

Me Biosciences EPIGENETIC REPORT

for **Sample Client**

Welcome

Welcome to your Genomic Report!

Me Biosciences use a complex systems approach to optimize performance.

It is important to understand that the human system is a complex system, rather than a complicated system. In a complicated system there are many independent pieces that can be modified without affecting the other pieces; whereas, in a complex system, each piece is dependent on its relationship with the other pieces.

Let's take **flight** as an example; A computer can explain and model an airplane because it is a complicated system. It cannot adequately model and explain a bird, a complex system.

Your genetic blueprint is one of the many pieces of the complex human system. The genetic blueprint is made up of a combination of DNA markers (C, T, A, G) known as Single Nucleotide Polymorphisms, or SNPs.

While studies demonstrate the SNPs in this report are impactful on different lifestyle aspects, they are one part of the system. DNA is not deterministic; one SNP does not correspond to one outcome. Other aspects of the complex system affect the expressions of your genetic blueprint such as environment, mindset, and exercise. Complex systems require complex thinking which is where Me Biosciences and AI comes into the picture; AI is capable of complex thinking.

As you read through the report, use the below legend:

- Gray benefits the most from support
- Light Red is likely to have benefit from support
- Deep red is typically desirable; support can be leveraged to enhance performance
- Left represents low and right represents high
- When gauges have no benefit or support need, results range in shades of red



About Nutrition

ABOUT NUTRITION

Genetics are responsible for determining physical traits such as hair and eye color, however, genetics are probability/propensity, not guaranteed. For instance, genetics may program for brown hair, yet hair color typically changes as an individual ages. This process is an example of epigenetics; how the environment affects genetics. In this example, the hair color (brown or grey) is referred to as the 'expression'. One of the most impactful ways to affect epigenetic expression is through nutrition. This report covers three areas that have a strong impact on epigenetic expression; food sensitivities, eating behaviors, and macronutrients.



The food sensitivity genetics relate to the body's response to food such as dairy or gluten. Eating behavior genetics consider propensity towards snacking habits and sweet consumption. Understanding macronutrient ratios (protein, carbohydrate, and fat) is the foundation for developing nutrition plans. Understanding genetic blueprint is pivotal to optimize expression.

Nutrition is one of the most impactful ways to affect epigenetic expression. There are two genetics-informed strategies to approach nutrition; nutrigenetics and nutrigenomics. Nutrigenetics is eating solely based on genetics; following genetic propensity regardless of goals or lifestyle. Nutrigenomics is eating and supplementing to optimize epigenetic expression; strategically consuming nutrients based on the combination of genetics, goals, and lifestyle. While going through this report, an epigenetic coach can assist in creating an individualized strategic nutrition plan based on nutrigenomics.

Hunger & Satiety

WHAT THIS MEANS

Appetite is a combination of hunger response and satiety. Many studies have identified DNA variations that contribute to hunger and satiety signaling. Science reveals this is a complex interaction between many systems, including: brain neurotransmitters (responsible for carrying chemical messages to and from the brain), messages between cells, and appetite hormones.

Hunger Propensity: Hunger is the sensation to eat.

Satiety: Satiety is the sensation of fullness.



WHY THIS MATTERS

All of these systems require coordination in the central sensing mechanism of our brains to create a response. Identifying these components can provide the guidance we need to create an optimal outcome. When signals are not expressing in an optimal manner, we can institute strategies to improve signaling and create a more favorable response.

Hunger Propensity: Sometimes individuals experience a desire for food that is not actual hunger. It could be due to sleepiness, boredom, habits etc. While hunger is affected by environmental factors, understanding genetic propensities can provide insight towards optimal strategies.

Satiety: Individuals with low sensation of satiety may not accurately perceive when they reach fullness. As a result, they may consume more food than intended, and subsequently gain weight.

RELEVANT SNP'S

Gene	Marker	Your Genotype
ADIPOQ(2)	rs17300539	GG
MC4R(1)	rs17782313	TT
ANKK1	rs1800497	GG
COMT	rs4680	GA
DRD2(1)	rs6277	AA
NMB	rs1051168	GG
LEPR(1)	rs1137100	.
ADIPOQ(1)	rs17366568	GG
HTR2C	rs3813929	C

Hunger Perception



Accurate

You are likely to have good sensing of hunger; abnormal experience of hunger could relate to specific components that make up this report such as dopamine status, hunger hormones from fatty tissue, or intestinal neuropeptides. Consider discussing with your coach to identify specific interventions that may assist.

Satiety Sensing



Accurate

You likely have a propensity to accurately sense your bodily signals of satiety.

MTHFR 1298c	rs1801131	TG
FTO(1)	rs9939609	TT
GHSR(1)	rs572169	CC
GHSR(2)	rs490683	GG
POMC	rs1042571	.
LEPR(2)	rs1137101	.

Insulin Resistance

WHAT THIS MEANS

Insulin is a hormone that regulates the amount of glucose (sugar) in the blood. Insulin resistance means a body requires greater amounts of insulin in order to drive down blood sugar levels. It is usually associated with diabetes or a pre-diabetic state. Studies demonstrate that some individuals possess a greater predisposition towards insulin resistance, which can be more probable based on genetic variations. Individuals that carry greater propensity tend to have higher fasting blood sugar and insulin levels.



WHY THIS MATTERS

Higher fasting blood sugar levels promote accelerated rates of aging and overall lower levels of health. Individuals with a propensity towards insulin resistance often report greater difficulty losing weight than others that follow similar diets (despite aggressive adherence to the diet).

RELEVANT SNP'S

Gene	Marker	Your Genotype
GCKR	rs780094	TT
MTNR1B(2)	rs10830963	CC
TCF7L2(1)	rs7903146	CT
FABP2	rs11724758	GG
PPARD(2)	rs2267668	AA
VDR fok	rs2228570	.
IRS1	rs2943634	AC
CRY2	rs11605924	AA
FADS1(1)	rs174550	CC
PROX1	rs340874	TT
ADCY5	rs11708067	AG
SLC30A8	rs13266634	CT
G6PC2	rs560887	CC

Insulin Resistance Propensity



Average Risk

You have an average propensity towards insulin resistance. This does not mean that you are protected from developing insulin resistance. A healthy diet that keeps simple carbohydrates and sugars low is still advised. Continue working with your coach or physician to measure blood sugar markers such as HbA1c, fasting glucose, and fasting insulin. Consider limiting sugar intake and supplementing with [Berberine](#).

Response to Metformin



Ideal

Likely to have desirable response to metformin

MADD	rs7944584	AT
ADRA2	rs10885122	GG
GLIS3	rs7034200	CC
LIPC(2)	rs1800588	CT
OCT1	rs628031	GG

Dairy Digestion

WHAT THIS MEANS

This section relates to the processing of sugar and fat in dairy products.

Lactose Sensitivity: Lactose is a sugar found in milk, whereas lactase breaks down lactose and is essential to digest milk.

Weight Gain with Dairy Fat: People with certain genetic variants have a propensity towards adverse responses to foods with saturated fat and especially high dairy fat content.



WHY THIS MATTERS

Lactose Sensitivity: Approximately 65% of the world's population is lactose intolerant; however individuals with European ancestry have a propensity to be lactose tolerant. Consuming lactose with a predisposition towards lactose intolerance can result in gut disruption, sinus inflammation, stuffy nose, and phlegm.

Weight Gain with Dairy Fat: Certain genotypes express a greater propensity toward weight gain and obesity when consuming high fat dairy.

Foods with high dairy fat: heavy cream, whole milk, cream cheese, butter, and full-fat yogurt.

RELEVANT SNP'S

Gene	Marker	Your Genotype
APOA2	rs5082	GA
MCM6(1)	rs4988235	GG
MCM6(2)	rs182549	CC

Lactose Intolerance



Strong Genetic Risk

Your genetics correspond with a 5x higher potential for sensitivity to the lactose in dairy. This does not guarantee that you will have lactose intolerance as it is only an increased genetic risk. Keep in mind this does not assess your response to milk proteins.

Dairy Fat Induced Weight Gain



Low Risk

Some people have a genetic propensity for weight gain with too much saturated fat in the diet. Dairy is a significant source of this. Your genetics indicate that you are less sensitive to this effect.

Gluten

WHAT THIS MEANS

In order to develop a gluten allergy, three criteria must be met: genetic predisposition, leaky gut syndrome, and exposure to gluten. The genetics related to gluten are based on predisposition and are only suggestive of susceptibility to developing reactions to gluten in foods. This is not a diagnostic test.

WHY THIS MATTERS

Gluten can be found in wheat and some related grains as well as in many food preparations because it provides elasticity and chewiness to many prepared and processed foods.



Foods containing gluten: wheat, barley, rye, triticale, sauces, and oats

RELEVANT SNP'S

Gene	Marker	Your Genotype
HLA-DQA1	rs2187668	CC
HLA-DQA2	rs2858331	AG
HLA-DRA	rs2395182	TT
HLA-DQB1	rs7775228	TT

Gluten Allergy Propensity



Low Propensity

Your genetics are associated with decreased potential for development of gluten allergy. This does not mean that it cannot develop, only it is less likely.

Grain Sensitivity

WHAT THIS MEANS

Many people believe they have a gluten sensitivity; however, unless there is a demonstrated gluten allergy or celiac diagnosis, it is likely a grain sensitivity. Grain sensitivity is often due to excess glutamate and/or insufficient GABA. Glutamate is involved in virtually every major excitatory brain function, and in excess can cause anxiety, agitation, and difficulty sleeping.

Conversely, gamma aminobutyric acid (GABA) produces an inhibitory and calming effect which can mitigate feelings of anxiety, stress, and fear. Glutamic acid decarboxylase (GAD) is responsible for the conversion of glutamate into GABA; decreased GAD function contributes to a grain sensitivity propensity.



WHY THIS MATTERS

Many grains, sauces, and oils are high in glutamate. When these variations are significant and the symptoms are expressed, it is important to reduce exposure to glutamate. If this is the case, we want to ensure healthy B6 levels since it is required for glutamic acid to work optimally.

Sources of high glutamic acid foods include wheat and grains, soy, dairy, seeds, protein powder, and the flavor enhancer MSG (monosodium glutamate).

RELEVANT SNP'S

Gene	Marker	Your Genotype
GAD1(1)	rs3749034	GA
GAD1(2)	rs3828275	CT
GAD1(3)	rs3791878	GG
GAD1(4)	rs769407	GG
GAD1(5)	rs12185692	CA

Grain Sensitivity



Possible

You have a possible sensitivity to glutamic acid. If you notice undesirable reactions to MSG and grains containing glutamic acid, consider limiting intake of foods listed above and consider supplementing with [Vitamin B6](#) and [Magnesium Glycinate](#).

Sweets and Snacking

WHAT THIS MEANS

Sweet Perception: These genetics look at how intensely we taste sweetness. Genetic variants affects the way our brain responds when we taste something sweet or sugary.

