiovascular system after exercise. Journal of applied physiology (Bethesda, Md. : 1985), 122(4), 925–932.

HAND GRIP STRENGTH

RESULTS

Hand grip strength measures the maximum amount of static force that you can squeeze through a dynamometer [1]. It is a strong indicator of a person's total muscle strength, illnesses/diseases, any cognitive impairments, and of local fractures [2]. Myosins (motor proteins) and the skeletal muscle protein α-actin are essential for muscle contraction. α-actin is encoded by the ACTA1 gene, mutations of which can cause changes in myopathies.

People with your genetic profile tend to have an increased grip ability following physical activity

SCIENTIFIC DETAILS

Gene	rsID	Genotype
ACTA1	rs605428	GG

REFERENCES

[1] Kim, C. R., Jeon, Y. J., Kim, M. C., Jeong, T., & Koo, W. R. (2018). Reference values for hand grip strength in the South Korean population. PloS one, 13(4), e0195485.

[2] Bohannon R. W. (2019). Grip Strength: An Indispensable Biomarker For Older Adults. Clinical interventions in aging, 14, 1681–1691.

QUADRICEPS STRENGTH

RESULTS

Your quadriceps (often known as quads) are the big muscle group in your thighs. A deficit in quadricep strength is often the result of an anterior cruciate ligament injury and limits many sports people from performing at the levels at which they might have done in the past [1]. The FokI polymorphism of the VDR gene alters how it is decoded, and the C allele of FokI reduces a person's quadriceps strength. Studies show that BsmI (which is another VDR polymorphism) impacts the functions of skeletal muscles and the bb genotype of this gene variation might increase quadricep strength in healthy women [2].

People with your genetic profile are likely to increase quadriceps strength easier during workouts

SCIENTIFIC DETAILS

Gene	rsID	Genotype
VDR	rs2228570	AA

REFERENCES

[1] Palmieri-Smith, R. M., & Lepley, L. K. (2015). Quadriceps Strength Asymmetry After Anterior Cruciate Ligament Reconstruction Alters Knee Joint Biomechanics and Functional Performance at Time of Return to Activity. The American journal of sports medicine, 43(7), 1662–1669.

[2] Hopkinson, N. S., Li, K. W., Kehoe, A., Humphries, S. E., Roughton, M., Moxham, J., Montgomery, H., & Polkey, M. I. (2008). Vitamin D receptor genotypes influence quadriceps strength in chronic obstructive pulmonary disease. The American journal of clinical nutrition, 87(2), 385–390.

EQUILIBRIUM

RESULTS

During any athletic activity, cardio exercises, resistance/strength training it is vital to maintain the body's equilibrium and balance in order to try and avoid injury, muscle strain and suchlike. Maintaining a dynamic equilibrium during physical activities can aid sports people to perform better and for longer periods of time [1]. Variations in neurology genes can affect a person's mobility and balance. A variation in the Beta-III spectrin gene can cause Spinocerebellar ataxia (Lincoln ataxia) which impacts a person's cerebellum; which is responsible for regulating balance and equilibrium in the body [2].

People with your genetic profile are likely to have altered equilibrium

SCIENTIFIC DETAILS

Gene	rsID	Genotype
SLC7A2	rs2248010	AG

REFERENCES

[1] Hrysomallis C. (2011). Balance ability and athletic performance. Sports medicine (Auckland, N.Z.), 41(3), 221–232.
[2] Public Library of Science. (2012, December 6). New genetic disorder of balance and cognition discovered. ScienceDaily. Retrieved May 2, 2021

JOINT MOBILITY

RESULTS

Joint mobility is defined as the degree of flexibility, articulation, and movement between two joints without any muscular restrictions. Flexibility and articulation are required in any form of sport activities and are determinants of overall physical fitness and performance. Muscle strength and joint mobility are strictly correlated [1]. Joint hypermobility syndrome due to mutation in the COL3A1, COL5A2 and COL6A3 causes loose and overly flexible joints which gives greater agility. Although a syndrome, this condition is known to benefit activities that require high flexibility such as acrobatics and gymnastics [2]. Other studies show that variation of the COL12A1 with T/T or C/T genotype reduces joint flexibility and movement and therefore protects sports people against severe ligament rupture [3].

People with your genetic profile have a lower range of joint motion and less joint laxity and flexibility

SCIENTIFIC DETAILS

Gene	rsID	Genotype
COL12A1	rs970547	TT

REFERENCES

[1] Micheo, W., Baerga, L., & Miranda, G. (2012). Basic principles regarding strength, flexibility, and stability exercises. PM & R : the journal of injury, function, and rehabilitation, 4(11), 805–811.
[2] Grahame R. (1999). Joint hypermobility and genetic collagen disorders: are they related?. Archives of disease in childhood, 80(2), 188–191.
[3] O'Connell K, Knight H, Ficek K, Leonska-Duniec A, Maciejewska-Karlowska A, Sawczuk M, Stepien-Slodkowska M, O'Cuinneagain D, van der Merwe W, Posthumus M, Cieszczyk P, Collins M. Interactions between collagen gene variants and risk of anterior cruciate ligament rupture. Eur J Sport Sci. 2015;15(4):341-50.

REACTION TIME (REFLEXES)

RESULTS

A person's reaction time is the period of time that they require to respond to stimulus. The DRD4- 521 CT polymorphism (dopamine D4 receptor gene) can negatively affect a person's cognitive function, attention span, and reaction time, whilst the COMT Val158Met polymorphism involved in dopamine neurotransmission can also reduce a person's attention control. These impacts can lead to a person having a slower reflex [1]. The metalloproteinase 3 promoter is bound by a protein encoded by the TCF20 gene. The TCF20 regulates general cognitive functions and reaction times [2].

People with your genetic profile are likely to have a low reaction time

SCIENTIFIC DETAILS

Gene	rsID	Genotype
TCF20	rs5758659	CT

REFERENCES

[1] Szekely, A., Balota, D.A., Duchek, J.M., Nemoda, Z., Vereczkei, A. and Sasvari-Szekely, M. (2011), Genetic factors of reaction time performance: DRD4 7-repeat allele associated with slower responses. Genes, Brain and Behavior, 10: 129-136.

[2] Davies G, et al. Genetic contributions to variation in general cognitive function: a meta-analysis of genome-wide association studies in the CHARGE consortium (N=53949). Mol Psychiatry. 2015 Feb;20(2):183-92. doi: 10.1038/mp.2014.188. Epub 2015 Feb 3. PMID: 25644384; PMCID: PMC4356746.

AGILITY

RESULTS

Agility is the body's ability to move with the changes in speed and position in response to stimuli. To have agility and perform well, athletes and sports people need to develop strength, endurance, speed, plus a good reflex and sense of balance [1].

People with your genetic profile are likely to have good agility

SCIENTIFIC DETAILS

Gene	rsID	Genotype
MYOZ3	rs116090320	AA

REFERENCES

[1] Sheppard, J. M., & Young, W. B. (2006). Agility literature review: classifications, training and testing. Journal of sports sciences, 24(9), 919-932.

PRECISION

RESULTS

The term precision is related to accuracy and validity, which in sport is needed in order to hit a target. High precision requires accuracy, coordination, agility, and often speed, and for this, eyesight and hearing are generally required. Having a good awareness of one's body, senses, functions, and suchlike is fundamental for the young; in order to develop controlled motor skills. Myopia is a condition which affects a person's eyesight and causes objects in the distance to appear blurry. Hepatocyte Growth Factor (HGF), Matrix Metalloproteinases (MMPs), and variations of the PAX6 and PPFIA2 genes seem to be associated with the development of Myopia, which can negatively affect athletes that require precision and accuracy in their sport [1,2]. Toll-Like Receptors (TLRs) play a significant role in the immune system and can be found on different types of membranes in the body, such as the retinal pigment: epithelium. However, genetic variations lead to TLRs not protecting the external retina or the choroid (the vascular layer of the eye) as as they should and this can negatively impact a person's levels of accuracy in sports such as archery [3].

People with your genetic profile are likely to have good eyesight precision

SCIENTIFIC DETAILS

Gene	rsID	Genotype
TLR3	rs3775291	CC

REFERENCES

[1] Valle, M. S., Lombardo, L., Cioni, M., & Casabona, A. (2018). Relationship between accuracy and complexity when learning underarm precision throwing. European journal of sport science, 18(9), 1217-1225.

[2] Singh, M., & Tyagi, S. C. (2018). Genes and genetics in eye diseases: a genomic medicine approach for investigating hereditary and inflammatory ocular disorders. International journal of ophthalmology, 11(1), 117-134.

[3] Ma L, Tang F, et al. Association of toll-like receptor 3 polymorphism rs3775291 with age-related macular degeneration: a systematic review and meta-analysis. Sci Rep. 2016; 6:19718.

