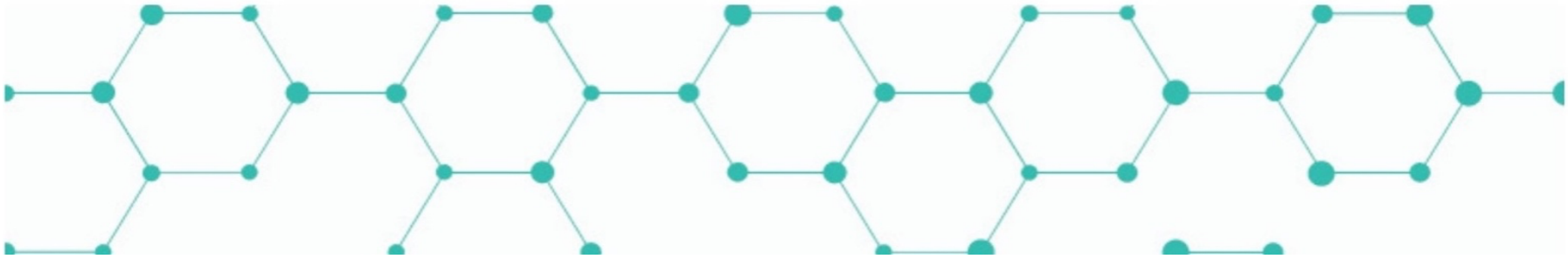
DNARX

Genetic Report

Prepared For:

Name: Sample
Birthdate: August 19, 1981
Vial Number: RX00000
Report Date: February 17, 2022



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How to read this test:

In this report, approximately 40 genetic variations (single nucleotide polymorphisms) are tested and reported for you in an understandable format. The basic functions of these variations are outlined throughout the report; however, if you want a more in depth understanding of each one we invite you to visit our blog referenced below. There, we provide references and detailed information about how each variation interacts in your body. You will see how each of these variations play a role in a variety of health conditions. Foods, supplements, or lifestyle tips are provided in each post. Please consult with your healthcare provider before making changes that may affect your medical care. Nothing in this report is intended to diagnose, treat, cure, or prevent disease. Pairing this report with annual labs, especially micronutrient testing, is an excellent way to optimize your wellness care. At DNA RX, we believe that health education is vital. That is why we are proud to offer this wellness genetic test to act as an education aid for you and your family.

Genetic Testing – This test only looks at your DNA. It does not test for actual nutrient deficiencies, neurotransmitters, diseases, or epigenetic expression. This is purely your genetic blueprint, which tells us your potential for certain biochemical changes. You will find recommended testing on each page if you would like to use this information to work with a healthcare provider.

Variant – A variant is a small change in allele pairing. This genetic variation alters the way a gene functions. For example, if a gene's purpose is to make an enzyme that breaks down a certain vitamin, a variation may make that enzyme less effective; thus, creating potential for vitamin deficiency. This test looks at variations within each gene listed by category. Caveat: Some people use the term "mutation" instead of "variant," but we reserve that word for genetic mutations that cause disease (i.e., Hemophilia) – things for which we do not test. The negative connotation often associated with the term "mutation" is something we believe should be avoided when discussing genetics related to diet and lifestyle.

Your Results: You will find your results at the bottom of each page.

Gene – This is the name of each gene tested.
RSID – This is a specific identification code for a gene.
Allele – Your inherited portion of the gene that is tested.
Risk – How your allele determines function.
Recommendations – The next tests we recommend to determine if your genetics are at play when you have a high risk allele.

For more information visit our blog at: www.dnarx.com

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Fat Soluble Vitamins

Fat soluble vitamins are found in their active form in fatty foods (salmon, beef, eggs, etc.), as they are transported and absorbed in a similar fashion as fats. These vitamins are stored in your body and have the potential to be too high or too low. The genes tested in the panel often create deficiencies for these vitamins. If you have a genetic variation associated with deficiency, it is recommended that you follow up with your healthcare provider to run specific tests that determine your current nutrient status. It is recommended that you do this yearly as a part of your wellness routine.

Signs and symptoms of deficiency for these vitamins are often linked to poor immune function and hormone dysfunction. Vitamin A deficiency is linked to thyroid dysfunction, IBS, growth delays, chronic lung infections, and poor eye health. Vitamin D deficiency is linked to poor bone health, autoimmune conditions, and chronic infections. Vitamin E deficiency is linked to autoimmune conditions that affect the skin (psoriasis is an example) and brittle hair/skin/nails. Vitamin K deficiency is linked to poor blood clotting and gut dysbiosis.