Sweet Addiction Propensity: Along the same lines, many perceive the inability to stop eating sweets is based on willpower; however, this is also coded in DNA.

Snacking Drive: Many people perceive snacking behaviors are based on willpower. While this may be true in some cases, much of the drive toward snacking is coded in our DNA.



WHY THIS MATTERS

Sweet Perception: Those with a decreased sensing of sweetness are likely to consume more sweets, yet, the opposite is not necessarily true - those with an increased sweet perception may not always consume less sweets. Other factors contribute to determining overall sweet intake.

Snacking Drive: Clinical practices have shown there is an extremely high correlation between genetic variations and reported snacking behaviors.

Sweet Addiction Propensity: Research demonstrates there are genes that code for the brain's response to sweet and sugary foods. In some individuals, sugar decreases inhibitions and encourages greater consumption regardless of willpower.

RELEVANT SNP'S

Gene	Marker	Your Genotype
MC4R(1)	rs17782313	TT
ANKK1	rs1800497	GG
COMT	rs4680	GA
DRD2(1)	rs6277	AA
NMB	rs1051168	GG
LEPR(1)	rs1137100	.
FTO(3)	rs1421085	TT
MTHFR 1298c	rs1801131	TG

Sweet Perception



Less Intense Sensing

You're likely to have decreased sweet perception which may contribute to increased sweet intake or a lack of desire for sweets. Be aware that your taste receptors are likely wired to be less sensitive than others, which can drive eating more sugar to get the same "reward" that other people can get from less. Try to use this to your advantage and use mindful awareness while eating sweet foods (eat slowly and consciously enjoy your food).

FTO(1)	rs9939609	TT
FGF21	rs838133	GG
SLCA2	rs5400	AA
SLC2A2	rs1499821	CC
TAS1R2	rs3935570	GT
TAS1R3	rs35744813	.
TAS2R38	rs1726866	GA

Snacking Drive



Genetically Low

You're unlikely to have a strong snacking drive; this is subject to changes in epigenetic expression based on the environment. For example, sugar, stress, and neurotransmitter imbalances can create an increased desire for snacking despite this genetic propensity.

Sweet Addiction Propensity



Typical

People with your genetic profile in this category tend to not over-indulge on sweets due to the genetics of this taste receptor profile.

Carbohydrates

WHAT THIS MEANS

There are two different types of carbohydrates: simple and complex. Simple carbohydrates include foods like sugar, pasta, and bread, whereas complex carbohydrates are primarily fibrous foods such as vegetables.

Carbohydrate Intake: Carbohydrates are a very individualized component of the diet. Using scientific literature and clinical experience, we are able to identify the relevant impactful genes for optimal complex carbohydrate intake.

Fiber Benefit: Research has shown some genetic variants contribute to a desirable response from increased fiber intake.



WHY THIS MATTERS

Simple carbohydrates should generally be avoided. The optimal amount of complex carbs is variable based on genetic predisposition.

Carbohydrate Intake: This is especially relevant in relation to ideal body composition as some people do better with a lower carbohydrate intake while others tend to burn fat in the flame of a carbohydrate.

Fiber Benefit: Some individuals show a propensity towards improved weight loss and cholesterol management with higher levels of fiber in their nutrition plan.

Examples of fibrous complex carbohydrate foods include vegetable such as broccoli, carrots, and leafy greens. Carbohydrates such as sweet potato and rice also provide benefit however are less impactful to desirable outcomes than fibrous vegetables.

RELEVANT SNP'S

Gene	Marker	Your Genotype
KCDT10	rs10850219	GC
MMAB	rs2241201	CC
PLIN1	rs894160	CT
UCP1	rs1800592	TT
TCF7L2(1)	rs7903146	CT
TCF7L2(2)	rs12255372	GT
TCF7L2(3)	rs290487	CC

Carbohydrate Intake

Higher Intake

You're genetics are likely to respond well to a higher complex carbohydrate intake. Research and our clinical experience has found that with your particular genetic variants, you should demonstrate a greater benefit for abdominal fat loss with complex carbohydrate intake greater than 200g/day.

TCF7L2(4)	rs290481	CC
CEBPA	rs12691	GG
ABCG4	rs3802885	AA
VLDLR	rs2242104	GG
IGF1R	rs7166565	GG
LPIN2	rs607549	TT
AGER	rs184003	CC
GIPR	rs2287019	CC
FTO(5)	rs8050136	CC

Fiber Intake



Highly Beneficial

Fiber intake response based on your genetics suggests that it is strongly beneficial.

Interpretations & Recommendations from your coach, Cory Duffy

PLIN1- T allele = complex carbs will aid abdominal fat loss (150-250+ grams/day)

GIPR- C allele = better weight loss and appetite response with higher carb intake

Total Fats

WHAT THIS MEANS

There are three primary fats within the human diet; saturated fats (SFA), monounsaturated fats (MUFA), and polyunsaturated fats (PUFA). There are several opinions regarding which fats are 'good' and which fats are not. There are two problems with this: (1) fats are a macronutrient that our bodies require for optimal health, (2) there are significant differences in how each person responds to the types of fat.



WHY THIS MATTERS

This section provides guidelines for planning the ideal percentage of calories from fat in your daily diet. When using genetic variations to provide guidance on fat intake, it is important to understand that many of the studies used did not differentiate the types of fat.

RELEVANT SNP'S

Gene	Marker	Your Genotype
APOe(3)	rs4420638	AA
PPARG	rs1801282	CC
FABP2	rs11724758	GG
APOA2	rs5082	GA
APOB	rs1367117	GG
ADIPOQ(1)	rs17366568	GG
TFAP2B	rs987237	AG
FTO(1)	rs9939609	TT
TNF	rs1800629	GG
LIPC(1)	rs2070895	GA
APOe(1)	rs429358	TC
APOe(2)	rs7412	.

Total Fat Intake Benefit



Higher Intake Benefit

Your genetics suggest a good response to fat overall and suggests some flexibility here. Some experimentation with higher fat intake may be desirable. See individual fat recommendations for more details.

Saturated Fats

WHAT THIS MEANS

Saturated Fat Intake: Saturated fats (SFA) represent one of the most debated aspects of human nutrition today. Various studies discuss the benefits and drawbacks of SFA intake. The Atkins and Paleo movements have brought saturated fat into the forefront of discussions. Ultimately, saturated fats are necessary for healthy human function. Saturated fat makes up 50% of the membrane fats in every cell of the body and is essential for healthy immune function. The brain is 60% fat and is predominantly saturated fat and cholesterol. Despite this, high intake isn't necessarily beneficial.

APOe Status: APOe status is a genetic predisposition that is highly impactful across many aspects of the human system.



WHY THIS MATTERS

Saturated Fat Intake: Individuals carry genetic variations that change the response to saturated fats from a health and wellness standpoint. The propensity identified below is based on leading scientific studies into genome wide associations as well as from our extensive experience in applying this in clinical practice. Even with moderate intake recommendations, it is best for most individuals to keep saturated fat intake to less than 10% of total calories per day.

APOe Status: APOe status can create differences in how individuals respond to saturated fat. In certain variants, saturated fat intake can trigger an increased propensity towards plaque buildup and cognitive decline over time. Understanding your APOe status can assist you to create bio-specific strategies for optimal outcomes.

Sources of saturated fat include coconut oil, butter, ghee, red meat, and dairy products

RELEVANT SNP'S

Gene	Marker	Your Genotype
PPARG	rs1801282	CC
APOA2	rs5082	GA
APOB	rs1367117	GG
APOe(1)	rs429358	TC
APOe(2)	rs7412	CC
APOe(3)	rs4420638	AA

Saturated Fat Response



Likely Caution

Indications to potentially limit saturated fat intake to less than 5% of your daily caloric intake to encourage desirable outcomes. Some individuals possess genetic variants that create greater inflammation, potential weight gain, and greater risk for health consequences with saturated fat.

APOe Status



APOe 3/4

Apoe 3/4 means it's important to keep saturated fat intake low.

Keep coconut oil, dairy fat, and other high saturated fat foods to a minimum.

Polyunsaturated Fats

WHAT THIS MEANS

Polyunsaturated fatty acids (PUFA) have a role in many physiological processes, including energy production, inflammation modulation, and maintenance of cell membrane integrity. PUFAs include omega-6 (O6) and omega-3 (O3) and are essential for life; there are health benefits to consuming both in the appropriate ratios.

Omega-6 PUFA Intake: O6 contributes to improved immune health and blood clotting and is responsible for providing beneficial inflammation in the body.

Omega-3 Need: O3 plays an important role in the body; its primary functions include maintaining the immune system, counteracting inflammation, and supporting cognitive function.



WHY THIS MATTERS

Research has focused on omega-6/omega-3 ratios and there is a clear benefit to keeping this ratio at 4:1 or less. While this is the beneficial zone, most people consume these fats in a 10:1 ratio. Many in the industrialized world are reaching levels as high as 25:1

Omega-6 PUFA Intake: Individuals with certain genotypes show a propensity towards higher inflammation from Omega-6 and therefore should consume less omega-6 to achieve an optimal ratio.

Omega-3 Need: Research demonstrates having optimal levels of fish-based omega-3 contributes to highly beneficial epigenetic changes.

Beneficial omega-6 sources include nuts and fish, however, other sources such as soybeans, vegetable oils, and sunflower oil should be avoided. Beneficial Omega-3 sources include fatty fish and fish oil.

RELEVANT SNP'S

Gene	Marker	Your Genotype
APOA5	rs662799	AA
FADS1(2)	rs174537	TT
ELOVL2	rs953413	GA
PTGS2(1)	rs5275	AG
COX-2	rs4648310	TT
IL-1B	rs16944	GG
TNF	rs1800629	GG
BDNF	rs6265	CT

Omega-6 PUFA Intake



Lower Intake Beneficial

Keep omega-6 intake on the lower side - many nuts, seeds, vegetable oils - most oils that are liquid at room temperature are high O-6 unless they specifically are high in monounsaturated fat (such as olive oil and avocado oil). Omega-6 fats are required by the body but the amount relative to other fats is important to health. Omega-6 to Omega-3 ratio is best kept on the lower side for optimal health. See the chart of common oil compositions [here](#).

Omega-3 Need



Higher Need

Strong benefit from maintaining optimal omega-6 and omega-3 balance. Consider blood lab testing to assess, as well as [fish oil supplementation](#) and regular seafood consumption.

Interpretations & Recommendations from your coach, Cory Duffy

APOA5- AA = better response from lower saturated fat, increased PUFA and MUFA

ELOVL2- G allele = normal activity; stronger need for DHA

Monounsaturated Fats

WHAT THIS MEANS

Monounsaturated fats (MUFA) support many bodily functions and are typically beneficial for everyone, although some genetic variants indicate an increased benefit from higher levels of intake.

WHY THIS MATTERS?