BODY MASS INDEX

RESULTS

Body Mass Index (BMI) is an indicator of body fat composition across the body which indicates a person's fitness. It is calculated by measuring the weight of an individual in kilograms and then dividing that number by the square of their height in meters. People with BMI values below 18.5 are considered to be underweight, those who have a BMI between 18.5 to 24.9 are considered to be in the healthy weight range, and those who have a BMI above 29.9 are considered to be in the obese range [1]. According to medical research, five main genes (MC4R, PCSK1, POMC, ADRB2 and BDNF) are associated with obesity and can increase a person's risk of developing obesity [2, 3].

People with your genetic profile are predisposed to have a tendency to gain weight easily

SCIENTIFIC DETAILS

Gene	rsID	Genotype
ADRB2	rs1042713	GA

REFERENCES

[1] Nuttall F. Q. (2015). Body Mass Index: Obesity, BMI, and Health: A Critical Review. Nutrition today, 50(3), 117–128.

[2] Choquet, H., & Meyre, D. (2011). Genetics of Obesity: What have we Learned?. Current genomics, 12(3), 169–179.

[3] Mitra SR, Tan PY, Amini F. Association of ADRB2 rs1042713 with Obesity and Obesity-Related Phenotypes and Its Interaction with Dietary Fat in Modulating Glycaemic Indices in Malaysian Adults. J Nutr Metab. 2019 Mar 17;2019:8718795. doi: 10.1155/2019/8718795. PMID: 31007954; PMCID: PMC6441509.

BODY MASS INDEX (NON-SMOKING VS SMOKERS INTERACTION)

RESULTS

Body Mass Index (BMI) is a calculation that can help people find out what their healthy weight is/would be. It provides indications of any medical problems that a person classified as having an unhealthy BMI might face. Research indicates that people who smoke often tend to have a lower body weight than non-smokers, people who stop smoking tend to gain weight [1]. This is because smoking can cause insulin resistance which can then lead to fat accumulation.

People with your genetic profile are likely to have an increase in body mass index in response to cigarette smoking

SCIENTIFIC DETAILS

Gene	rsID	Genotype
CFH	rs460184	TT

REFERENCES

[1] Abramowitz, M. K. et al. (2018). Muscle mass, BMI, and mortality among adults in the United States: A population-based cohort study. PLOS ONE, 13 (4), s. e0194697.

OBESITY IN THE ABSENCE OF METABOLIC DISEASES

RESULTS

Metabolic syndrome is a series of conditions that increase the risk of heart disease, stroke and type 2 diabetes. Metabolic syndrome is also closely linked to being overweight or obese [1]. However, obesity could be due to genetic factors in absence of metabolic disease and is often inherited. In obesity, the participation in the regulation of energy expenditure by the ADRB2, ADRB3, ADRB1 genes makes themselves excellent candidates for studying this condition. They belong to the B-adrenoceptor gene families [2].

People with your genetic profile have a greater tendency to become obese

SCIENTIFIC DETAILS

Gene	rsID	Genotype
ADRB1	rs1801253	CC

REFERENCES

[1] Hunt, K. J., Heiss, G., Sholinsky, P. D., & Province, M. A. (2000). Familial history of metabolic disorders and the multiple metabolic syndrome: the NHLBI family heart study. Genetic epidemiology, 19(4), 395-409.

[2] Plotnikov D, Williams C, Guggenheim JA. Association between birth weight and refractive error in adulthood: a Mendelian randomisation study. Br J Ophthalmol. 2020 Feb;104(2):214-219. doi: 10.1136/bjophthalmol-2018-313640. Epub 2019 May 16. PMID: 31097437.

WAIST CIRCUMFERENCE ADJUSTED FOR BODY MASS INDEX

RESULTS

Waist circumference measurement (often used to assess the level of fat in the area), along with any adjustment for Body Mass Index (BMI), can be useful to help measure a person's obesity related health risks [1]. Experimental studies show that the MC4R gene is a key regulator of a person's energy balance; affecting their food intake and energy expenditure through changing hormonal neuronal pathways. If the MC4R gene changes its signal, it can affect a person's glucose utilization and insulin sensitivity, so impacting their waist circumference [2].

People with your genetic profile tend to have a smaller waist circumference than average

SCIENTIFIC DETAILS

Gene	rsID	Genotype
MC4R	rs12970134	GG

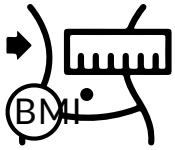
REFERENCES

[1] Berentzen, T. L. et al. (2012). Waist Circumference Adjusted for Body Mass Index and Intra-Abdominal Fat Mass. PLOS ONE, 7 (2), s. e32213. doi:10.1371/journal.pone.0032213

[2] Kang J, Guan RC, Zhao Y, Chen Y. Obesity-related loci in TMEM18, CDKAL1 and FAIM2 are associated with obesity and type 2 diabetes in Chinese Han patients. BMC Med Genet. 2020 Mar 30;21(1):65. doi: 10.1186/s12881-020-00999-y. PMID: 32228543; PMCID: PMC7106578.

WAIST-HIP RATIO

RESULTS



The Waist-Hip Ratio (WHR) compares a person's Body Mass Index (BMI) and waist circumference to help assess a their physical fitness and risk of developing Cardiovascular Disease (CVD), type 2 diabetes, hypertension (also known as high blood pressure) and elevated cholesterol levels [1]. The impact of genetics upon a person's fat distribution is complex with only about 48 Single-Nucleotide Polymorphisms (SNPs) (DNA sequence variations) identified in the study. However, according to a recent Genome-Wide Association Study (GWAS), the TBX15, HOXC13, RSPO3 and CPEB4 genes were strongly associated with fat distribution and obesity risk factors such as insulin resistance, metabolic change and changes of the adipokine levels. Adipokine are a group of adipose tissue-derived bioactive molecules that are important in regulating diverse processes such as appetite, metabolism, fat distribution, insulin activity, and inflammation [2].

People with your genetic profile are likely to have a greater distribution of body fat

SCIENTIFIC DETAILS

Gene	rsID	Genotype
RSPO3	rs9491696	CG

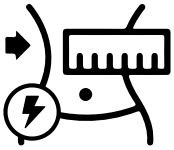
REFERENCES

[1] Emdin, C. A. et al. (2017). Genetic Association of Waist-to-Hip Ratio With Cardiometabolic Traits, Type 2 Diabetes, and Coronary Heart Disease. JAMA, 317 (6), s. 626. doi:10.1001/jama.2016.21042

[2] Schleinitz, D., Böttcher, Y., Blüher, M., & Kovacs, P. (2014). The genetics of fat distribution. Diabetologia, 57(7), 1276–1286.

WAIST-HIP RATIO (ENERGY INTERACTION WITH THE DIET)

RESULTS



Diet plays an essential role in energy consumption which then influences a person's Waist-Hip Ratio (WHR). Foods with a low Glycemic Index (GI) (do not produce high insulin release peaks) and low energy density are associated with lower levels abdominal fat and weight gain. Studies suggest that the TFAP2B gene is associated with a person's Body Mass Index (BMI) and waist circumference, which affects their WHR. TFAP2B is normally expressed in fat tissue and a variation of the gene can lead to an overexpression in the fat cells, increasing glucose uptake and insulin resistance [1,2]. ADAMTS9 T2D risk alleles are also associated with insulin resistance and differences in body fat distribution [3].

People with your genetic profile are likely to have a typical distribution of body fat in response to diet

SCIENTIFIC DETAILS

Gene	rsID	Genotype
ADAMTS9	rs6795735	CC

REFERENCES

[1] Romaguera, D., Ängquist, L., Du, H., Jakobsen, M. U., Forouhi, N. G., Halkjær, J., Feskens, E. J., van der A, D. L., Masala, G., Steffen, A., Palli, D., Wareham, N. J., Overvad, K., Tjønneland, A., Boeing, H., Riboli, E., & Sørensen, T. I. (2011). Food composition of the diet in relation to changes in waist circumference adjusted for body mass index. PloS one, 6(8), e23384.

[2] Stocks, T. et al. (2012). TFAP2B Influences the Effect of Dietary Fat on Weight Loss under Energy Restriction. PLOS ONE, 7 (8), s. e43212. doi:10.1371/journal.pone.0043212

[3] Heid IM, Jackson AU, Randall JC, et all. Meta-analysis identifies 13 new loci associated with waist-hip ratio and reveals sexual dimorphism in the genetic basis of fat distribution. Nat Genet. 2010 Nov;42(11):949-60. doi: 10.1038/ng.685. Epub 2010 Oct 10. Erratum in: Nat Genet. 2011 Nov;43(11):1164. PMID: 20935629; PMCID: PMC3000924.

