Client Name:	John Smith
Client DOB:	1/1/1900
Vial Number:	Sample Report
Client Sex:	Male
Referring Account:	Chad Yarbrough, DC
Sample Received:	11/2/12018
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DNA

DNA can be described as your own personal cookbook. Full of recipes that create you as a human being, each page contains specific details about every cellular process in your body.

Proteins

Proteins are created by a series of amino acids that all code for specific functions in cells, tissues, and organs.

Genes

Genes should be considered the recipes of your cookbook. Each recipe is designed to produce a fully functional product. In this case, your product is a protein. You inherit your genes from your parents.
Your recipes need the appropriate ingredients. In this case, ingredients are called alleles.

Variations

Variations (or single nucleotide polymorphism – SNP) in allele pairing create regulatory issues within the body. Variations can be considered slight changes to your ingredients in the recipe. When you inherit genes from your parents, your alleles may join in a specific pattern. We call these patterns wild type, heterozygous, and homozygous. Wild type simply means that the pairing is most commonly found in nature. Heterozygous means you have one variation from a parent (different alleles). Homozygous means you have two variations (the same allele) from both parents.

Alleles

Alleles are the nitrogenous bases: adenine (A), thymine (T), cytosine (C), and guanine (G). When sequenced together correctly, they create the final product: proteins. Alleles also determine the visual expression of your genes. For example: curly hair, green eyes, etc. This is known as your phenotype.

Epigenetics

Epigenetics is the study of how the environment influences genetic expression. While we may have variations in our genetic code, our environment controls whether our genes are switched on or off. Our test does not account for environmental influences. We report genetic variations only. Work with a trained provider if you need help understanding the epigenetic influences.

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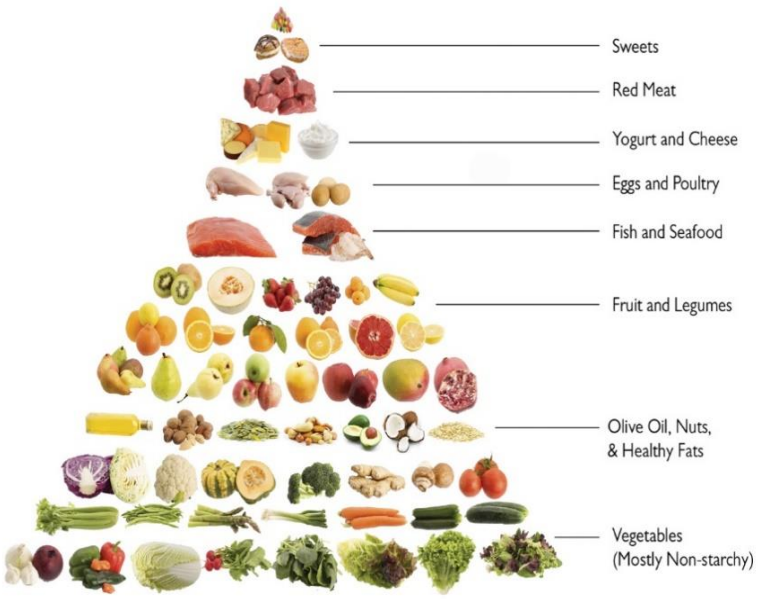
Diet & Genetics

Your genes control how your body responds to fats and carbohydrates, your metabolism, your emotional response to food, and habits that control weight management. Each page of this report will contain information that can help you create a long-term eating plan, one that balances not only the types of food you consume but also when you eat and what you can do to supplement your diet. The information contained in this report should be used as an addition to a wellness plan for longevity and health.



The most well researched diet is the Mediterranean Diet. It is made of low-inflammatory foods that contain a wide variety of nutrients. It is full of vegetables, fruits, lean meats, and healthy fats. The majority of people should consume a healthy amount of fats, specifically from sources like nuts, avocados, and olives. While most people will do well eating this way, certain genes suggest whether or not you can tolerate extra fats and carbohydrates. In this report, we will discuss the variations of tolerance to fats and carbs and how the Mediterranean Diet can be altered to accommodate.

Genetics play a major role in the development of disease; however, dietary and lifestyle factors can greatly enhance or reduce your risk of chronic health conditions. Along with your susceptibility factors, we will discuss what you can do to reduce your chance of developing these chronic diseases. Specifically, this report will dive into the concerns of weight management, diabetes, autoimmunity, and cardiovascular disease.

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Client Sex:	Male			

Carbohydrates & Your Genetics

In addition to a standard Mediterranean Diet, there are several things that can be done to maintain a healthy weight and long-term wellness. Carbohydrates (sugars) are needed for energy production, and the source of those sugars is important. Carbohydrates come in the form of vegetables, fruit, legumes, and grains. When we talk about healthy carbohydrates, we mean this. They also come in the form of refined and processed sources. Pastas, cookies, cakes, and candies fall into this category. These are not considered healthy options. Refined carbs increase your chances of chronic disease.

YOUR RESULTS

CARBOHYDRATE SENSITIVITY

You are genetically sensitive to refined carbs. This means that you should avoid highly refined carbs such as breads, pastas, and processed foods, as they will increase inflammation.

WEIGHTLOSS

You may have a lower BMI on a high complex carb diet. Consume at least 9 servings of vegetables a day. Limit high amounts of simple or refined carbs, as they will increase BMI.

DIABETES & BLOOD SUGAR

You have genes associated with diabetes, insulin resistance, or metabolic syndrome. Limit your consumption of refined carbohydrates. Increase your consumption of vegetables and healthy fats.

You should also avoid foods sweetened with refined sugar/high fructose corn syrup. Work with a healthcare provider to monitor blood glucose, insulin, and leptin levels.

MaxGen LABS

MaxFood MaxFunction

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Fats & Your Genetics

Contrary to popular belief, fats are actually a necessary part of a healthy diet. Sources of good, healthy fats include eggs, fish, nuts, seeds, avocados, and olives. Your genes determine if you will have a sensitivity to the various kinds of fats. Some people have introduced a high fat, low carb diet (Ketogenic) into their lifestyle with remarkable success. Others have not. Below, we discuss the various types of fat and whether or not you can successfully incorporate them into your diet.

MONOUNSATURATED FAT

These fats are considered to be heart healthy, lowering so called bad cholesterol and anti-inflammatory. Examples: Olive Oils, Nuts, Avocados

POLYUNSATURATED FAT

These fats are also considered to be heart-healthy, but some are higher producers of inflammation. Stick to the following examples: Wild-caught Salmon & Sunflower Seeds

SATURATED FAT

Given a bad reputation over the years, saturated fats are actually required for proper hormone production. Some people, however, are genetically sensitive to them and should lower consumption. Examples: Animal Fats, Butter, Coconut Oil

YOUR RESULTS

MONOUNSATURATED FAT	POLYUNSATURATED FAT	SATURATED FAT
You would not benefit from an increased consumption of monounsaturated fats.	You would benefit from the consumption of polyunsaturated fats. These fats may lower inflammation. Avoid poor quality polyunsaturated fats, however.	You are genetically sensitive to saturated fats. This means you should avoid them whenever possible, as they increase inflammation.

CHOLESTEROL

Cholesterol is a necessary fat that is needed for proper brain and hormone health. While it is suggested that so-called bad cholesterol and triglycerides will lead to heart disease, it is important to keep dietary cholesterol in perspective. Eating fat according to your genes

YOUR RESULTS

You have an increased risk of elevated LDL and Total Cholesterol levels
You do not have an increased risk of elevated triglyceride levels.
You have an increased risk of lower HDL levels. Consider increasing exercise.
Consumption of animal products will not lower your HDL.

KETOGENIC DIET RESULTS

You could follow a high fat, low carbohydrate diet (aka Ketogenic). This diet is high in healthy fats, such as avocado, olive oil, nuts, seeds, and fatty fish.

Research suggests it is a good choice for neurological disorders, male infertility, and weight loss. Do not follow a keto diet if you have ApoE2, ApoE4, or are a female with thyroid issues.

MaxGen LABS

MaxFood MaxFunction

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Gluten, Dairy & Your Genetics

The next piece of the puzzle when it comes to dietary needs is knowing whether or not you have a food intolerance. While you do not require a genetic mutation to acquire one, if you are genetically susceptible, you should be advised to avoid potential food triggers. In this test, we look at the two most common culprits of autoimmunity: gluten and lactose.

DAIRY/LACTOSE

Lactose is a sugar found in dairy products. While many people are already aware of lactose intolerance due to digestive issues, others may not notice any symptoms.

YOUR LACTOSE RESULTS

You are not genetically lactose intolerant.