MUFAs are suspected to be the major health benefit of the Mediterranean diet where some traditionally consume as much as 40% of their total calories from extra virgin olive oil. MUFAs also have a long list of studies supporting health benefits which include; decreased inflammation, lower cancer rates, less chance of heart disease, and weight loss.

Beneficial MUFA sources include extra virgin olive oil, macadamia nut oil, avocado, macadamia nuts, beef, salmon, pumpkin seeds, and chicken.



RELEVANT SNP'S

Gene	Marker	Your Genotype
ADIPOQ(2)	rs17300539	GG
APOA5	rs662799	AA
FAAH	rs324420	CC
LPL	rs13702	TC
IL-1B	rs16944	GG
ADIPOQ(1)	rs17366568	GG
TNF	rs1800629	GG
BDNF	rs6265	CT
GCKR(2)	rs1260326	TT
ANGPTL4	rs2278236	GG

MUFA Benefit

Good Response

You're likely to benefit from monounsaturated fat intake. Extra Virgin Olive oil, macadamia nuts, and avocado are ideal sources. From an epigenetic standpoint, the monounsaturated fat along with the beneficial phytonutrients in olive oil, you cannot go wrong. Olive oil has a profoundly beneficial effect on gene expressions and you possess a genetic pattern that has a good response.

Interpretations & Recommendations from your coach, Cory Duffy

FAAH- CC = improved weight loss, insulin resistance and insulin levels with higher MUFA intake

LPL- C allele = benefit from higher MUFA intake, especially for lowering triglycerides and cholesterol

Protein

WHAT THIS MEAN

The human body requires 20 amino acids (body's building blocks) to create many different proteins. Ten of these amino acids are considered essential, meaning they are not made in the body so must be consumed in the diet. This is a complex network of gene interactions and there are ways to epigenetically shift the expressions of these genes to achieve desired outcomes.



WHY THIS MATTERS

Protein is a macronutrient the body needs in relatively large amounts to grow, develop, and function properly. Some people will respond better to a diet with a higher percentage of calories from protein, while others do better with lower intake.

RELEVANT SNP'S

Gene	Marker	Your Genotype
FTO(2)	rs1558902	TT
LPIN1	rs4315495	GA
BDNF-AS	rs4923461	AG
TFAP2B	rs987237	AG
FTO(1)	rs9939609	TT

Protein and Weight Loss



Lower Intake

You're likely to have optimal weight loss effects from 15-20% of calories from protein

Plant Sterols

WHAT THIS MEANS

Plant Sterol Buildup: Plant sterols are cholesterol-like molecules found in all plant foods, with the highest concentrations occurring in vegetable oils. Plant sterols work by blocking cholesterol absorption.

Plant Sterol Benefit: Plant sterols are typically understood to decrease inflammation, lower cholesterol levels, and enhance cardiovascular support.



WHY THIS MATTERS

Plant Sterol Buildup: Under normal circumstances plant sterols are absorbed in trace amounts, but some individuals have a genetic propensity to absorb greater amounts. Dietary plant sterol intake can be beneficial in some cases, however, excess amounts could be undesirable and contribute to increased plaque build-up.

Plant Sterol Benefit: While many individuals are likely to benefit from plant sterols, some carry genotypes which correspond with no benefit.

RELEVANT SNP'S

Gene	Marker	Your Genotype
ABCG8(1)	rs4299376	GT
ABCG8(2)	rs6544713	TC
ABCG8(3)	rs4245791	CT
CETP	rs5882	AA
ABCG5(1)	rs11887534	GG
ABCG5(2)	rs6720173	GG

Plant Sterol Buildup



Low Probability

You're likely to have regular plant sterol absorption.

Plant Sterol Benefit



Less Likely

Plant sterols are unlikely to provide anti-inflammatory support.

Metabolism

WHAT THIS MEANS

Metabolism is how effectively an individual creates energy and burns calories. Metabolism is often measured using basal metabolic rate (BMR). BMR is the number of calories burned while resting throughout a day; it's a complex combination of genetics and environmental factors.

WHY THIS MATTERS

Metabolism aids in creating precise strategies to fuel your body effectively. Leveraging genetic predispositions can increase the body's energy levels and enhance overall function.



RELEVANT SNP'S

Gene	Marker	Your Genotype
GCKR	rs780094	TT
MC4R(1)	rs17782313	TT
UCP2(1)	rs659366	CC
FTO(6)	rs17817449	TT
PPARGC1A	rs8192678	CT
UCP2(2)	rs660339	GG

Metabolism



Likely Lower

Likely to have slightly decreased resting metabolic rate; may benefit from mitochondria boosters such as high quality sleep, exercise, intermittent fasting, cold showers, [berberine](#), [D-ribose](#), or [NMN](#)

Interpretations & Recommendations from your coach, Cory Duffy

PPARGC1A- TT>CT = Decreased mitochondrial biogenesis; increased need for regular exercise

Interventions: Exercise, high-quality sleep, intermittent fasting, cold thermogenesis
Berberine, NR, green tea extract, MitoQ, D-ribose, resveratrol

About Supplementation

ABOUT SUPPLEMENTATION

As covered in the Nutrition section, nutrigenomics is eating and supplementation to optimize epigenetic expression; strategically consuming nutrients based on the combination of genetics, goals, and lifestyle. Supplementation, obtaining micronutrients from nonfood sources, is the second half of nutrigenomics. Many people believe micronutrients should come solely from food, however modern farming techniques have impacted the nutrient levels in food. The nutrients in vegetables are much lower now than they were 100 years ago.



In addition, our ancestors historically lived in the same environments for generations and their bodies (genes) adapted accordingly. Since then, technology has increased the ability to easily travel around the world. Ease of travel has encouraged blending genetic profiles from a wide variety of environments. Today it is almost impossible to find the environment our genes are optimized for; instead we use supplementation to enhance our genetic expression. This is why the genetic blueprint is so impactful for precise recommendations.

Through nutrigenomics, strategic supplementation can prevent deficiencies and optimize performance. Several of the nutrients in this report can be found in a high quality multivitamin. While going through this report, an epigenetic coach can assist in creating an individualized strategic supplementation plan based on nutrigenomics.

Vitamin B12

WHAT THIS MEANS

B12 Need: Vitamin B12 plays an essential role in the production of red blood cells and DNA, as well as the proper functioning of the nervous system. It is absorbed through the stomach lining and is typically found in animal-based foods.

FUT2 Status: Determines genetic propensity for an individual towards being a secretor or non-secretor. A secretor is likely to have less B12 production in the body and also have a healthy diverse gut bacteria. A non-secretor is likely to produce more B12 in the body and have a less diverse gut biome.



WHY THIS MATTERS

B12 Need: It's estimated that 40% of American's don't get enough vitamin B12, and deficiencies can contribute to fatigue and brain fog.

FUT2 Status: Certain variants of FUT2 show good correlation with body B12 levels as well as propensities for certain gut conditions.

Benefits of Vitamin B12 include:

Increased energy – B12 converts carbohydrates into glucose, increases overall energy, and reduces fatigue.

Improved brain function – B12 helps make DNA and keep the nervous system healthy. It may reduce depression, lower stress levels, and reduce brain shrinkage.

Healthy digestive system – B12 promotes gut health and may prevent heart disease by curbing cholesterol levels, protecting against stroke and high blood pressure.

B12 food sources include liver, salmon, tuna, mackerel, sardines, red meat, cheese, and eggs.

RELEVANT SNP'S

Gene	Marker	Your Genotype
FUT2(1)	rs492602	AA
FUT2(2)	rs602662	GG
FUT2(3)	rs601338	GG
MTR	rs1805087	AG
COMT	rs4680	GA

B12 Need



Increased Need

You're likely to have decreased B12 levels; strong benefit from regular [B12 supplementation](#)

TCN1	rs526934	AA
MTRR A66G	rs1801394	AG
MTHFR 677t	rs1801133	GA
VDR taq	rs731236	AG

FUT2 Status



Secretor

You're likely to have more desirable gut biome health, with reduced levels of B12 in the blood; increased benefit from [B12 supplementation](#).

Vitamin B6

WHAT THIS MEANS

Vitamin B6 is a vitamin which is significant to protein, fat, and carbohydrate metabolism as well as the creation of red blood cells and neurotransmitters. Common symptoms of low vitamin B6 are irritability, depression, and anxiety.

WHY THIS MATTERS

Vitamin B6 is important for many processes in the body; it helps turn food into energy, supports adrenal function, and maintains a healthy nervous system. It also supports the healthy development in babies' brains during pregnancy and breastfeeding.



Benefits of Vitamin B6 include

Adrenal function – Through regulating hormones, B6 lowers stress, stabilizes mood, and contributes to a happy disposition.

Metabolism – Crucial to hundreds of metabolic processes, B6 assists the body to turn food into energy.

Healthy nervous system – B6 is often referred to as the happy vitamin because it helps make serotonin and norepinephrine, which impacts mood.

Digestive support – B6 assists the body to maintain healthy digestive processes.

B6 food sources include brewer's yeast, bananas, milk, cheese, eggs, fish, carrots, spinach, peas, legumes, and potatoes.

RELEVANT SNP'S

Gene	Marker	Your Genotype
NBPF3	rs4654748	TT
ALPL(1)	rs1256341	TT
ALPL(2)	rs1256335	AA

B6 Need



Typical Need

You're likely to have ideal B6 levels

Vitamin A

WHAT THIS MEANS

Vitamin A is naturally present in many foods and has two forms; Beta-carotene and retinoic acid. Beta-carotene is found in plant based food whereas retinoic acid is found in animal foods. The body converts beta-carotene into retinoic acid, and genetics can affect conversion rate. Vitamin A supplements can contain beta-carotene, retinoic acid, or both.

WHY THIS MATTERS

The body relies on vitamin A conversion for healthy maintenance of the heart, kidneys, lungs, and eyes.



Benefits of Vitamin A

Improved immune system – Vitamin A boosts the immune system and assists in fighting infections. It also helps mucus membranes stay moist, which strengthens white blood cell activity.

Healthy skin – With the ability to trap free radicals and toxins, vitamin A keeps skin supple & healthy. Free radicals are unstable atoms that can damage cells, causing illness and aging.

Increased tooth strength – Vitamin A keeps teeth strong by forming a hard material just beneath the surface of the teeth, called dentin.

Eye health – Vitamin A supports macular health and provides overall protection for the eye.

Retinoic acid sources of vitamin A include fish liver oil, beef liver, and egg yolk.

RELEVANT SNP'S

Gene	Marker	Your Genotype
BCMO1(1)	rs7501331	CT
BCMO1(2)	rs12934922	AT
BCMO1(3)	rs11645428	GA
BCMO1(4)	rs6420424	GG
BCMO1(5)	rs8044334	TT
BCMO1(6)	rs6564851	TT

Vitamin A Conversion



Low Conversion

Low conversion of vitamin A. You have a strong benefit from a [multivitamin](#) that includes palmitate.