SUBCUTANEOUS ADIPOSE TISSUE

RESULTS

The tissue beneath the skin is called the Subcutaneous Adipose Tissue (SAT) or subcutaneous fat. Women mainly tend to store this fat in their gynoid regions, e.g. their hips, thighs, and gluteal region (buttocks). SAT is different from visceral fat tissue (fat stored within the abdominal cavity) as it is present in the lining of a person's internal organs [1]. A high accumulation of SAT leads to health risks such as metabolic syndrome, hypertension, and insulin resistance, whilst fat in the gynoid and gluteal regions lowers the risk of developing Cardiovascular Disease (CVD). Studies suggest that rs17782313 of MC4R and rs4846567 of LYPLAL1 are strongly associated with obesity and subcutaneous fat mass [2].

People with your genetic profile are likely to have regular accumulation of subcutaneous adipose tissue

SCIENTIFIC DETAILS

Gene	rsID	Genotype
PLIN1	rs2304795	AA

REFERENCES

[1] Mittal B. (2019). Subcutaneous adipose tissue & visceral adipose tissue. The Indian journal of medical research, 149(5), 571–573.
[2] Daily, J.W., Yang, H.J., Liu, M. et al. Subcutaneous fat mass is associated with genetic risk scores related to proinflammatory cytokine signaling and interact with physical activity in middle-aged obese adults. Nutr Metab (Lond) 16, 75 (2019).

RATIO OF VISCERAL VS SUBCUTANEOUS ADIPOSE TISSUE

RESULTS

The ratios of visceral fat tissue (fat stored within the abdominal cavity) compared to Subcutaneous Adipose Tissue (SAT) (subcutaneous fat) is associated with cardiometabolic risk factors such as insulin resistance, blood pressure, and dyslipidemia. However, visceral fat storage is riskier to hold than SAT. According to a Genome-Wide Association Study (GWAS) study, genetic variants in the TFAP2B gene and near the MSRA gene significantly influence visceral fat gain in visceral fat tissues. The Pro12Ala variant of the PPARG gene increases a person's insulin sensitivity and reduces their risk of type 2 diabetes by reducing fat storage in their visceral and subcutaneous tissues [1].

People with your genetic profile are likely to have an unbalance between visceral adipose tissue/subcutaneous adipose tissue.

SCIENTIFIC DETAILS

Gene	rsID	Genotype
ROBO1	rs17377726	GG
LGALS12	rs933186	CT
AL139390.1 - RREB1	rs2842895	CC
AC116362.1	rs10060123	CC

REFERENCES

[1] Kaess, B. M. et al. (2012). The ratio of visceral to subcutaneous fat, a metric of body fat distribution, is a unique correlate of cardiometabolic risk. Diabetologia, 55 (10), s. 2622–2630. doi:10.1007/s00125-012-2639-5

TAKING DIETARY MACRONUTRIENTS

RESULTS

Macronutrients form most of a person's diet and are essential for energy supply and sufficient nutrition. However, an overconsumption of macronutrients such as carbohydrates will lead to a surplus, causing weight gain and potentially obesity. A high intake of fibre and nuts causes a person less weight gain than a high intake of carbohydrates with a high Glycemic Index (GI). A person's macronutrient intake and their metabolic mechanism are strongly correlated with weight and other metabolic disorders [1].

People with your genetic profile tend to lose more weight by taking personalised dietary macronutrients

SCIENTIFIC DETAILS

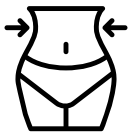
Gene	rsID	Genotype
MTNR1B	rs10830963	CG

REFERENCES

[1] Fogelholm, M., Anderssen, S., Gunnarsdottir, I. & Lahti-Koski, M. (2012). Dietary macronutrients and food consumption as determinants of long-term weight change in adult populations: a systematic literature review. Food & nutrition research, 56 (1), s. 19103. doi:10.3402/fnr.v56i0.19103

LOSS OF BODY FAT RESPONSE TO PHYSICAL ACTIVITY

RESULTS



Although physical endurance training increases a person's ability to process food (including fatty acids), carbohydrates are still the main energy source when exercising skeletal muscles. It has been suggested that the major effects of exercise on fat metabolism may occur after exercise, although this has never clearly been proven. Therefore, how exercise leads to a reduction in fat mass is still not completely clear. Since fat oxidation is increased during exercise, and since physical endurance exercise training increases the capacity to oxidize fat, by extension, it is assumed that 1) more fat is oxidized on a day that exercise is performed; and 2) people will oxidize more fat over a 24 hour period if they have exercised [1,2].

People with your genetic profile are likely to not have any enhanced benefits from exercise to lose body fat

SCIENTIFIC DETAILS

Gene	rsID	Genotype
LPL	rs328	CC

REFERENCES

[1] Booth, F. W., Chakravarthy, M. V. & Spangenburg, E. E. (2002). Exercise and gene expression: physiological regulation of the human genome through physical activity. The journal of physiology, 543 (2), s. 399–411. doi:10.1113/jphysiol.2002.019265
[2] Hainer, V., Zamrazilová, H., Spálová, J., Hainerová, I., Kunesová, M., Aldhoon, B., & Bendlová, B. (2008). Role of hereditary factors in weight loss and its maintenance. Physiological research, 57 Suppl 1, S1–S15.

LEAN MASS

RESULTS

A person's weight is a combination of the body fat required for energy and the lean muscles, bones, organs, and suchlike. A lower lean mass is an important determinant of body health and the opposite can lead to disability and chronic diseases [1]. Studies show that the rs2276541 of the ACVR2B gene is strongly associated with lean body mass, particularly that of the muscles [2].

People with your genetic profile are likely to have a regular lean mass

SCIENTIFIC DETAILS

Gene	rsID	Genotype
TRHR	rs16892496	AA

REFERENCES

[1] Pomeroy, E., Macintosh, A., Wells, J. C. K., Cole, T. J. & Stock, J. T. (2018). Relationship between body mass, lean mass, fat mass, and limb bone cross-sectional geometry: Implications for estimating body mass and physique from the skeleton. American journal of physical anthropology, 166 (1), s. 56-69. doi:10.1002/ajpa.23398
[2] Xiao-Gang Liu, Li-Jun Tan, Shu-Feng Lei, Yong-Jun Liu, Hui Shen, Liang Wang, Han Yan, Yan-Fang Guo, Dong-Hai Xiong, Xiang-Ding Chen, Feng Pan, Tie-Lin Yang, Yin-Ping Zhang, Yan Guo, Nelson L. Tang, Xue-Zhen Zhu, Hong-Yi Deng, Shawn Levy, Robert R. Recker, Christopher J. Papasian, Hong-Wen Deng, Genome-wide Association and Replication Studies Identified TRHR as an Important Gene for Lean Body Mass, The American Journal of Human Genetics, Volume 84, Issue 3, 2009, Pages 418-423, ISSN 0002-9297

GROWTH POTENTIAL OF LEAN MASS

RESULTS

Strength training can increase a person's lean body mass [1]. Studies suggest that the rs1056513 variant in the PATJ gene, and the rs12439003 variant of the CAPN3 gene could help a person to increase their lean mass, to a degree [2,3].

People with your genetic profile are likely to have a lower growth potential of lean mass

SCIENTIFIC DETAILS

Gene	rsID	Genotype
PATJ	rs1056513	GA

REFERENCES

[1] Thomas, M. H., & Burns, S. P. (2016). Increasing Lean Mass and Strength: A Comparison of High Frequency Strength Training to Lower Frequency Strength Training. International journal of exercise science, 9(2), 159–167
[2] Klimentidis, Y. C., Bea, J. W., Thompson, P., Klimecki, W. T., Hu, C., Wu, G., Nicholas, J. S., Ryckman, K. K., & Chen, Z. (2016). Genetic Variant in ACVR2B Is Associated with Lean Mass. Medicine and science in sports and exercise, 48(7), 1270–1275.

[3] Novel Genetic Loci Identified for the Pathophysiology of Childhood Obesity in the Hispanic Population Anthony G. Comuzzie,Shelley A. Cole,Sandra L. Laston,V. Saroja Voruganti,Karin Haack,Richard A. Gibbs,Nancy F. Butte Published: December 14, 2012.

PERCENTAGE OF FIBERS THAT MAKE UP THE MUSCLE: WHITE

RESULTS

White muscle fibers (also known as “fast-twitch” fibers), are composed of certain enzymes and proteins. Although a high resting energetic state is present within white muscle fibers, they fatigue quickly [1,2].

People with your genetic profile are likely to have a low white muscle fiber percentage

SCIENTIFIC DETAILS

Gene	rsID	Genotype
ACVR2B	rs2268757	CT

REFERENCES

[1] Herbison, G. J., Jaweed, M. M., & Ditunno, J. F. (1982). Muscle fiber types. Archives of physical medicine and rehabilitation, 63(5), 227–230.
[2] Tajsharghi H. (2008). Thick and thin filament gene mutations in striated muscle diseases. International journal of molecular sciences, 9(7), 1259–1275.