Each of these genes is related to the conversion of these nutrients from their inactive to their active state. Meaning, eating foods high in the inactive forms (plant-based) may create deficiencies of the active vitamin if a genetic variation exists. To bypass these genetic variations, it is best to consume foods with the active version of the vitamins, namely animal fat sources, or supplement with active forms under the care of your healthcare provider.

Your Genetic Results

Vitamin	Gene	RSID	Allele	Risk	Recommendation
Vitamin A	BCMO1	rs6564851	GG	High risk of Vitamin A deficiency.	Micronutrient test
Vitamin A	BCMO1	rs6420424	AG	Moderate risk of Vitamin A deficiency.	Micronutrient test
Vitamin A	BCMO1	rs11645428	GG	High risk of Vitamin A deficiency.	Micronutrient test
Vitamin D	GC	rs2282679	TT	Low risk of Vitamin D deficiency.	Test active and inactive Vitamin D levels
Vitamin E	INTERGENIC	rs12272004	CC	High risk of Vitamin E deficiency.	Micronutrient test
Vitamin K	CYP4F2	rs2108622	TC	Moderate risk of Vitamin K deficiency.	Micronutrient test

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Water Soluble Vitamins

Water soluble vitamins are actively dissolved in water and are not stored within your body. These vitamins include all B vitamins and Vitamin C. Daily intake of foods that are high in water soluble vitamins is crucial to health for a variety of reasons. Found in both plant and animal foods, it is fairly easy to get enough with a proper diet; however, two of these vitamins may require supplementation if you are on a restrictive diet. Vitamin C is not naturally found in the body, so consuming foods such as citrus fruits, cherries, peppers, and green veggies is ideal. Vitamin B12 is found most heavily in animal foods, especially beef and lamb, so vegetarian and/or vegan diets may fall short without supplementation. All other B vitamins are readily found in both plant and animal foods.

The genes tested on this panel are directly related to potential vitamin deficiency. These genes allow for conversion of the dietary forms of these nutrients into usable, cellular forms. In order to understand great detail about each of these genes, please visit our blog, where we account for a variety of health conditions associated with deficiency. These genes are critical to over 200 processes in the body, especially detoxification, brain health, heart health, and pregnancy. If you have a genetic variation associated with deficiency, it is recommended that you follow up with your healthcare provider to run specific tests that determine your current nutrient status.

You will find that most of these vitamins are fortified in common processed foods, especially flours and cereals; however, those vitamin forms can be detrimental to people with specific gene variants. As a catch all, we recommend avoiding the forms folic acid and cyanocobalamin in foods and supplements.

Your Genetic Results

Vitamin	Gene	RSID	Allele	Risk	Recommendation
Vitamin C	SLC23A8	rs1279386	AA	Low risk of Vitamin C deficiency.	Micronutrient test
Vitamin C	SLC23A1	rs33972313	CC	Low risk of Vitamin C deficiency.	Micronutrient test
Folate	MTHFR 1298	rs1801131	GT	Moderate risk of Folate deficiency.	RBC Folate, Homocysteine
Folate	MTHFR 677	rs1801133	GG	Low risk of Folate & B2 deficiency.	RBC Folate, Homocysteine
Folate	SLC19A1	rs1051266	CC	High risk of Folate deficiency.	RBC Folate, Homocysteine
Vitamin B12	MTRR	rs1801394	AA	Low risk of Vitamin B12 deficiency.	Methylmalonic Acid
Vitamin B12	MTRR	rs1532268	CC	Low risk of Vitamin B12 and Folate deficiency.	Methylmalonic Acid
Vitamin B12	CUBN	rs1801222	GA	Moderate risk of Vitamin B12 deficiency.	Methylmalonic Acid, Anemia
Vitamin B12	FUT2	rs601338	GG	High risk of Vitamin B12 deficiency.	Methylmalonic Acid, Stool
Vitamin B6	NBPF3	rs4654748	CC	High risk of Vitamin B6 deficiency.	Micronutrient test

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Fatty Acids

Fatty acids are a group of nutrients that play a supporting role in a variety of cell functions. Nerve transmission, methylation, cell signaling, and lipid (fat) metabolism are just a few areas that require specific fatty acids. In this report, we focus on the genes that cause deficiencies for Choline and Omega 3 Fatty Acids. These nutrients are readily found in foods such as eggs and fish; however, there are some plant-based options like non-GMO soy, sunflower seeds, flax seeds, and chia seeds that can also be consumed, albeit the fatty acids are in lesser quantities than the animal-based sources.