Selenium

WHAT THIS MEANS

Selenium is a mineral found in the soil which plays a key role in metabolism. It is an antioxidant, so it protects the body from free radicals and oxidative stress. Oxidative stress is an imbalance between the production of free radicals and the ability of the body to counteract their effects.

WHY THIS MATTERS

Selenium delays cell damage and protects the body from oxidizing agents caused by many diseases and pollutants. Selenium is nutritionally essential for everyone as it supports thyroid hormone metabolism and protects against infections. The gauges determine the severity of a selenium deficiency. An increased result does not necessarily a need for more selenium; it indicates a stronger need for optimal levels because deficiencies will likely have a strong impact. Limit selenium below 400mcg per day to avoid having too much.



Benefits of Selenium

Thyroid support – Selenium is important for producing thyroid hormone.

DNA repair – Selenium prevents serious DNA damage by neutralizing free radicals.

Metal detoxification – Organic selenium supports the excretion of the harmful element mercury.

Reproductive health – Selenium is vital reproductive health. In men, it enables sperm movement. In women, low selenium can negatively impact fertility and fetal development.

Selenium sources include brazil nuts, fish, beef liver, pork, and mushrooms.

RELEVANT SNP'S

Gene	Marker	Your Genotype
GPX1(1)	rs1050450	GA
SEPP1	rs7579	TT
AGA	rs1395479	CA
BHMT(1)	rs567754	CC
MST1	rs3197999	GA
DMGDH	rs921943	CC

Selenium Need



Increased Need

You're likely to have more intense symptoms with selenium deficiency; likely to benefit from regular supplementation such as in a [multivitamin](#).

Magnesium

WHAT THIS MEANS

Magnesium is a mineral found in the earth, sea, plants, animals, and humans. It is an essential nutrient needed in high amounts, however, about 50% of Americans are likely deficient. 200-400 milligrams per day is typically recommended.

WHY THIS MATTERS

Magnesium is vital to over 300 reactions in the body including metabolism, transmission of nerve impulses, and blood pressure regulation. It impacts several systems and can affect mood.



Benefits of Magnesium

Bone strength – Magnesium supports bone absorption of calcium.

Healthy metabolism – Magnesium is essential in metabolic processes, especially carbohydrate processing.

Heart health – Magnesium is responsible for keeping the heart muscles healthy and strong. It assists with the transmission of electrical signals throughout the body. Proper magnesium levels have shown to lower artery calcification, hypertension, and atherosclerosis (fatty buildup on artery walls).

Anxiety – Low magnesium levels have been shown to increase anxiety.

Gut – Magnesium works as a stool softener and can relieve constipation naturally.

Magnesium food sources include dark leafy greens, brazil nuts, mackerel, white beans, quinoa, avocados, yogurt, bananas, and dark chocolate.

RELEVANT SNP'S

Gene	Marker	Your Genotype
CNNM2	rs3740393	GG
MUC1	rs4072037	CC
DCDC5	rs3925584	TT
Shroom3	rs13146355	GG
TRPM6(1)	rs2274924	TT
TRPM6(2)	rs3750425	CC

Magnesium Need



Supplementation Benefit

You're likely to benefit from regular supplementation. [Magnesium Glycinate](#) benefits sleep, [Magnesium Threonate](#) benefits cognition and performance

Choline

WHAT THIS MEANS

Choline is an important ingredient in many process and plays a major role in metabolism and neurotransmitter health. The body doesn't produce sufficient quantities of this essential nutrient to maintain optimal health.

WHY THIS MATTERS

Less than 10 percent of adults get enough choline in their diet. Some risks of choline deficiency include muscle damage, anxiety, and brain fog. Those at risk for choline deficiency include: pregnant women, choline depleted diets (plant based diets), and people with genetic variations. It's particularly important for fetuses and babies to ensure healthy brain development.



Benefits of Choline

Cell structure – Choline make the fats that help maintain the structural integrity of all cell membranes.

Cell messaging – Choline assists with the production of compounds that act as cell messengers.

Fat transport and metabolism – Insufficient choline levels can lead to fatty liver.

DNA synthesis – Choline, vitamin B12, and folate are three vital nutrients in DNA synthesis.

Nervous system health – Acetylcholine, a neurotransmitter involved in memory, muscle movement, and regulating heartbeat, is derived from choline.

Choline food sources include beef liver, eggs, chicken breast, cauliflower, broccoli, mushrooms, dark leafy greens, shellfish, asparagus, brussel sprouts, bok chow, and cod.

RELEVANT SNP'S

Gene	Marker	Your Genotype
BHMT(2)	rs3733890	GG
CHDH	rs9001	TT
MTHFD1	rs2236225	GA
PEMT	rs7946	CT
CHKA	rs10791957	AA

Choline Supplementation Need



Increased Need

You're likely to have higher choline needs; this is especially impactful for pregnant women, and individuals with regular exercise programs. Regular consumption of runny egg yolks is recommended, or [Alpha GPC](#) supplementation.

Vitamin C

WHAT THIS MEANS

Vitamin C, also known as ascorbic acid and ascorbate, is a nutrient that plays several key roles in bodily functions. It isn't produced by the body naturally and is consumed in the form of fruits and vegetables.

WHY THIS MATTERS

Vitamin C is a powerful antioxidant responsible for trapping free radicals and preventing harmful effects of toxins. Those with a genetic predisposition or those with diets lacking fruits and vegetables have a stronger propensity for deficiency.



Benefits of Vitamin C

Collagen synthesis – Vitamin C repairs and regenerates tissues and maintains healthy skin and connective tissue.

Protection against heart disease – Through increasing the body's level of glutathione, vitamin C protects the arteries.

Iron absorption – Vitamin C prevents anemia and assists iron absorption.

Cholesterol and triglyceride reduction – Vitamin C reduces the risk of heart attack and stroke.

Blunts oxidative stress – In disease states, vitamin C has shown to help reduce cellular damage by free radicals.

Vitamin C food sources include bell peppers, guava, dark leafy greens (especially turnip greens), kiwi, broccoli, strawberries, tomatoes, peas, papaya, oranges, grapefruits, and lemons.

RELEVANT SNP'S

Gene	Marker	Your Genotype
GSTT1	rs11550605	.
SLC23A1(1)	rs6596471	AG
SLC23A1(2)	rs10063949	TT
SLC23A2	rs6133175	AG

Vitamin C Need



Much Increased Need

Your genes are associated with lower C levels.

1-2g of [liposomal vitamin C](#) supplementation recommended each day

Vitamin E

WHAT THIS MEANS

Vitamin E Need: Vitamin E plays a vital role in many aspects of health. Although there are eight forms of Vitamin E, Alpha-tocopherol is the only form that is readily absorbed and used by the body.

Vitamin E Inflammation Propensity: While vitamin E is typically anti-inflammatory, some genotypes are predisposed to inflammation from high dose supplementation.



WHY THIS MATTERS

Vitamin E Need: Vitamin E is a powerful antioxidant that assists in maintaining optimal levels of selenium, vitamin K, and many other essential nutrients.

Vitamin E Inflammation Propensity: High dose vitamin E (greater than 400IU) can correspond with high levels of inflammation in individuals with genetic predisposition.

Benefits of Vitamin E

Helps store vitamins A, K, iron, and selenium – Vitamin E helps maintain sufficient levels of many essential nutrients.

Supports the formation of red blood cells – Red blood cells rely on vitamin E to strengthen their interior lining, which is another way it toughens the immune system.

Keeping skeletal, cardiac, and smooth muscles healthy – Vitamin E is important for the structural function and maintenance of these muscles.

Prevent eye damage – Studies suggest relatively high vitamin E intake may reduce the occurrence of macular degeneration and cataracts in elderly individuals.

Vitamin E food sources include almonds, swiss chard, pine nuts, broccoli, mustard greens, avocado, spinach, turnip greens, kale, plant oils, and hazelnuts.

RELEVANT SNP'S

Gene	Marker	Your Genotype
CD36	rs1527479	TC
SCARB1	rs11057830	GA
ZPR1	rs964184	CC
TNF(2)	rs361525	GG
GSTP1(1)	rs1695	AA
IL10	rs1800896	TC

Vitamin E Need



Typical Need

You're likely to have optimal vitamin E levels.

Vitamin E Inflammation Propensity



High Propensity

You're likely to have an inflammatory reaction to high-dose vitamin E supplementation rather than an anti-inflammatory effect; avoid >400 IU of vitamin E supplementation. Levels found in food and multivitamins are fine.

Vitamin D

WHAT THIS MEANS

Vitamin D is not readily found in many foods. An estimated 70 percent of the population is thought to be vitamin D deficient. This is concerning because it is responsible for regulating over 1000 genes in the human genome.

Sunlight Response: The skin can convert sunlight into vitamin D.

Vitamin D Testing: There is an active and inactive form of vitamin D. The active form is the form that supports the body: however, when testing vitamin D levels most blood analysis only look at the inactive form. The inactive form tends to correlate well with the active form. In some rare cases, some individuals genetics correspond with higher levels of the active form which is not reflected in typical vitamin D testing.



WHY THIS MATTERS

Vitamin D Supplementation Need: From a genetic standpoint, people tend to vary in their ability to process dietary vitamin D. This means that there's a difference in the baseline amount needed to maintain healthy vitamin D levels from person to person.

Sunlight Response: Certain genotypes demonstrate a decreased ability to convert sunlight into vitamin D.

Vitamin D Testing: When individuals have the corresponding genetics, analysis of the active form of vitamin D (1,25) in combination with the inactive form (25-OH) may be beneficial to determining optimal levels.

Benefits of Vitamin D

Bone health – Vitamin D increases calcium and strengthens bones.

Prevention of diabetes – Vitamin D can decrease the risk of both Type 1 and Type 2 diabetes.

Heart health – Studies have shown vitamin D deficiency as a risk factor for congestive heart failure and heart attacks.

Mood regulator – Vitamin D is believed to reduce or prevent depression.

Muscle growth – Vitamin D has been shown to aid in muscle growth and retention in both adults and the elderly.

Vitamin D food sources include fatty fish, tuna, mackerel, salmon, beef liver, cheese, egg yolks, and cod liver oil.

RELEVANT SNP'S

Gene

Marker

Your Genotype

GC	rs2282679	TT
CYP2R1(1)	rs12794714	GG
CYP2R1(2)	rs1993116	GG
CYP2R1(3)	rs10741657	GG
DHCR7	rs7041	CC
DHCR7(2)	rs12785878	TT
CYP27B1	rs4646537	TT
CYP24A1	rs2296241	GA
Klotho	rs9536314	TT
VDR taq	rs731236	AG
VDR apal	rs7975232	CA
VDR fok	rs2228570	.
VDR bsm	rs1544410	CT
TYR	rs1042602	CA
TYR(2)	rs1393350	GG

Vitamin D Supplementation Need



Typical Need

You're likely to benefit from [vitamin D supplementation](#) due to global deficiency; measuring via blood lab testing can support optimal performance

Sunlight Response



Typical

You're likely to convert sunlight into vitamin D effectively.