PERCENTAGE OF FIBERS THAT MAKE UP THE MUSCLE: RED

RESULTS

Red muscle fibers are “slow-twitch” muscle fibers and have a completely different composition and energy demand compared to white muscle fibers. Slow-paced, low-intensity exercise requires oxidative red muscle fibers. The red muscle has slow isoforms and its oxidative capacity is threefold higher than that of white muscle fibers [1]. An overexpression of the MSTN gene by the rs1805086 variant with the CC and TC genotype has a negative effect on muscle mass but leads to a higher red muscle fiber percentage [2,3].

People with your genetic profile are likely to have an average red muscle fiber percentage

SCIENTIFIC DETAILS

Gene	rsID	Genotype
MSTN	rs1805086	TT

REFERENCES

[1] Glancy, B., & Balaban, R. S. (2011). Protein composition and function of red and white skeletal muscle mitochondria. American journal of physiology. Cell physiology, 300(6), C1280–C1290.
[2] Fuku, N. et al. (2016). Muscle-Related Polymorphisms (MSTN rs1805086 and ACTN3 rs1815739) Are Not Associated with Exceptional Longevity in Japanese Centenarians. PLOS ONE, 11 (11), s. e0166605. doi:10.1371/journal.pone.0166605
[3] Chen X, Guo Y, et al. (2018). Arginine promotes skeletal muscle fiber type transformation from fast-twitch to slow-twitch via Sirt1/AMPK pathway. The Journal of Nutritional Biochemistry, 61, 155-162.

BODY ENERGY EXPENDITURE (24 HOURS)

RESULTS

A person's energy expenditure is determined by looking at their body size, its composition, their food consumption and their physical activity. The person's resting energy expenditure depends upon their body size, body composition (to upkeep more weight requires a higher energy expenditure), and food intake. Any form of physical activity causes energy expenditure [1].

People with your genetic profile are likely to have an enhanced metabolic rate

SCIENTIFIC DETAILS

Gene	rsID	Genotype
UCP2	rs659366	CT

REFERENCES

[1] Westerterp, K. R., & Plasqui, G. (2004). Physical activity and human energy expenditure. Current opinion in clinical nutrition and metabolic care, 7(6), 607-613.

METABOLISM AT REST

RESULTS

A person's Resting Metabolic Rate (RMR) is the total number of calories burned by their body when they are resting and which enables them to maintain a "physiological homeostasis and equilibrium". RMR is associated with blood circulation, breathing, and organ and neurological function [1,2]. The RMR is proportional to lean body mass and it decreases with fat percentage gain. Energy deficiency during a high RMR can cause growth impairment in people with SS genotype Sickle cell disease [3].

People with your genetic profile are likely to have regular catalytic rate at rest

SCIENTIFIC DETAILS

Gene	rsID	Genotype
CYP1A1	rs1048943	TT

REFERENCES

[1] Blundell, J. E., Caudwell, P., Gibbons, C., Hopkins, M., Naslund, E., King, N., & Finlayson, G. (2012). Role of resting metabolic rate and energy expenditure in hunger and appetite control: a new formulation. Disease models & mechanisms, 5(5), 608-613.
[2] McMurray, R. G., Soares, J., Caspersen, C. J., & McCurdy, T. (2014). Examining variations of resting metabolic rate of adults: a public health perspective. Medicine and science in sports and exercise, 46(7), 1352-1358.
[3] Singhal, A., Parker, S., Linsell, L. & Serjeant, G. (2002). Energy intake and resting metabolic rate in preschool Jamaican children with homozygous sickle cell disease. The american journal of clinical nutrition, 75 (6), s. 1093-1097. doi:10.1093/ajcn/75.6.1093

ENERGY EXPENDITURE

RESULTS

Energy expenditure refers to the amount of energy a person requires to maintain the functions of their body during physical activity. Total daily energy expenditure is the sum of a person's Basal Metabolic Rate (BMR): the heat that they produce after a meal, and the energy that they use up in physical activity. To avoid obesity and weight loss, a person's daily energy expenditure must equate to their consumption of calories. [1,2,3]

People with your genetic profile are likely to have a higher consumption of energy

SCIENTIFIC DETAILS

Gene	rsID	Genotype
LEP	rs7799039	GG

REFERENCES

[1] Heaney J. (2013) Energy: Expenditure, Intake, Lack of. In: Gellman M.D., Turner J.R. (eds) Encyclopedia of Behavioral Medicine. Springer, New York, NY.
[2] Braud, S., Ciufolini, M., & Harosh, I. (2010). 'Energy expenditure genes' or 'energy absorption genes': a new target for the treatment of obesity and Type II diabetes. Future medicinal chemistry, 2(12), 1777–1783.
[3] Jiang, L., Penney, K. L., Giovannucci, E., Kraft, P. & Wilson, K. M. (2018). A genome-wide association study of energy intake and expenditure. PLOS ONE, 13 (8), s. e0201555. doi:10.1371/journal.pone.0201555

PHYSICAL ACTIVITY IN WEIGHT LOSS

RESULTS

Exercise plays a crucial role in a person's weight loss as it utilizes any excess calories that are stored as fat. During exercise, the body uses its fat stores to produce and then break down glucose to meet the body's demand for energy. Glucose breakdown is essential for weight loss. The GCK gene plays a vital role in breaking down glucose in the body, and variations in the gene could significantly affect the breakdown of glucose in the body and ultimately lead to weight gain [1,2].

People with your genetic profile are predisposed to being overweight

SCIENTIFIC DETAILS

Gene	rsID	Genotype
FTO	rs1121980	GA

REFERENCES

[1] Cox C. E. (2017). Role of Physical Activity for Weight Loss and Weight Maintenance. Diabetes spectrum : a publication of the American Diabetes Association, 30(3), 157–160.
[2] Matschinsky, F. M. & Wilson, D. F. (2019). The Central Role of Glucokinase in Glucose Homeostasis: A Perspective 50 Years After Demonstrating the Presence of the Enzyme in Islets of Langerhans. Frontiers in physiology, 10. doi:10.3389/fphys.2019.00148

BLOOD PRESSURE RESPONSE TO PHYSICAL ACTIVITY

RESULTS

Systolic Blood Pressure (BP) is the measurement of the pressure placed on a person's arterial walls with each heartbeat. This of course increases during physical activity where the heart rate is raised due to an increase in muscular demand for oxygen. However, when a person's systolic BP significantly increases during exercise, they can also experience a Hypertensive Response to Exercise (HRE). The 235T and 174M variants of the Angiotensinogen (AGT) gene can potentially lead to hypertension, and the EDN1 gene plays an important role in encoding Endothelin 1 (ET-1) (a 21-amino acid peptide which controls blood pressure) [1,2].

People with your genetic profile have an increased likelihood of elevated blood pressure

SCIENTIFIC DETAILS

Gene	rsID	Genotype
EDN1	rs5370	GT

REFERENCES

[1] Kim, D. & Ha, J.-W. (2016). Hypertensive response to exercise: mechanisms and clinical implication. Clinical hypertension, 22 (1). doi:10.1186/s40885-016-0052-y
[2] Effect of Endothelin 1 Genotype on Blood Pressure Is Dependent on Physical Activity or Fitness Levels Tuomo Rankinen, Timothy Church, Treva Rice, Nathan Markward, Arthur S. Leon, Dabeeru C. Rao, James S. Skinner, Steven N. Blair, and Claude Bouchard. Originally published15 Oct 2007https://doi.org/10.1161/HYPERTENSIONAHA.107.093609Hypertension. 2007;50:1120–1125

INTERACTION BETWEEN LDL CHOLESTEROL LEVELS AND PHYSICAL ACTIVITY

RESULTS

Exercise alone does not lower a person's "bad" cholesterol levels (formed of Low-Density Lipoproteins (LDLs)); also required is an improvement in their diet. Reducing LDLs through physical activity (endurance exercises are often the most beneficial [1]) and a managed diet can reduce a person's risk of developing Cardiovascular Disease (CVD). The LDL receptors present in the liver transport cholesterol out of the bloodstream, but mutations to the LDLR, APOB, PCSK9, LRP1B and LDLRAP1 genes in the LDL receptors can cause hypercholesterolemia, a dangerous condition associated with CVD [2,3,4].

People with your genetic profile are likely to have a stronger reduction of LDL levels in response to physical activity

SCIENTIFIC DETAILS

Gene	rsID	Genotype
LRP1B	rs7583934	TT

REFERENCES

[1] Albarrati, A. M., Alghamdi, M., Nazer, R. I., Alkorashy, M. M., Alshowier, N., & Gale, N. (2018). Effectiveness of Low to Moderate Physical Exercise Training on the Level of Low-Density Lipoproteins: A Systematic Review. BioMed research international, 2018, 5982980.
[2] Hobbs, H. H., Brown, M. S., & Goldstein, J. L. (1992). Molecular genetics of the LDL receptor gene in familial hypercholesterolemia. Human mutation, 1(6), 445–466.
[3] Paththinige, C., Sirisena, N. & Dissanayake, V. (2017). Genetic determinants of inherited susceptibility to hypercholesterolemia – a comprehensive literature review. Lipids in health and disease, 16 (1). doi:10.1186/s12944-017-0488-4.

