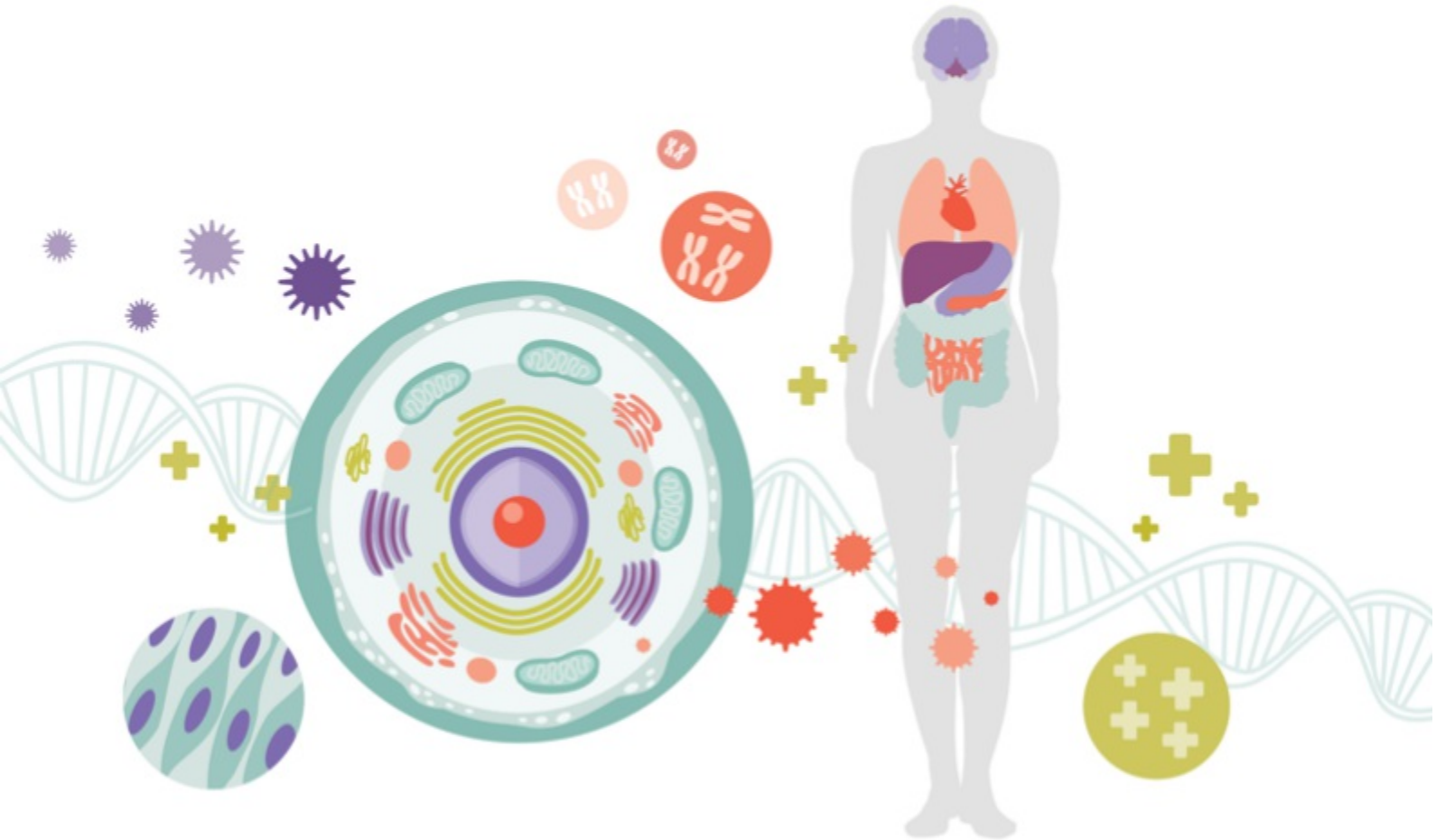
3X4 GENETICS



THE PERSONAL GENETIC STORY OF

DEE ENNAY

Sample 3X4 Blueprint 3.0

INTRODUCTION

The journey to taking control of your health begins with understanding your body

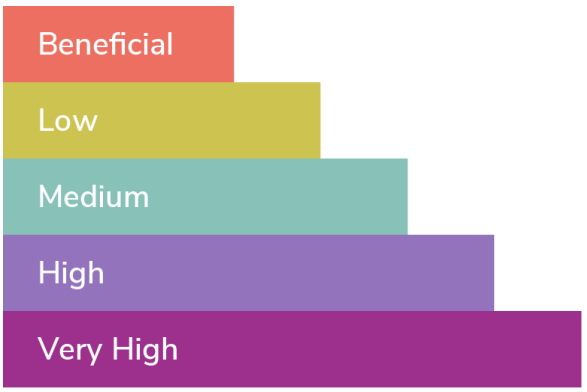
Your genes are the basic instructions for your body. Which begs the question: How well do you know your genes? Understanding your individual genetic blueprint can guide you to make health choices that may help you to live a happier, longer and better life.

Can we change our genetic destiny?

The old idea that genes are "set in stone" has been disproven. The genetic code we are born with cannot be changed. But how that genetic code is expressed, can. We are the product of the interaction of our genes with the choices we make in our environment. Our DNA is the floor plan, but our daily decisions build the house. Every health choice you make can and should be personalized for you and your unique body.

The Language of Color

We have used color-coding in your 3X4 Blueprint to help you discover the most potentially impactful genes and pathways in your results and what research suggests may be the most effective diet and lifestyle changes you can make. Each pathway is color-coded from a dark purple (highest impact on your health) to light green (lowest impact on your health) to help you and your healthcare practitioner know where to start and what to focus on.



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YOUR 3X4 SUMMARY PLAN

Welcome to your personalized 3X4 plan. We have identified the top 3 most potentially significant pathways where you will likely see the biggest impact to your health, based on your unique genetic profile. For each pathway, we provide three recommended diet and lifestyle interventions and three supplement suggestions.

Your healthcare practitioner will use these recommendations in combination with your current diet, lifestyle, medical conditions, medical history, family history, and environmental exposures to build a complete picture of where you are now and a plan for how to move forward, resulting in practical and personalized recommendations that guide you on your journey to making health a daily choice.

INFLAMMATION — VERY HIGH

Inflammation is a normal automatic immune response to injury, irritation or infection. When you bump your toe and it becomes swollen, that's the inflammatory response working to speed up healing. Sometimes injuries or irritations are internal (in places like our gut, muscles, joints, or blood vessels). Inflammation is protective by design, but can become destructive if left unchecked. Long term, chronic inflammation can eventually lead to conditions like arthritis, eczema, IBS, autoimmune conditions, and several diseases.

1. Include organic, non-GMO, anti-inflammatory foods, herbs and spices e.g. berries, cocoa, olives, hazelnuts, dark chocolate, wild-caught fatty fish, avocado, chia seeds, walnuts, macadamia nuts, celery, green pepper, blackberries, apples, thyme, turmeric, black pepper, cardamom and cumin seeds.
2. Favor unsaturated fats (salmon, sardines, cold-pressed olive and avocado oil), prebiotic fibers (garlic, onions), and beta-glucans (whole grains, shiitake mushrooms). Limit intake of pro-inflammatory fats e.g. omega-6 rich vegetable oils and saturated fats. Eliminate trans fats.
3. Consider a trial elimination of pro-inflammatory foods like gluten, dairy, saturated fats, sugar, processed foods and then systematically reintroduce them as tolerated.

1. Limit exposure to environmental inflammatory triggers such as pollen, mold, pesticides, non-organic cleaning products, perfumes, cosmetics and air fresheners.
2. Fasting, intermittent fasting, mimic fasting and/or caloric restriction under health practitioner supervision may be useful to support inflammation.
3. Use relaxation techniques to reduce exposure to stress hormones e.g. meditation, yoga, Qi Gong, massages and practice good sleep hygiene.

1. Specialized Pro-Resolving Mediators (SPMs) with healthcare practitioner supervision.
2. Zinc (30mg), selenium (200mcg), curcumin, boswellia. Quercetin and Luteolin to block mast cell activation.
3. Fat soluble vitamins such as vitamin A, D3 and E.

METHYLATION — VERY HIGH

Methylation is the biochemical process of making sure every cell is functioning optimally. Methylation is not just responsible for how we repair genetic material, but also how we make energy, respond to stress, handle inflammation, how well our cells detoxify, and how our brain chemistry works. Methylation is the process involved in actually turning genes on or off. We may be able to reduce our risk of developing certain diseases and some types of cancers by optimizing methylation.

1. Focus on foods high in B-complex vitamins, magnesium and choline by eating 3-4 servings of a combination of leafy and cruciferous vegetables (raw), avocados, citrus fruits, legumes, poultry, eggs, nuts, and seeds.
2. Eat quality proteins with essential building blocks for methylation and foods rich in vitamin B12, methionine and betaine like wild-caught fish, organic poultry, grass-fed meats or wild game, garbanzo beans and edamame.
3. Support toxin breakdown with cruciferous vegetables, green and black teas. Support B vitamin absorption with fermented foods, adequate fiber, and limit alcohol.

1. Use daily relaxation techniques to reduce exposure to stress hormones which may burden the methylation cycle e.g. meditation, yoga, Qi Gong and massages.
2. Intentionally limit exposure to substances that overload the methylation cycle including medication, alcohol and endocrine disruptors.
3. Avoid external toxins like pesticides, plastic packaging, Teflon cooking utensils, cleaning products, cosmetics and synthetic clothing. Also eliminate toxins that cause DNA damage e.g. heavy metals like arsenic, cadmium, lead, pesticides, and contaminated drinking water.

1. B vitamins including 5-MTHF (200-400mcg), Methyl-B12 (100mcg), vitamin B2, B3, and B6 (P5P).
2. Zinc (20-30mg) and Magnesium (250-500mg).
3. Sulforaphane from whole broccoli sprout powder yielding 20mg (or as recommended by a healthcare practitioner), choline and methionine.

BLOOD PRESSURE — VERY HIGH

Blood pressure indicates how hard the heart is working in order to pump blood around the circulatory system, and is used as a measure for confirming good health. High blood pressure can cause damage to blood vessels, delicate tissues in organs and systems in the body. Genetic variance impacts the ability to contract and relax blood vessels and balance fluid volume within them.

1. Aim for 2-3 servings of nitric oxide boosting foods to improve vasodilation (beets, green leafy vegetables, nuts, seeds, dark chocolate and pomegranate).
2. Include 2-3 servings of blood pressure regulating foods (garlic, ginger, basil, fermented soy, berries, eggs and buckwheat).
3. Focus daily on Potassium, Magnesium and Calcium for blood vessel regulation. Ensure regular daily intake of pumpkin seeds, avocado, green leafy vegetables, yogurt, bananas and citrus fruit.

1. Avoid substances that increase blood pressure: caffeine, NSAID's (Aspirin, Tylenol) and decongestants (pseudoephedrine).
2. Maintain a healthy body composition. Exercise for 2-3 hours a week outdoors.
3. Regularly practice relaxation activities that stimulate the vagus nerve: rhythmic breathing, loud singing and cold water immersion.