Vitamin D Testing



Suggest Added Testing

Your genetics suggest typical vitamin D testing may be unreliable. Consider testing inactive and active vitamin D levels with a physician or coach to ensure optimal management.

Vitamin K

WHAT THIS MEANS

Vitamin K has many different forms that contribute to blood clotting, bone metabolism, and regulating blood calcium levels. The most impactful forms of vitamin K include vitamin K1 and vitamin K2. Vitamin K1 is found in plants, such as leafy green vegetables. Vitamin K2 is usually of bacterial origin and can be found in some animal-based and fermented foods, it is mostly converted by the large intestine or liver from vitamin K1.



WHY THIS MATTERS

Many people get an adequate amount of vitamin K through their diet. It's also present in most multivitamin supplements. Genetics are an active player in this process and can be predictive of absorption and conversion.

Benefits of Vitamin K

Bone health – In a study in the Netherlands, vitamin K2 was three times more effective in enhancing bone metabolism than K1.

Blood clotting – Vitamin K is essential to blood clotting. In fact, in studies of severe vitamin K deficiency, clotting was almost impossible.

Supporting the efficacy of vitamin D – Vitamin K improves the impact of vitamin D when they are taken in combination.

Vitamin K1 food sources include spinach, kale, turnip greens, collards, swiss chard, mustard greens, parsley, romaine, brussel sprouts, broccoli, cauliflower, and cabbage. Vitamin K2 food sources include fermented foods, liver and natty

RELEVANT SNP'S

Gene	Marker	Your Genotype
APOe(1)	rs429358	TC
APOe(2)	rs7412	.
NQ01	rs1800566	GG

Vitamin K Need



Typical Need

You're likely to have typical propensity for a vitamin K deficiency, and typical effects from deficiency.

Folate

WHAT THIS MEANS

Folate Need: Folate, or vitamin B9, is one of the B-vitamins needed to make red and white blood cells in the bone marrow, convert carbohydrates into energy, and produce DNA. It is available in many foods and typically found in multivitamin supplements.

Folic Acid Conversion: Folic acid is the synthetic, inactive form of vitamin B9. In order to be used by the body, it needs to be converted into the active form: folate.



WHY THIS MATTERS

Folate Need: It's difficult to get too much folate from food; however, it is possible to consume too much folic acid in the form of supplements or fortified foods. Folate is crucial to the body, brain and heart; those organs rely on sufficient folate levels for optimal health.

Folic Acid Conversion: Some individuals have a genetic predisposition towards decreased conversion of folic acid. When folic acid is consumed regularly, it can lead to a buildup in the body which can contribute to undesirable outcomes.

Benefits of Folate

DNA synthesis and repair – Folate helps with the creation and maintenance of DNA.

Tissue growth – Folate's role in DNA synthesis makes it essential to tissue and cell growth.

Cardiovascular health – Studies have shown that folate encourages normal cholesterol levels which are important to cardiovascular health.

Neurological health – Most observational studies show that higher folate levels correlate with low Alzheimer's disease and dementia.

Folate food sources include beef liver, spinach, broccoli, bananas, strawberries, oranges, beans, avocado, tomatoes, beets, celery, asparagus, legumes, yeast, mushrooms, fish, and eggs.

RELEVANT SNP'S

Gene	Marker	Your Genotype
DHFR(1)	rs1643649	TC
FOLR1	rs2071010	GG
DHFR(2)	rs70991108	DI
SLC19A1	rs1051266	TT

Folate Need



Increased Need

Your genetics are associated with increased folate need; recommend low-dose supplementation via a [multivitamin](#).

MTHFR
677t

rs1801133

GA

Folic Acid Conversion



MTHFR
1298c

rs1801131

TG

Low

A buildup of folic acid is likely with supplementation; avoid folic acid form, and use the methylfolate form of B9 instead.

Thiamine

WHAT THIS MEANS

Thiamine, also known as vitamin B1, is essential to many bodily functions, including nervous system integrity, muscle function, digestion, and carbohydrate metabolism.

WHY THIS MATTERS

Very little thiamine is stored in the body and depletion can occur quickly when not supplied through diet or supplementation. It is sometimes called an "anti-stress" vitamin because it can strengthen the immune system and improve the body's ability to withstand stressful conditions.



Benefits of Thiamine

Energy production - B1 is responsible for converting sugar into energy which supports the smooth functioning of the body organs, especially the heart, brain, lungs, and kidneys.

Improves brain function - It ensures optimal cognitive performance of the brain and helps improve memory and concentration. Vitamin B1 helps relieve stress and also helps strengthen the nerves.

Thiamine food sources include beef, brewer's yeast, legumes (beans, lentils), milk, nuts, oats, oranges, pork, and rice.

RELEVANT SNP'S

Gene	Marker	Your Genotype
SLC19A3	rs6713116	CC

Thiamine Need



Increased

You're likely to benefit from increased thiamine intake from foods. For optimal levels, ensure your B complex or [multivitamin](#) has thiamine or focus on macadamia nuts as a source.

Copper

WHAT THIS MEANS

Copper is a micronutrient that is involved in many processes in the body and can easily become deficient due to the lack of intake (even in a healthy diet). The body cannot produce copper on its own so it requires dietary intake with food or supplementation.

WHY THIS MATTERS

Copper has a narrow range of safety; it is a common deficiency yet can create toxicity if over-supplemented. Most whole food sources are low in copper.



Benefits of Copper

Cognitive function - Too little or too much copper can have a negative impact on the brain. Ideal levels promote growth and development of brain pathways.

Thyroid health - Copper promotes optimal thyroid levels. A healthy thyroid is important in keeping adequate absorption of copper from the diet.

Long-term health - Copper is a requirement for ongoing DNA maintenance and repair.

Bone - Copper is important in maintenance and repair of bone and cartilage. Deficiencies can lead to low bone density.

Blood - Lack of copper can lead to iron deficiency.

Skin & hair - Copper is involved in the production of melanin, a pigment responsible for skin and hair color.

Copper food sources include oysters, shellfish, whole grains, beans, nuts, potatoes, and organ meats (kidneys, liver, etc).

RELEVANT SNP'S

Gene	Marker	Your Genotype
SELENB1	rs2769264	TG
ATP7B	rs76151636	GG

Copper Levels



High Levels Likely

Your genetics are associated with higher copper levels in the blood.

Copper/zinc/ceruloplasmin testing through a physician may be beneficial depending on symptoms. Avoid supplementation without directly testing blood levels.

Zinc

WHAT THIS MEANS

Zinc is an essential mineral responsible for regulating the nervous system. It assists at least 100 different processes in the human body and is a common micronutrient deficiency.

WHY THIS MATTERS

Deficiencies can lead to many health issues and optimal levels are essential to thrive. Plant based sources of zinc generally provide significantly lower bioavailability than animal based food sources.



Benefits of Zinc

Immunity - Zinc is an essential nutrient for the immune system.

Cognitive function - It is essential for optimal communication between neurons in the brain.

Common cold - Zinc has been shown to lessen the severity and duration of the common cold.

Wound healing - Zinc decreases inflammation and reduces bacterial growth to maintain skin integrity.

Taste & smell - The senses of taste and smell are reliant on zinc for proper function; it has been shown to heighten these senses.

Weight loss - Zinc deficiencies can lead to overeating.

Zinc food sources include oysters, beets, chicken, pork, seeds, nuts, lentils, and mushrooms.

RELEVANT SNP'S

Gene	Marker	Your Genotype
CA1	rs1532423	AG
PPCDC(1)	rs2120019	TC
PPCDC(2)	rs4826508	T

Zinc levels



High Levels Likely

Your genetics are associated with higher levels of zinc maintained in the blood.

Copper/zinc/ceruloplasmin testing through a physician may be beneficial depending on symptoms. Avoid supplementation without directly testing blood levels.

Iron

WHAT THIS MEANS

Iron Need: Iron is an essential mineral and one of the most common nutritional deficiencies around the world. Individuals with the highest likelihood of an iron deficiency include menstruating females, pregnant women, children, and those consuming a plant based diet.

Iron Excess Propensity: Some individuals have a genetic propensity towards increased iron levels.



WHY THIS MATTERS

Iron Need: Almost 10% of women in developed countries are iron deficient. Fatigue, insomnia, hair loss, and ice crunching are common signs of deficiency. Inadequate intake of vitamin C can contribute to iron malabsorption. Plant based iron is not incorporated as well as animal based iron.

Iron Excess Propensity: Excessive levels of iron can contribute to fatigue, weakness, loss of libido, and high blood sugar.

Benefits of Iron

Hemoglobin production - Dietary iron is a critical component for producing oxygen transport proteins within red blood cells.

Oxygen transport - Iron contributes to oxygen transport throughout muscles.

Muscle function - Iron is critical for the brain and it is important in the production of neurotransmitters. Insufficient iron in the diet is associated with low iron levels in the brain which can lead to changes in behavior and cognitive functioning.

Iron food sources include fish, eggs, meat (especially high in red meats) legumes, lentils, green leafy vegetables, spinach, turnips, and sprouts.

RELEVANT SNP'S

Gene	Marker	Your Genotype
TMPRSS6	rs4820268	GG
TFR2	rs7385804	CA
TF	rs3811647	GA
HFE(1)	rs1799945	CC
HFE(2)	rs1800562	GG

Iron Need



Increased

You're likely to have increased iron requirements. Consider checking ferritin or transferrin levels with a physician, especially if you're female or consuming a plant-based diet. Increasing vitamin C intake will support absorption in general.

HFE(3)

rs1800730

AA

Iron Excess Propensity



Typical

You're unlikely to have increased iron levels.

Nitric Oxide

WHAT THIS MEANS

Nitric Oxide is a molecule made by the body that allows blood, nutrients, and oxygen to travel to every part of your body effectively and efficiently. Bodies are capable of producing nitric oxide but some genetic variants can alter that ability. Nitrates are the natural forms of nitric oxide that the body can utilize. 80% of the nitrates in our diet come from vegetables. Interestingly, organic vegetables have less nitrates than conventionally farmed food due to reduced use of nitrogen based fertilizers.



WHY THIS MATTERS

High levels of nitric oxide have been shown to boost endurance and oxygen utilization.

Benefits of Nitric Oxide

Cardiovascular – Nitric oxide can lower blood pressure and dilate blood vessels.

Exercise – Nitrates have been shown to decrease oxygen requirements of muscles during exercise and lead to greater endurance.

Brain – Nitric oxide is a potent antioxidant in the brain and functions as a neurotransmitter.

Immunity – Nitric oxide is used by our immune cells to kill invading bacteria.

Nitric oxide food sources include spinach, kale, beets, carrots, legumes, celery, eggplant, ham, and bacon.