[4] Chun-Xiang Liu, Yonghe Li, Lynn M. Obermoeller-McCormick, Alan L. Schwartz, Guojun Bu, The Putative Tumor Suppressor LRP1B, a Novel Member of the Low Density Lipoprotein (LDL) Receptor Family, Exhibits Both Overlapping and Distinct Properties with the LDL Receptor-related Protein*, Journal of Biological Chemistry, Volume 276, Issue 31, 2001, Pages 28889-28896, ISSN 0021-9258,

HDL (GOOD) CHOLESTEROL RESPONSE TO PHYSICAL ACTIVITY

RESULTS

Exercise can decrease levels of the cholesterol known as Low-Density Lipoproteins (LDL) and increase the cholesterol known as High-Density Lipoproteins (HDL) (the former being of detriment to the body, the latter being of benefit to the body). The function of HDL is to transport any surplus bad cholesterol from the blood to the liver where it is then broken down and excreted from the body [1]. Moderate to intense exercise is associated with higher HDL. People with certain metabolic syndromes have a low HDL level which can lead to obesity, high blood pressure and type 2 diabetes. In the Heritage Family Study, people with the C/T and T/T genotypes for the rs2076167 of the PPARD gene variants were more likely to have enhanced HDL levels when exercising than those without the variants. People with the latter might be able to increase their levels through exercise but may not experience enhanced effects.

People with your genetic profile are likely to have an enhanced benefit in their HDL levels through exercise

SCIENTIFIC DETAILS

Gene	rsID	Genotype
PPARD	rs2076167	CT

REFERENCES

[1] Ruiz-Ramie, J. J., Barber, J. L. & Sarzynski, M. A. (2019). Effects of exercise on HDL functionality. Current opinion in lipidology, 30 (1), s. 16–23. doi:10.1097/mol.0000000000000568

INSULIN SENSITIVITY RESPONSE

RESULTS

Insulin is a hormone produced in the pancreas that enables people to keep their glucose levels low. In healthy people and in those with type 2 diabetes, exercise increases their insulin-stimulated glucose uptake and regulates their lipid metabolism [1].

People with your genetic profile are likely to have an enhanced insulin sensitivity in response to exercise

SCIENTIFIC DETAILS

Gene	rsID	Genotype
LIPC	rs1800588	CC

REFERENCES

[1] Venkatasamy, V. V., Pericherla, S., Manthuruthil, S., Mishra, S., & Hanno, R. (2013). Effect of Physical activity on Insulin Resistance, Inflammation and Oxidative Stress in Diabetes Mellitus. Journal of clinical and diagnostic research : JCDR, 7(8), 1764–1766.

INCREASE OF GLUCOSE UPTAKE IN RESPONSE TO EXERCISE

RESULTS

The skeletal muscle contractions caused by exercise increase a person's glucose uptake. Exercise can increase a person's glucose uptake 50-fold; where the glucose is brought to the muscle, the glucose enters the muscle cells, and then the cells process it [1,2].

People with your genetic profile are likely to have a regular glucose uptake in muscle fiber in response to exercise

SCIENTIFIC DETAILS

Gene	rsID	Genotype
BDKRB2	rs1799722	CC

REFERENCES

[1] Richter, E. A., Derave, W. & Wojtaszewski, J. F. P. (2001). Glucose, exercise and insulin: emerging concepts. The journal of physiology, 535 (2), s. 313–322. doi:10.1111/j.1469-7793.2001.t01-2-00313.x,
[2] Sylow, L., Kleinert, M., Richter, E. et al. Exercise-stimulated glucose uptake — regulation and implications for glycaemic control. Nat Rev Endocrinol 13, 133–148 (2017).

INCREASED HEART RATE IN RESPONSE TO EXERCISE

RESULTS

It is a well-known fact that a person's heart rate increases significantly during exercise and remains higher than normal for a time afterward [1]. There is a strong association between an increased heart rate and variants of the YWHAQ gene; a member of the family of signalling proteins which take part in processes such as cellular suicide, cell division, and metabolism. Individuals with a certain YWHAQ gene variant can be at an increased vulnerability of developing an excessive heart rate during physical exercise [2].

People with your genetic profile are susceptible to an excessive increase in heart rate following physical activity

SCIENTIFIC DETAILS

Gene	rsID	Genotype
YWHAQ	rs12692388	CT

REFERENCES

[1] Jagoda, A., Myers, J. N., Kaminsky, L. A., & Whaley, M. H. (2014). Heart rate response at the onset of exercise in an apparently healthy cohort. European journal of applied physiology, 114(7), 1367–1375.
[2] Rankinen T, Sung YJ, Sarzynski MA, Rice TK, Rao DC, Bouchard C. Heritability of submaximal exercise heart rate response to exercise training is accounted for by nine SNPs. J Appl Physiol (1985). 2012;112(5):892-897.

HEART RATE RESPONSE TO POST-RECOVERY EXERCISE

RESULTS

During intense exercise, a person will have a high heart rate, but within about 2 minutes, it will quickly return to normal [1, 2]. Post-exercise recovery time is the number of hours between when a person finishes exercising and their cardiovascular system returns to its "resting state" and it accounts for the physiological processes taking place in the body following exercise activity [1, 2]. The protein hormone called Insulin-like Growth Factor 2 (IGF-2) regulates different metabolic processes and affects heart rate during the cardiovascular recovery process.

People with your genetic profile are likely to have a regular heart rate reduction during recovery

SCIENTIFIC DETAILS

Gene	rsID	Genotype
IGF-II	rs680	TT

REFERENCES

[1] Javorka, M., Zila, I., Balhárek, T. & Javorka, K. (2002). Heart rate recovery after exercise: relations to heart rate variability and complexity. Brazilian journal of medical and biological research, 35 (8), s. 991–1000. doi:10.1590/s0100-879x2002000800018.

[2] Romero, S. A., Minson, C. T. & Halliwill, J. R. (2017). The cardiovascular system after exercise. Journal of applied physiology, 122 (4), s. 925–932. doi:10.1152/japplphysiol.00802.2016.

ATHLETIC DIFFICULTIES DUE TO REDUCED HEART RATE

RESULTS

Athletic Heart Syndrome (AHS) is a condition in which a person's heart is enlarged, causing the resting heart rate to be lower than it would be, were it in a "normal" state. This condition can be had by athletes or people who do practice sport for more than one hour per week. Although the syndrome is not potentially harmful, it can cause issues such as dizziness and fainting [1]. Bradycardia (a slower than normal heart rate) can cause Atrial Fibrillation (AF) which can then increase a person's risk of heart failure or stroke.

People with your genetic profile are likely to have a lower heart rate

SCIENTIFIC DETAILS

Gene	rsID	Genotype
CHRM2	rs324640	GA

REFERENCES

[1] Moses, S., (2008) Athletic Heart Syndrome. Family Practice Notebook.here online Archived 26 May 2008 at the Wayback Machine.

COGNITIVE BENEFITS (HIGH MOTOR COORDINATION)

RESULTS

Physical activities that involve motor coordination can improve a person's motor skills and cognitive function [1]. Cognitive function is, however, largely influenced by genetics. One study suggests that the APOE gene and brain-derived neurotrophic factor (BDNF Val66Met) polymorphisms interact to affect a person's cognitive function and can reduce their episodic memory. These genetic variations could ultimately lead to cognitive function disorders such as dementia and Alzheimer's disease [2].

People with your genetic profile are likely to receive cognitive benefits for motor coordination from physical activity

SCIENTIFIC DETAILS

Gene	rsID	Genotype
BDNF	rs6265	CC

REFERENCES

[1] Zeng, N., Ayyub, M., Sun, H., Wen, X., Xiang, P., & Gao, Z. (2017). Effects of Physical Activity on Motor Skills and Cognitive Development in Early Childhood: A Systematic Review. BioMed research international, 2017, 2760716.
[2] Fan, J., Tao, W., Li, X., Li, H., Zhang, J., Wei, D., Chen, Y., & Zhang, Z. (2019). The Contribution of Genetic Factors to Cognitive Impairment and Dementia: Apolipoprotein E Gene, Gene Interactions, and Polygenic Risk. International journal of molecular sciences, 20(5), 1177.