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GLUTEN

Gluten is the protein found in wheat, barley, and rye. Known for its sticky nature, gluten can be added to foods unexpectedly. If you are gluten-intolerant, you must work diligently to avoid any hidden sources, such as soups, sauces, and lunch meats. A gluten intolerance is not synonymous with Celiac Disease; although, for the purposes of this test, we strongly encourage you to be tested if you have the genetic potential. Gluten intolerance and/or Celiac Disease can lead to a number of physical symptoms: GI dysfunction, Skin conditions Mood disorders, Hormone issues, and Autoimmunity

YOUR GLUTEN RESULTS

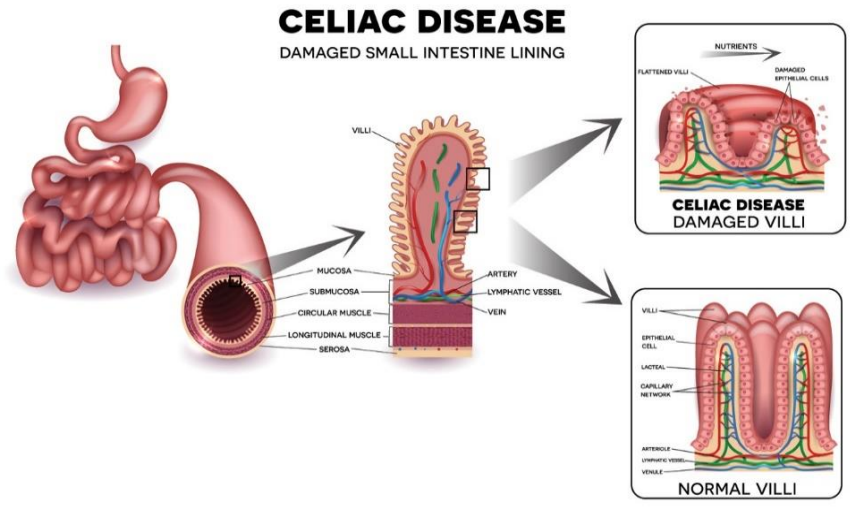
You tested positive for potential gluten intolerance. If you have symptoms, consult with a healthcare provider to consider further testing and possible interventions. You could also take the proactive approach and avoid gluten all together.

GI DISEASE RESULTS

You have an increased risk for developing autoimmune gastrointestinal diseases with the consumption of gluten.

PEANUT RESULTS

You do not have an increase risk for developing a peanut allergy.



MaxGen LABS

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Weight loss, Eating Habits & Your Genetics

Your attitude around food can often determine your physical reaction to it. Whether you are an emotional eater, prefer snacking, or are more of a picky eater can all be seen in your genetic code. These small behaviors can have a drastic impact on your weight and well-being.

YOUR RESULTS

ENERGY CONSUMPTION

You are not prone to eating more calories than needed.

CALORIC OUTPUT

You have a lower resting metabolism.

EXERCISE & WEIGHTLOSS

You are likely to lose fat in response to exercise. Check your MaxFitness panel to see what exercise is best for you.

CALORIC RESTRICTION

You may be able to use calorie restriction for weight loss.

EMOTIONAL EATING

You are genetically prone to addictive or emotional eating. Make sure you have a healthy psychological relationship with food.

INERMITTENT FASTING

You do not have genetic issues with eating late at night and weight management. Intermittent fasting may not serve you as a weight loss tool.

BITTER FOODS

You are able to taste bitter foods. This may make you less likely to eat green vegetables due to taste. Be sure to consume at least 9 servings per day.

FEELING FULL

You are less able to feel full when you eat. Be sure to watch portion control, as you may consume more calories than needed. Consume additional fiber and water with meals.

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Vitamins & Your Genetics

Your ability to metabolize vitamins plays a critical role in your health. While we like to think we can get all the vitamins we need from our food supply, due to modern agricultural practices this is becoming less likely. Vitamins are necessary for cellular health, which is the root of all bodily functions. If you want to avoid chronic lifestyle-related diseases, such as heart disease and diabetes, proper micronutrient levels must be monitored. If you have any potential for vitamin deficiencies, it is wise to consult with a practitioner about supplementation. Do not simply go to the health food store to buy generic multivitamins. Each genetic variant requires specific forms of micronutrients.

VITAMIN E

This vitamin is a powerful antioxidant that protects cells from damage. Eating foods rich in vitamin E is recommended, including sunflower seeds, hazelnuts, and almonds. You could take a supplement for vitamin E, but most companies use soy or wheat germ as their source. Talk with your healthcare provider about getting a good quality brand.

YOUR RESULTS

Normal potential Vitamin E levels

VITAMIN C

This vitamin is critical for proper immune response and tissue repair. Deficiencies in vitamin C can lead to problems with connective tissues (such as bone, collagen, and muscles). Foods high in vitamin C are citrus fruits. Many opportunistic infections (yeast, bacterial, viral) use vitamin C as a source of energy. This can lead to an increase in oxalic acid, which may cause significant symptoms.

YOUR RESULTS

Normal potential Vitamin C levels

B6 (PYRIDOXINE)

This vitamin is involved in several neurological functions, including the production of serotonin, noradrenaline, and protecting nerve cells. Foods that are rich in B6 include legumes, leafy green vegetables, eggs, and fish. You can also take a specific B6 supplement (use P-5-P).

YOUR RESULTS

You tested positive for a marker associated with potential risk for lower vitamin B6 levels. Taking a daily supplement or increasing B6 containing foods should be considered.

B2 (RIBOFLAVIN)

This vitamin is critical for nerve health, heart health, and healthy skin, hair, and nails. This vitamin works closely with all other B vitamins, helping to convert food sources into cellular energy (ATP). You could take riboflavin as a part of a healthy B complex.

YOUR RESULTS

You have tested for a marker that potentially requires additional B2. Consider testing and supplementation.

MaxGen LABS

MaxFood MaxFunction

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Vitamin D & Your Genetics

Vitamin D is a fat-soluble vitamin that must be converted in the liver and kidneys. Limited foods supply Vitamin D, so substantial exposure to sunlight or specific supplementation can be used when a deficiency is present. Vitamin D is crucial for calcium concentrations, bone growth, immune function, and the reduction of inflammation.

For daily use, both D2 and D3 forms of Vitamin D are beneficial, but D3 (cholecalciferol) should be used for therapeutic dosing during a deficiency. Supplements between 5,000 IU and 10,000 IU are ideal for daily therapeutic dosing. Daily intake should be between 1,000 – 2,000 IU of Vitamin D or cod liver oil for general wellness. Ideally, Vitamin D should be absorbed from natural sunlight exposure. Between the hours of 10am – 3pm, UV rays should hit the face, neck, arms, and shoulders for 10-30 minutes at least twice a week (avoid skin burns).

The three VDR SNPs in this test are from a physician poll of the most common SNPs needed in clinical practice. For blood work, practitioners tend to look at 25(OH) D by itself, while other practitioners also look at 1,25(OH)2D. The 1,25-dihydroxyvitamin D is formed from 25(OH)D in the kidneys under the influence of Parathyroid Hormone and specific enzymes; whereas, 25(OH)D is converted in the liver.

VITAMIN D FOODS

Cod Liver Oil
Swordfish
Salmon
Beef Liver
Egg Yolks
Cheese

VITAMIN D TESTING

1,25 OH Vitamin D may be helpful in some complicated cases. Your Doctor may order the following tests.
- 25-hydroxy (OH) vitamin D
- 1,25 dihydroxyvitamin D

HEALTH CONDITIONS

Rickets
Osteoporosis
Cancer
Inflammatory Bowel Disease
Multiple Sclerosis
Type I and II Diabetes

YOUR RESULTS

VDR- BSM

You tested as having a mild variation in VDR-BSM. Consider watching your vitamin D levels and consuming foods high in vitamin D.

VDR - TAQ

You tested as having a mild variation in VDR-TAQ. Consider watching your vitamin D levels and consuming foods high in vitamin D.

VDR - FOK

No issue detected.

MaxGen LABS

MaxFood MaxFunction

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B12 & Your Genetics Expanded Report

Do you get enough vitamin B12? Do you take the right form of B12? Since your body does not produce B12, it is important to make sure you get adequate amounts of it in the correct form. B12 is important for a number of processes in the body, especially the production of neurotransmitters, energy, and blood cells. People often feel better switching to the correct form of B12 based on genetics and/or increasing their consumption. Consider micronutrient testing on a yearly basis.

YOUR RESULTS

B12 BLOOD LEVELS

Many genes are associated with decreased blood B12 levels. Increasing supplementation or using dermal or injectable B12 can help bypass a possible genetic issue.

You tested as having a mild possibility for low serum vitamin B12 levels. Consider discussing supplementation with your practitioner.

METHYL-B12 NEED

Produced by the enzyme MTRR, Methylcobalamin is the main form of B12 used for detoxification and neurotransmitter production. It is more bioactive than other forms like cyanocobalamin.

You tested positive for both markers suggesting the need for methyl-B12. Methyl-B12 supplementation and routine homocysteine testing should be considered.

ADENOSYL-B12 NEED

Adenosylcobalamin is mainly used to produce energy within the mitochondria. Many people report increased energy with Adeno-B12 supplementation.

There are no indications of additional need for Adeno-b12 supplementation. Adeno-B12 could still be of use in some cases of fatigue.

METHYL-B12 SENSITIVITY

Some people report sensitivities to methylated B12, including increased aggression and hyperactivity. We can occasionally predict these sensitivities by looking at other mutations.

YOUR RESULTS

You tested for two of the six markers for methyl-B12 sensitivity. There is a small chance of being sensitive to methyl-B12.

LOW B12 SYMPTOMS

-Fatigue
-Poor Balance
-Memory loss
-Neuropathy
-Tingling feet
-Depression
-Anxiety
-Pale Skin
-Smooth Tongue
-Constipation
-Diarrhea
-Heart Palpitations

MaxGen LABS

MaxFood MaxFunction

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Folate & Your Genetics Expanded

Folate, or B9, is a vitamin required for numerous processes in the body. DNA replication, neurotransmitter production and degradation, detoxification, and prevention of cardiovascular disease are just a few. It is found naturally in uncooked leafy green vegetables.

