DIET, NUTRITION & EXERCISE
YOUR PERSONAL GENETIC REPORT
Protected Health Information
### HEALTH PREDISPOSITIONS

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### EXERCISE & FITNESS

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HOW DO YOU MEASURE UP TO THE ELITE?

A score of 3 indicates that my similarity to an elite marathoner is AVERAGE.

Your aptitude for marathon running is represented by your personalized marathon score. This score was calculated by our proprietary artificial intelligence algorithm, which compared your genetic makeup to the genotypes of 1,119 mixed-race, elite runners who qualified for the AWIS World Sanctioned Marathon.

We performed a large scale genotype analysis of elite marathoners to determine whether any genetic markers are associated with superior long distance running ability. By comparing the genotypes of over 1000 elite marathoners and 2500 normal individuals, we discovered that elite marathoners are genetically different from the normal population with regard to genes that influence traits such as endurance, anxiety, and susceptibility to hamstring/Achilles tendon injury.
I have a genetic predisposition that would benefit from isotonic/isometric training to develop strength and resistance.

**TRAINING TYPE**
**STRENGTH & RESISTANCE TRAINING**
Strength and resistance training is the process by which muscles are forced to contract against an external resistance in order to increase muscle tone, mass, and strength. We have analyzed the genes that could potentially influence your strength and resistance performance.

**INTENSITY LEVEL**
**FREQUENCY:** 2-3 days/week  
**DURATION:** 45 minutes-1 hour  
**INTENSITY:** Lift 70% of my one repetition maximum (1RM) for 2-3 sets. Perform 3-6 reps per set for a total range of 8-15 repetitions. Rest between sets and one minute between exercises.  
**ROUTINE:** To build strength and resistance I should perform isotonic/isometric training. I should circuit train by alternating cardio isometric and isotonic exercises while also alternating between exercises that isolate and compound muscle groups. Alternate activities to rest muscle groups so muscles are not fatigued. Example: push-ups followed by squats followed by bicep curls followed by calf raises. Example isotonic exercises: squats, stair climbing, bicep curls and push-ups. Example isometric exercises: plank, side bridge, yoga poses such as chair and tree poses.

I am genetically predisposed to benefit from low flexibility exercises in order to improve my range of motion.

**TRAINING TYPE**
**FLEXIBILITY TRAINING**
Flexibility is the capacity of your joints and muscles to move freely through a given Range of Motion (ROM). Ligamentous and tendinous flexibility are essential determinants of ROM. Flexibility is important in fitness and health because it enables better performance in sports and exercise, and it adds to your comfort level in day-to-day activities such as bending, walking and lifting. To a large degree, flexibility is determined by the molecule collagen, which is a secreted protein that constitutes connective tissue such as ligaments and tendons. We have analyzed the genes that could potentially influence your flexibility.

**INTENSITY LEVEL**
**FREQUENCY:** 3-7 days/week  
**DURATION:** Ideally: 5-10 minutes everyday or 20-30 minutes at least 3 days/week  
**INTENSITY:** I should perform dynamic stretches for my warm-up to improve my range of motion to the point of mild tightness. During my warm-down, I should perform static stretches to prevent muscle cramps.  
**ROUTINE:** Warm-up (dynamic stretches): lunge with a twist, knee to chest, high kicks, hip stretch with a twist, T-push-ups, jump squats, jump lunges. Stretches: Yoga, Tai Chi, Proprioceptive Neuromuscular Facilitation Warm-down (static stretches): Hold single muscle stretch for 15 seconds.

I have a genetic predisposition that would benefit from medium intensity cardio training.

**TRAINING TYPE**
**CARDIORESPIRATORY TRAINING**
Cardiorespiratory endurance is your body's ability to respond to aerobic activity. It is the capacity of your heart and lungs to deliver oxygen to your muscles over an extended period of time. We have analyzed the genes that could potentially influence your cardiorespiratory endurance.