PREDISPOSITION TO MODERATE TO VIGOROUS PHYSICAL ACTIVITY LEVELS

RESULTS

Physical activity is key in both obtaining and retaining physical and mental health. However, certain genetic variants can bring about risk in moderate to vigorous physical activities. The GNPDA2 gene encodes glucosamine-6-phosphate deaminase, which is involved in the biosynthesis of glucosamine and is expressed by a small part of the brain called the hypothalamus. People with variations in the GNPDA2 gene are less likely to follow intense workouts and instead prefer more moderate physical exercise [1]

People with your genetic profile are likely to have a low predisposition to benefit from vigorous physical activity levels

SCIENTIFIC DETAILS

Gene	rsID	Genotype
GNPDA2	rs10938397	AG

REFERENCES

[1] Zhang, X., & Speakman, J. R. (2019). Genetic Factors Associated With Human Physical Activity: Are Your Genes Too Tight To Prevent You Exercising?. Endocrinology, 160(4), 840–852.

MUSCLE RESPONSE TO RESISTANCE TRAINING

RESULTS

Resistance training can improve a person's skeletal muscle function through causing the regeneration of muscular tissue. During resistance training, muscle fibers and motor neurons work together as a "motor pool" to coordinate the contractions of the muscles. Variations in the NR3C1 gene (which is responsible for binding to glucocorticoid hormones) can decrease a person's muscle strength and reduce their lean mass which then affects their muscles'response to resistance training [1].

People with your genetic profile are likely to have low muscle response to resistance training

SCIENTIFIC DETAILS

Gene	rsID	Genotype
NR3C1	rs4634384	CT

REFERENCES

[1] Bandy, W. D., Lovelace-Chandler, V., & McKitrick-Bandy, B. (1990). Adaptation of skeletal muscle to resistance training. The Journal of orthopaedic and sports physical therapy, 12(6), 248-255.

CREATINE KINASE

RESULTS

Creatine Kinase (CK) is an enzyme present in several types of tissue, including the heart, the brain, and with the highest concentration found in skeletal and cardiac muscles. The enzyme levels are elevated when physical activities cause muscle damage [1].

People with your genetic profile are likely to have a costant creatine kinase level after racing

SCIENTIFIC DETAILS

Gene	rsID	Genotype
SOD2	rs4880	GG

REFERENCES

[1] Bais, R., & Edwards, J. B. (1982). Creatine kinase. Critical reviews in clinical laboratory sciences, 16(4), 291–335.

SPORT INJURY RISK

RESULTS

Sports injuries are a common occurrence. Direct injury and prolonged stress and inflammation cause ligament, soft tissue, tendon, bone, and nerve injuries in the majority of athletes. Their age, gender, the nature of the activity, and indeed several genes, influence if a person experiences a sports injury at all, and how severe it is [1]. Genes variants related to general inflammation lead to a person being at greater risk of breaking ligaments.

People with your genetic profile are likely to have a lower tendency to incur sport injuries

SCIENTIFIC DETAILS

Gene	rsID	Genotype
COL1A1	rs1800012	CC

REFERENCES

[1] Pan, F., Tian, J., Winzenberg, T. et al. Association between GDF5 rs143383 polymorphism and knee osteoarthritis: an updated meta-analysis based on 23,995 subjects. BMC Musculoskelet Disord 15, 404 (2014).

TENDINOPATHY

RESULTS

Tendinopathy is where the collagen of a tendon breaks down. It occurs commonly in tendons across the body and is a major issue faced by lots of athletes and sports people. Common symptoms include pain after strenuous activities, tendon tenderness, and reduced strength and activity in the inflamed area. Increased activities and certain genetic factors can increase the pressure on a tendon's enthesis (where the tendon is attached to the bone), which can then lead to tendinopathy [1].

People with your genetic profile have an increased likelihood of getting tendonitis

SCIENTIFIC DETAILS

Gene	rsID	Genotype
MMP3	rs679620	TT

REFERENCES

[1] Xu, Y., & Murrell, G. A. (2008). The basic science of tendinopathy. Clinical orthopaedics and related research, 466(7), 1528–1538.

PREDISPOSITION TO TENDINOPATHIES

RESULTS

People experiencing tendinopathies often have a genetic predisposition to it. Tendonitis involves an inflammation of the tendon itself and its'enthesis (where the tendon is attached to the bone). Hypoxia (a lack of oxygen supply) is a trigger for tendinopathies because rather than it promoting the synthesis of type 1 collagen (typical for tendons), it promotes the synthesis of type III collagen, which is less resistant than type I and stimulates proinflammatory molecules [1].

People with your genetic profile are likely to have a high predisposition to tendonitis and other tendinopathies

SCIENTIFIC DETAILS

Gene	rsID	Genotype
TIMP2	rs4789932	GG

REFERENCES

[1] Xu, Y., & Murrell, G. A. (2008). The basic science of tendinopathy. Clinical orthopaedics and related research, 466(7), 1528–1538.

JOINT FRAGILITY

RESULTS

The joints represent the junctions between two bones covered by a layer of cartilage. Under "normal conditions", the cartilage has a smooth surface. Prolonged engagement in sport can lead to weak and fragile joints (especially in the knees and ankles), which can then predispose a person to joint injuries. Joints can often be painful; continuous joint pain may be felt. Ultimately it can lead to post-traumatic osteoarthritis: characterized by articular cartilage degeneration that causes joint pain and dysfunction. To try and avoid joint injury, it is advisable to moderate a person's exercise [1].

People with your genetic profile are likely to have an increased chance of joint fragility

SCIENTIFIC DETAILS

Gene	rsID	Genotype
IL1B	rs16944	GG

REFERENCES

[1] Buckwalter J. A. (2003). Sports, joint injury, and posttraumatic osteoarthritis. The Journal of orthopaedic and sports physical therapy, 33(10), 578–588.

SHOULDER DISLOCATION

RESULTS

Shoulder dislocations commonly fall into one of two categories. The first are anterior dislocations which occur either when a person's arm is abducted and externally rotated, or when the posterior humerus falls out of the joint. The second category is that of a posterior dislocation, which happens with an injury to the anterior shoulder. With a posterior dislocation a person's shoulder joint is prone to dislocations as the shallow glenoid (part of the shoulder socket) moves around the humerus (the small head of the bone). Dislocations can lead to nerve damage, tissue tears, fractures, and a type of fracture. Strong force or extreme rotation can pop the shoulder humerus out of the pocket. Some immediate relocation techniques include Scapular manipulation, the external rotation technique, the Cunningham technique, and the Stimson technique [1].

People with your genetic profile are likely to have a lower tendency to dislocate their shoulder

SCIENTIFIC DETAILS

Gene	rsID	Genotype
COL1A1	rs1800012	CA

REFERENCES

[1] Abrams R, Akbarnia H. Shoulder Dislocations Overview. [Updated 2020 Nov 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-.

ROTATOR CUFF DISEASE

RESULTS

Rotator cuff disease is a type of shoulder tendon injury that results from tears. Intensive activities, shoulder injuries, and prolonged use of the related joints are a risk factor for developing rotator cuff disease. Partial and anterior tears can develop into cuff degeneration. People with this disease show common onset symptoms such as acute pain and when examined, tenderness to the area, and muscle atrophy. People with this disease find it difficult to engage in overhead sports, to carry heavy objects, and often, carry out daily activities. Studies show that genetics play an important role and that the rs1800972 C>G variant of the DEFB1 gene is seen more frequently in people with the disease [1,2].

People with your genetic profile are likely to have a higher susceptibility to rotator cuff disease

SCIENTIFIC DETAILS

Gene	rsID	Genotype
DEFB1	rs1800972	GG

REFERENCES

[1] May T, Garmel GM. Rotator Cuff Injury. [Updated 2020 Jul 2]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-
[2] Dabija, D. I., Gao, C., Edwards, T. L., Kuhn, J. E., & Jain, N. B. (2017). Genetic and familial predisposition to rotator cuff disease: a systematic review. Journal of shoulder and elbow surgery, 26(6), 1103-1112.

CRUCIATE LIGAMENT/ANTERIOR CRUCIATE LIGAMENT INJURIES

RESULTS

The Anterior Cruciate Ligament (ACL) is one of the 2 ligaments responsible for supporting a person's knee joint. Injury to the ACL is very common during sports activities, due to rapid movements, sudden changes in direction, sudden stops, and jumping/landing motions. Some of the most common injuries to the ACL are sprains and tears; where people will often hear a snap/popping sound, feel severe pain, and notice the swelling of the joint [1].

People with your genetic profile likely have a high risk factor for anterior cruciate ligament injuries

SCIENTIFIC DETAILS

Gene	rsID	Genotype
COL5A1	rs12722	CT

REFERENCES

[1] Evans J, Nielson JI. Anterior Cruciate Ligament Knee Injuries. [Updated 2021 Feb 19]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-.

ANKLE INJURY

RESULTS

Acute ankle injuries are the most common type of injury experienced by athletes and sports people. They affect soft tissue; causing sprains and dislocations, mainly in the Anterior Talofibular Ligament (ATFL) and the Calcaneofibular Ligament (CFL). Severe injuries or dislocations can even require surgical intervention [1].