RELEVANT SNP'S

Gene	Marker	Your Genotype
NOS3(2)	rs2070744	TT
NOS1(1)	rs3782218	CT
NOS1(2)	rs2682826	GG
NOS2	rs2248814	GG
NOS3(1)	rs1800779	AA
NOS3(3)	rs7830	GG

Nitric Oxide Need



Typical Need

Your genetics are associated with normal nitric oxide levels; consider using a [saliva tester strip](#) to check levels to ensure optimal performance

Sodium

WHAT THIS MEANS

Sodium balance is one of the most monitored systems in the body. Because sodium is so important to the maintenance of health, it is finely tuned to a very narrow and precise level. Taking excess sodium for most people will not result in health problems, assuming the body is functioning well.

WHY THIS MATTERS

Genetics can increase the effect the sodium on blood pressure and overall functionality.

Types of sodium include table salt (sodium chloride and iodine), himalayan salt (slightly lower sodium plus calcium, potassium, iron oxide (pink color)), and celtic salt (slightly lower sodium and trace minerals).



RELEVANT SNP'S

Gene	Marker	Your Genotype
ACE del	rs4343	GG
AGT	rs699	AG
ADD1	rs4961	GG
NEDD4L	rs4149601	AA
WNK1	rs12828016	GG

Sodium Sensitivity



Increased Possibility

Your genetics suggest higher correlation between blood pressure and sodium. If you notice the effects of sodium on blood pressure, it may be beneficial to reduce sodium intake.

Caffeine

WHAT THIS MEANS

Caffeine is a stimulant of the central nervous system. It is one of the most researched substances in the history of science and the world's most consumed psychoactive drug. Genetic propensity can determine how beneficial caffeine is for an individual's system.

Caffeine Metabolism: Genetics provide an insight into how quickly an individual breaks down or metabolizes caffeine.

Caffeine Jitters: Many people experience jitters when consuming high amounts of caffeine, genetics can inform the predisposition to experience jitters with low or moderate consumption.



WHY THIS MATTERS

Caffeine Metabolism: While many individuals metabolize caffeine slowly, some have a genetic propensity to eliminate caffeine from their bodies efficiently. Studies demonstrate fast metabolizers have additional benefits from caffeine consumption.

Caffeine Jitters: Caffeine may cause anxiety and have undesirable effects on sleep. While this is dependent on several variables such as timing and quantity, some have an increased genetic propensity.

Benefits of Caffeine

Energy – Caffeine can improve daily energy by interfering with a substance called adenosine.

Fat burning – Caffeine is one of only a handful of natural substances proven to improve fat loss.

Physical performance – Caffeine is a true performance enhancing substance.

Reduced risk of neurodegenerative diseases - Coffee itself has been linked to reduced risk of cognitive decline.

RELEVANT SNP'S

Gene	Marker	Your Genotype
ADORA2A	rs5751876	CC
ADA	rs73598374	CC
CYP1A2(1)	rs762551	CA
CYP1A2(2)	rs2472297	CC
AHR	rs4410790	TC

Caffeine Metabolism

Slow Metabolizer

Your genetics are associated with slower caffeine metabolism; caffeine is likely to be less beneficial for cardiovascular health, blood pressure and athletic performance.

Limit coffee consumption to 1 cup/day or less and only consume during morning time.

Caffeine Jitters



Typical

You have a typical propensity towards jitters from caffeine.

About Sleep

ABOUT SLEEP

33% of your life is spent sleeping.

Sleep is the cornerstone of the human system. If sleep is out of balance, no other area will function effectively. Not only is it foundational, it is the most ignored performance enhancing activity. It is the most impactful and yet often the most neglected area of wellness.

As you learned in Nutrition and Supplementation, humans are able to change gene expression with lifestyle changes. Sleep genes are a little different; typically the most effective way to optimize expression is by following your genetic blueprint and keeping healthy sleep habits.

Studies show sleep deprivation and alcohol consumption have the similar effects on cognition. Two hours of sleep loss is the equivalent to drinking 2-3 beers; 8 hours of sleep loss has the same effect as having 10-11 beers.

Sleep needs to be optimized in order to benefit from exercise, weight loss, and cognitive performance.



Circadian Propensity

WHAT THIS MEANS

The circadian rhythm is a cycle that signals our bodies when to sleep, rise and eat. Humans are a diurnal species, meaning we are active during the day and sleep at night. Many feel more awake, alert, and capable of our best work effort in the morning. However, there are those at the opposite end of the spectrum who prefer to stay up late and sleep well into the daytime hours. These individuals find themselves most alert in the evening.



WHY THIS MATTERS

Recent research has revealed that the circadian clock is not as basic as we once suspected. Individual circadian variations regulate the timing of functions such as appetite, hormone release, and metabolism. Sleep genes are some of the most important and impactful genetics individuals inherit. They are also unlikely to change with epigenetic expression. While some individuals are aware with their circadian rhythms, many are living in opposition of their genetic propensities. Forcing the body to fit into a sleep-wake cycle that does not match our genetics, can lead to circadian desynchronization.

RELEVANT SNP'S

Gene	Marker	Your Genotype
PER3(1)	rs10462021	GG
PER3(2)	rs228697	CC
AANAT	rs28936679	.
GNB3	rs5443	CC
PER2(2)	rs934945	CT
ARNTL	rs2278749	CC

Circadian Propensity



Morning

You're likely to perform best with early wake and sleep times. 8-10pm is typically ideal bedtime, with a 4-6am wake-time. Reinforce this with good light exposure habits and sleep hygiene.

Melatonin

WHAT THIS MEANS

Melatonin is the sleep hormone. Genetic can help to guide the need for supplementation by looking at production, response to supplementation, and breakdown speed. Melatonin can be supplemented in conditions where production or response is diminished.



Melatonin Production: Light has a strong production on melatonin; melatonin production decreases when light gets brighter and increases as lights dim. It can take up to 4 hours to produce optimal melatonin levels for optimal sleep.

Melatonin Response: Certain individuals tend to respond to melatonin supplementation whereas others experience minimal effects.

Melatonin Breakdown: Similar to caffeine, genetics can predispose individuals to vary in melatonin breakdown efficiency.

WHY THIS MATTERS?

Melatonin Production: Production drops off dramatically as we age and this can have significant health impacts. Genetics provide an understanding as to optimal strategies to increase melatonin production and increase sleep quality.

Melatonin Response: Those with specific genetics may experience a better response from dietary sources of melatonin rather than supplementation.

Melatonin Breakdown: Depending on melatonin breakdown efficiency, some forms of melatonin may be more beneficial than others. For example, a fast metabolizer may benefit from a delayed release supplement, whereas a slow metabolizer may feel waking drowsiness from the same levels.

Functions of melatonin:

Sleep - Melatonin is intimately involved with regulation of our circadian rhythm.

Antioxidant - A powerful free radical scavenger, melatonin interacts with immune cells to help boost response to infectious organisms.

Immune function - Melatonin interacts with immune cells to help boost response to infectious organisms.

Anti-aging - Melatonin plays a role in longevity.

RELEVANT SNP'S

Gene	Marker	Your Genotype
MTNR1B(1)	rs1387153	CC
MTNR1B(2)	rs10830963	CC

Melatonin Production



Moderate

You're likely to have moderate production of melatonin; strong benefit from maintaining healthy sleep habits.

MTNR1B(4)	rs7942988	CC
TPH2(1)	rs4570625	GT
AANAT	rs28936679	.
ADA	rs73598374	CC
CYP1A2(1)	rs762551	CA

Melatonin Response



Average

You're likely to respond effectively to [melatonin supplementation](#).

Melatonin Breakdown



Slow

You're likely to break down melatonin slowly throughout the night; you're likely to benefit from lower doses (0.3 to 1.5mg) of supplementation. Extended-release melatonin should be avoided.

Sleep Onset

WHAT THIS MEAN

Normal sleep onset is the time from lying down to the first stages of sleep. Onset is approximately 15-20 minutes, however, falling asleep faster can indicate a degree of sleep deprivation.

WHY THIS MATTERS

Individual genetics play a large role in predicting longer or shorter sleep onset. Despite possessing a propensity for delayed sleep onset, identifying the genetic components that are most impactful to the process allows a much more directed and personalized approach to optimal sleep interventions. Onset of sleep outside of the typical range usually indicates either a genetic or lifestyle component.

0-5 minutes = severe sleep deprivation
 6-15 minutes = moderate sleep deprivation
 15-20 minutes = normal
 >20 minutes = probable genetic or environmental



RELEVANT SNP'S

Gene	Marker	Your Genotype
NPSR1	rs324981	AT
CLOCK(3)	rs1801260	AA
PER3(1)	rs10462021	GG
PER3(2)	rs228697	CC
COMT	rs4680	GA
AANAT	rs28936679	.
CACNA1C(1)	rs4765913	AT
CACNA1C(2)	rs2239063	AC

Sleep Onset



Typical Onset

You're likely to fall asleep normally; within 15-20 minutes of going to bed or starting your sleep routine.

Sleep Duration

WHAT THIS MEANS

When we don't get enough sleep we experience surges of stress hormones which disrupt cognition and emotional regulation.

WHY THIS MATTERS

Just two hours of sleep deprivation (5 - 6 hours of sleep) results in a vigilance level equivalent to the consumption of two alcoholic drinks. Despite the detrimental decline in vigilance *our perceived level of vigilance will be normal*. Lost sleep reduces productivity, diminishes concentration, and impairs memory. It lowers creativity, reduces the ability to communicate, impairs motor skills, and increases stress and anxiety. Assessing your genetic sleep variations and establishing effective sleep strategies are essential steps in the process of sleep optimization.



Sleep requirements: Teens need 9-10 hours of sleep whereas adults need 7-9 hours.

RELEVANT SNP'S

Gene	Marker	Your Genotype
NPSR1	rs324981	AT
CLOCK(1)	rs11932595	AA
CLOCK(2)	rs1801260	AA
COMT	rs4680	GA
ADA	rs73598374	CC
GNB3	rs5443	CC
ABCC9(1)	rs1517284	TT
GRIA3(1)	rs687577	C
ABCC9(2)	rs11046205	GG
CLOCK(4)	rs12649507	GG
DEC2	rs121912617	GG

Sleep Duration



Shorter Sleep Time

Your genetics are associated with shorter sleep cycles. (6.5-8 hours of high quality sleep is desirable). Consider the impact of this section in combination with sleep onset and sleep disruption.

Sleep Disruption

WHAT THIS MEANS

Sleep is the most important thing you can do to improve performance in life. Sleep quality is determined by a complex network of interacting physiological processes which are strongly influenced by lifestyle. It is influenced by the amount of deep sleep, the number of rapid eye movement (REM) episodes, and the number and duration of waking episodes. When our lifestyle is not in sync with our chronotype, sleep quality can be significantly impacted.



WHY THIS MATTERS

Genetic predispositions can provide a directed approach that can be taken to improve sleep quality. It's important to align with your circadian propensity before addressing sleep quality.