FOLATE / MTHFR

The MTHFR enzyme processes folates into methyl-folate, crucial for methylation, DNA synthesis and numerous other processes in the body. Low levels of methylfolate have been associated with numerous symptoms and diseases. There are two main variants: C667T and A1298C.

Since MTHFR creates methylfolate, you can supplement with oral methylfolate. This can speed up the methylation cycle, returning detoxification and neurotransmitter production back to normal. This testing and approach has become common in fertility and psychiatric practices.

It is important to start slow and titrate up when using methyl folate. 400mcg is a common starting point for adults. Some research points to benefits from 400mcg to 15mg; however, many people do very well on doses under 2mg. Please see a licensed practitioner for help with dosages.

MTHFR SYMPTOMS

-Depression
-Anxiety
-ADD/ADHD
-Miscarriage
-Cardiovascular Disease
-Blood Clots
-Bipolar
-Schizophrenia
-Cancer
-Midline defects
-And More

YOUR RESULTS

MTHFR

You have tested positive for one copy of the MTHFR C677T. This can result in up to a 40% decrease in conversion of dietary folate into Methyl-Folate. Consider homocysteine or methylation testing.

Avoiding synthetic folic acid and possibly supplementing with methyl-folate could potentially improve symptoms. Please discuss supplementation with a trained practitioner.

METHYLFOLATE SENSITIVITY

Some people can be sensitive to methylfolate. In this case, different forms of vitamin B9 may be used. Consider folinic acid, and working with a practitioner.

You tested for two of the six markers for methyl-folate sensitivity. Folinic acid is a safer form and can be used in cases of methyl-folate sensitivity.

FOLLOW UP TESTING

You have tested as having potentially low levels of methyl folate. Homocysteine, RBC Folate, and SAM/SAH ratio tests should be ordered by your doctor to confirm.

You have not tested for variations involving the folate receptor.

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MaxGen LABS

MaxFood MaxFunction

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Vitamin A & Your Genetics Expanded

Vitamin A is essential for proper vision, growth, immune function, and gut health. There are two types of vitamin A: retinoids and carotenoids. Carotenoids are found in orange plants, such as carrots, and are precursors to retinoids (the bioavailable form). Retinol is the active form that is required for health.

VITAMIN A / BCMO1

When most people think about increasing their vitamin A levels, they typically reach for a carrot or orange-colored vegetable. However, this is a carotenoid, not a retinoid or retinol. Our bodies have to convert carotenoids into retinoids by an enzyme called BCMO1. Some people have issues in BCMO1 that slow down their ability to form retinol from beta carotene. Your test checked for five different variations that might slow down retinal formation within your body.
Consider working with a provider to monitor your blood retinol levels.

LOW VITAMIN A SYMPTOMS

- Vision issues
- Infertility
- Mood disorders
-Skin problems
-Thyroid dysfunction
-Growth delays
-Infections

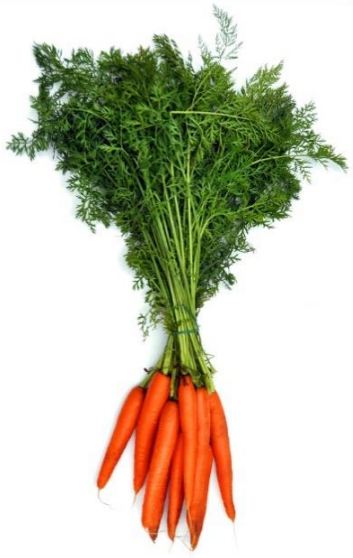
DIETARY SOURCES OF RETINOIDS

- Free range eggs
- Organic heavy cream
- Shrimp
-Cod-liver oil
- Grass fed butter
- Grass fed beef liver
- Grass fed beef
- Wild caught fatty fish

HIGH VITAMIN A SYMPTOMS

- Hair loss
-Liver damage
-Mental confusion

YOUR RESULTS



VITAMIN A

You tested for one of the five markers associated with having difficulty producing the active form of vitamin A. Retinal Palmitate might be beneficial.

VITAMIN A CAUTION

Vitamin A is a fat soluble vitamin and there are studies that show excessive intake can lead to toxic levels. High levels of retinol might contribute to increased levels of heart disease and cancer. Please discuss supplementation with a trained provider and monitor blood retinol levels.

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Inflammation & Your Genetics

Inflammation is a natural part of our immune system that is used to protect us; however, it can become overactive. This increase in inflammation can cause many problems, such as cardiovascular, neurological, and autoimmune diseases. The Standard American Diet (SAD) is full of inflammatory foods and chemicals that add to this disease process. Your genes make you more susceptible to inflammation. Maintaining low levels of inflammation is the key to health.

ANTI-INFLAMMATORY FOODS

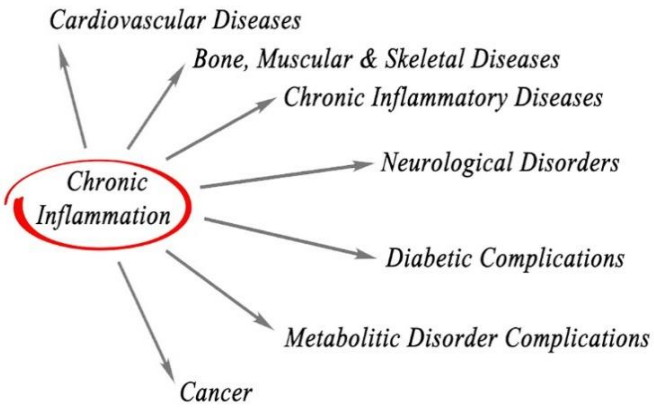
- Blueberries
- Ginger/Turmeric
- Dark Chocolate
- Good fats
- Grass fed butter
- Free ranged eggs
- Grass fed beef
- Wild caught fatty fish

PRO-INFLAMMATORY FOODS

- Sugar
- Vegetable oils
- Fried foods
- Wheat flour
- Dairy
- Bad fats
- Processed meats
- Traditionally raised meats
- Fast foods
- Trans fat

OTHER CAUSES OF INFLAMMATION

- Lack of sleep
- Lack of exercise
- Lack of rest
- Over training
- Poor gut health
- Infection
- Toxic exposures
- Food Sensitivities



LABS YOUR PHYSICAN MAY ORDER

HS-CRP: High Sensitive C-Reactive Protein
ESR: Erythrocyte Sedimentation Rate
Omega 3/6 Ratios or Fatty Acid Tests
LPS: lipopolysaccharide

YOUR RESULTS

GENERALIIZED INFLAMMATION

You tested negative for the marker for increased levels of inflammation. There may still be inflammation present.

ARACHIDONIC ACID

You tested as having normal levels of the pro-inflammatory fatty acid, arachidonic acid. There may still be inflammation present.

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Detoxification & Your Genetics

Every day, we are exposed to hundreds of toxic chemicals in our environment. Our bodies also make toxic metabolic waste that has to be filtered hourly. Many of these pathways can be slowed down by different genetic variations. This section will break down some of these variations we have found in your sample.

YOUR RESULTS

INSECTICIDES

Organophosphate insecticides are one of the most toxic substances on the planet. They can cause diarrhea, PDD, autism, depression, aggression, and other emotional conditions. Children exposed to these have twice the risk of autism and PDD. Children tend to be more susceptible to insecticides.

You tested negative for increased sensitivity to organochloride insecticides.

ACETAMINOPHEN

Due to the prevalence of acetaminophen use, knowing your genetic potential for toxic side effects is crucial. It has been associated with liver conditions, asthma, autism, GI issues, acidosis, blood cancers, and immune system depression. These are due to lowered glutathione levels and liver involvement.

You tested negative for increased toxic response to acetaminophen use.

GLUTATHIONE

Glutathione is our master antioxidant and detoxifying molecule. Oxidative stress and toxic exposures can cause low levels of glutathione. Those with genetic predisposition to low levels may be more susceptible to the effects of environmental toxins. MTHFR and methylation SNPs can also affect glutathione levels

You tested as having moderately reduced levels of glutathione production with one of three markers. Consider liposomal glutathione supplementation and glutathione lab work.

ESTROGEN

In women, excessive levels of estrogen can lead to many conditions, including anxiety and even cancer. There are certain genetic situations that might limit someone's ability to remove estrogen from the body, which will increase estrogen levels.

ESTROGEN LEVELS

You tested for three of the four markers associated with conditions in estrogen metabolism. Estrogen levels should be evaluated and appropriate medical intervention should be utilized.

4-OH ESTRADIOL

You have tested positive for a marker associated with increased 4-OH-Estradiol, a very reactive form of estrogen. Evaluate 4-OH-Estradiol annually and appropriate medical intervention should be utilized.

MaxGen LABS

MaxFood MaxFunction

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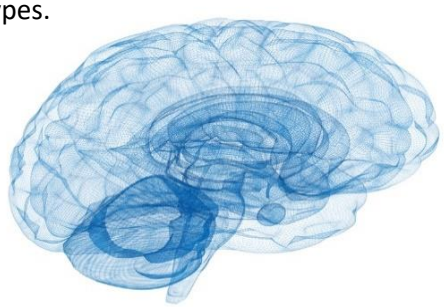
APoE & Your Genetics

Apolipoprotein E (APOE) is a gene that codes for a transport lipoprotein that carries fats and cholesterol throughout the body. There are several E types, namely E2, E3, and E4. Both E1 and E5 exist; however, they are extremely rare. Most of the population carries the E3 status, and it is considered neutral for disease risk. Everyone has two E types (example: E2/E2, E3/E4, E4/E4, E3/E4 etc.), where one type is inherited from each parent. APOE status plays a role in cardiovascular disease and Alzheimer's risk. Exercise, especially lifting, climbing, and movement-based exercises are beneficial for all types.