People with your genetic profile are likely to not have an increased risk to develop Ankle injury

SCIENTIFIC DETAILS

Gene	rsID	Genotype
MGAT4C	rs10506913	AA

REFERENCES

[1] Polzer, H., Kanz, K. G., Prall, W. C., Haasters, F., Ockert, B., Mutschler, W., & Grote, S. (2012). Diagnosis and treatment of acute ankle injuries: development of an evidence-based algorithm. Orthopedic reviews, 4(1), e5.

MUSCLE CRAMPS

RESULTS

Muscle cramps are the involuntary contractions of skeletal muscles which usually last for a short period of time but which can cause severe pain and immobility of the muscle in question. They often occur either during or after exercise. Causes of the cramps are uncertain; with some studies stating that they are caused by an imbalance in the body's levels of salt and water, some say they are due to unusual spinal reflect movements, whilst others claim that they are caused by fatigue or dehydration [1]. Also associated with muscle cramps are long periods of exercise or physical work (especially those in hot weather) and certain medications and illnesses [1].

People with your genetic profile are likely to have a decreased risk factor to develop muscle cramps after intense workouts

SCIENTIFIC DETAILS

Gene	rsID	Genotype
MCT1	rs1049434	AA

REFERENCES

[1] Maughan, R. J., & Shirreffs, S. M. (2019). Muscle Cramping During Exercise: Causes, Solutions, and Questions Remaining. Sports medicine (Auckland, N.Z.), 49(Suppl 2), 115–124.

PROPENSITY TO THE DEVELOPMENT OF MUSCLE PAIN

RESULTS

Muscle pain can be experienced during physical activity, straight after physical activity, and later on as the result of muscle cramps. Muscle pain from exercise is due to lactic acid formation, ion imbalances, hormonal factors, and proteins [1]. Certain genetic factors are associated with it and some variations can predispose a person to muscle damage and soreness. Studies suggest that the R577X polymorphism of the ACTN3 gene and the TT genotype of the SLC30A8 gene are biomarkers for exercise induced muscle damage or pain [2].

People with your genetic profile are likely to have a low propensity to feel muscle pain

SCIENTIFIC DETAILS

Gene	rsID	Genotype
SLC30A8	rs13266634	CT

REFERENCES

[1] Miles, M. P., & Clarkson, P. M. (1994). Exercise-induced muscle pain, soreness, and cramps. The Journal of sports medicine and physical fitness, 34(3), 203-216.

[2] Baumert, P., Lake, M. J., Stewart, C. E., Drust, B., & Erskine, R. M. (2016). Genetic variation and exercise-induced muscle damage: implications for athletic performance, injury and ageing. European journal of applied physiology, 116(9), 1595-1625.

RISK OF SUFFERING MUSCLE DAMAGE

RESULTS

Exercise can lead to the risk of athletes/sports people experiencing muscle damage. Repetitive, strenuous exercise can cause disruption to muscle fibers, causing them to become inflamed and possibly damaged [1]. Studies indicate that polymorphisms in the ACTN3, IGF2, TNFA, and IL6 genes can increase a person's risk of muscle damage following exercise. Gene variants that decrease CCL2 or CCR2 levels can also increase the risk of muscle damage and cause recovery to be more challenging [2].

People with your genetic profile are likely to have a regular risk of suffering muscle damage

SCIENTIFIC DETAILS

Gene	rsID	Genotype
CCL2	rs1860189	AA

REFERENCES

[1] Clarkson, P. M., & Hubal, M. J. (2002). Exercise-induced muscle damage in humans. American journal of physical medicine & rehabilitation, 81(11 Suppl), S52–S69.

[2] Hubal, M. J., Devaney, J. M., Hoffman, E. P., Zambraski, E. J., Gordish-Dressman, H., Kearns, A. K., Larkin, J. S., Adham, K., Patel, R. R., & Clarkson, P. M. (2010). CCL2 and CCR2 polymorphisms are associated with markers of exercise-induced skeletal muscle damage. Journal of applied physiology (Bethesda, Md. : 1985), 108(6), 1651–1658.

EXERCISE-INDUCED MYOPATHY

RESULTS

Myopathy is a disorder that affects people's muscular structure and metabolism, commonly causing them muscle pain, weakness, cramps and stiffness after/during exercise [1]. Several studies show genetic mutations associated with exercise-induced myalgia (muscle pain). Skeletal muscle cells require an energy supply to function and to move the body. The enzyme called Aadenosine Monophosphate Deaminase (AMD) comes from the AMPD1 gene. AMD is found in the muscles used for voluntary movements (skeletal muscles), which play a role in energy production. Alterations to AMD can, amongst other things, show up as exercise-induced muscle pain.

People with your genetic profile are likely to have a low tendency to experience myopathy

SCIENTIFIC DETAILS

Gene	rsID	Genotype
AMPD1	rs17602729	GG

REFERENCES

[1] Nagy H, Veerapaneni KD. Myopathy. [Updated 2021 Jan 20]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-.

SLOW MUSCLE REPAIR

RESULTS

Bodies tend to naturally repair their injured muscles by making changes to the Extracellular Matrix (ECM) [1] - which includes things such as collagen and enzymes. The CD163 gene, along with anti-inflammatory white blood cells, are involved in facilitating the production growth factors (including the Insulin-like Growth Factor-1 (IGF-1)) which reduce muscle inflammation, prevent cell apoptosis, and promote muscle repair [2]. However, the INSIGF2 variation could increase the risk of muscle damage and increase the muscle recovery period [3].

People with your genetic profile are likely to have a good muscle repair ability

SCIENTIFIC DETAILS

Gene	rsID	Genotype
INS-IGF2	rs7924316	TT

REFERENCES

[1] Petrosino, J. M., Leask, A., & Accornero, F. (2019). Genetic manipulation of CCN2/CTGF unveils cell-specific ECM-remodeling effects in injured skeletal muscle. FASEB journal : official publication of the Federation of American Societies for Experimental Biology, 33(2), 2047–2057.

[2] Peake, J. M., Neubauer, O., Della Gatta, P. A., & Nosaka, K. (2017). Muscle damage and inflammation during recovery from exercise. Journal of applied physiology (Bethesda, Md. : 1985), 122(3), 559–570.

[3] Baumert P, Lake MJ, Stewart CE, Drust B, Erskine RM. Genetic variation and exercise-induced muscle damage: implications for athletic performance, injury and ageing. Eur J Appl Physiol. 2016;116(9):1595-1625.

PREDISPOSITION TO THE DEVELOPMENT OF INGUINAL STRESS HERNIAS

RESULTS

An inguinal hernia is when the contents of a person's abdominal peritoneum protrude out of a part of their groin (inguinal hernia) [1] and evidence suggests that this could be down to a lack of collagen regulation in the body [2]. People with indirect inguinal hernias seem to have lower collagen levels and have a reduced ratio of type I collagen to type III collagen.

People with your genetic profile are likely to have a low predisposition for inguinal stress hernias

SCIENTIFIC DETAILS

Gene	rsID	Genotype
EFEMP1	rs11899888	AA

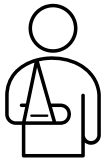
REFERENCES

[1] Purkayastha, S., Chow, A., Athanasiou, T., Tekkis, P., & Darzi, A. (2008). Inguinal hernia. BMJ clinical evidence, 2008, 0412.,

[2] Sezer, S., Şimşek, N., Celik, H. T., Erden, G., Ozturk, G., Düzgün, A. P., Çoşkun, F., & Demircan, K. (2014). Association of collagen type I alpha 1 gene polymorphism with inguinal hernia. Hernia : the journal of hernias and abdominal wall surgery, 18(4), 507–512.

STRESS FRACTURE PERIOD PREVALENCE

RESULTS



Stress fractures often occur when people are involved in continuous physical activity; which is very common in athletes/sports people. According to research, the prevalence of stress fractures in elite athletes is between 14% and 21% and could be influenced by genetics. One study indicated that the presence of the Single Nucleotide Polymorphism (SNP) rs3018362 of RANK in the heterozygous and homozygous alleles is strongly associated with the prevalence of stress fracture periods in athletes/sportspeople [1].

People with your genetic profile are likely to have a lower tendency to develop stress fractures

SCIENTIFIC DETAILS

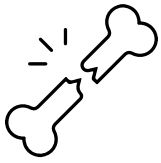
Gene	rsID	Genotype
RANKL	rs1021188	TT

REFERENCES

[1] Varley, I., Hughes, D. C., Greeves, J. P., Stellingwerff, T., Ranson, C., Fraser, W. D., & Sale, C. (2015). RANK/RANKL/OPG pathway: genetic associations with stress fracture period prevalence in elite athletes. Bone, 71, 131–136.