1. Calcium (500-1000mg), Magnesium (250-500mg), Vitamin D (2000-5000IU)
2. Olive or Dandelion leaf, Hawthorne
3. Tart Montmorency Cherry, L-Carnitine, Alpha-Lipoic Acid

GENE SUMMARY

You will notice that some of the genes have a star ★ next to them. Based on your individual results, these genes have been identified as having a bigger impact on your pathways and individual health. It's important that you and your practitioner are aware of them, as they need to be considered along with your existing diet, lifestyle and medical history in creating your personalized 3X4 plan.

BENEFICIAL

Gene	Variant	Result
BHMT	Arg239Glu G>A	AA
CETP	Taq1B G>A	AA
CYP1A2	–163 A>C	AA
CYP1B1	Asn453Ser A>G	AG
CYP2C19	*1/*2/*17	*1/*17
UCP2	–866 G>A	GA
UCP3	–55 C>T	TT

NO IMPACT

Gene	Variant	Result
ACSL1	T>C	TT
ADIPOQ	–395 G>A	GG
ADRB3	Trp64Arg T>C	TT
AKT1	G1172+23A T>C	TT
ALDH2	Glu504Lys G>A	GG
ANK3	318473 C>T	CC
ANK3	A>G	AA
APOA2	–492 T>C	TC
APOA5	–1131 T>C	TT
APOA5	C>A	CC
APOC3	3175 C>G	CC
BDNF	Val66Met G>A	GG
CBS	699 C>T	CC
CLOCK	3111 T>C	TT
COL3A1	Ala698Thr G>A	GG
CYP1A1	Ile462Val A>G	AA
CYP2C9	Ile359Leu A>C	AA
CYP2C9	Arg144Cys C>T	CC
CYP3A4	–392 A>G	AA
DAO	His645Asp C>G	CC
DIO2	Thr92Ala T>C	TT
DRD1	–48 G>A	AA
DRD2	TaqIA C>T	CC
DRD3	Ser9Gly T>C	TT
ENOS	Glu298Asp G>T	GG
F2	20210 G>A	GG
F5	Arg506Gln G>A	GG
FAAH	Pro129Thr C>A	CC
FOXO1	A>G	AG
FOXO3	G>T	GT

NO IMPACT

Gene	Variant	Result
FUT2	Trp153Ter G>A	GA
GABRA2	Lys132Lys A>G	AA
GC	A>C	AA
GPX1	Pro198Leu C>T	CC
GSTO2	Asn142Asp A>G	AA
GSTP1	Ile105Val A>G	AA
GSTP1	Ala114Val C>T	CC
HFE	C282Y/H63D	CC/HD
HLA	DQ 2.2/2.5/8	DQ2.2/DQ2.2
HNMT	Thr105Ile C>T	CC
HPA-1	T>C	TT
IL-6R	Asp358Ala A>C	AA
MMP2	Gly226Gly G>C	GG
MMP3	A>G	AG
MTR	2756 A>G	AA
NAT1	Arg187Gln G>A	GG
NAT2	R/I/S	Rapid
NQO1	Pro187Ser C>T	CC
NRF2	A>G	AA
OGG1	Ser326Cys C>G	CC
OPRMI	Asn40Asp A>G	AA
PEMT	–744 G>C	TC
PLIN	11482 G>A	GG
PPARD	294 T>C	TT
SHBG	Pro185Leu C>T	CC
SLC23A1	790 G>A	GG
SLC2A2	Thr110Ile C>T	CC
SLCO1B1	Val174Ala T>C	TT
SRD5A1	A>G	AA
TNFA	–308 G>A	GG
TNFA	–238 G>A	GG
UGT2B15	T>G	GG
UGT2B17	INS/DEL	INS
VDR	Bsm1 G>A	GG
VDR	Fok1 T>C	CC
VDR	Taq1 T>C	TT
VEGF	–634 G>C	GG

GENE SUMMARY

Dee Ennay

LOW

Gene	Variant	Result
ACTN3	577 R/X	RX
ACVR1B	A>G	AG
AGT	Met235Thr A>G	AG
CACNA1C	G>A	GA
COL1A1	1546 G>T	GT
CYP17A1	34 T>C	TC
CYP19A1	C>T	CT
CYP2R1	A>G	AG
DAO	C>T	CT
EPHX1	Tyr113His T>C	TC
FABP2	Ala54Thr G>A	GA
FADS1	592 G>T	GT
FADS2	C>G	CG
FTO	87653 T>A	TA
GDF5	5'UTR C>T	CT
IRS1	C>T	CT
MMP1	–1607 1G/2G	1G/2G
NOS3	–786 T>C	TC
OXTR	A>G	AG
PON1	Gln192Arg A>G	AG
PPARG	Pro12Ala C>G	CG
TCF7L2	IVS3 C>T	CT
UCP1	–3826 A>G	AG

MEDIUM

Gene	Variant	Result
ACE2	A>G	GG
CHRNA5	C>T	TT
COMT	Val158Met G>A	GA
CYP2D6	*1/*3/*10	*1/*10
LEPR	Lys109Arg A>G	GG
MNSOD	Val16Ala T>C	TC
MTHFR	1298 A>C	AC
MTHFR	677 C>T	CT
NBPF3	T>C	CC
PPARA	89204 G>C	GG
SIRT1	994 T>C	TT
TAS2R38	Ala262Val C>T	TT
TIMP4	–55 T>C	TT

HIGH

Gene	Variant	Result
ACE2	7132 T>C	TT
ADIPOQ	–11391 G>A	GG
ADRB2	Arg16Gly A>G	GG

HIGH

Gene	Variant	Result
ADRB2	Gln27Glu C>G	GG
AMPD1	133 C>T	CC
CAT	–262 C>T	CC
CETP	279 G>A	GG
CHRNA5	Asp398Asn G>A	AA
CKM	NcoI T>C	TT
COL12A1	AluI A>G	AA
CRP	2147 G>A	GG
DRD1	–94 G>A	AA
DRD4	–521 C>T	TT
FUT2	Gly258Ser G>A	GA
HIF1A	Pro582Ser C>T	CC
HNMT	939 A>G	AA
HO-1	–413 A>T	TT
HTR1A	–1019 C>G	GG
LEPR	Gln223Arg A>G	GG
LEPR	Lys656Asn G>C	GG
LPL	Ser474Ter C>G	CC
MC4R	T>C	CC
MTRR	66 A>G	GG
SHBG	−68 G>A	AA
SULT1A1	Arg213His G>A	AA
VEGFA	-2578 C>A	AA

VERY HIGH

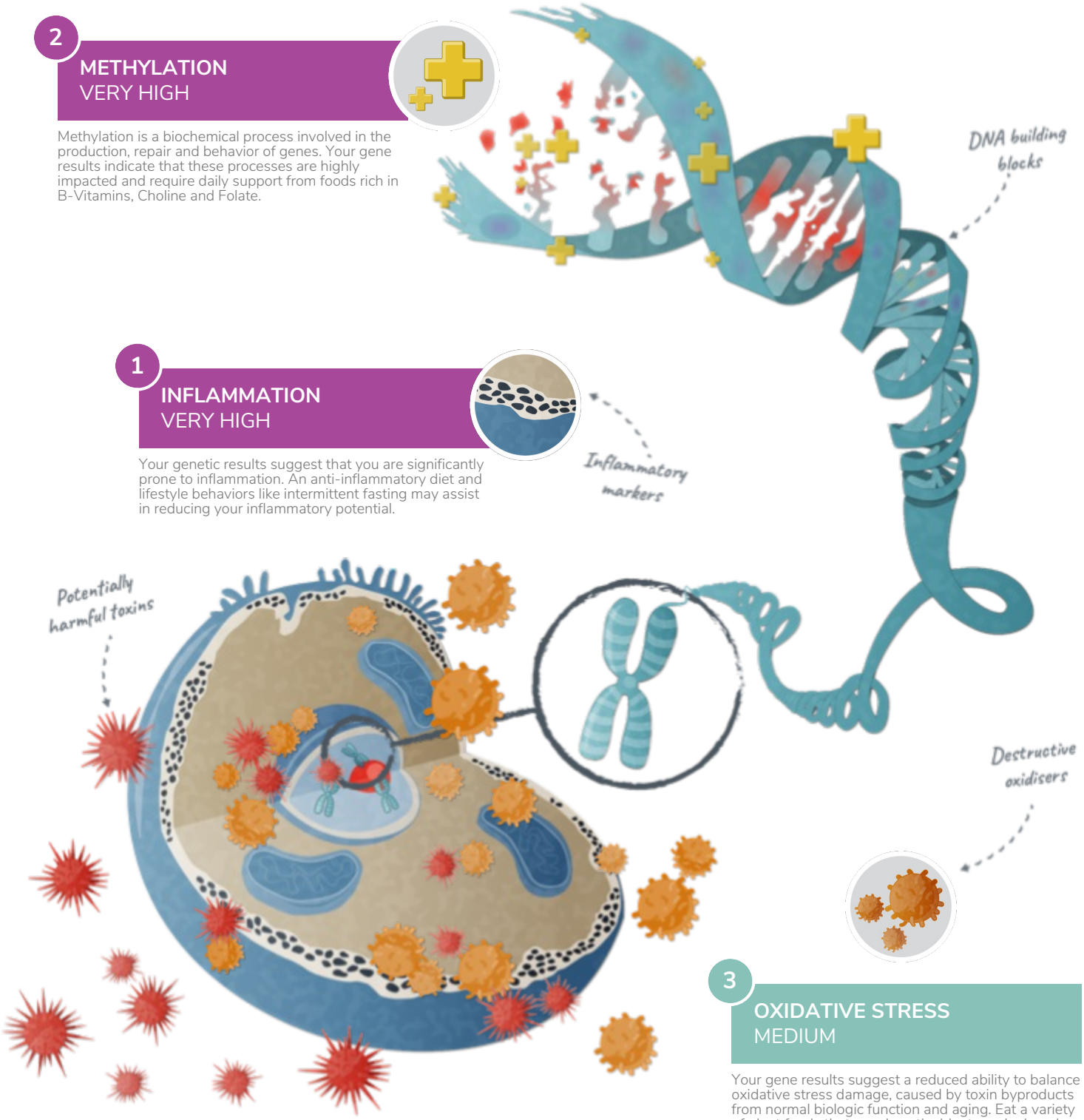
Gene	Variant	Result
★ ACE	Ins/Del	DD
★ APOE	E2/E3/E4	E2/E4
CYP1B1	Leu432Val C>G	GG
★ GSTM1	INS/DEL	DEL
GSTT1	INS/DEL	DEL
IL-1	+/–	+
IL-6	–174 G>C	CC
MTHFD1	1958 G>A	AA
PPARGC1A	Gly482Ser G>A	GG
★ TCN2	776 C>G	GG

PATHWAY-BASED RESULTS

	PATHWAY	IMPACT
CELLULAR	Inflammation	VERY HIGH
	Methylation	VERY HIGH
	Oxidative stress	MEDIUM
	Detoxification	MEDIUM
SYSTEMS	Mood & behavior	HIGH
	Hormone balance	HIGH
	Memory & brain health	HIGH
	Collagen & joints	MEDIUM
	Bone health	MEDIUM
	Histamine overload	MEDIUM
	Glucose & insulin	LOW
CARDIOVASCULAR HEALTH	Blood pressure	VERY HIGH
	Vascular health	VERY HIGH
	Cholesterol	MEDIUM
	Blood clotting	LOW
ENERGY	Exercise response	VERY HIGH
	Appetite/Satiety/Intake	VERY HIGH
	Pro-inflammatory fat	HIGH
	Adipogenesis	HIGH
	Energy expenditure	HIGH
	Weight gain & weight loss resistance	MEDIUM
ACTIVITY	Training response	MEDIUM
	Injury	MEDIUM
	Power	MEDIUM
	Recovery	MEDIUM
	Endurance	LOW
NUTRIENTS	Vitamin B12	VERY HIGH
	Folate	VERY HIGH
	Fatty acids	MEDIUM
	Choline	LOW
	Vitamin D	LOW
	Gluten	LOW
	Iron overload	LOW
	Vitamin C	LOW
	Caffeine	LOW
	Salt	LOW

CELLULAR OVERVIEW

We are the sum of our cells, and we are only as healthy as they are. Every cell in your body functions independently - like a small apartment or office space inside a high-rise building - each unit takes care of its own day-to-day maintenance, but ultimately contributes to the overall success and functionality of the building as a whole. Similarly, every cell in your body has its own mechanisms in place to clean and protect it, as well as to maintain health for the whole body and all its organs.