RELEVANT SNP'S

Gene	Marker	Your Genotype
MTNR1B(4)	rs7942988	CC
PPP2R4	rs10988217	AA
COMT	rs4680	GA
ADORA2A	rs5751876	CC
GNB3	rs5443	CC
GRIA3(1)	rs687577	C
ARNT	rs2228099	CG
FABP7	rs2279381	CC
TNF	rs1800629	GG
BDNF	rs6265	CT

Sleep Disruption



Low

Overall, your genetics are indicative of natural propensity for good sleep quality with healthy sleep habits. If your experience is different, your coach can assist in achieving your sleep goals.

Daytime Drowsiness

WHAT THIS MEANS

Daytime Drowsiness involves a decreased ability to regulate sleep/wake cycles.



WHY THIS MATTERS?

Certain genotypes may predispose individuals to increased daytime drowsiness propensity in combination with micronutrient deficiencies.

RELEVANT SNP'S

Gene	Marker	Your Genotype
HLA-DRB1	rs3135388	GG
TRCA	rs1154155	TT
P2RY11	rs2305795	GA

Daytime Drowsiness Propensity



Unlikely to Express

You have a low propensity towards daytime drowsiness. If you're experiencing sleepiness during the day, it may be the result of sleep deprivation. Your coach can assist in enhancing your performance.

Sleep Movement

WHAT THIS MEANS

Excessive sleep movement is a condition that can disrupt your sleep. It is characterized by a need to move the legs and tends to be worse while attempting to sleep. Spontaneous movements are triggered by rest, relaxation, or sleep. Potential causes include iron deficiency, genetic predisposition, brain neurotransmitter imbalances, and increased brain glutamate.



WHY THIS MATTERS

Carrying genetic predispositions does not suggest that it is present, this is solely based on probability. Many people have the symptoms without a genetic predisposition as well. The genetic variations can provide interventions that will have a higher probability of mitigating expression.

RELEVANT SNP'S

Gene	Marker	Your Genotype
MEIS1	rs2300478	TG
BTBD9(1)	rs9357271	TT
BTBD9(2)	rs3923809	AG
MAP2K5(1)	rs12593813	AG
MAP2K5(2)	rs11635424	AG
PTPRD	rs4626664	GA

Excessive Sleep Movement Propensity



Increased

Increased propensity towards sleep movement; consider [vitamin B6](#) and [magnesium glycinate](#) to support; also consider measuring ferritin through your physician/coach to ensure optimal iron levels.

Phase 1 Detox

WHAT THIS MEANS

Phase 1 is the first line of defense against toxins.

Although 'toxins' have a negative connotation, they are necessary for bodily function. Toxins include medications, supplements, and even things that are produced by an individual's physiology. Phase 1 changes toxins into a form that can be flushed out of an individual's system.

Medication, anesthetic, acetaminophen, and NSAID metabolisms: Each individual has different breakdown speeds of various toxins depending on genetic propensity and also epigenetic factors.

Estrogen Metabolism: This is a more complex breakdown compared to other toxins. There are multiple ways estrogen can break down; some more desirable than others. Genetics can predict this likelihood.



WHY THIS MATTERS

This first phase can convert toxins into benign forms but it also has the potential of creating an even more toxic product. Therefore, it is important to pay attention to both phase 1 and phase 2 detoxification pathways.

Medication, anesthetic, acetaminophen, and NSAID metabolisms: Depending on breakdown speed, individuals can experience different forms of imbalance when there's a build-up of these toxins. Understanding one's propensity can provide insight into how the body responds to them.

Estrogen Metabolism: Understanding the propensity can indicate an area that may benefit from more precise measurement and support.

RELEVANT SNP'S

Gene	Marker	Your Genotype
CYP1A1	rs2606345	CA
CYP2A6(2)	rs5031017	CC
CYP2C9(2)	rs1799853	.
CYP1B1(1)	rs1056836	CC
CYP2C19(2)	rs28399504	AA
CYP3A4(1)	rs2740574	TT
CYP2D6(1)	rs3892097	CT

Medication Metabolism



Optimal

Ideal breakdown of nicotine, nitrosamines, and certain medications. Ensure optimal glutathione function.

Anesthetics Metabolism



Optimal

Likely to have an ideal, fast metabolism of anesthetics.

CYP2D6(3)	rs133333	GA
CYP2D6(4)	rs5758550	GA
CYP2E1(1)	rs6413419	GG
CYP2E1(2)	rs2031920	CC

Acetaminophen Metabolism



Optimal

Fast metabolism of acetaminophen (tylenol).

NSAIDs Metabolism



Typical

Moderate metabolism of NSAIDs. Consider limiting their usage.

Estrogen Metabolism



Ideal

Great metabolism of estrogen.

Methylation

WHAT THIS MEANS

Methylation is one of the most important processes in the body and plays a crucial part in epigenetics.

WHY THIS MATTERS

When methylation is out of balance, it causes systemic effects that can lead to undesirable outcomes. There are many variables to consider such as micronutrient levels and lifestyle factors.

Impactful micronutrients include B12, B6, and folate, whereas, important lifestyle factors include smoking and alcohol reduction, consistent exercise, and stress optimization.

Overmethylation symptoms include paranoia, self mutilation, depression, artistic abilities, upper body pain, high pain threshold, excess body hair, hard time shutting mind off, food/chemical sensitivities, sleep disorder, anxiety, panic tendencies, and adverse reactions to antihistamine.

Undermethylation symptoms include obsessive compulsive tendencies, history of perfectionism, history of high accomplishment, ritualistic behaviors, low tolerance for pain, addictive tendencies, self-motivated, history of competitiveness in sports, social isolation, tendency towards slenderness, phobias, seasonal allergies, frequent headaches, very strong willed, poor concentration endurance.



RELEVANT SNP'S

Gene	Marker	Your Genotype
DHFR(1)	rs1643649	TC
FOLR1	rs2071010	GG
COMT	rs4680	GA
DHFR(2)	rs70991108	DI
SLC19A1	rs1051266	TT
MTHFR 677t	rs1801133	GA
MTHFR 1298c	rs1801131	TG
CBS	rs234706	GG

Methylation



Undermethylation

Genes associated with relatively lower methylation ability. Ensure optimal micronutrient levels such as [magnesium](#), [B12](#) and other [B vitamins](#). Consider working with your physician/coach and ordering blood tests for further assessment.

MTHFR Status



48% Enzyme Activity

Slightly reduced MTHFR activity; you may benefit from ensuring optimal micronutrient levels

Interpretations & Recommendations from your coach, Cory Duffy

High-impact SNP for methylation, a key process that affects stress response, inflammation, brain chemistry, energy production, immune response, detoxification, antioxidant production, cell repair, and genetic expression.
MTHFR 677t- AG = decreased function; increased histamine sensitivity
MTHFR 1298c- GT = decreased dopamine production; decreased enzyme activity; increased histamine sensitivity

*Increase expression/decrease homocysteine: methyl B12, methylfolate, B6, phosphatidylserine, NAC, betaine, riboflavin, curcumin, O3, Vitamin C, Vitamin D, testosterone, leafy greens

Acetylation

WHAT THIS MEANS

As you know, epigenetics changes the expression of genes based on the environment. Acetylation plays a crucial part in this process, and optimal balance rates desirable outcomes. Acetylation is one of the most important processes in the body and it plays a significant role in detoxification. It works to help detoxify histamines, tobacco smoke, exhaust fumes, and medications.



WHY THIS MATTERS

Proper acetylation contributes to optimal organ function, and provides protection against long term imbalances.

RELEVANT SNP'S

Gene	Marker	Your Genotype
NAT1(1)	rs1805158	CC
NAT1(2)	rs4986782	GG
NAT2(1)	rs1801280	TC
NAT2(2)	rs1799931	GG
NAT2(3)	rs1801279	GG

Acetylation



Typical

Genes associated with normal acetylation function.

Glutathione System

WHAT THIS MEANS

Phase 2 detoxification systems are responsible for eliminating toxins from the body. Glutathione is one of the most important systems of the phase 2 detoxification process. It is the master antioxidant and is generally responsible for reducing inflammation. While many people focus on taking antioxidants, this may not be the best option for optimizing the body. Focusing on enhancing the glutathione system will allow the body to manage inflammation more efficiently.



WHY THIS MATTERS

In addition to inflammation management, glutathione boosts immune function, enhances mitochondrial function, repairs DNA, and detoxifies heavy metals, medications, environmental toxins, and pollutants.

RELEVANT SNP'S

Gene	Marker	Your Genotype
GSTM1(2)	rs366631	AA
GPX1(2)	rs3448	CC
GSTT1	rs11550605	.
GPX1(3)	rs3197999	GA
GSTP1(2)	rs1138272	CC
GSTP1(1)	rs1695	AA
GPX1(1)	rs1050450	GA
GSTM1(1)	rs1056806	CC
GCLC	rs553822	CC
CAT	rs1049982	TC
CAT(2)	rs769217	CT
TXN	rs2301241	GG

Glutathione



Support Benefit

You have an increased benefit from supporting your glutathione systems. Your coach can provide more individualized support; however, you're likely to benefit most from adequate selenium from a [multivitamin](#), [adaptogens](#), and [NAC](#).

Vitamin C Need



Much Increased Need

Your genes are associated with lower C levels.

1-2g of [liposomal vitamin C](#) supplementation recommended each day

Mitochondria

WHAT THIS MEANS

The mitochondria are classically viewed as the batteries of our cells. They produce the energy required for cell function. Many opportunities for enhancements are either directly or indirectly related to mitochondria; health experts have increasingly focused on maximizing mitochondrial health to optimize the human system.



WHY THIS MATTERS

Because of energy production, the mitochondria produce free radicals. Free radicals are typically understood as unstable atoms that can damage cells, causing illness and aging. This is not completely accurate as some free radicals are essential and beneficial. Therefore, it is important to maintain balance and homeostasis in the body.

RELEVANT SNP'S

Gene	Marker	Your Genotype
NQO1	rs1800566	GG
UCP2(1)	rs659366	CC
SOD2	rs4880	AG
UCP4	rs2270450	CT
SIRT1	rs12778366	TT
SIRT5	rs10498683	CC
SOD2(2)	rs2758331	CA
ATP5C1(1)	rs11255367	GG
ATP5C1(2)	rs2802460	TT
NDUFS2	rs1136224	AA
NRF2(1)	rs6721961	.
NRF2(2)	rs1962142	GG
PPARGC1A	rs8192678	CT

Mitochondria



Strong

Great mitochondrial function. You boost it even further with mitochondrial boosters such as [Fish oil](#), [MitoQ](#), [NMN](#), and [D-ribose](#), as well as high quality sleep, intermittent fasting, regular exercise, and cold thermogenesis.

Mold Sensitivity

WHAT THIS MEANS

It is estimated that nearly 25% of the population carries genetics that predispose to decreased mold detoxification. Often genetic variants correspond to decreased production of the antibodies that eliminate mold toxins. This can lead to chronic inflammation and overall diminished wellness. There are two factors to consider when determining need for support: level and duration of exposure and genetics of the detoxification system.