STRESS FRACTURE

RESULTS



Stress fractures are bone fractures occurring in healthy bones that have experienced stresses after repeated and prolonged exercises such as running, sprinting, and jumping. The stresses trigger the osteoclastic mechanism which weakens bones over time, making them more prone to stress fractures [1].

People with your genetic profile are likely to have a regular tendency to get stress fractures

SCIENTIFIC DETAILS

Gene	rsID	Genotype
RPS6KA5	rs1286083	TT

REFERENCES

[1] Knapik, J. J., Reynolds, K., & Hoedebecke, K. L. (2017). Stress Fractures: Etiology, Epidemiology, Diagnosis, Treatment, and Prevention. Journal of special operations medicine : a peer reviewed journal for SOF medical professionals, 17(2), 120–130.,

OPTIMISM

RESULTS

When a person is optimistic, they feel positive and hopeful for the future. People with high levels of optimism during challenging times often have effective coping mechanisms, and positive stimuli [1]. Optimism is a strong indicator of one's mental health which then positively affects their physical health. Recent studies suggest that levels of optimism could be inherited and that the genetic variation in the LINC01470 gene could be responsible. The OXTR gene that is linked to oxytocin production appeared to indirectly influence optimism and depression [2].

People with your genetic profile are predisposed to have a high sense of optimism

SCIENTIFIC DETAILS

Gene	rsID	Genotype
LINC01470	rs4958581	TC

REFERENCES

[1] Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2010). Optimism. Clinical psychology review, 30(7), 879–889.

[2] Rana, B. K., Darst, B. F., Bloss, C., Shih, P. A., Depp, C., Nievergelt, C. M., Allison, M., Parsons, J. K., Schork, N., & Jeste, D. V. (2014). Candidate SNP associations of optimism and resilience in older adults: exploratory study of 935 community-dwelling adults. The American journal of geriatric psychiatry : official journal of the American Association for Geriatric Psychiatry, 22(10), 997–1006.e5.

LEADERSHIP

RESULTS

Leadership is a position of responsibility, requiring skill, consistency, and certain behaviors and attitudes; enabling people to effectively guide others. Leadership is a valued skill in team sports as well as in the workplace. By leadership, we refer to the relationship of the one who occupies the highest position in an organised social structure. Leadership may be determined by genetic components involved in the transmission of the neuronal signal [1].

People with your genetic profile are likely to have higher leadership abilities

SCIENTIFIC DETAILS

Gene	rsID	Genotype
HTR2A	rs6311	CT

REFERENCES

[1] Vender R. J. (2015). Leadership: an overview. The American journal of gastroenterology, 110(3), 362–367.

CONSCIENTIOUSNESS

RESULTS

There are several defined states of consciousness and can include (but are not limited to) experience, different mental states, being aware that they are aware, being aware of their surrounding, feeling self-conscious, remembering personal actions, and more [1,2].

People with your genetic profile are likely to have a less conscientious personality.

SCIENTIFIC DETAILS

Gene	rsID	Genotype
LINC00461	rs3814424	CT
KATNAL2	rs2576037	CC

REFERENCES

[1] Feinberg, T. E., & Mallatt, J. (2013). The evolutionary and genetic origins of consciousness in the Cambrian Period over 500 million years ago. Frontiers in psychology, 4, 667.

[2] A.Zeman, Consciousness, Brain, Volume 124, Issue 7, July 2001, Pages 1263–1289

EXTRAVERSION

RESULTS

Extraversion is one of the 5 human traits of human personality, characterized by sociability, excitability, and talkativeness. Extraverted people engage with others confidently and seek a busy social life. Their personality trait is the opposite of introverts who tend to prefer their own space, have less of a natural desire to be around social stimuli and avoid engagement more often [1].

People with your genetic profile are likely to be more extraverted.

SCIENTIFIC DETAILS

Gene	rsID	Genotype
LOC105377179	rs57590327	GG
MTMR9	rs2164273	AG

REFERENCES

[1] McCabe, K. O., & Fleeson, W. (2012). What is extraversion for? Integrating trait and motivational perspectives and identifying the purpose of extraversion. Psychological science, 23(12), 1498–1505.

INSUFFICIENCY OF EXPERIENTIAL LEARNING

RESULTS

Experiential learning is a way of learning through experience and reflection; suitable in many environments [1]. People affected by cognitive disabilities do, however, tend to find this kind of learning practice rather challenging. DISC1 is a gene implicated in the regulations of cells, such as cell duplication and differentiation (when a cell changes from one type to another). If a person's DISC1 gene is not regulated properly, cognitive deficits can result.

People with your genetic profile are likely to have a good ability for experiential learning

SCIENTIFIC DETAILS

Gene	rsID	Genotype
DISC1	rs821616	AA

REFERENCES

[1] Green A. J. (1995). Experiential learning and teaching--a critical evaluation of an enquiry which used phenomenological method. Nurse education today, 15(6)

IMPULSIVITY

RESULTS

Impulsivity is a trait associated with sudden and sometimes unclearly calculated decisions and responses to circumstances; rather than calm, mindful decisions where all factors are considered. Psychologists define impulsivity as when a person gives their behavior little to no forethought, they have a tendency to act on a whim, and they do not consider the potential consequences of their actions. Contributing factors to impulsivity could be motor activation, inattentiveness, and a lack of planning. Impulsivity can be an indicator of some psychiatric and cognitive disorders [1]. Impulsive actions tend to negatively impact a person's long-term goals. In genetics, it has been reported that the rs1406946 mutation in the HTR1E gene results in low protein expression and is associated with an increase in impulsivity.

People with your genetic profile are likely to have a lower tendency to act impulsively

SCIENTIFIC DETAILS

Gene	rsID	Genotype
HTR1E	rs1406946	CC

REFERENCES

[1] Bakhshani N. M. (2014). Impulsivity: a predisposition toward risky behaviors. International journal of high risk behaviors & addiction, 3(2), e20428.

RESPONSE TO ANGER

RESULTS

Anger is a natural emotion but one which can be a serious obstacle in sports, negatively impacting focus and energy levels. There are however treatments/therapies to help manage anger, some of which include making changes to how one interacts socially, modifying how one interprets information, and finding ways to desensitize oneself [1].

People with your genetic profile are likely to have a good ability to handle feelings of anger

SCIENTIFIC DETAILS

Gene	rsID	Genotype
NRTN	rs1379868	AA

REFERENCES

[1] Steffgen G. (2017). Anger Management - Evaluation of a Cognitive-Behavioral Training Program for Table Tennis Players. Journal of human kinetics, 55, 65–73.

COMBATIVE PERSONALITY

RESULTS

Combative personalities are often associated with aggressive, hostile, angry and violent behaviors in people. People with these traits can have dysfunctional neural circuits responsible for regulating emotional control. On a biochemical level, the combative personality is associated with several enzymes, including the one encoded by the COMT gene; which determines levels of neurotransmitters like Dopamine and Serotonin. These neurotransmitters play a key role in determining people's reactions and moods. Since Serotonin is responsible for inhibition in the brain's Prefrontal Cortex (PFC), a deficiency of Serotonin can enable aggressive behaviors [1].

People with your genetic profile are likely to have a higher tendency to have a combative personality

SCIENTIFIC DETAILS

Gene	rsID	Genotype
COMT	rs4680	GA

REFERENCES

[1] Pavlov, K. A., Chistiakov, D. A., & Chekhonin, V. P. (2012). Genetic determinants of aggression and impulsivity in humans. Journal of applied genetics, 53(1), 61-82.

GLOSSARY

ALLELE	An allele is a variant form of a gene that is located at a specific position, or genetic locus, on a specific chromosome. Humans have two alleles at each genetic locus, with one allele inherited from each parent.
CHROMOSOME	A chromosome is a condensed thread-like structure of DNA that carries hereditary information, or genes. Human cells have 22 chromosome pairs plus two sex chromosomes, giving a total of 46 per cell.
GENOTYPE	The genetic makeup of an individual organism. It may also refer to just a particular gene or set of genes carried by an individual. The genotype determines the phenotype, or observable traits of the organism.
SNP	Single nucleotide polymorphisms, frequently called SNPs, are the most common type of genetic variation among people. A SNP is a variation in a single nucleotide that occurs at a specific position in the genome.
GENE	Genes are the basic units of inheritance. They contain DNA and are present in two forms called alleles.
ZYGOSITY	Zygosity describes whether you inherited one copy of this variant from one of your parents (heterozygous), or you inherited two copies from both of your partents (homozygous). Typically for pathogenic variants homozygosity cause a more severe form of the condition. In many cases, heterozygous variants do not lead to the condition becoming apparent in the patient (also known as a recessive condition) but do mean that the next generation is at risk of inheriting the condition (or themselves becoming a carrier).
POLYMORPHISM	A polymorphism consists of the different forms or variants in which a certain stretch of DNA can occur.