Choline is most commonly found in the form of phosphatidylcholine (95% in tissues). It has been widely studied for its use in stroke recovery, pregnancy, and post-concussive syndrome. Supplementation may be more difficult with Choline, as it can be cost prohibitive. Eating approximately 2 eggs daily appears to be sufficient. Supplementation during pregnancy, however, is critical. Forms such as choline citrate may be more tolerable.

Omega 3 Fatty Acids are most commonly discussed as fish oils; however, algae is a vegan source for DHA. Omega 3 Fatty Acids are widely studied for their use in post-concussive syndrome, heart health, and mental or cognitive health.

We recommend consuming regular amounts of Omega 3 Fatty Acids daily by eating fish or taking fish oil supplements. Studies have conclusively shown that between 1-4 grams daily will reduce inflammation and provide support for a healthy nervous system. Children often require more DHA, and adults typically thrive on a EPA:DHA ratio of 2:1. Discuss dosing options with your healthcare provider if you have genes associated with deficiency.

Your Genetic Results

Fatty Acids	Gene	RSID	Allele	Risk	Recommendation
Choline	PEMT	rs7946	CC	Low risk of Choline deficiency.	Micronutrient test
Choline	FADS1	rs174548	GC	Moderate risk of Choline deficiency.	Micronutrient test
Omega 3	MYRF	rs174537	TT	High risk of Omega 3 Fatty Acid deficiency.	Omega Count
Omega 3	FADS2	rs1535	GA	Moderate risk of Omega 3 Fatty Acid deficiency.	Omega Count

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Minerals

Minerals are nutrients that are needed for a variety of bodily functions. They are generally broken into two groups: macrominerals (major) and trace minerals. Macrominerals are needed in higher quantities than trace minerals; however, they are all equally important. A balanced diet makes it easy to consume minerals daily; however, the genes addressed in this test are known to cause deficiencies even in someone who eats adequate amounts. We recommend following up with your healthcare provider to test your levels on a yearly basis.

The specific minerals assessed here include Magnesium, Zinc, Molybdenum as it relates to sulfur metabolism, and Iron. While there are many genes associated with mineral deficiency, these appear to be the most problematic and common. If supplementation is necessary due to deficiency, these minerals can safely be taken independently; however, a multimineral is often more tolerated on a wellness basis.

Magnesium is important for bone health, building muscles, bowel health, nerve transmission, and immune health.

Zinc is critical for hormone and immune health, sperm count, fetal development, taste perception, wound healing, and making protein.

Molybdenum helps metabolize sulfur.

Iron helps carry oxygen in red blood cells and helps with energy metabolism.

All of these minerals are readily found in legumes and green leafy vegetables, but seafood is an ideal source, too. Red meats, especially organ meats, are high in iron. If you have the gene that states you need to avoid iron supplementation, you may also consider reducing red meats.

Your Genetic Results

Minerals	Gene	RSID	Allele	Risk	Recommendation
Magnesium	SLC30A8	rs13266634	CT	Moderate risk of Magnesium and Zinc deficiencies.	Micronutrient test
Magnesium	BDNF	rs6265	TT	Low risk of mineral deficiencies.	Micronutrient test
Molybdenum	SUOX	rs7297662	GA	Moderate need for Molybdenum.	Micronutrient test
Iron	HFE	rs1799945	CC	Low risk of Iron deficiency.	Full Iron Panel

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Antioxidants

Antioxidants are nutrients that clean up free radicals, unstable molecules that are created from environmental toxins and external pressures (stress) that damage cells. This leads to a problem called oxidative stress or damage. When you have too much oxidative stress, the body begins creating disease processes. Lifestyle factors that create free radicals include smoking, drinking alcohol, consuming fried foods, and exposure to pesticides and herbicides.

While there are many antioxidants, including Vitamins C and E, the master antioxidant discussed in the test is Glutathione. This nutrient has been studied widely in connection to autism, fatty liver disease, psoriasis, aging, autoimmunity, peripheral artery disease, poor lung health, and insulin resistance. It directly scavenges free radicals to help reduce oxidative stress and damage. The gene assessed in this panel is directly linked to Glutathione deficiency. When you do not have enough Glutathione, you are more likely to have oxidative stress.

Foods high in Glutathione include spinach, asparagus, and avocados. Foods high in sulfur also help create Glutathione, so kale, brussels sprouts, broccoli, mustard greens, and watercress are ideal. Selenium rich food help increase Glutathione because it is a mineral cofactor, so foods such as brazil nuts, brown rice, beef, chicken, and fish are beneficial. Foods rich in Vitamin C also help to recycle Glutathione that is naturally occurring in the body.

Supplementing with whey protein and milk thistle may also help increase Glutathione levels.