2 METHYLATION
VERY HIGH

Methylation is a biochemical process involved in the production, repair and behavior of genes. Your gene results indicate that these processes are highly impacted and require daily support from foods rich in B-Vitamins, Choline and Folate.

1 INFLAMMATION
VERY HIGH

Your genetic results suggest that you are significantly prone to inflammation. An anti-inflammatory diet and lifestyle behaviors like intermittent fasting may assist in reducing your inflammatory potential.

3 OXIDATIVE STRESS
MEDIUM

Your gene results suggest a reduced ability to balance oxidative stress damage, caused by toxin byproducts from normal biologic function and aging. Eat a variety of plant foods that supply antioxidants and minerals, and avoid pollutants.

4 DETOXIFICATION ★ GSTM1 DEL
MEDIUM

Your genetic results indicate that you may have a reduced ability to neutralize and remove toxins. Support detoxification processes using food, supplements & lifestyle interventions. Reduce toxin exposure from your diet and environment.

SYSTEMS & CARDIOVASCULAR OVERVIEW

Inside your body at any given moment are several highly sophisticated systems operating at the same time to keep you alive, healthy and running smoothly. Think of the network inside you as being similar to a complex underground railroad system below a big city, where multiple separate but interconnected parts are meticulously being organized to keep everything on track, on schedule, and safe. If these orderly systems stopped working properly and began rail-crossing, there would quickly be widespread chaos, delays, and eventually a complete stand-still.

1 MOOD & BEHAVIOR
HIGH

Genes influence the creation and balance of chemicals in the brain that manage mood, anxiety, depression and related behaviors. Genetically, you may be susceptible to an imbalance. Nutrients like Zinc and B-vitamins are important.

3 MEMORY & BRAIN HEALTH
★ APOE E2/E4

HIGH

Your genetic results show that you are likely to lose some flexibility in the brain; important for learning, processing, remembering and storing information. A healthy diet, regular exercise and brain games are advised.

6 HISTAMINE OVERLOAD
MEDIUM

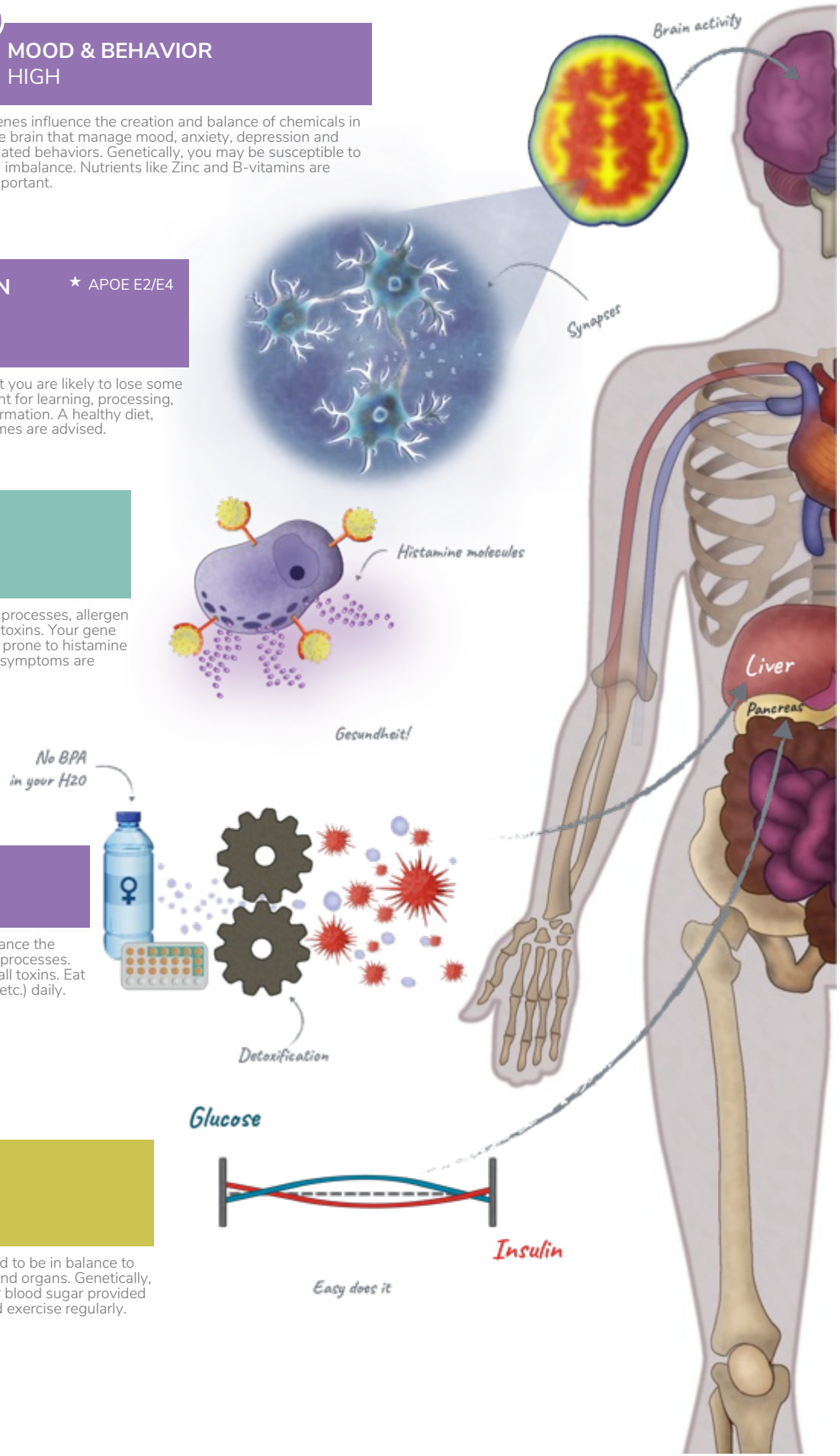
Histamine is produced during immune processes, allergen removal, and in response to injury and toxins. Your gene results indicate that you may be mildly prone to histamine overload. Limit high histamine foods if symptoms are triggered.

2 HORMONE BALANCE
HIGH

Genetically, you have a reduced ability to balance the hormones required for female-related bodily processes. Manage stress, insulin and limit exposure to all toxins. Eat cruciferous vegetables (broccoli, cauliflower, etc.) daily.

7 GLUCOSE & INSULIN
LOW

Glucose and insulin production need to be in balance to prevent damage to cells, systems and organs. Genetically, you should be able to regulate your blood sugar provided you eat a balanced healthy diet and exercise regularly.



4 CARDIOVASCULAR HEALTH

BLOOD CLOTTING
LOW

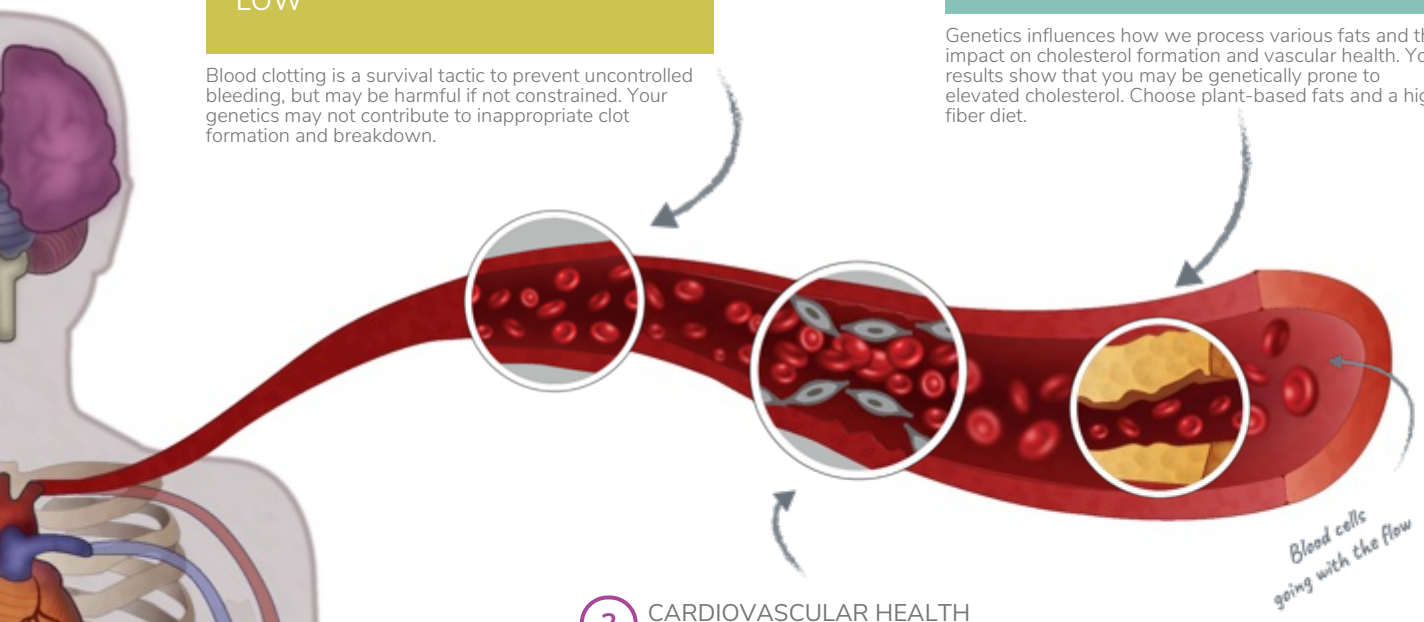
Blood clotting is a survival tactic to prevent uncontrolled bleeding, but may be harmful if not constrained. Your genetics may not contribute to inappropriate clot formation and breakdown.