DETERMINING APOE STATUS

APOE status is technically defined by these two SNPs, rs429358 and rs7412.



e1 = rs429358(C or +) & rs7412 (T or +)
e2 = rs429358(T or -) & rs7412(T or +)
e3 = rs429358(T or -) & rs7412(C or -)
e4 = rs429358(C or +) & rs7412(C or -)

E4 DIET RECOMMENDATIONS

Intermittent Fasting
Mediterranean, Low fat, or Paleo Diets
Avoid alcohol, & saturated fat
Limit Seafood that is high in mercury
Limit cholesterol intake
Consider Iodine supplementation
Consider regular sauna visits

E4 RISK FACTORS

Alzheimer's Disease
Faster progression of MS
Traumatic Brain Injury
Cardiovascular disease
Unable to detoxify heavy metals

E2 DIET RECOMMENDATIONS

Mediterranean Diet
Low Glycemic Diet
Intermittent Fasting
Avoid Refined Carbs
Paleo Diet
Low Fat

E2 RISK FACTORS & BENEFITS

Hyperlipoproteinemia Type III
Elevated Triglycerides & LDL
Insulin & Glucose Concerns
Less risk for Alzheimer's
Vertebral Fractures
Neuro-protective
Vascular disease
Psoriasis

YOUR RESULTS

APOE RS429358	APOE RS7412
You tested as having a homozygous variation. C/C	No variant detected. C/C

Your results: E4/E4 Please speak with your Physician.

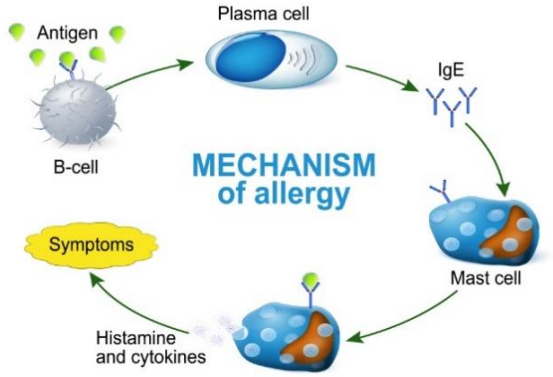
MaxGen LABS

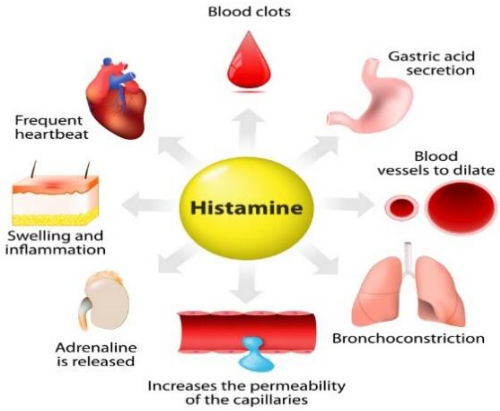
MaxFood MaxFunction

Client Name:	John Smith		Referring Account:	Chad Yarbrough, DC
Client DOB:		1/1/1900	Sample Received:	11/2/12018
Vial Number:	Sample Report		Report Date:	11/20/2018
Client Sex:	Male			

Histamine & Your Genetics

Histamine is commonly known as an immune system chemical that is released during mast cell degranulation or when exposed to allergens. However, it is also a neurotransmitter in the brain and plays a role in digesting food in the stomach. In humans, histamine is broken down by two main pathways, Histamine N-Methyltransferase (HNMT) and Diamine Oxidase (DAO/AOC1). Excessive histamine can cause numerous issues in the body, and there are some genetic predispositions that enhance these issues.





HIGH HISTAMINE FOODS

Alcohol/Ferments	Walnuts
Citrus Fruits	Cashews
Dried Fruits	Peanuts
Soured Foods	Aged Cheese
Eggplants	Smoked Meats
Spinach	Shellfish
Tomatoes	

HISTAMINE RELEASING FOODS

Bananas
Wheat
Strawberries
Beans
Chocolate
Food Dyes
Food Additives

HISTAMINE SYMPTOMS

Headaches/Migraines
Nasal Congestion
Fatigue/Adrenal Fatigue
Irregular Menstrual cycles
Digestive Issues
Blood Pressure Issues
Anxiety

DAO (AOC1) EXPLAINED

The DAO Enzymes is responsible for breaking down dietary histamine and histamine outside of your cells. It requires adequate levels of copper and can be inactivated by certain drugs and even curcumin.

HNMT EXPLAINED

HNMT is responsible for breaking down histamine inside of your cells and is common in asthma. This enzyme requires adequate levels of SAMe from the methylation cycle.

YOUR RESULTS

DAO

No issue detected. Normal potential histamine.

HNMT

No issue detected.

MaxGen LABS

MaxFood MaxFunction

Client Name:	John Smith		Referring Account:	Chad Yarbrough, DC
Client DOB:		1/1/1900	Sample Received:	11/2/12018
Vial Number:	Sample Report		Report Date:	11/20/2018
Client Sex:	Male			

MAO & Your Genetics

Monoamine oxidase (MAO) has two types, A and B, and plays a role in the oxidation of neurotransmitters. MAOA is chiefly responsible for the oxidation of serotonin and norepinephrine, while MAOB oxidizes phenylethylamine. Both oxidize dopamine. Each genetic variation of MAO creates different outcomes of the enzyme. MAO is also found on the X chromosome, so males who inherit the variation are technically hemizygous. Our algorithm, however, reports it as homozygous since we do not know the sex of each person performing this test. If your results suggest you have decreased MAO activity, it is suggested that you avoid cheese and other fermented/aged foods that are high in tyramine.

YOUR RESULTS

MAO-A (RS6323)	MAO-A (RS72554632)	MAO-B
You tested as having a heterozygous variation. This, in some literature, is the desired combination. Normal activity MAO.	No variants detected.	No variants detected. Possible Increase in aggression.

FAST MAO

A fast MAO enzyme will significantly decrease neurotransmitter levels and create symptoms of deficiency. Depression, anxiety, and low mood are commonsymptoms. Your practitioner may want to try nutraceuticals like St. Johns Wort, 5-HTP, tyrosine, resveratrol, B vitamins, sun and light exposure to help support a healthy mood.

LOW SEROTONIN

Anxiety / Depression
Insomnia
Loss of pleasure
Paranoia
Weight Issues
Inner rage
Support:
5-HTP & St. John's Wort

LOW DOPAMINE

Depression / Hopelessness
Lack of Motivation
Brain Fog/ Fatigue
Weight Issues
Low Libido
GI Issues
Support: Tyrosine, Bacopa

LOW NOREPINEPHRINE

Brain Fog
Depression
Low Blood Pressure
Adrenal Fatigue
Support: Vit. C,
Copper Balancing, Tyrosine

LOW PEA

Brain Fog
Depression
Difficulty Paying Attention
Incomplete Thoughts
Support: B6
DL-phenylalanine

SLOW MAO

A slow MAO enzyme will allow for greater levels of neurotransmitters and cause symptoms of excess. Increased aggression and lack of empathy are common. In general, it is recommended to avoid caffeine, smoking, and stress when possible. Utilizing meditation techniques, trying a low tyramine diet, and insuring proper B2, zinc and hormone levels are all possible options to support a healthy mood.

HIGH SEROTONIN

Headaches
Diarrhea
Muscle Twitching
Confusion
Seizures
High Blood Pressure
Support: B2, B5

HIGH DOPAMINE

Excessive Energy
ADD/ADHD
Anxiety
Agitation
Insomnia
Addiction
Support: B2, Methylation, & Vitamin C

HIGH NOREPINEPHRINE

Anxiety
Heart Palpitations
Sweating
Constipation
Support:
Methylation & B2

HIGH PEA

Mind Racing
Insomnia
Anxiety
Schizophrenia
Support: Methylation & L-Threonine

Client Name: John Smith
Client DOB: 1/1/1900
Vial Number: Sample Report
Client Sex: Male

Referring Account: Chad Yarbrough, DC
Sample Received: 11/2/12018
Report Date: 11/20/2018

COMT & Your Genetics

Catechol-O-methyltransferase (COMT) is a gene that creates an enzyme that breaks down dopamine, norepinephrine, epinephrine, and estrogen. These chemicals play a major role in mood, stress response, and productivity. Estrogen needs to be balanced and reduced appropriately to avoid issues. COMT does require the methylation cycle, with SAMe and magnesium being required in adequate amounts. It has been observed that individuals with slower COMT tend to be sensitive to methyl donors. In these cases, non-methylated vitamins like Folinic Acid and Hydroxocobalamin might be better options. People who are sensitive to these tend to have mood swings and anger issues. It has also been observed that carriers of the VDR-TAQ variation have additional risks.

YOUR RESULTS

COMT V158M	COMT H62H	VDR-TAQ
Slow COMT (Worrier). Possible increase in Dopamine, Anxiety, & Estrogen issues. AA Allele (++)	Possible slow COMT. Mercury sensitive. Estrogen issues.	You tested as having a heterozygous variation. No real influence.