Supplementing with Glutathione directly is difficult, as it has poor absorption in the gastrointestinal tract; however, liposomal forms and L-Glutathione forms may be beneficial.

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Antioxidants	Gene	RSID	Allele	Risk	Recommendation
Glutathione	GPX1	rs1050450	GG	Low risk of Glutathione deficiency.	Organic Acids

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Metabolism

Genes assessed in this section are directly related to your ideal diet. If you want to maintain proper body mass, consuming carbohydrates and fats according to your genetics may be beneficial. Two categories are discussed on this page: carbohydrate and fat metabolism. Each type of macronutrient directly plays a role in energy production, weight, and cardiovascular health.

The **AMY1** gene controls your ability to digest carbohydrates through digestive enzymes. Digestive enzymes are found in saliva and are also released by the pancreas, liver, and gallbladder. The AMY1 gene is linked to amylase, the enzyme that breaks down carbs and starches. When a genetic variation is found, it may make digestion of those carbs and starches more difficult, leading to gastrointestinal discomfort and pancreatitis. Foods that contain amylase are raw honey, mangos, and bananas. You can also take a digestive enzyme supplement that contains amylase with meals.

The **FTO** gene is known as the "obesity gene." Variations are linked to excessive weight gain with the consumption of refined carbohydrates, such as sugar, refined grains (white flours, white bread, white rice, some cereals), high fructose corn syrup, and desserts. These are foods that have a high glycemic index and rapidly spike insulin. If you have this gene variation, avoid refined carbohydrates.

The **PLIN** gene determines how well you metabolize carbohydrates in general, and it is linked to body mass. Some people cannot consume large quantities of carbs (more than 80 grams a day) without an impact on their body mass. In order to maintain a healthy weight, consuming a low-carb diet is ideal. Paleo would be a common nomenclature for this type of diet. Others can consume large amount of carbohydrates (more than 144 grams per day) to maintain a healthy body mass. Popular nomenclature for this diet is Mediterranean. Ideal carbohydrates for all genetic types are complex carbs (i.e., vegetables, fruits, and whole grains). All genetic variations should avoid refined carbs.

The **ADIPOQ** gene is directly related to the cardiovascular risk of fat consumption. For those who need to follow a low-fat diet, consuming less than 30% of your daily calories from fat is ideal. Fats that are safe for all genetic types include olive oil, avocados, nuts and seeds. Avoid saturated fats.

Your Genetic Results

Macros	Gene	RSID	Allele	Risk	Recommendation
Carbohydrate	AMY1	rs4244372	TT	Low need for digestive enzyme support.	Stool – digestive enzymes
Carbohydrate	FTO	rs9939609	TT	Low risk for obesity.	Stool – carb metabolism
Carbohydrate	PLIN	rs894160	TC	High-carb diet is beneficial.	Stool – carb metabolism
Lipid (Fat)	ADIPOQ	rs17300539	GG	Consuming unsaturated fat is safe.	Stool – fat metabolism

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Food Sensitivities

Sensitivities to foods are common in modern societies, especially with the growth of corporate agricultural practices. However, there are genes that have evolved over time to create potential for food sensitivities, namely dairy or gluten intolerance and severe sensitivities to pesticides and other chemicals. In this test, the genes assessed are highly linked to these sensitivities.

The vast majority of people are sensitive to lactose, the sugar found in dairy products. This can cause symptoms such as chronic ear infections, skin conditions, gastrointestinal discomfort, and insulin resistance. Dairy is also linked to obesity and cardiometabolic diseases. Contrary to popular belief, dairy is not a necessary food at any age. It can be avoided regardless of genetic predispositions.

Gluten is the protein found in wheat, barley, and rye. It gives the “sticky” feeling when making breads and baked goods. While many feel gluten-free diets are just a fad, they can, in fact, be quite beneficial for a variety of health conditions. In addition, many people have genetic variations that create a risk for developing autoimmunity with the consumption of gluten over time. You may not have symptoms now, but you may develop them at any point in life. We recommend following a gluten-free diet if either of the HLA genetic variations are present. If you have other genetic variations in this section but no symptoms, following a gluten-free diet is not absolutely necessary.

Pesticides are found in abundance in our society, so they are not always avoidable. They are, however, linked to autism, OCD, ADHD, poor lung health, skin conditions, cardiovascular disease, infertility, and mental health conditions. Choose organic foods whenever possible, especially if a sensitivity is present.