3 CARDIOVASCULAR HEALTH

CHOLESTEROL
MEDIUM

★ APOE E2/E4

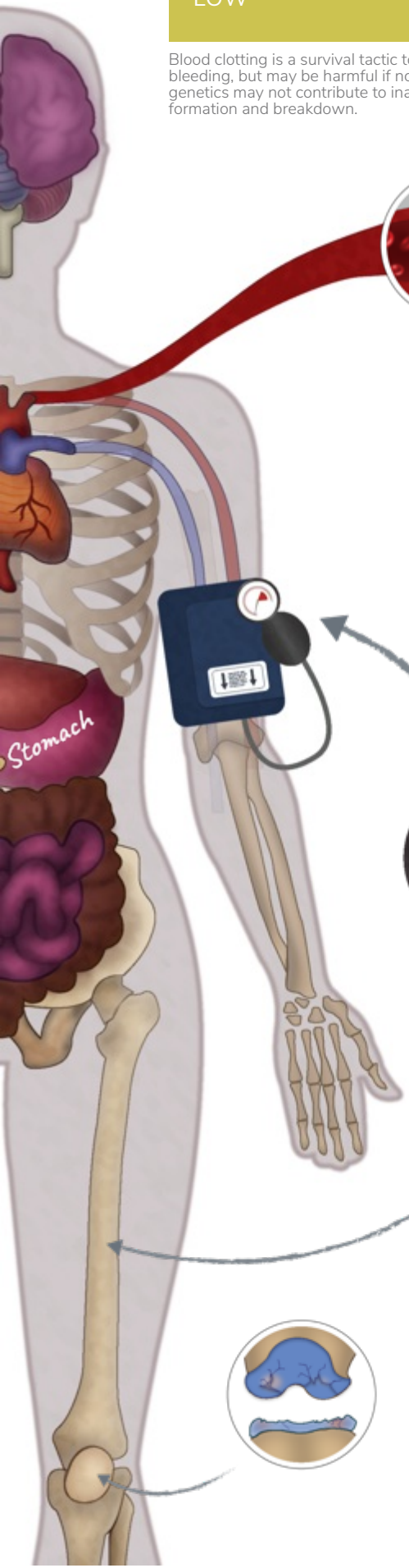
Genetics influences how we process various fats and their impact on cholesterol formation and vascular health. Your results show that you may be genetically prone to elevated cholesterol. Choose plant-based fats and a high-fiber diet.



2 CARDIOVASCULAR HEALTH

VASCULAR HEALTH
VERY HIGH

Genes impact the integrity of arteries and veins, affecting blood flow. Your results show that injury to your blood vessels may be strongly impacted by genetics. A diet rich in polyphenols, stress management and exercise is advised.



1 CARDIOVASCULAR HEALTH

BLOOD PRESSURE
VERY HIGH

★ ACE DD

High blood pressure is associated with damage to the artery wall and fluid retention in the vessel. Your genes are highly likely to contribute to the development of high blood pressure. Diet and stress factors must be addressed.

5

BONE HEALTH
MEDIUM

Bone health refers to maintaining the balance between build-up and breakdown of bone tissue. Genetically, your bone turnover is mildly impacted. It is important to include sunlight, minerals, vitamins D and K, and exercise regularly.

4

COLLAGEN & JOINTS
MEDIUM

Connective tissue degeneration and injury occurs when breakdown in joints, ligaments, collagen, cartilage and skin, exceeds repair. Genetically, you may be prone to collagen damage. Eat quality protein and micronutrients necessary for repair.

ENERGY OVERVIEW

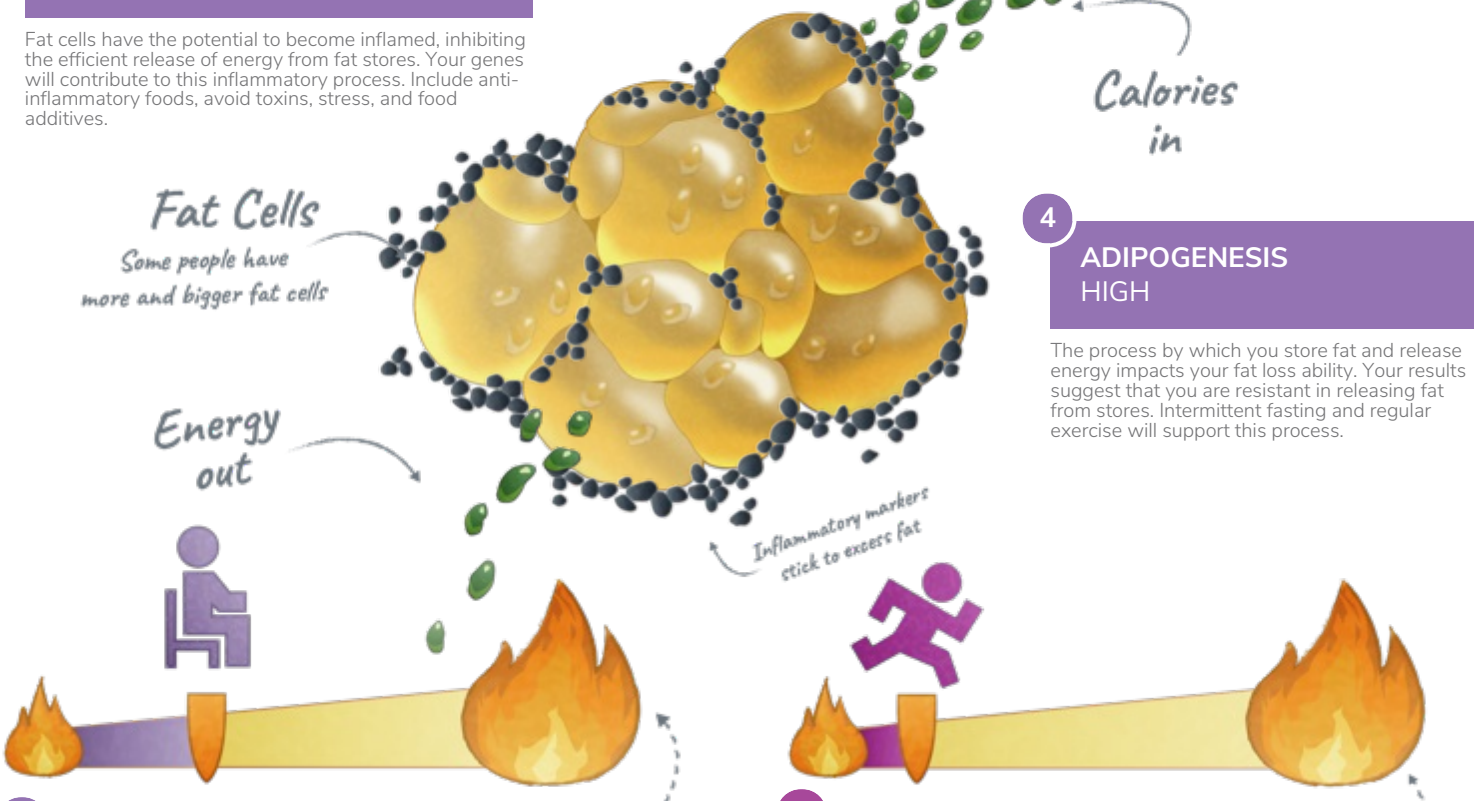
Glucose is our main fuel source and what we make energy from. How we extract, absorb, burn, distribute, store and waste this fuel source varies between individuals, partly because of genetic variation. People respond very differently to calories, exercise, fasting, fatigue, etc. Hunger is also experienced very personally and with great variability. Knowing how you're hard-wired to handle fat, food, and fitness can save you a lot of frustration and, well...energy. These insights can be a powerful tool that enables you to work with your body, not against it, to finally reach your health goals.

2 APPETITE/SATIETY/INTAKE
VERY HIGH

We all experience appetite, hunger, and fullness differently. Your genetics may strongly influence your eating patterns and food choices. Structure meals, eat protein and fiber regularly, and practice mindful and intuitive eating.

3 PRO-INFLAMMATORY FAT
HIGH

Fat cells have the potential to become inflamed, inhibiting the efficient release of energy from fat stores. Your genes will contribute to this inflammatory process. Include anti-inflammatory foods, avoid toxins, stress, and food additives.



4 ADIPOGENESIS
HIGH

The process by which you store fat and release energy impacts your fat loss ability. Your results suggest that you are resistant in releasing fat from stores. Intermittent fasting and regular exercise will support this process.

5 ENERGY EXPENDITURE
HIGH

Energy is needed for important functions such as breathing, digestion and activity. Your results indicate that your genes will likely reduce the efficiency of your metabolism. Choose nutrient-dense, low-energy foods and regular, intensive exercise.

1 EXERCISE RESPONSE
VERY HIGH

The ability to mobilize and release stored energy during exercise varies. Your genetics may make it difficult to release energy in response to activity. A nutrient-rich diet, regular exercise, and quality sleep will help manage weight.

6 WEIGHT GAIN & WEIGHT LOSS RESISTANCE
MEDIUM

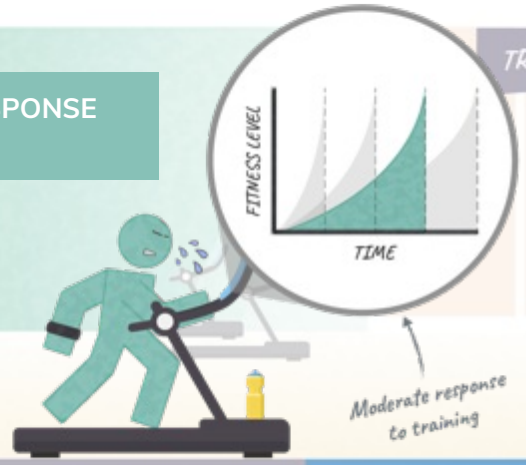
The ability to lose, gain or maintain a healthy body weight varies by person and is influenced by genetics. Your results indicate that your genes may impact your weight management. Set realistic goals and use behavioral therapies to assist.

ACTIVITY OVERVIEW

Your activity infographic provides insights into how your body responds to training. Understanding the best training strategy for your body helps you train effectively while avoiding injury. Your potential for endurance and power-based sports performance provides insights to optimize and personalize your training program. Finally, knowing how your body recovers helps you train and achieve your fitness goals in a sustainable way.

1 TRAINING RESPONSE
MEDIUM

Your gene results suggest you are likely to have a medium training response after exercise. You will likely have an average fitness to start, but will see positive gains in VO2 max, leading to better sports performance.