**INTENSITY LEVEL**
**FREQUENCY:** 3-4 days/week  
**DURATION:** 20-40 minutes  
**INTENSITY:** Using the revised Borg Rating of Perceived Exertion (From no exertion "0" to maximal exertion "10"), I should target a 5. It is recommended I stay around 70% of my maximum heart rate. I should be able to talk with heavy breathing, but not running out of breath that would disrupt the continuation of my exercise.  
**ROUTINE:** I should target medium intensity workouts for a moderate duration. Examples include: cycling, walking, jogging, running, rowing, stair climbing, Nordic skiing/elliptical, dancing, hiking, swimming, aerobics.
It is more difficult for me to keep weight off after losing it. Maintaining a healthy diet and exercise regimen may help keep the extra pounds off.

There are genes associated with the tendency to gain weight back after a person loses weight, and there are genes that protect a person from weight regain. In one study, people with the G/G genotype at a marker in the ADIPOQ gene were "More Likely to Gain Weight Back," while people with other genotypes were more likely to show "Weight Loss Maintained". It is best after losing weight to maintain a healthy diet, exercise and nutrition plan to keep the extra pounds off and support long-term health.
I have a typical likelihood towards decreased aerobic capacity (VO2max).

Maximal oxygen uptake (VO2max) is widely used as the best measure of an individual's cardiorespiratory fitness. VO2max is defined as the maximum volume of oxygen per unit time that an individual uses at maximum exertion. The baseline VO2max level can vary depending on age, gender, past medical history, current health and level of physical activity. However, anyone can increase their fitness and VO2max by endurance training. Elite athletes in endurance sports, such as cross-country skiing and long-distance running, have a higher VO2max than elite athletes in power sports, such as wrestling and weightlifting. The rs8192678 SNP in the PPARGC1A gene, which is a key regulator of energy metabolism, was associated with baseline VO2max (L/min) in a study of 303 Spanish and British men. The G/G and G/A genotypes of rs8192678 were associated with "Typical" VO2max, whereas the A/A genotype was associated with a "Decreased" VO2max. Please remember that you can always increase your VO2max and fitness by endurance training, even if you start with a decreased aerobic capacity.
SPORT ENDURANCE

My genotype is associated with average endurance ability.

Endurance related sports are typically moderate intensity exercises with extended duration times such as cycling, swimming, and track and field. A number of factors relating to cellular metabolism and cardiovascular function can influence the capacity to perform endurance related exercise. A number of genetic variants have been shown to be associated with endurance performance. Three levels of exercise that are recommended based on tendencies correlated to your specific genetic predisposition. A specific set of genetic markers is known to be associated with “Average Ability” for endurance performance, while a different set is associated with “Above Average Ability”, and a third set is indicative of “Excellent Ability”. This classification can be used to determine your personal recommended sports types or training program.

SPORT ACHILLES TENDINOPATHY

My genotype is associated with an increased likelihood of Achilles tendinopathy.

The Achilles tendon connects your calf muscles to your heel bone. Tendinopathy describes either the inflammation or tiny tears to the tendon. People who place stress on the Achilles tendon, such as runners or other sports participants, are particularly prone to developing Achilles tendinopathy. Specific genetic variants have been shown to correlate with the risk of Achilles tendinopathy and are characterized by three different genotype classifications based on the individuals specific genotype; “Increased Risk”, “Average Risk”, and “Reduced Risk”. This classification provides the individual with useful information regarding their propensity to develop Achilles tendinopathy and the need to take appropriate preventive measures to reduce the risk of injury.
ANKLE INJURY

My genotype is associated with an average likelihood of ankle injury.

Ankle injuries are the most common musculoskeletal injuries that occur in athletes. Forms of injury include ankle sprains which stretch or tear ligaments, and ankle strains which stretch or tear muscle or tendons. Low ankle sprains involving injury to the lateral ligament complex being the most common. Specific genetic variants have been shown to correlate with the risk of ankle injury, and are characterized by two different genotype classifications based on the individuals specific genotype; "Increased Risk", "Average Risk". This classification provides the individual with useful information regarding their propensity toward ankle injuries and the need to take appropriate preventive measures to reduce the risk of injury during sports and exercise.

HAMSTRING INJURY

My genotype is associated with an average likelihood of hamstring injury.