FAST COMT

Fast versions of the COMT enzyme are associated with decreased levels of neurotransmitters like dopamine. People with this have been shown to have higher pain thresholds, are capable of operating under adverse stress (The Warrior Gene), and have lower levels of anxiety.

LOW DOPAMINE

Depression Lack of Motivation Fatigue Focus Issues	Constipation GERD Muscle Cramps	**Support**: Tyrosine Bacopa

LOW EPINEPHRINE

Depression Restless Leg	Migraines Sleep Disorders	**Support**: Methionine Tyrosine

LOW NOREPINEPHRINE

Focus Issues Depression	Brain Fog Low Blood Pressure	**Support**: Tyrosine Vit. C Copper Balancing

SLOW COMT

Slower versions of the COMT enzyme are associated with increased levels of neurotransmitters like dopamine. This has been shown to lower pain thresholds, increase a person's sensitivity to stress, and increase anxiety (The Worrier Gene). However, these individuals typically have an advantage at memory and attention based tasks.

HIGH DOPAMINE

ADD/ADHD Anxiety Mania	Insomnia Addiction Excessive Energy	**Support**: Riboflavin(B2) Vit. C Methylation

HIGH EPINEPHRINE

Anxiety Heart Palpitations Sweating	Weight Loss Constipation	**Support**: Adaptogens Phosphatidylserine

HIGH NOREPINEPHRINE

Anxiety Heart Palpitations	Sweating Constipation	**Support:** Methylation Riboflavin (B2)

MaxGen LABS

MaxFood MaxFunction

Client Name: John Smith
Client DOB: 1/1/1900
Vial Number: Sample Report
Client Sex: Male

Referring Account: Chad Yarbrough, DC
Sample Received: 11/2/12018
Report Date: 11/20/2018

Your Genetic Summary

Vitamin Markers	B12 Levels:	You tested as having a mild possibility for low serum vitamin B12 levels. Consider discussing supplementation with your practitioner.
	Methyl-B12 Need:	You tested positive for both markers suggesting the need for methyl-B12. Methyl-B12 supplementation and routine homocysteine testing should be considered.
	Methy-B12 Sensitivity	You tested for two of the six markers for methyl-B12 sensitivity. There is a small chance of being sensitive to methyl-B12.
	Adeno-B12 Need	There are no indications of additional need for Adeno-b12 supplementation. Adeno-B12 could still be of use in some cases of fatigue.
	Vitamin A Levels:	You tested for one of the five markers associated with having difficulty producing the active form of vitamin A. Retinal Palmitate might be beneficial.
	Vitamin D Levels:	There are no indications of a genetic Vitamin D issue.
	MTHFR/Folate:	You have tested positive for one copy of the MTHFR C677T. This can result in up to a 40% decrease in conversion of dietary folate into Methyl-Folate. Consider homocysteine or methylation testing.
	Methyl-Folate Sensitivity	You tested for two of the six markers for methyl-folate sensitivity. Folinic acid is a safer form and can be used in cases of methyl-folate sensitivity.
Histamine	Dietary Histamine:	No issue detected. Normal potential histamine.
	Cellular Histamine:	You have tested negative for an issue associated with the enzyme that breaks down histamine, HNMT.
Fats & Inflammation	DHA Fish Oil:	You tested as having normal levels of the beneficial omega 3 fatty acid, DHA.
	Phos-Choline:	You tested as having normal levels of the beneficial lipid, Phosphatidylcholine.
	Arachidonic Acid:	You tested as having normal levels of the pro-inflammatory fatty acid, arachidonic acid. There may still be inflammation present.
	Inflammation:	You tested negative for the marker for increased levels of inflammation. There may still be inflammation present.
Miscellaneous	Estrogen Levels:	You tested for three of the four markers associated with conditions in estrogen metabolism. Estrogen levels should be evaluated and appropriate medical intervention should be utilized.
	Bad Estrogen:	You have tested positive for a marker associated with increased 4-OH-Estradiol, a very reactive form of estrogen. Evaluate 4-OH-Estradiol annually and appropriate medical intervention should be utilized.
	Pesticide Sensitivity:	You tested negative for increased sensitivity to organochloride insecticides.
	Glutathione Need:	You tested as having moderately reduced levels of glutathione production with one of three markers. Consider liposomal glutathione supplementation and glutathione lab work.
	Probiotic:	There are no probiotic recommendations based upon your results. FUT2 Secretor.

MaxGen LABS

MaxFood MaxFunction

Client Name: John Smith
Client DOB: 1/1/1900
Vial Number: Sample Report
Client Sex: Male

Referring Account: Chad Yarbrough, DC
Sample Received: 11/2/12018
Report Date: 11/20/2018

MaxFunction SNP Report

Gene	RS#	Result	Client	Minor	Short Description
APOE	rs429358	++ Homozygous	CC	C	If rs7412 is T = E1 (Rare) If RS7412 is C = E4
APOE	rs7412	-- Wild Type	CC	T	If rs429358 is C = E4 If rs 429358 is T = E3 (Normal)
BCMO1	rs11645428	-- Wild Type	GG	A	Normal vitamin A levels.
BCMO1	rs12934922	-- Wild Type	AA	T	Normal vitamin A levels.
BCMO1	rs6564851	++ Homozygous	GG	G	Risk of low Vitamin A Levels. Retinal palmitate or acetate might benefit.
BCMO1	rs7501331	-- Wild Type	CC	T	Normal vitamin A levels.
BCMO1	rs6420424	-+ Heterozygous	GA	A	Slight risk for low vitamin A levels.
CBS	rs4920037	-- Wild Type	GG	A	normal
CBS	rs2851391	-- Wild Type	CC	T	normal
CBS 360	rs1801181	-- Wild Type	GG	A	normal
CBS 699	rs234706	-- Wild Type	GG	A	normal
COMT 61 P199P	rs769224	-- Wild Type	GG	A	Normal COMT status
COMT H62H	rs4633	++ Homozygous	TT	T	Possible down regulation of COMT. Mercury sensitive. Estrogen issue
COMT L136L	rs4818	-- Wild Type	CC	G	Normal COMT status
COMT V158M	rs4680	++ Homozygous	AA	A	Slower COMT (Worrier). Possible increase in Dopamine, Anxiety, etc. Estrogen issues.
DAOA/DAAO	rs3741775	-- Wild Type	AA	C	Normal DAAO Enzyme
DAO (AOC1)	rs10156191	-- Wild Type	CC	T	Normal DAO Enzyme
DHFR	rs1643649	-- Wild Type	TT	C	no variant detected.
FADS1	rs174548	-- Wild Type	CC	G	no variant detected.
FADS1(MYRF)	rs174537	-+ Heterozygous	GT	T	Average arachidonic acid levels.
FADS2	rs1535	-+ Heterozygous	GA	G	Possible low DHA levels, consider fish oil.
FOLR2	rs651933	-+ Heterozygous	GA	A	possible low levels of intracellular folate. Avoid folic acid.
FUT2	rs602662	-+ Heterozygous	GA	A	Possible b12 issues, consider testing and supplementation
FUT2	rs492602	-+ Heterozygous	AG	G	Possible b12 issues, consider testing and supplementation
FUT2	rs601338	-+ Heterozygous	GA	A	Possible b12 issues, consider testing and supplementation
G6PD	rs1050828	-- Wild Type	CC	T	no variant detected.
G6PD	rs1050829	-- Wild Type	TT	C	no variant detected.
G6PD	rs5030868	-- Wild Type	GG	A	no variant detected.
GPX1	rs1050450	-+ Heterozygous	GA	A	risk of low glutathione and elevated heavy metals.
GSTP1	rs1138272	-- Wild Type	CC	T	no variant detected.
GSTP1	rs1695	++ Homozygous	GG	G	Decreased ability to detoxify toxins and heavy metals. Consider sauna & GSH
HFE	rs1799945	-- Wild Type	CC	G	potential iron deficiency in women
HFE	rs1800562	-- Wild Type	GG	A	No variant detected. Increased risk of Iron anemia.
HFE	rs1800730	-- Wild Type	AA	T	No variant detected. Increased risk of Iron anemia.
MAOA T1410C	rs1137070	-+ Heterozygous	CT	T	Possible slight increase MAO activity
MAOA	rs6323	-+ Heterozygous	GT	G	Possible slight increase in MAO activity.
MAOA	rs72554632	-- Wild Type	CC	T	no variant detected.
MAOB	rs1799836	-- Wild Type	TT	C	Linked to increased anger and Parkinson's disease risk.
**Notice: MAO is a X linked gene and is only passed down from the maternal line. Male Children are technically "hemizygous."					