TRAINING FOR THE RACE

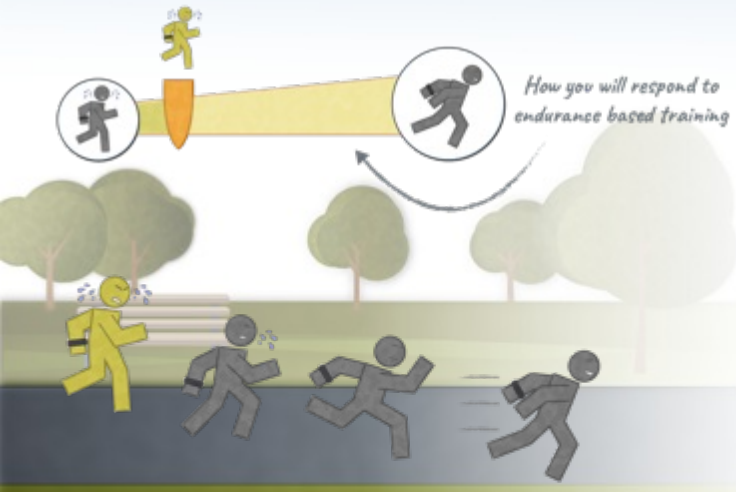
2 INJURY
MEDIUM

Your gene results suggest your risk for soft tissue injury is moderate. You can prevent injuries and posture changes over time by incorporating movements that increase range of motion, and improve strength and balance.

COMPETING IN THE RACE

5 ENDURANCE
LOW

Your gene results suggest average endurance potential. Your endurance levels and overall health can improve with regular aerobic exercise. Gradually increase both frequency and duration of your aerobic training sessions.

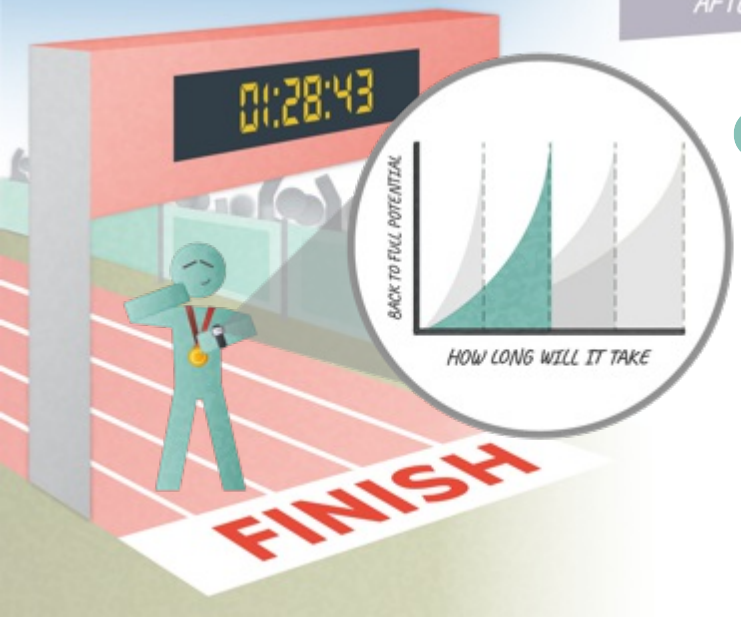


3 POWER
MEDIUM

★ ACE DD

Your results indicate you are likely to produce above-average gains from power training. Perform full-body functional movements rather than targeting specific muscles. Incorporate high intensity interval sessions requiring force and speed.

AFTER THE RACE



4 RECOVERY
MEDIUM

Your results suggest you may need some support to achieve adequate recovery between exercise sessions. Plan for active recovery sessions or rest days, and ensure quality sleep and nutrient-dense foods to enhance recovery times.

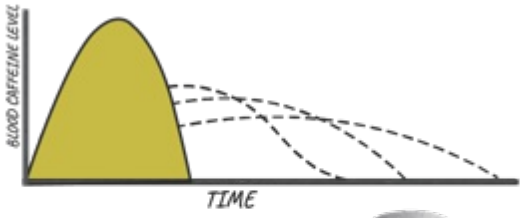
NUTRIENTS OVERVIEW

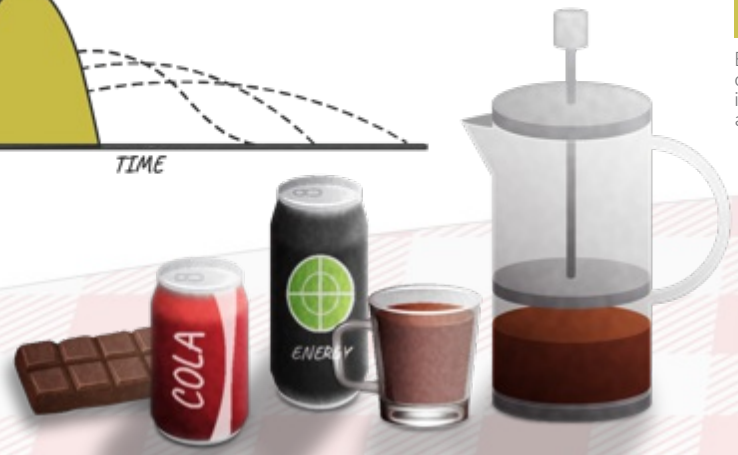
The vitamins, minerals and compounds we find in food are integral to keeping our body's processes working optimally. They keep our cells robust, efficient and healthy, they support the work of our genes, and they help transport oxygen to the tissues. Making the best choices means understanding how much we need of these nutrients, which foods we should choose. It also gives us insight into how we respond to certain nutrients.

9

CAFFEINE
LOW

The efficiency with which we process caffeine varies by person; affecting our sleep, detoxification, alertness and sports performance. As a fast metabolizer, you may not need to limit your caffeine consumption.





7

IRON OVERLOAD
LOW

Excessive iron accumulation in the body can damage organs and precipitate disease conditions such as cancer, irregular heartbeat, and liver cirrhosis. Genetic variants associated with iron overload were not detected.

3

FATTY ACIDS
MEDIUM

Fatty acids, the building blocks of dietary fat, play many important roles in the body including cell membrane structure and function. Your genetic results suggest you should include adequate omega-3 intake to optimize fatty acid processes.

4

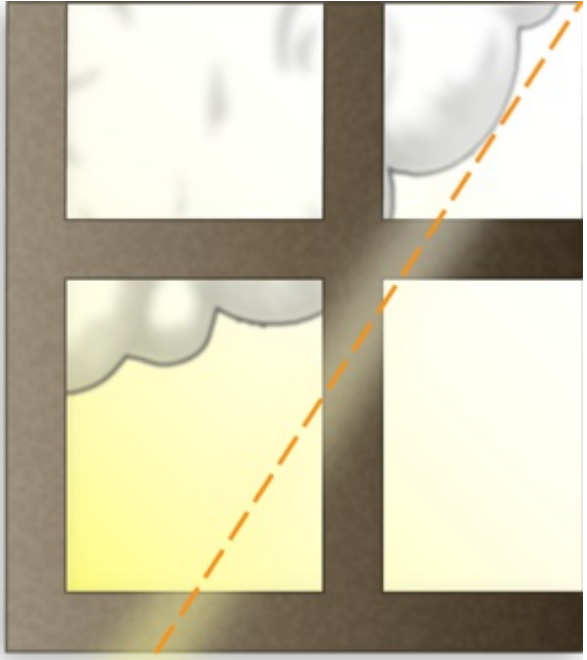
CHOLINE
LOW

Choline regulates memory, mood, and DNA building and plays a valuable role in pregnancy. Your results indicate that synthesis and availability of choline is not affected by your genes. Adequate dietary intake is still advised.

2

FOLATE
VERY HIGH

Genetically, you may have a greatly reduced ability to optimally use folate. Folate works with other B vitamins to build tissues, maintain brain chemicals, and ensure DNA health. Eat dark green leafy vegetables and beans daily.



6

GLUTEN
LOW

Your genetic results indicate that you are not likely to develop celiac disease. Investigate for other food sensitivities or non-celiac gluten sensitivity if symptomatic.

5

VITAMIN D
LOW

Vitamin D is a vital nutrient involved in many biochemical pathways in the body, essential for heart, bone and neurological health. Your results show that when vitamin D is sufficient, your ability to use and manage it is optimal.

10

SALT
LOW

Salt has the potential to raise blood pressure, but genetics influences the extent to which this may happen. Your genetic results show that you are unlikely to have high blood pressure caused by salt intake and restriction is unnecessary.

8

VITAMIN C
LOW

Although vitamin C activity is not affected by your genes, it is an important nutrient for the maintenance of connective tissue, immune health and the removal of toxins. Ensure foods rich in vitamin C are included in your diet.

1

VITAMIN B12
★ TCN2 GG

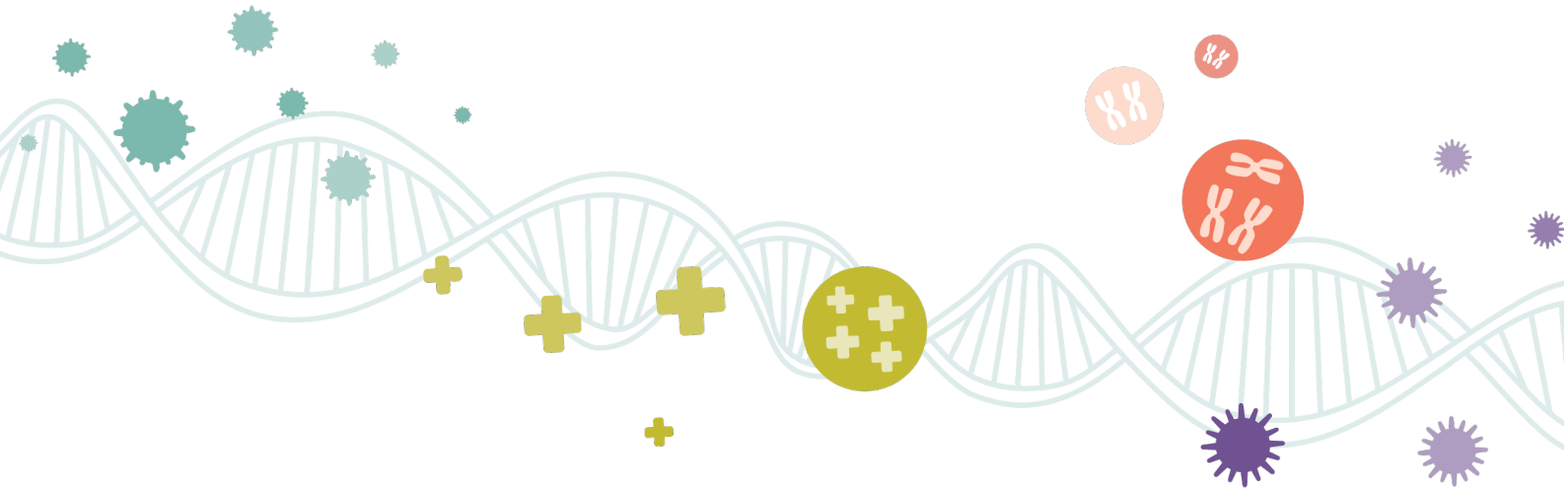
VERY HIGH

Vitamin B12 is an essential nutrient for both brain and blood cells, as well as for the making of DNA. Genetically, you may have a markedly reduced ability to transport B12 to cells making animal protein foods or a B12 supplement necessary.