The hamstring is comprised of both muscle and tendons, where the hamstring muscles represent the group of three large muscles spanning the back of the thigh bone and the hamstring tendon connects the hamstring muscles to the thigh bone. Injuries typically involve hamstring muscle strains that range in severity from minor strains to complete tears of the muscle or associated tendon. Genetic variants have been shown to correlate with the risk of hamstring injury and are characterized by two different genotype classifications based on the individuals specific genotype, "Average Risk" and "Increased Risk". This classification provides the individual with useful information regarding their predisposition toward hamstring injuries and the need to take appropriate preventive measures to reduce the risk of hamstring injury during sports and exercise.
My genotype is associated with an average likelihood of medial collateral ligament injury.

The medial collateral ligament of the knee functions as a valgus as a valgus stabilizer. Injuries of the medial collateral ligament are a common knee injury in a study of students at a United States Military Academy, the incidence rate was 7.27 per 1000 person years. Genetic variants have been shown to be associated with risk of medial collateral ligament injury. Some people have genetic markers that are associated with "Average Risk" for medial collateral ligament injury, some have genetic markers that are associated with "Increased Risk". This result can be used to help protect your body and reduce the injury occurrences during sports or exercise.
My genotype is associated with average power ability.

Power-related sports typically involve activities with short duration such as sprinting or throwing as well, as activities with repetitive power movement such as rowing. The development of enhanced muscular power is a priority for athletes in power-related sports in order to achieve maximum performance levels. Genetic variants have been shown to correlate with power abilities and are characterized by three different genotype classifications based on the individuals specific genotype, "Average Ability", "Excellent Ability" and "Above Average Ability", with respect to muscular power. This classification can be used to assist individuals in assessing their power abilities, and the choice of appropriate sports and individualized training programs.
INSOMNIA

My genotype is associated with an average likelihood of insomnia.

Insomnia is a significant health problem affecting 10-20% of adults in the United States and worldwide. The prevalence of insomnia is significantly elevated among military veterans (20-50%) where insomnia is frequently associated with mental health complications and functional impairment. Insomnia also contributes significantly to poor perceived health, disability, and healthcare utilization in the overall population. Genetic variants have been correlated with the risk of insomnia and are characterized by two distinct genotype classifications based on the individuals specific genotype, "Average Risk", and "Reduced Risk" of insomnia. This classification can be used to assist individuals in understanding their propensity for insomnia and for appropriate measures to manage their insomnia and maintain good mental health and fitness.

ANXIETY

My genotype is associated with an average likelihood of anxiety.

The effects of anxiety on athletic performance have been a central focus in sports psychology and medicine in recent years. Although specific anxiety disorders have different symptoms, they typically share a common origin stemming from irrational and excessive fear/apprehension. Studies have presented mental health models suggesting a relationship between psychopathology and athletic performance. Genetic variants have been correlated with the risk of anxiety, and are characterized by two classifications based on the individuals specific genotype, "Average Risk", and "Increased Risk" of anxiety. This classification can be used to assist individuals in understanding their risk of developing sports related anxiety and assessing appropriate measures to manage their mental health status in order to improve their sports performance.
My genotype is associated with an average sweat sodium concentration.

Hydration is directly correlated to body thermoregulation whereby perspiration evaporation is used as a cooling mechanism and the subsequent water loss controls hydration needs. Electrolytes levels, in particular, Sodium levels, within perspiration are used to regulate the sweating process. Hydration needs are directly linked to electrolyte levels in the blood. Electrolyte levels are similar and stable in healthy individuals, but show inter-individual variability in some individuals that can be seen and monitored in their altered sweat electrolyte concentration. Specific markers in the CFTR gene have been shown to contribute to the variability in the amount of sodium and chloride electrolytes lost by sweating during exercise. Genetic variants have been shown to correlate to hydration and are characterized by two classifications based on the individuals’ specific genotype, ”Average Sweat Sodium Concentration”, and ”High Sweat Sodium Concentration”. This classification can be used to assist individuals in understanding their hydration status, the risk of electrolyte depletion during sports and exercise activities and the potential need for appropriate hydration measures through water and sports drink intake of carbohydrates and electrolytes.