MaxGen LABS

MaxFood MaxFunction

Client Name: John Smith
Client DOB: 1/1/1900
Vial Number: Sample Report
Client Sex: Male

Referring Account: Chad Yarbrough, DC
Sample Received: 11/2/12018
Report Date: 11/20/2018

Gene	RS#	Result	Client	Minor	Short Description
MAT1A R264H	rs72558181	-- Wild Type	CC	T	no variant detected.
MMAB	rs2287182	-- Wild Type	CC	T	no variant detected.
MTHFS	rs6495446	++ Homozygous	TT	T	Possible issues using folinic acid or Leucovorin.
MTHFD1	rs2236225	++ Homozygous	AA	A	Possibly low levels of 5,10 methylenetetrahydrofolate, MTHFR's substrate.
MTHFR A1298C	rs1801131	-- Wild Type	TT	G	no variant detected.
MTHFR C677T	rs1801133	-+ Heterozygous	AG	A	40% reduction in enzyme activity. Consider methylfolate and methyl testing.
MTR	rs1805087	-+ Heterozygous	GA	G	Possible elevation in homocysteine.
MTRR	rs1801394	++ Homozygous	GG	G	Reduced Levels of Methyl-B12 and increased homocysteine.
MTRR A66G	rs1532268	++ Homozygous	TT	T	Reduced Levels of Methyl-B12 and increased homocysteine
MUT	rs1141321	-- Wild Type	CC	T	no variant detected.
MUT	rs9369898	-+ Heterozygous	AG	G	Possible benefit to using Adeno-B12
NOS3	rs1799983	++ Homozygous	TT	T	Low Nitric Oxide levels, small artery disease risk factor. Consider L-arginine.
NOS3	rs2070744	-- Wild Type	CC	T	No variant detected. Less likely an athlete and possibly lower NO levels.
NQO1	rs1800566	-- Wild Type	GG	A	no variant detected.
PEMT	rs4244593	-+ Heterozygous	GT	T	Possible low phosphatidylcholine levels. Consider supplementation.
PEMT	rs4646406	-+ Heterozygous	TA	A	Possible low phosphatidylcholine levels. Consider supplementation.
PEMT	rs7946	-+ Heterozygous	CT	T	Possible low phosphatidylcholine levels. Consider supplementation.
PON1 Q192R	rs662	-- Wild Type	TT	C	slight Increased risk of coronary heart disease & dementia.
SHMT1	rs1979277	++ Homozygous	AA	A	Worsens MTHFR 677 variations and lowers Methylfolate levels. Consider B6.
SLC19A1	rs1051266	-+ Heterozygous	CT	T	Possible cellular folate issue. Consider RBC Folate test.
SOD1	rs2070424	-- Wild Type	AA	G	normal levels of SOD1
SOD1	rs4998557	-- Wild Type	GG	A	no variant detected.
SOD2	rs2758331	-- Wild Type	CC	A	no variant detected.
SOD2	rs4880	++ Homozygous	AA	A	Increased chance of oxidative stress. Consider SOD supplementation.
SOD3	rs1799895	-- Wild Type	CC	G	normal levels of plasma SOD3
SUOX(A628C)	rs7297662	-+ Heterozygous	GA	G	Possible sulfite oxidase deficiency. Consider Molybdenum supplementation.
SUOX(S370S)	rs773115	-- Wild Type	CC	G	no variant detected.
TCN1	rs526934	-- Wild Type	AA	G	no variant detected.
TCN2	rs1801198	-- Wild Type	CC	G	no variant detected.
TNF	rs1800629	-- Wild Type	GG	A	no variant detected.
VDR TAQ	rs731236	-+ Heterozygous	GA	G	Consider monitoring 1,25 and 25-oh vitamin D.
VDR-BSM	rs1544410	-+ Heterozygous	CT	T	Consider monitoring 1,25 and 25-oh vitamin D.
VDR-FOK	rs2228570	-- Wild Type	GG	A	no variant detected.
Prothrombin (F2)	rs1799963	-- Wild Type	GG	A	no variant detected.
HNMT	rs1050891	-- Wild Type	AA	G	no variant detected.
AHCY-01	rs819147	++ Homozygous	TT	T	lower levels of homocysteine and glutathione, consider laboratory evaluation.
Factor 5	rs6025	-- Wild Type	CC	G	no variant detected.
CYP1B1 L432V	rs1056836	++ Homozygous	GG	G	Breast cancer risks. Monitor 4-OH Estradiol. Lower prostate cancer risks.
CYP2E1 *5b	rs2031920	-- Wild Type	CC	T	no variant detected.
CYP2E1 *6	rs6413432	-- Wild Type	TT	A	no variant detected.

MaxGen LABS

MaxFood MaxFunction

Client Name:	John Smith		Referring Account:	Chad Yarbrough, DC
Client DOB:		1/1/1900	Sample Received:	11/2/12018
Vial Number:	Sample Report		Report Date:	11/20/2018
Client Sex:	Male			

Combo Bonus SNPs

Gene	RS#	Result	Client	Minor	Short Description
DAO(AOC1)	rs2052129	-- Wild Type	GG	T	no variant detected.
CYP1A2	rs762551	-- Wild Type	AA	C	Fast Caffeine Metabolizer.
HLA-SNP	rs9275596	-- Wild Type	TT	C	no variant detected.
MMp9 C1562T	rs3918242	-- Wild Type	CC	T	no variant detected.
TNF C857T	rs1799724	-- Wild Type	CC	T	no variant detected.
Fcrl3-3-169C	rs7528684	++ Homozygous	GG	G	Increase in Inflammation and autoimmune risks.
IRF1	rs9282763	-- Wild Type	TT	C	no variant detected.

MaxFood SNP Report

Gene	RS#	Result	Client	Minor	Short Description
Diet Section					
FABP2 Ala54Thr	rs1799883	-- Wild Type	TT	C	significantly increased potential to refined carbs
KCTD10	rs10850219	-- Wild Type	GG	C	potential reduced HDL ("good" cholesterol) levels associated with a high carb diet.
PLIN	rs894160	-+ Heterozygous	CT	T	High complex carb diet will lower risk of obesity/Lower carb diet = risk of obesity.
LIPC	rs1800588	-- Wild Type	CC	T	no predicted increased benefit from a high carb diet.
FADS1(MYRF)	rs174537	-+ Heterozygous	GT	T	normal polyunsaturated fat levels
APOA2	rs5082	++ Homozygous	AA	A	normal dietary fat intake recommended
FABP2 Ala54Thr	rs1799883	-- Wild Type	TT	C	significantly increased potential sensitivity to saturated fats
FABP2 Ala54Thr	rs1799883	-- Wild Type	TT	C	normal potential nonesterified fatty acids in bloodstream after meal
FABP2 Ala54Thr	rs1799883	-- Wild Type	TT	C	x-normal potential triglyceride levels
ADIPOQ	rs17300539	-- Wild Type	GG	A	It is not recommended to avoid a high fat diet.
PPARG	rs1801282	-- Wild Type	CC	G	normal benefit from monounsaturated fats (avocados, nuts, olive oils, etc.).
ADIPOQ	rs17300539	-- Wild Type	GG	A	normal benefit from monounsaturated fats (avocados, nuts, olive oils, etc.).
PPARG	rs1801282	-- Wild Type	CC	G	increased benefit from consumption of polyunsaturated fats
APOA2	rs5082	++ Homozygous	AA	A	normal blood lipid metabolism
Vitamin Risks					
FUT2	rs602662	-+ Heterozygous	GA	A	normal potential B12 levels
FUT2	rs601338	-+ Heterozygous	GA	A	normal potential B12 levels
MTHFR C677T	rs1801133	-+ Heterozygous	AG	A	moderate potential risk for decreased folate levels
MTHFR A1298C	rs1801131	-- Wild Type	TT	G	x-normal folate pathway
BCMO1	rs12934922	-- Wild Type	AA	T	x-Normal potential Vitamin A levels
BCMO1	rs7501331	-- Wild Type	CC	T	x-Normal potential Vitamin A levels
MTHFR	rs1801133	-+ Heterozygous	AG	A	moderate potential risk for decreased Vitamin B2 levels
NBPF3	rs4654748	-- Wild Type	CC	T	potential risk for lower vitamin B6 (pyridoxine) levels
SLC23A1	rs33972313	-- Wild Type	CC	T	x-Normal potential Vitamin C levels
GC	rs2282679	-- Wild Type	TT	G	x-Normal potential Vitamin D levels
INTERGENIC	rs12272004	++ Homozygous	CC	C	normal potential Vitamin E levels. (Homozygous, isn't always bad)

MaxGen LABS

MaxFood MaxFunction

Client Name: John Smith
Client DOB: 1/1/1900
Vial Number: Sample Report
Client Sex: Male

Referring Account: Chad Yarbrough, DC
Sample Received: 11/2/12018
Report Date: 11/20/2018