CLOSING

Practitioner-Driven Personalization

Whether you want to focus on personal well-being, managing your weight, preventing chronic illness, or up your athletic performance, your 3X4 Blueprint will help you get there, but genetic results provide only partial information about our health. The answers in your 3X4 Blueprint need to be put into context by your healthcare practitioner who will use these genetic insights alongside other factors such as lifestyle choices, family medical history, and health status to help build a complete picture of who you are and how your body functions, resulting in practical and personalized recommendations that guide you towards incremental improvements and sustainable health.



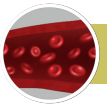
THE GLOSSARY

ADIPOGENESIS | HIGH — ENERGY

The formation, storage, and release of fat cells are affected by variability in our genes. These gene variations may be partly responsible for why some people find it easy to gain or lose weight compared to others, even though their diet and lifestyles are similar. How our fat cells release energy is determined by certain genes and their variations. Knowing how your fat cells are predisposed to store and release energy can empower you to make the right diet and lifestyle choices to suit your unique genotype.

APPETITE/SATIETY/INTAKE | VERY HIGH — ENERGY

Some people are very sensitive to the sensation of satiety (fullness), while others often overeat and take longer to register that they are full. We all experience hunger and fullness differently. While many people believe that serving sizes and other eating behaviors should be equal for all, variations in our genes determine our appetite level and satiety to some degree, and consequently, may affect our eating patterns (snacking, binge eating, servings, frequency of meals, etc.) in a very real, biological way.



BLOOD CLOTTING | LOW — CARDIOVASCULAR HEALTH

Blood clotting is a survival mechanism designed to prevent uncontrolled bleeding. On the other hand, excess blood clotting, which may be linked to genetic variants coupled with diet and lifestyle factors also needs to be addressed. When clotting occurs, the clot travels to a small blood vessel or vein in either the heart, brain or extremities and may result in a stroke, heart attack or deep vein thrombosis. There are numerous preventative actions that can be taken.

BLOOD PRESSURE | VERY HIGH — CARDIOVASCULAR HEALTH

Blood pressure indicates how hard the heart is working in order to pump blood around the circulatory system, and is used as a measure for confirming good health. High blood pressure can cause damage to blood vessels, delicate tissues in organs and systems in the body. Genetic variance impacts the ability to contract and relax blood vessels and balance fluid volume within them.

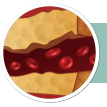
BONE HEALTH | MEDIUM — SYSTEMS

Bones offer important structural support and protective roles within our body. Bone is made up of minerals such as calcium and phosphorus, which is also used elsewhere in the body. The turnover of these minerals in the breakdown or build-up of new bone cells is important for bone health. Gene variants may impact these processes and affect the balance of breakdown and build-up. Diet and lifestyle choices also contribute a great deal to these processes.

CAFFEINE | LOW — NUTRIENTS

Caffeine is a central nervous system stimulant. In small amounts, caffeine's effects include mild euphoria, alertness, and enhanced cognitive performance, but in higher quantities, it can trigger anxiety, restlessness, irritability, nausea, and insomnia. The break down (metabolism) of caffeine in the body can vary to up to 40-fold between individuals, and is largely a genetically-determined ability. Certain gene variants confer a higher sensitivity to caffeine and are associated with slower metabolism of caffeine.

THE GLOSSARY

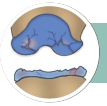


CHOLESTEROL | MEDIUM — CARDIOVASCULAR HEALTH

Cholesterol metabolism refers to processes that determine the distribution of lipids in the body. Fats bind to proteins that transport them in the bloodstream between organs. Different forms of fat particles have important roles to play as part of cell membrane structures and as precursors for hormones. Suboptimal cholesterol processes may result in an imbalance in the accumulation and breakdown of fats in the bloodstream, which most commonly leads to cardiovascular diseases like heart disease and stroke.

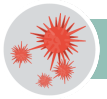
CHOLINE | LOW — NUTRIENTS

Choline is a vitamin that plays an important role in the building of cell membranes. It is a key nutrient for a healthy pregnancy, mood regulation, memory and making new DNA. It is also involved in fat transport and supports methylation. Certain genes may affect the availability of choline, increasing dietary choline requirements.



COLLAGEN & JOINTS | MEDIUM — SYSTEMS

All our cells are continuously being renewed by being broken down and replaced by new ones. Collagen is the major structural protein and the foundation of all our soft-tissue (skin, hair, nails, joints, and organs). Variations in collagen genes might affect the structure and function of these areas. Causing excessive breakdown of cells without a comparable formation of new cells will result in degeneration. Genes play a large part in the process of collagen formation and breakdown, as does lifestyle factors such as diet and exercise.



DETOXIFICATION | MEDIUM — CELLULAR

Detoxification is the body's way of getting rid of toxins that could otherwise build up and interfere with health. Signs of poor detox include lethargy, fatigue, difficulty concentrating and unexplained aches and pains in the body. The liver is the main site of whole-body detox but every cell has its own toxin-eliminating processes to keep it clean, healthy and working well. Detoxification can be optimized by making the right diet and lifestyle changes to support good cellular cleaning processes.

ENDURANCE | LOW — ACTIVITY

Endurance refers to activities where muscles are exercised at lower intensities for prolonged periods of time. Your genes play a role in determining how well you will respond to endurance-based activities, and can be used as a guide to optimize your exercise program to get the best results. Endurance levels will improve when you follow a program that gradually increases your training load (duration, frequency and intensity). Numerous health benefits can be achieved at lower intensities of exercise.

ENERGY EXPENDITURE | HIGH — ENERGY

Energy expenditure is the amount of energy (kilojoules or calories) that is needed to carry out important functions such as breathing, digesting food, circulating blood, regulating temperature, and exercising. The more commonly used term when referring to how we burn calories is to say we have a 'fast' or 'slow' metabolism. The rate at which we use and manage calories for energy is largely determined by our genes, our activity, what and how much we eat, resulting in significant individual differences between how we burn energy.

THE GLOSSARY

EXERCISE RESPONSE | VERY HIGH — ENERGY

Research has confirmed that people's response to exercise varies considerably. Some respond quickly to exercise (e.g. they get fit fast and their body composition changes favorably), while others are less sensitive to exercise's effects. A significant contributor to these differences in exercise response is genetics. An individual's ability to mobilize stored body fat and burn it for exercise fuel is partly predisposed by certain genes. It is useful to understand the extent exercise may help weight loss and how to balance these factors out.

FATTY ACIDS | MEDIUM — NUTRIENTS

Fatty acids are the building blocks of fats and perform many important functions in the body. They are the base for cell membranes, help make hormones, are involved in inflammation, brain function and the immune system. Different dietary fats impact the body in different ways and our genes impact how these fats are metabolized and processed. Good quality dietary fat intake may correct these imbalances driven by genes.

FOLATE | VERY HIGH — NUTRIENTS

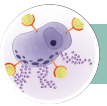
Folate is an essential vitamin that works together with all B vitamins and plays a vital role in methylation. Folate also helps maintain brain, nerve, blood cells, and DNA health. Natural occurring folate is found in numerous foods including leafy greens, legumes and asparagus. The synthetic form is called folic acid, commonly used in supplements and fortified foods, but is less beneficial compared to folate. Genetic variation affects the availability and the requirement for folate.

GLUCOSE & INSULIN | LOW — SYSTEMS

Our cells run on glucose, a simple sugar obtained from the food we eat. Our bodies work hard to ensure the amount of glucose in the blood is kept at just the right level. High blood glucose is often associated with weight issues and diabetes, but chronically elevated blood sugar also has other effects such as accelerated aging and chronic inflammation, which underlie every major chronic illness. Insulin is manufactured in the body and is used to regulate glucose levels. The way insulin and glucose do their job is determined by certain genes as well as by other factors such as our weight, diet, and lifestyle choices.

GLUTEN | LOW — NUTRIENTS

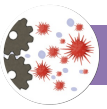
Celiac disease occurs when there is an immune reaction to gluten which is the protein found in wheat, barley, triticale and rye. In these cases, gluten can cause inflammation in the gut which may damage the gut wall and potentially lead to complications resulting in deficiency conditions like anemia, osteoporosis and thyroid problems. If certain genes variants are present, gluten may need to be removed from the diet completely.



HISTAMINE OVERLOAD | MEDIUM — SYSTEMS

Histamine is a chemical produced by mast cells, that is involved in immunity and the removal of allergens from the body. It also helps with digestion and is released in response to injury and toxins. Histamine can be made by bacteria in the gut but is also present in certain foods. Genes regulate enzymes that are responsible for histamine breakdown. Inefficient breakdown may result in a histamine overload and cause symptoms like migraines, flushing, dizziness, skin rashes and hives.

THE GLOSSARY



HORMONE BALANCE | HIGH — SYSTEMS

Hormones are chemical messengers produced by our glands. They instruct organs and systems in the body on how to function. The main female hormones include estrogen and progesterone. These are necessary throughout the life cycle for the regulation of most major female-related bodily processes including puberty, fertility, pregnancy, and menopause. Androgens are also present in women but to a lesser degree. The main male hormones are known as androgens which include the powerful male hormone testosterone. Androgens are necessary throughout the life cycle for the regulation of most major male-related bodily processes including puberty, fertility, and andropause. Estrogen is also present in men but to a lesser degree. Ineffective hormone metabolism can contribute to certain conditions. Genes, as well as diet and lifestyle factors, regulate the activation and breakdown of these hormones.

INFLAMMATION | VERY HIGH — CELLULAR

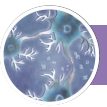
Inflammation is a normal automatic immune response to injury, irritation or infection. When you bump your toe and it becomes swollen, that's the inflammatory response working to speed up healing. Sometimes injuries or irritations are internal (in places like our gut, muscles, joints, or blood vessels). Inflammation is protective by design, but can become destructive if left unchecked. Long term, chronic inflammation can eventually lead to conditions like arthritis, eczema, IBS, autoimmune conditions, and several diseases.

INJURY | MEDIUM — ACTIVITY

Injuries are caused by many internal and external factors. A torn tissue or chronic overuse of muscles, tendons or ligaments does not affect everyone in the same way, or necessarily result in injury. The combination of your body's make-up and genetics contribute to the development of injuries. Knowing your genetically determined risk for injury can help to manage and avoid these risks, and help you adjust exercise, lifestyle, diet, and recovery routines accordingly.

IRON OVERLOAD | LOW — NUTRIENTS

Certain genes affect the body's ability to transport iron from the tissues to the blood, so that excess iron can be excreted. Excessive iron accumulation within the tissues, known as hemochromatosis, is a condition that can result in the damage of organs which can precipitate disease conditions such as diabetes, cancer, irregular heart beat and liver cirrhosis.



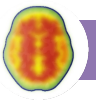
MEMORY & BRAIN HEALTH | HIGH — SYSTEMS

The brain is the control center of the body, and keeping it healthy is crucial for overall mental and physical health. Apart from regulating all of your hormones and other biological processes, the brain is also responsible for cognitive function, including attention, focus, learning capacity, and memory. Brain health and function tend to decline with age but at a faster rate in individuals with unfavorable diet and lifestyle behaviors. Certain genetic variations may be another reason why our brain health and cognitive function might not be optimal.