Your Genetic Results

Food	Gene	RSID	Allele	Risk	Recommendation
Dairy	MCM6	rs4988235	GG	Lactose intolerant. Avoid dairy.	Food Sensitivity Test
Dairy	APOA	rs5082	AA	Dairy is not linked to obesity.	Cardiometabolic Panel
Gluten	HLA-DQ8	rs7454108	TT	No need to avoid gluten.	Celiac Panel
Gluten	HLA-DQ2.5	rs2187668	CC	No need to avoid gluten.	Celiac Panel
Gluten	MYO9B	rs2305764	AA	Gluten-free diet is beneficial for autoimmunity.	Autoimmune tests based on symptoms
Gluten	TNF	rs1800629	GG	No need to avoid gluten.	Autoimmune tests based on symptoms
Pesticides	PON1	rs662	CC	Pesticide sensitivity.	Environmental Toxins

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Neurotransmitters

Neurotransmitters are chemical messengers. They are often associated with mental health; however, they do have a variety of functions throughout the body. The genes assessed in this test affect three common neurotransmitters that can have profound effect on mood, allergies, and hormones. Please visit our blog to get a full understanding of each gene, especially supplement and dietary changes related to symptoms.

The **HNMT** gene is related to histamine. This neurotransmitter is best known for allergies; however, it can cause anxiety, asthma, ADHD, headaches, and interfere with fertility. Consuming a low-histamine diet may be beneficial for some variants.

The **MAOa & MAOb** genes are most commonly associated with serotonin levels; however, it can play a role on every neurotransmitter. It is discussed as having high, balanced, or low activity depending on the allele. High MAOa activity means you burn through serotonin quickly, causing a deficiency. Low MAOa activity means you do not use serotonin as efficiently, creating an abundance. Each of these conditions comes with a specific set of symptoms and can be helped with supplements and dietary changes. MAOb gene variants typically create low activity and follow similar patterns as low MAOa.

The **COMT** gene is most commonly associated with dopamine levels; however, it can play a role on every neurotransmitter. It is also discussed as having high, balanced, or low activity depending on the allele. High COMT activity means you burn through dopamine quickly, causing a deficiency. Low COMT activity means you do not use dopamine as efficiently, creating an abundance. Each of these conditions comes with a specific set of symptoms and can be helped with supplements and dietary changes.

Your Genetic Results

N.T.	Gene	RSID	Allele	Risk	Recommendation
Histamine	HNMT	rs1050891	GA	Moderate risk for histamine intolerance.	Serum Histamine
Serotonin	MAOA	rs6323	GG	High MAOa activity.	Organic Acids
Serotonin	MAOB	rs1799836	TT	Balanced MAOb activity.	Organic Acids
Dopamine	COMT V158M	rs4680	AG	Balanced COMT activity.	Organic Acids

Genetic Testing FAQs

Why take a genetic test?
Genetic testing provides a blueprint to your body. While we cannot change our genes, we can create lifestyles that honor them. Use this genetic test as a means to understand what nutrient deficiencies and dietary sensitivities you may be prone to developing. This is not a full genome, so the only genes tested are ones that have enough research and actionable steps for each category.

What are the methods and limitations of this test?
DNA RX uses mass spectrometry to extract genetic material from your provided sample. Our genetic team has set high levels of specificity and sensitivity to pull the necessary information. Unfortunately, genetic material can be degraded if one consumes citrus or dairy products within an hour of performing the cheek swab. If the genetic material appears to be less than desirable in the sample, we do collect reswabs from the client. This test is also limited in the sense that it is only looking at the 40+ genes stated in the report. No additional information is pulled beyond what is listed in the report. There is no raw data file available beyond this report.

How do I use this information?
As stated before, we believe genetic testing allows you to honor your potential. Take this information and follow the action steps outlined in the report for wellness routines. If you have specific medical needs, please take this information to your healthcare provider and pair it with other types of testing. This information is not, however, intended to diagnose, treat, cure, or prevent any type of disease and is not regulated by the FDA. This test should be considered an educational tool, not a diagnostic one.

Is your lab CLIA certified?
Each genetic sample is analyzed at a CLIA and CAP certified lab. If you would like the specific identification number for the lab, please contact help@dnarx.com.

Why don't you put words such as wild type or homozygous in your report?
While it is common nomenclature to use the terms wild type, heterozygous, and homozygous when reporting results, we feel it does a disservice to you in understanding the allele changes. These terms have often been used to describe good or bad results from variations rather than give you a proper view of allele function. Instead, we simply report your allele and the concerns (or lack thereof) associated with it.

What resources do you use to create your report?
We us dbSNP as the guide for alleles, and we have a database of peer reviewed literature to guide our recommendations. https://www.ncbi.nlm.nih.gov/snp/