Gene	RS#	Result	Client	Minor	Short Description
Food Intolerances					
CCR3	rs6441961	-+ Heterozygous	CT	C	moderate potential risk for gluten intolerance
HLA-DQ2.5	rs2187668	-- Wild Type	CC	T	x-normal potential gluten tolerance
IL21	rs13119723	-+ Heterozygous	GA	G	moderate potential risk for gluten intolerance
IL21	rs6822844	-- Wild Type	GG	T	x-normal potential gluten tolerance
MYO9B	rs2305764	++ Homozygous	GG	G	increased risk for gluten intolerance/celiac disease
MCM6	rs4988235	++ Homozygous	AA	A	lactose persistence
APOA2	rs5082	++ Homozygous	AA	A	normal BMI with high dairy intake
Disease Risks					
MYO9B	rs2305764	++ Homozygous	GG	G	increased risk for ulcerative colitis
MYO9B	rs2305764	++ Homozygous	GG	G	Increased risk for inflammatory bowel & Celiac disease.
MYO9B	rs2305764	++ Homozygous	GG	G	Normal risk for GERD, Barrett's Esophagus and Esophageal Adenocarcinoma
Eating Habits					
FTO	rs8050136	++ Homozygous	AA	A	normal potential food intake
MC4R	rs17782313	-- Wild Type	TT	C	x-normal potential total energy intake
MC4R	rs17782313	-- Wild Type	TT	C	x-normal potential %fat in total energy intake
ANKK1/DRD2	rs1800497	-- Wild Type	GG	A	x-Normal food desire
FTO	rs9939609	++ Homozygous	AA	A	risk of increased appetite
LEPR	rs2025804	++ Homozygous	AA	A	lower 24 hour energy expenditure
NMB	rs1051168	-- Wild Type	GG	T	x-Normal hunger response
FTO	rs9939609	++ Homozygous	AA	A	risk of increased intake needed for satiety
LEPR	rs2025804	++ Homozygous	AA	A	normal snacking behavior
MC4R	rs17782313	-- Wild Type	TT	C	x-normal potential snacking desire
FTO	rs9939609	++ Homozygous	AA	A	Increased risk of binge eating behavior, higher emotional eating risk.
FTO	rs9939609	++ Homozygous	AA	A	increased risk for disorder of corporeality and emotional eating
TAS2R38	rs713598	-+ Heterozygous	CG	G	more able to taste bitter flavors in healthy foods such as broccoli and cabbage.
Obesity & Weight loss					
ADRB3	rs4994	-- Wild Type	AA	G	x-normal
FTO	rs1558902	++ Homozygous	AA	A	increased risk for obesity
MC4R	rs17782313	-- Wild Type	TT	C	x-normal risk for higher BMI
ITGB2	rs235326	++ Homozygous	GG	G	normal risk of obesity on Western Diet
ADIPOQ	rs17300539	-- Wild Type	GG	A	x-normal BMI potential
APOA2	rs5082	++ Homozygous	AA	A	normal BMI potential
FTO	rs9939609	++ Homozygous	AA	A	increased risk for higher BMI
FTO	rs8050136	++ Homozygous	AA	A	normal fat mass and weight loss in response to exercise
FTO	rs16945088	-- Wild Type	AA	G	x-normal potential for weight loss
BCAA associated P	rs1440581	++ Homozygous	CC	C	potential risk for decreased weight loss and insulin sensitivity response to diet
ADIPOQ	rs17300539	-- Wild Type	GG	A	x-Normal risk of regaining weight after losing it
PPARG	rs1801282	-- Wild Type	CC	G	x-potential normal diet response
ACSL5	rs2419621	-- Wild Type	CC	T	x-potential normal diet response
PLIN	rs894160	-+ Heterozygous	CT	T	normal potential for fat loss during calorie restriction diet
PLIN	rs894160	-+ Heterozygous	CT	T	normal risk for eating late related to lower weight loss effectiveness

MaxGen LABS

MaxFood MaxFunction

Client Name: John Smith
Client DOB: 1/1/1900
Vial Number: Sample Report
Client Sex: Male

Referring Account: Chad Yarbrough, DC
Sample Received: 11/2/12018
Report Date: 11/20/2018

Gene	RS#	Result	Client	Minor	Short Description
Blood Sugar & Diabetes					
ADRA2A	rs10885122	-- Wild Type	GG	T	x-normal risk of elevated blood sugar
IRS1	rs2943641	-- Wild Type	CC	T	x-normal risk for insulin sensitivity, type 2 diabetes, hyperinsulinemia.
ADIPOQ	rs17300539	-- Wild Type	GG	A	increased risk of insulin resistance, high glucose levels and metabolic syndrome.
PPARG	rs1801282	-- Wild Type	CC	G	x-normal risk of insulin sensitivity
ADRB2	rs1042714	++ Homozygous	GG	G	decreased risk of diabetes
FTO	rs8050136	++ Homozygous	AA	A	normal risk of type 2 diabetes
FTO	rs9939609	++ Homozygous	AA	A	increased risk of type 2 diabetes
PPARG	rs1801282	-- Wild Type	CC	G	x-normal risk of type 2 diabetes
ADIPOQ	rs17300539	-- Wild Type	GG	A	normal risk of overweight and obesity in uncontrolled type 2 diabetes
Blood Lipids					
FADS1	rs174537	-+ Heterozygous	GT	T	risk for higher LDL and total cholesterol
LPL	rs328	-- Wild Type	CC	G	normal risk for higher triglyceride levels
KCTD10	rs10850219	-- Wild Type	GG	C	increased risk of reduced good cholesterol (HDL)
LIPC	rs1800588	-- Wild Type	CC	T	Normal HDL cholesterol association with fat intake

Client: Your genotype.
Minor: The genotype that is found least in nature.
Wild Type: The genotype that is found most often in nature, this is reported as green. This isn't always ideal.
Homozygous: This means you tested for both copies of the minor type allele. This typically has more severe issues.
Heterozygous: This means you tested for one copy of the minor allele and one copy of the wild type allele.
Gene: This is the specific gene we are looking at for variations.
RS#: This is the specific variation within the gene. There are multiple locations within a gene for potential variations, all of which can indicate a different issue or severity.

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Consult with a licensed healthcare professional before making changes based upon any information contained within this report. These recommendations and explanations are based upon clinical observation by MaxGen Labs and current medical research. These results are for educational purposes only and not intended to diagnose, treat or cure any disease or condition. The use of this test and its recommendations have not been approved by the FDA. MaxGen Labs and its staff are not responsible for how this test is used or any damages resulting from its use.

Basic Genetics

DNA

DNA can be described as your own personal cookbook. Full of recipes that create you as a human being, each page contains specific details about every cellular process in your body.

Proteins

Proteins are created by a series of amino acids that all code for specific functions in cells, tissues, and organs.

Genes

Genes should be considered the recipes of your cookbook. Each recipe is designed to produce a fully functional product. In this case, your product is a protein. You inherit your genes from your parents.
Your recipes need the appropriate ingredients. In this case, ingredients are called alleles.

Variations

Variations (or single nucleotide polymorphism – SNP) in allele pairing create regulatory issues within the body. Variations can be considered slight changes to your ingredients in the recipe. When you inherit genes from your parents, your alleles may join in a specific pattern. We call these patterns wild type, heterozygous, and homozygous. Wild type simply means that the pairing is most commonly found in nature. Heterozygous means you have one variation from a parent (different alleles). Homozygous means you have two variations (the same allele) from both parents.

Alleles

Alleles are the nitrogenous bases: adenine (A), thymine (T), cytosine (C), and guanine (G). When sequenced together correctly, they create the final product: proteins. Alleles also determine the visual expression of your genes. For example: curly hair, green eyes, etc. This is known as your phenotype.

Epigenetics

Epigenetics is the study of how the environment influences genetic expression. While we may have variations in our genetic code, our environment controls whether our genes are switched on or off. Our test does not account for environmental influences. We report genetic variations only. Work with a trained provider if you need help understanding the epigenetic influences.

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Strength vs Endurance

The type of exercise that is best for you is largely dependent on gene expression. Certain genes determine muscle fiber types, which drive one to excel in long distance running or another in sprinting. Other genes determine whether you could become an elite endurance athlete. While research has been done on a variety of men (and few women), ones who are trained Olympians and others who are trying to get in shape, please keep in mind that you do have the ability to exercise and participate in sport regardless of genetic potential. Genetic testing does, however, help guide you on proper function for your body, and it allows you to modify your exercise routine to maximize gains.

Understanding the make up of your muscle fibers can help determine what form of exercise is best for you. Broadly put, muscle fibers are broken into two categories: fast twitch and slow twitch. While these categories can be further expanded, for the purposes of this report we will discuss the bigger picture. Fast twitch muscle fibers are important for short bursts, high energy, high strength actions. Exercises such as sprinting or heavy weight lifting require speed and brut force that are controlled by fast twitch fibers. On the other hand, slow twitch muscle fibers are important for endurance sports such as long distance running and swimming. They require greater amounts of oxygen and blood flow over longer periods of time. Most of the population has a mixture of these two fibers and could be served well by combining exercises; however, knowing your muscle fiber type can help you define the appropriate training both for pleasure or performance.

The gene ACTN3 is commonly known as the “gene for speed.” The wild type is found in a large population of elite athletes who focus on sprinting and fast action sports. Variants within this gene appear to reduce the fast twitch action of muscle fibers into a slow twitch action, creating an ideal setting for endurance sport. With the ADRB3 gene, one may have a greater chance of training to become an elite endurance athlete. The MSTN gene may play a role in whether one can perform instant muscle contractions that require peak muscle power (example: vertical box jumping) which would be required in HIIT training (High Intensity Interval Training).

Endurance Examples: long distance running, swimming, biking, dance, basketball, tennis, and soccer.
Strength Examples: low rep weight lifting, sprinting, sit ups, pull ups, climbing stairs, and box jumping.

Strength Vs Endurance	Elite Endurance Athlete	HIIT Training Safety
Your muscles are built for strength training and speed.	You have average endurance training abilities.	You may be less able to create peak muscle power for instant movements. This can increase your chances of injury during fast, intense exercises.

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Aerobic Capacity

VO2Max is maximum oxygen uptake, which suggests how much oxygen is used by the body during intense, prolonged periods of exercise. It is a common measurement used during endurance training. People who have higher VO2Max can typically succeed at endurance sports. In the fitness world, the ability to maximize cardiorespiratory function can play a critical role in whether one becomes an endurance athlete. One gene appears to aid in the ability to train, while the other determines sustainability.