METHYLATION | VERY HIGH — CELLULAR

Methylation is the biochemical process of making sure every cell is functioning optimally. Methylation is not just responsible for how we repair genetic material, but also how we make energy, respond to stress, handle inflammation, how well our cells detoxify, and how our brain chemistry works. Methylation is the process involved in actually turning genes on or off. We may be able to reduce our risk of developing certain diseases and some types of cancers by optimizing methylation.

THE GLOSSARY



MOOD & BEHAVIOR | HIGH — SYSTEMS

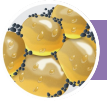
It is normal for our mood to change depending on the situation, but when our emotional state leads to changes in behavior that affect our ability to deal with daily routines, support should be sought. Genetics affects our ability to manufacture and balance chemicals in the brain that are necessary to manage mood, anxiety, depression, addiction and related behaviors. In addition, diet and lifestyle choices impact brain chemicals and may require adjustment.

OXIDATIVE STRESS | MEDIUM — CELLULAR

Oxidative stress is the human equivalent of rusting. The impact of all exposures over time results in damage to our cells. Unmanaged, oxidation can impact on our energy levels, memory, premature aging and sometimes cancer risk. In a healthy functioning cell, enzymes that counteract oxidative damage, a 'rust block' so to speak, are made. The ability to make those enzymes is determined by certain genes. However, a good diet and lifestyle can aid towards a lower oxidative burden and help maintain the health of your cells.

POWER | MEDIUM — ACTIVITY

Power refers to activities where muscles are exercised at higher intensities for shorter periods of time. It is the product of force and the speed at which the action is performed. Power is important for athletic performance, and genetics play a significant role in how a person's power capacity can improve following a strength and power-based training program. Many daily activities are enhanced by adequate power capacity. It becomes even more important to continue with strength and power-based exercises as you age and muscle mass decreases.



PRO-INFLAMMATORY FAT | HIGH — ENERGY

Fat cells are not just inactive storage compartments for excess weight - they are metabolically active messengers that control our energy levels. These messenger molecules found in fat tissue are called adipokines. Fat tissue secretes various pro- and anti-inflammatory adipokines to manage inflammation. If there is excess adipose tissue in the body, the inflammatory response can become disrupted, and these proinflammatory molecules increase. Obesity-induced inflammation can be managed by losing excess weight, which reduces adipokines.

RECOVERY | MEDIUM — ACTIVITY

Because exercise is a type of ‘stress’ on the body (the good kind of stress), some level of wear and tear inevitably occurs in muscles and tissues during and directly after a workout (this is how muscles grow). Given the right recovery resources and building blocks, the body quickly repairs and rebuilds muscles and tissues back to a healthy, normal state, ready for the next exertion. Without enough recovery time or resources, inflammation and oxidative stress can arise in the body and the risk for tissue break-down, injury, and pain increases.

SALT | LOW — NUTRIENTS

Salt sensitivity is estimated to be present in 51% of individuals with high blood pressure and 26% with normal blood pressure. In individuals with salt sensitivity, blood pressure may increase when excess sodium is consumed. Although the mechanisms underlying salt sensitivity are complex, your genes can help determine and predict your response to salt.

THE GLOSSARY

TRAINING RESPONSE | MEDIUM — ACTIVITY

Your genetics plays a significant role in influencing your baseline fitness level, as well as your response to aerobic training. Your fitness levels and training response can be measured as VO2 max, which is the maximum amount of oxygen you can use during intense exercise. The higher your VO2 max, the fitter you are. Being fitter reduces your risk of cardiovascular disease and improves quality of life. High VO2 max levels are associated with performance in endurance-based sports.

VASCULAR HEALTH | VERY HIGH — CARDIOVASCULAR HEALTH

Veins and arteries make up a network in the body responsible for transporting oxygen and nutrients to our organs and systems, and for removing waste. Having healthy blood vessels means maintaining their strength and flexibility. Loss of function makes them vulnerable to damage and disease. Certain genes, and diet and lifestyle factors influence how these vessels are maintained and kept healthy.

VITAMIN B12 | VERY HIGH — NUTRIENTS

Vitamin B12 is an essential vitamin that works together with folate and other B vitamins . It's a major player in maintaining the health of both brain and blood cells, as well as the synthesis of DNA. Vitamin B12 is exclusively available from animal products, but may be made in the gut by bacteria. Genes may affect the availability, metabolism and requirement for Vitamin B12.

VITAMIN C | LOW — NUTRIENTS

Vitamin C is capable of excreting or neutralizing substances such as toxins and biproducts of normal cellular function that may cause rust-like damage within our cells. It is also a key nutrient in the health of our collagen and blood vessels and assists in iron absorption, and wound healing. Certain genes show us how effective we are at activating vitamin C for use in these functions.

VITAMIN D | LOW — NUTRIENTS

Vitamin D is made in the skin when exposed to sunlight. It is then activated in the liver and kidneys to produce vitamin D3. Vitamin D3 is able to switch multiple genes on, genes that are responsible for the maintenance of bone health and immunity, as well as the health of the hormone, glucose and cardiovascular systems. Variants in the VDR gene impact absorption, metabolism, and utilization of Vitamin D, therefore dietary intervention and increased sun exposure may be required.

WEIGHT GAIN & WEIGHT LOSS RESISTANCE| MEDIUM — ENERGY

There is considerable inter-individual variability in our physical ability to lose, gain, or maintain a healthy weight. Certain gene variations affect how we regulate energy and make us more genetically- prone to weight gain and slow weight loss. A one-size-fits-all model does not exist when it comes to how much or how frequently we should eat, or what type of exercise we should do and for how long. Genetic variations can explain, at least in part, how people respond to overeating, exercise, and diet.

GENES BY PATHWAY

You will notice that some of the genes have a star ★ next to them. Based on your individual results, these genes have been identified as having a bigger impact on your pathways and individual health. It's important that you and your practitioner are aware of them, as they need to be considered along with your existing diet, lifestyle and medical history in creating your personalized 3X4 plan.

CELLULAR

INFLAMMATION 1		METHYLATION 2		OXIDATIVE STRESS 3		DETOXIFICATION 4	
APOE E2/E3/E4	E2/E4	MTHFD1 1958 G>A	AA	APOE E2/E3/E4	E2/E4	★ GSTM1 INS/DEL	DEL
IL-1 +/–	+	MTRR 66 A>G	GG	GSTM1 INS/DEL	DEL	GSTT1 INS/DEL	DEL
IL-6 –174 G>C	CC	COMT Val158Met G>A	GA	GSTT1 INS/DEL	DEL	CYP1B1 Leu432Val C>G	GG
CRP 2147 G>A	GG	MTHFR 1298 A>C	AC	HO-1 –413 A>T	TT	SULT1A1 Arg213His G>A	AA
HO-1 –413 A>T	TT	MTHFR 677 C>T	CT	MNSOD Val16Ala T>C	TC	COMT Val158Met G>A	GA
CYP1B1 Leu432Val C>G	GG	NBPF3 T>C	CC	PON1 Gln192Arg A>G	AG	CYP2D6 *1/*3/*10	*1/*10
FUT2 Gly258Ser G>A	GA	TCN2 776 C>G	GG	PPARG Pro12Ala C>G	CG	CYP17A1 34 T>C	TC
SIRT1 994 T>C	TT	CBS 699 C>T	CC	UCP1 –3826 A>G	AG	EPHX1 Tyr113His T>C	TC
TIMP4 –55 T>C	TT	MTR 2756 A>G	AA	CAT –262 C>T	CC	MNSOD Val16Ala T>C	TC
FADS1 592 G>T	GT	NQO1 Pro187Ser C>T	CC	UCP2 –866 G>A	GA	MTHFR 677 C>T	CT
MNSOD Val16Ala T>C	TC	OGG1 Ser326Cys C>G	CC	UCP3 –55 C>T	TT	PON1 Gln192Arg A>G	AG
CYP1A1 Ile462Val A>G	AA			ALDH2 Glu504Lys G>A	GG	CYP1B1 Asn453Ser A>G	AG
DAO His645Asp C>G	CC			ENOS Glu298Asp G>T	GG	CYP2C19 *1/*2/*17	*1/*17
ENOS Glu298Asp G>T	GG			GPX1 Pro198Leu C>T	CC	ALDH2 Glu504Lys G>A	GG
FOXO3 G>T	GT			GSTO2 Asn142Asp A>G	AA	CYP1A1 Ile462Val A>G	AA
FUT2 Trp153Ter G>A	GA			GSTP1 Ile105Val A>G	AA	CYP1A2 –163 A>C	AA
HLA DQ 2.2/2.5/8	DQ2.2/DQ2.2			HFE C282Y/H63D	CC/HD	CYP2C9 Arg144Cys C>T	CC
HNMT Thr105Ile C>T	CC			NQO1 Pro187Ser C>T	CC	CYP2C9 Ile359Leu A>C	AA
IL-6R Asp358Ala A>C	AA			OGG1 Ser326Cys C>G	CC	CYP3A4 –392 A>G	AA
PPARA 89204 G>C	GG			PPARGC1A Gly482Ser G>A	GG	GSTO2 Asn142Asp A>G	AA
TNFA –238 G>A	GG			TNFA –308 G>A	GG	GSTP1 Ala114Val C>T	CC
TNFA –308 G>A	GG					GSTP1 Ile105Val A>G	AA
						NAT1 Arg187Gln G>A	GG
						NAT2 R/I/S	Rapid
						NQO1 Pro187Ser C>T	CC
						SLCO1B1 Val174Ala T>C	TT