WHY THIS MATTERS

When it comes to mold, consider that according to the Environmental Protection Agency (EPA) Building Assessment Survey and Evaluation (BASE) study, 45% of U.S. buildings have current/ongoing water damage and 85% have past water damage. This is a ripe breeding ground for mold. Symptoms can include: chronic headache, fatigue, dizziness, memory problems/brain fog, muscle aches, cough, and shortness of breath.

RELEVANT SNP'S

Gene	Marker	Your Genotype
HLA-DRA(1)	rs7192	TG
HLA-DRA(2)	rs3135391	GG
HLA-DRA(3)	rs8084	AC

Sensitivity to Mold Toxin



More Sensitive

Genes suggest correlation with increased sensitivity and less ability to detoxify mold. Limit exposure overall; A HEPA air filter can assist in home and work environments.

Lyme Intensity

WHAT THIS MEANS



Lyme is a disease transmitted by ticks. There are two different variations of Lyme disease; acute and chronic. Acute infection is the immediate reaction after exposure to Lyme. It is well documented, and early treatment is important. Chronic Lyme disease is a bit more complicated and can be difficult to diagnose.

WHY THIS MATTERS

Antibody tests are available, however, they only confirm past infection. The diagnosis of chronic Lyme disease is based primarily on symptoms. These symptoms can include: chronic fatigue, headache, muscle and joint aches, memory loss /other cognitive impairments, numbness/tingling, and gastrointestinal symptoms. Chronic Lyme disease is becoming a significant issue and several genetic variants predispose individuals to more significant health issues.

RELEVANT SNP'S

Gene	Marker	Your Genotype
TLR1	rs5743618	AA
ACSL1	rs13120078	GA
GAD1(1)	rs3749034	GA
GAD1(2)	rs3828275	CT
GSTP1(2)	rs1138272	CC
GAD1(3)	rs3791878	GG
SOD2(2)	rs2758331	CA

Lyme Intensity Propensity



Increased

If exposed to Lyme, you may be more likely to have more intense symptoms and/or chronic effects.

Envirotoxin and Pollution Sensitivity

WHAT THIS MEANS

The consequences of living in an industrialized world is the exposure to new toxins created by society. Many of these envirotoxins can significantly alter gene expression if they aren't adequately detoxified. Genetic propensities indicate the inflammatory response after exposure to envirotoxins.



WHY THIS MATTERS

These toxins can cause chronic disruptions and can even lead to disruptions of genetic expressions in our children and subsequent generations. It is impossible to avoid exposure to these chemicals so it is essential to make sure our defense systems are optimized to manage and process exposure.

RELEVANT SNP'S

Gene	Marker	Your Genotype
CAT(3)	rs2300181	CC
NQO1	rs1800566	GG
UGT2B15	rs1902023	CC
LOX	rs1800449	CC
IL6	rs1800795	CC

Pollution and Envirotoxin Sensitivity



Typical

Likely to have typical reactions to envirotoxins such as pollution, cigarette smoke, etc. Limit exposure by using air and water filters. Consider hypo-allergenic and fragrance-free cleaning and beauty supplies.

Histamine Sensitivity

WHAT THIS MEANS

Histamines are a compound the body uses to signal that it is under attack, and is a natural part of our defense system. Histamines come from the environment and are also produced in our own gut.

WHY THIS MATTERS

Histamines are responsible for sneezing, itching, hives, rashes, stuffy nose, etc. These all sound unpleasant but they have a purpose. This system, like every system in the body, requires balance. This means that it is good to have the response but we also need to be able to control it and turn it off when it is no longer needed.



RELEVANT SNP'S

Gene	Marker	Your Genotype
AOC1(1)	rs10156191	CT
AOC1(2)	rs1049742	CC
AOC1(3)	rs1049793	CC
AOC1(4)	rs2052129	GT
HNMT	rs1050891	AG
MAO-B	rs10521432	A
MTHFR 677t	rs1801133	GA
MTHFR 1298c	rs1801131	TG
MAO-B(2)	rs1799836	C

Histamine Sensitivity



Increased

Genes associated with lower histamine processing. Consider environmental support such as [quercetin](#) for support against external histamines, or [DAO](#) for support against food-based histamine.

Food-based Histamine Sensitivity



Typical

Genes associated with relatively average histamine processing from food.

MTHFR Status



48% Enzyme Activity

Slightly reduced MTHFR activity; you may benefit from ensuring optimal micronutrient levels

Heavy Metal Processing and Impact

WHAT THIS MEANS

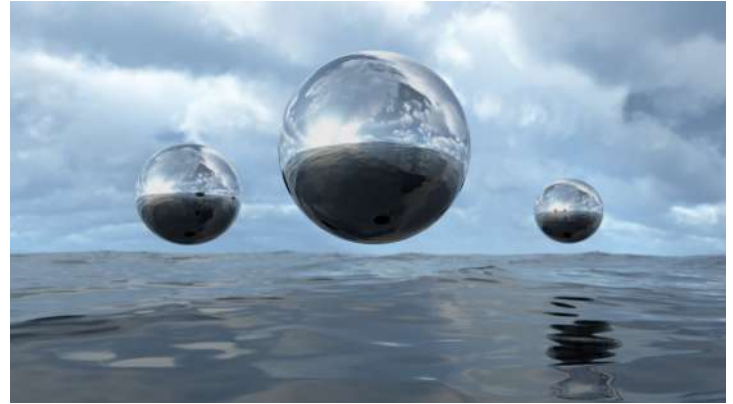
Genetics predispose the likely health impact of heavy metals such as lead, arsenic, cadmium, chromium, and mercury. All heavy metals are processed similarly, however mercury is the most encountered.

Overall Heavy Metal Processing: Heavy metal processing is how fast your body absorbs and eliminates heavy metals.

Inorganic Metal Processing: Inorganic mercury exposure comes from inhaled environmental pollutants, food, dental amalgams, vaccinations, and even supplements. Some Ayurvedic herbs have significant heavy metal contamination. Ayurveda is the traditional Hindu system of medicine; it is based on the idea of balance in the body and uses diet, herbal treatment, and yogic breathing.

Organic Metal Processing: Organic metal is the form found in nature; individuals are principally exposed to through fish consumption.

Heavy Metal Health Impact: Certain gene variants can predispose an individual to significant impact from even low levels of exposure. Studies have demonstrated that this may be related to genetics; gene variants provide a picture of how heavy metal ingestion affects overall health. Heavy metal effects impact each individual differently due to variations in the distribution, metabolism, and elimination.



WHY THIS MATTERS

Overall/Inorganic/Organic Metal Processing: Low processing can contribute to a build up of heavy metals in the system and creates non-desirable health impacts.

Heavy Metal Health Impact: Heavy metals can affect many body systems including the brain & nervous system, heart, and kidneys. There are impacts on reproductive and endocrine function. It can induce or exacerbate autoimmune disease and neurologic risks in the perinatal and early childhood period can lead to cognitive and behavioral changes. Although all forms of heavy metals have adverse effects on human health at high doses, the evidence suggests low level of exposure may potentially lead to significant outcomes.

RELEVANT SNP'S

Gene	Marker	Your Genotype
GSTM1(2)	rs366631	AA
GSTT1	rs11550605	.
GSTP1(2)	rs1138272	CC
MT4	rs11643815	GA
GSTP1(1)	rs1695	AA

Overall Heavy Metal Processing



Low

Low processing of heavy metals overall. Limit exposure and consider glutathione and antioxidant support to ensure optimal processing of heavy metals. Selenium from a [multivitamin](#), [NAC](#), and [Quercetin](#) are ideal for supporting processing.

GCLM	rs41303970	GG
GPX1(1)	rs1050450	GA
SEPP1	rs7579	TT
ABCC2(1)	rs1885301	AA
ABCC2(2)	rs717620	TT
ABCC2(3)	rs2273697	GG
ATP7B(2)	rs1061472	CC
BDNF	rs6265	CT
COMT	rs4680	GA
CPOX4	rs1131857	TT
CPOX5	rs1729995	TC
PON1	rs854561	.
PGR	rs1042838	CA
TF	rs3811647	GA
MMP2	rs243865	CC

Inorganic Metal Processing



Low

Low processing of heavy metals from inorganic sources such as dental amalgams. Limit exposure and consider glutathione and antioxidant support to ensure optimal processing of heavy metals. Selenium from a [multivitamin](#), [NAC](#), and [Quercetin](#) are ideal for supporting processing.

Organic Metal Processing



Moderate

Moderate processing of heavy metals from organic sources such as food. Limit exposure and consider basic glutathione support such as Selenium from a [multivitamin](#) or [NAC](#).

Heavy Metal Health Impact



High

Heavy metal buildup is likely to create intense and undesirable long-term effects. Limit your exposure and ensure optimal processing. Selenium from a [multivitamin](#), [NAC](#), and [Quercetin](#) are ideal for supporting this system.

Heavy Metal Impact

WHAT THIS MEANS

WHY THIS MATTERS

Although all forms of mercury have adverse effects on human health at high doses, the evidence that exposure to very low levels of exposure may potentially lead to significant consequences for humans is still open to interpretation. Mercury's health effects impact each individual differently due to variations in the distribution, metabolism, and elimination of this highly reactive heavy metal. Mercury can affect many body systems including the brain & nervous system, heart, and kidneys. There are impacts on reproductive and endocrine function. It can induce or exacerbate

autoimmune disease and neurologic risks in the perinatal and early childhood period can lead to cognitive and behavioral changes. Certain gene variants can predispose an individual to significant impact from even low levels of mercury exposure. Studies have demonstrated that this may be related to our genetics and we assess gene variants to get a picture of how mercury ingestion affects overall health.



RELEVANT SNP'S

Gene	Marker	Your Genotype
COMT	rs4680	GA
CPOX4	rs1131857	TT
CPOX5	rs1729995	TC
PON1(2)	rs662	TC
PGR	rs1042838	CA
TF	rs3811647	GA
MMP2	rs243865	CC
APOe(1)	rs429358	TC
BDNF	rs6265	CT
APOe(2)	rs7412	.

Heavy Metal Health Impact



High

Heavy metal buildup is likely to create intense and undesirable long-term effects. Limit your exposure and ensure optimal processing. Selenium from a [multivitamin](#), [NAC](#), and [Quercetin](#) are ideal for supporting this system.

Mercury and Fish

Fish consumption is one of the more robustly discussed topics as it represents the greatest source of exposure to organic mercury. This information by itself may prompt people to avoid fish yet it is only part of the story. The truth is that fish is very healthy; it is full of omega-3 fats. Additionally, most fish contain a high ratio of selenium to mercury. This ratio is much more important than the absolute mercury content because selenium essentially makes mercury nonreactive. Recent evidence suggests a major contributors of mercury symptoms may be due to selenium deficiency. Consuming fish with a higher level of selenium than mercury is safe and healthy. Listed below are the average ratios for many common fish.