The PPARGC1A gene has been studied in European men, and research suggests that variants of this gene may allow for normal oxygen use while training. People who do not have a variant here may be at a disadvantage during training, as it lowers aerobic capacity.

The GABPB1 (NRF2) gene has been studied for its aerobic sustainability and antioxidant function. This gene appears to determine longevity in endurance sport once a person is already fully trained. Variants of this gene add greater aerobic capacity for endurance athletes.

VO2Max Potential (PPARGC1A)

You appear to have lower VO2Max potential during training. This may impede your ability to train for endurance sports.

VO2Max Potential (GABPB1)

You have greater potential for higher VO2Max once you are trained for endurance sports. This may help you sustain oxygen uptake during endurance sports.

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Weight Loss & Exercise

Exercise plays a critical role in maintaining an ideal physique; however, losing weight and having the right fat to muscle ratio may not be dependent on exercise alone. Several genes determine how one will respond to exercise. This information can help you determine how much emphasis to place on exercise routines as it relates to weight and fat mass loss.

If you are a person who is less likely to lose weight or fat mass in response to exercise, it is important to note that you still need to be physically active for overall wellness. If weight loss is a goal, you may need to focus more on the quality of food you consume instead of spending hours in a gym. Choose an exercise routine that is fun and plays to your strengths.

If you are a person who would respond well to exercise and need to lose weight, keep in mind that you can modify your movements based on muscle fiber genetics to gain the most benefit from your exercise routine. Choose a routine that is fun and sustainable.

Children who are obese may also be at a disadvantage based on the INSIG2 gene. Early intervention with exercise programs will help some but not others. It is important for all children to be physically active regardless of this genetic variant.

Weight Loss With Exercise	Weight Gain With Inactivity	Early Childhood Intervention	Body Mass Reduction
You are less likely to lose weight with exercise. You should still move, but consider low impact movements that are enjoyable.	You have a greater chance of obesity if you are inactive. Exercise at least 30 minutes a day.	Early childhood intervention may not allow you to lose weight with exercise. You should still move, but consider low impact sports that are enjoyable.	You may be able to lower body mass with exercise.

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Resistance Training

Resistance training is a type of exercise that applies a force against your movement. When your muscles are contracting against an external force, you may have a greater ability to build bulk within the muscle belly, increase bone strength, and increase endurance. Subcutaneous fat loss may occur more readily with resistance training as compared to other forms of exercise. Women respond exceptionally well to resistance training, especially as it pertains to bone health. Consider using resistance training as a part of any exercise routine for general wellness and longevity.

Examples of resistance training include:
Lifting free weights
Using a resistance band
Using your body weight for pull ups or push ups
Running in water
Pulling heavy items
Using medicine balls or kettle bells

Fat Loss	Bone Strength	Muscle Gains
You may not be able to lose subcutaneous fat with resistance training.	You have a greater chance of building bone strength with resistance training.	You should be able to gain more muscle mass with resistance training.

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Cardiovascular Response to Exercise

There are variety of risks and benefits with any form of exercise. While every person needs to be physically active and get adequate amounts of exercise daily, some may need to know common risk factors that could occur with specific types of exercise routines. If you are an elite athlete or simply want to get fit, certain precautions should be taken into consideration. While these genetic factors are not diagnostic or absolutes, there are specific nutritional protocols that can reduce your risk of an incident while exercising. Please consult with a physician if any of these risks are of concern.

Insulin Response

You have an average response for insulin sensitivity when exercising. Monitor blood glucose, HbA1C, and HOMA-IR levels with your doctor.

Cholesterol Response

You may be able to raise healthy HDL levels with exercise. Increase resistance training.

Blood Pressure Response

Exercise should help regulate your blood pressure. Consider hydroxocobalamin if vitamin B12 is needed.

You have an average risk of high blood pressure while exercising if you are unfit.

Cardiovascular Health

You have an increased risk of exercise induced ischemia. Consider yearly cardiometabolic testing and micronutrient testing.

You have an average risk of exercise induced idiopathic venous thrombosis. Consider yearly cardiometabolic testing and micronutrient testing.

You have an increased risk of ischemic heart disease. Consider yearly cardiometabolic testing and micronutrient testing.

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Injuries to muscles, tendons, ligaments, and joints are common during exercise. Your genetics simply describe your propensity for these specific concerns, but injury can be exacerbated by a number of factors. To reduce your chances of injury, drink plenty of water, use proper form, and warm up appropriately. If you are already injured, consider changing your exercise routine so that you will not produce further damage.

Muscle Weakness & Soreness

You may have muscle soreness and strength loss after a workout. Consider using branch chain amino acids and magnesium glycinate immediately after a workout. Drink at least half your body weight in ounces of water daily.

Muscle Cramping

You have an average risk of muscle cramping after exercising.

Joint & Tendon Health

Osteoarthritis

You have an average risk of osteoarthritis as a response to exercise. Consider adding resistance training as a daily routine to build strength. You can also consider using collagen peptides as a nutrient.

Knee Pathology

You have an average risk of knee osteoarthritis. Consider adding resistance training as a daily routine to build strength. You can also consider using collagen peptides as a nutrient.

Achilles Tendinopathy

You have an increased risk of developing Achilles tendinopathy with exercise. Be sure to fully stretch before starting your exercise routine.

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GENE	rsID	Result	Client	Minor	Description
Muscle Performance					
ADRB3	rs4994	++ Homozygous	AA	A	Normal potential for elite endurance performance
NRF2	rs7181866	-- Wild Type	AA	G	Normal potential for elite endurance
PPARGC1A	rs8192678	-- Wild Type	CC	T	Increased potential endurance performance activity
ADRB2	rs1042713	-- Wild Type	GG	A	Normal endurance potential
GABPB1 (NRF2)	rs12594956	-+ Heterozygous	CA	A	Slightly higher endurance potential
GABPB1 (NRF2)	rs8031031	-- Wild Type	CC	T	Normal endurance potential
LIPC	rs1800588	-- Wild Type	CC	T	Enhanced benefit from endurance training
LPL	rs328	-- Wild Type	CC	G	Enhanced benefit from endurance training
PPARD	rs2016520	-+ Heterozygous	CT	T	Normal benefit from endurance training
ACTN3	rs1815739	-- Wild Type	CC	T	Better performing muscles-Likely sprinter
AMPD1	rs17602729	-- Wild Type	GG	A	Normal potential risk of muscle cramping
SLC30A8	rs13266634	-- Wild Type	CC	T	Normal post exercise soreness and strength loss
MSTN	rs1805086	-+ Heterozygous	CT	C	Lower potential peak muscle power
VO2Max					
GABPB1 (NRF2)	rs12594956	-+ Heterozygous	CA	A	Higher potential VO2 Max
GABPB1 (NRF2)	rs8031031	-- Wild Type	CC	T	Normal VO2 Max
PPARGC1A	rs8192678	-- Wild Type	CC	T	Lower potential baseline VO2 MAX
NRF2	rs7181866	-- Wild Type	AA	G	Normal VO2 Max
Weight loss					
LPL	rs328	-- Wild Type	CC	G	Normal fat loss in response to exercise
FTO	rs8050136	-+ Heterozygous	CA	A	Less potential fat mass and %body fat loss with exercise
INSIG2	rs7566605	++ Homozygous	GG	G	Less potential for weight loss after intervention
LEP	rs7799039	-+ Heterozygous	GA	A	Normal potential reduction in fat and BMI levels in response to exercise
FTO	rs1121980	-+ Heterozygous	GA	A	Greater potential for obesity or weight gain if inactive
Resistance Training					
INSIG2	rs7566605	++ Homozygous	GG	G	Less potential benefit from resistance training
IL15	rs1057972	-+ Heterozygous	TA	T	Greater potential post training strength improvement
LEPR	rs1805096	-+ Heterozygous	GA	A	Greater potential muscle gain in response to resistance training
IL15RA	rs2296135	-+ Heterozygous	CA	C	Greater potential strength improvement from resistance training
Cardiovascular and Injury Risks					
PPARD	rs2016520	-+ Heterozygous	CT	T	Increased benefit to HDL levels by exercising
NOS3	rs2070744	-+ Heterozygous	CT	T	More favorable potential blood pressure response to exercise
EDN1	rs5370	-+ Heterozygous	GT	T	Normal risk of blood pressure in unfit people
LIPC	rs1800588	-- Wild Type	CC	T	Normal insulin sensitivity in response to exercise
CCL2	rs1024611	++ Homozygous	AA	A	Increased potential risk of exercise induced ischemia
ADRB2	rs1042714	-+ Heterozygous	GC	C	Normal risk of idiopathic venous thrombosis
LEPR	rs1137101	++ Homozygous	GG	G	Increased potential risk for ischemic heart disease
GDF5	rs143383	++ Homozygous	GG	G	Normal potential risk for osteoarthritis
intergenic	rs4140564	++ Homozygous	AA	A	Normal potential risk of knee osteoarthritis
MMP3	rs679620	++ Homozygous	CC	C	Higher potential risk of developing Achilles tendinopathy

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This test does not analyze all variations within a gene that someone might carry. The rs#'s contained within the report were picked from scientific literature, multiple physician collaborations, and clinical observation by MaxGen Labs and are subject to change at any time.