GENES BY PATHWAY

SYSTEMS

MOOD & BEHAVIOR 1		HORMONE BALANCE 2		MEMORY & BRAIN HEALTH 3		COLLAGEN & JOINTS 4	
CHRNA5 Asp398Asn G>A	AA	CYP1B1 Leu432Val C>G	GG	★ APOE E2/E3/E4	E2/E4	COL12A1 AluI A>G	AA
DRD1 –94 G>A	AA	GSTM1 INS/DEL	DEL	COMT Val158Met G>A	GA	VEGFA -2578 C>A	AA
DRD4 –521 C>T	TT	GSTT1 INS/DEL	DEL	MTHFR 1298 A>C	AC	GDF5 5'UTR C>T	CT
HTR1A –1019 C>G	GG	SHBG –68 G>A	AA	MTHFR 677 C>T	CT	MMP1 –1607 1G/2G	1G/2G
CHRNA5 C>T	TT	COMT Val158Met G>A	GA	MNSOD Val16Ala T>C	TC	COL1A1 1546 G>T	GT
COMT Val158Met G>A	GA	SULT1A1 Arg213His G>A	AA	BDNF Val66Met G>A	GG	COL3A1 Ala698Thr G>A	GG
MTHFR 1298 A>C	AC	CYP17A1 34 T>C	TC	ENOS Glu298Asp G>T	GG	MMP3 A>G	AG
MTHFR 677 C>T	CT	CYP19A1 C>T	CT	IL-6R Asp358Ala A>C	AA		
CACNA1C G>A	GA	EPHX1 Tyr113His T>C	TC	MTR 2756 A>G	AA		
OXTR A>G	AG	MNSOD Val16Ala T>C	TC	NQO1 Pro187Ser C>T	CC		
AKT1 G1172+23A T>C	TT	MTHFR 677 C>T	CT				
ANK3 318473 C>T	CC	CYP1B1 Asn453Ser A>G	AG				
ANK3 A>G	AA	CYP2C19 *1/*2/*17	*1/*17				
BDNF Val66Met G>A	GG	CYP1A1 Ile462Val A>G	AA				
DRD1 –48 G>A	AA	CYP3A4 –392 A>G	AA				
DRD2 TaqIA C>T	CC	GSTP1 Ile105Val A>G	AA				
DRD3 Ser9Gly T>C	TT	NQO1 Pro187Ser C>T	CC				
FAAH Pro129Thr C>A	CC	SHBG Pro185Leu C>T	CC				
GABRA2 Lys132Lys A>G	AA	SRD5A1 A>G	AA				
MTR 2756 A>G	AA	UGT2B15 T>G	GG				
OPRMI Asn40Asp A>G	AA	UGT2B17 INS/DEL	INS				

GENES BY PATHWAY

SYSTEMS

BONE HEALTH	5
COL1A1 1546 G>T	GT
CYP2R1 A>G	AG
GDF5 5'UTR C>T	CT
DIO2 Thr92Ala T>C	TT
TIMP4 –55 T>C	TT
VDR Bsm1 G>A	GG
VDR Fok1 T>C	CC
VDR Taq1 T>C	TT

HISTAMINE OVERLOAD	6
HNMT 939 A>G	AA
DAO C>T	CT
DAO His645Asp C>G	CC
HNMT Thr105Ile C>T	CC

GLUCOSE & INSULIN	7
ADIPOQ –11391 G>A	GG
ADRB2 Arg16Gly A>G	GG
ADRB2 Gln27Glu C>G	GG
FABP2 Ala54Thr G>A	GA
FTO 87653 T>A	TA
IRS1 C>T	CT
TCF7L2 IVS3 C>T	CT
PPARG Pro12Ala C>G	CG
UCP2 –866 G>A	GA
ADIPOQ –395 G>A	GG
APOA2 –492 T>C	TC
CETP Taq1B G>A	AA
DIO2 Thr92Ala T>C	TT
FOXO1 A>G	AG
FOXO3 G>T	GT
PPARA 89204 G>C	GG
PPARGC1A Gly482Ser G>A	GG
SLC2A2 Thr110Ile C>T	CC
TNFA –308 G>A	GG

GENES BY PATHWAY

CARDIOVASCULAR HEALTH

BLOOD PRESSURE 1		VASCULAR HEALTH 2		CHOLESTEROL 3		BLOOD CLOTTING 4	
★ ACE Ins/Del	DD	ACE Ins/Del	DD	★ APOE E2/E3/E4	E2/E4	ENOS Glu298Asp G>T	GG
ACE2 7132 T>C	TT	APOE E2/E3/E4	E2/E4	CETP 279 G>A	GG	F2 20210 G>A	GG
ACE2 A>G	GG	CRP 2147 G>A	GG	LPL Ser474Ter C>G	CC	F5 Arg506Gln G>A	GG
AGT Met235Thr A>G	AG	IL-6 –174 G>C	CC	FABP2 Ala54Thr G>A	GA	HPA-1 T>C	TT
ALDH2 Glu504Lys G>A	GG	LPL Ser474Ter C>G	CC	CETP Taq1B G>A	AA		
ENOS Glu298Asp G>T	GG	HO-1 –413 A>T	TT	APOA5 C>A	CC		
		MTHFR 1298 A>C	AC	APOA5 –1131 T>C	TT		
		AGT Met235Thr A>G	AG	APOC3 3175 C>G	CC		
		MTHFR 677 C>T	CT	IL-6 –174 G>C	CC		
		ALDH2 Glu504Lys G>A	GG	TNFA –238 G>A	GG		
		APOA5 –1131 T>C	TT				
		CETP Taq1B G>A	AA				
		ENOS Glu298Asp G>T	GG				
		F2 20210 G>A	GG				
		F5 Arg506Gln G>A	GG				
		HPA-1 T>C	TT				
		OGG1 Ser326Cys C>G	CC				
		PPARA 89204 G>C	GG				
		VEGF –634 G>C	GG				

GENES BY PATHWAY

ENERGY

EXERCISE RESPONSE 1		APPETITE/SATIETY/INTAKE 2		PRO-INFLAMMATORY FAT 3	
ADRB2 Arg16Gly A>G	GG	LEPR Gln223Arg A>G	GG	IL-1 +/–	+
ADRB2 Gln27Glu C>G	GG	MC4R T>C	CC	ADIPOQ –11391 G>A	GG
LEPR Gln223Arg A>G	GG	LEPR Lys109Arg A>G	GG	CRP 2147 G>A	GG
LEPR Lys656Asn G>C	GG	TAS2R38 Ala262Val C>T	TT	IL-6 –174 G>C	CC
MC4R T>C	CC	FTO 87653 T>A	TA	ADIPOQ –395 G>A	GG
FTO 87653 T>A	TA	APOA2 –492 T>C	TC	IL-6R Asp358Ala A>C	AA
ADRB3 Trp64Arg T>C	TT	CLOCK 3111 T>C	TT	TNFA –238 G>A	GG
CLOCK 3111 T>C	TT	DRD2 TaqIA C>T	CC	TNFA –308 G>A	GG
LEPR Lys109Arg A>G	GG	FAAH Pro129Thr C>A	CC		
		LEPR Lys656Asn G>C	GG		
		SLC2A2 Thr110Ile C>T	CC		

GENES BY PATHWAY

ENERGY

ADIPOGENESIS	4
ADRB2 Arg16Gly A>G	GG
ADRB2 Gln27Glu C>G	GG
FABP2 Ala54Thr G>A	GA
PPARG Pro12Ala C>G	CG
ADRB3 Trp64Arg T>C	TT
MMP2 Gly226Gly G>C	GG
PLIN 11482 G>A	GG
PPARGC1A Gly482Ser G>A	GG

ENERGY EXPENDITURE	5
ADRB2 Arg16Gly A>G	GG
ADRB2 Gln27Glu C>G	GG
LEPR Gln223Arg A>G	GG
LEPR Lys109Arg A>G	GG
MC4R T>C	CC
FTO 87653 T>A	TA
UCP1 –3826 A>G	AG
UCP2 –866 G>A	GA
UCP3 –55 C>T	TT
ADRB3 Trp64Arg T>C	TT
CLOCK 3111 T>C	TT
LEPR Lys656Asn G>C	GG
PPARGC1A Gly482Ser G>A	GG

WEIGHT GAIN & WEIGHT LOSS RESISTANCE	6
ADIPOQ –11391 G>A	GG
ADRB2 Arg16Gly A>G	GG
ADRB2 Gln27Glu C>G	GG
LEPR Gln223Arg A>G	GG
MC4R T>C	CC
FABP2 Ala54Thr G>A	GA
FTO 87653 T>A	TA
PPARG Pro12Ala C>G	CG
TCF7L2 IVS3 C>T	CT
UCP1 –3826 A>G	AG
LEPR Lys109Arg A>G	GG
LEPR Lys656Asn G>C	GG
UCP2 –866 G>A	GA
UCP3 –55 C>T	TT
ADIPOQ –395 G>A	GG
ADRB3 Trp64Arg T>C	TT
APOA2 –492 T>C	TC
APOA5 –1131 T>C	TT
CLOCK 3111 T>C	TT
MMP2 Gly226Gly G>C	GG
PLIN 11482 G>A	GG

GENES BY PATHWAY

ACTIVITY

TRAINING RESPONSE 1		INJURY 2		POWER 3	
AMPD1 133 C>T	CC	COL12A1 AluI A>G	AA	★ ACE Ins/Del	DD
CAT −262 C>T	CC	VEGFA -2578 C>A	AA	ADRB2 Gln27Glu C>G	GG
CKM NcoI T>C	TT	GDF5 5'UTR C>T	CT	AMPD1 133 C>T	CC
HIF1A Pro582Ser C>T	CC	COL1A1 1546 G>T	GT	ADRB2 Arg16Gly A>G	GG
ACE Ins/Del	DD	COL3A1 Ala698Thr G>A	GG	ACTN3 577 R/X	RX
ACSL1 T>C	TT	MMP3 A>G	AG	ACVR1B A>G	AG
VEGF −634 G>C	GG	TNFA −308 G>A	GG	AGT Met235Thr A>G	AG
				NOS3 −786 T>C	TC
				CKM NcoI T>C	TT
				HIF1A Pro582Ser C>T	CC
				IL-6 −174 G>C	CC
				PPARGC1A Gly482Ser G>A	GG
				VDR BsmI G>A	GG
				VDR TaqI T>C	TT

RECOVERY 4		ENDURANCE 5	
CRP 2147 G>A	GG	PPARGC1A Gly482Ser G>A	GG
IL-6 −174 G>C	CC	CKM NcoI T>C	TT
MNSOD Val16Ala T>C	TC	PPARA 89204 G>C	GG
CAT −262 C>T	CC	ACE Ins/Del	DD
IL-1 +/−	+	ADRB2 Arg16Gly A>G	GG
GPX1 Pro198Leu C>T	CC	ADRB2 Gln27Glu C>G	GG
IL-6R Asp358Ala A>C	AA	NRF2 A>G	AA
TNFA −308 G>A	GG	PPARD 294 T>C	TT
		VEGF −634 G>C	GG

GENES BY PATHWAY

NUTRIENTS

VITAMIN B12	1
★ TCN2 776 C>G	GG
FUT2 Gly258Ser G>A	GA

FOLATE	2
MTHFD1 1958 G>A	AA
TCN2 776 C>G	GG
MTHFR 677 C>T	CT
MTHFR 1298 A>C	AC

FATTY ACIDS	3
FADS1 592 G>T	GT
FADS2 C>G	CG
APOA2 −492 T>C	TC

CHOLINE	4
MTHFD1 1958 G>A	AA
BHMT Arg239Glu G>A	AA

VITAMIN D	5
CYP2R1 A>G	AG
GC A>C	AA
VDR Bsm1 G>A	GG
VDR Fok1 T>C	CC
VDR Taq1 T>C	TT

GLUTEN	6
HLA DQ 2.2/2.5/8	DQ2.2/DQ2.2

IRON OVERLOAD	7
HFE C282Y/H63D	CC/HD

VITAMIN C	8
GSTO2 Asn142Asp A>G	AA
SLC23A1 790 G>A	GG

CAFFEINE	9
COMT Val158Met G>A	GA
CYP1A2 −163 A>C	AA
NAT2 R/I/S	Rapid

SALT	10
ACE Ins/Del	DD
AGT Met235Thr A>G	AG