

Summarised GENEWELL™ Report

Name	Female	Report Date	2020-07-01
Surname	Case Study	Date of Sample Collection	2016-05-15
Ref Number	00001014	Date Sample Received	2016-05-17
Sample Type	Buccal Swab	Referring Practitioner	Female Case Study
Gender	Female	Estimated Weight	80
Age	29	Estimated Height	1.6
Race	White/Caucasian	Estimated Waist	80
Date of Birth	1990-01-01	Blood Pressure	High

GENEWELL™

UNDERSTANDING THE RESULTS

The complexity of modern health care necessitates an innovative approach to manage the risk of multifactorial diseases that could be applied in a medical context where genetic test results are integrated with relevant clinical, environmental, lifestyle and pathology assessments.

Variations in DNA

Genetic variations account for the different phenotypes and diverse responses to the environment between individuals. The detection of genetic variations are reported as Single Nucleotide Polymorphisms (SNPs) or copy-number variations (CNVs).

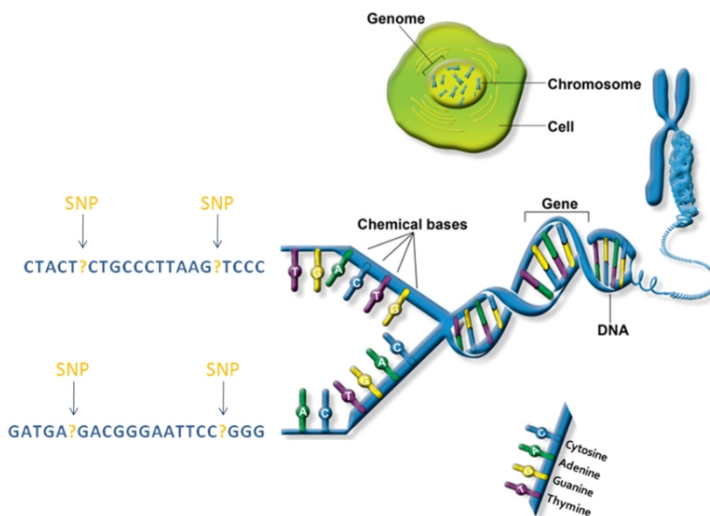
CNVs

CNVs comprise deletions, insertions and duplications. A CNV is present when the number of copies of a particular gene varies from one individual to the next. Thus, the genome (the entire set of 23 chromosomes in a person) experiences gains and losses of genetic material. <http://www.emedmd.com>

SNPs

DNA molecules consists of four different types of nucleotides that pair with each other in a very specific manner. Complementary base pairings are responsible for the double-helix structure of DNA. There are four different kinds of nucleotides that make up DNA: adenine (A), cytosine (C), guanine (G) and thymine (T). Only two kinds of base pairs are possible: GC (or CG) and AT (or TA). A variation at a single base pair is called a SNP. SNPs generate biological variation between people.

<https://kaiserscience.wordpress.com/biology-the-living-environment/genetics/>



Result Legend

- The red circle indicates a high impact, compared to the impact of the general population.
- The yellow circle indicates a moderate impact, compared to the impact of the general population.
- The green circle indicates a low impact, compared to the impact of the general population.
- The blue circle indicates no impact, (neutral effect) compared to the impact of the general population.

Current Status

Personal History	Family History	Diet
Cognitive	Cognitive	Fat Intake - High ●
Diabetes	Inflammatory	Folate Intake - Moderate ●
Fatty Liver	Hypertension	Fibre & Magnesium Intake - Moderate ●
Thyroid	Fatty Liver	
Overweight	PCOS	
PCOS	Pregnancy Loss	
Pregnancy Loss	Sleep	
Sleep	Anaemias	
Allergy: Fish	Bone density	
	Insulin Resistance	

Physical Activity	Lifestyle	Pharmaceutical
Casual, 1 - 2 days a week, 45 min, Very low intensity	Alcohol Consumption - Low ●	Vitamin B-complex
	Body Mass Index ●	Protein or other Shake
	Non-Smoker ●	

Priorities based on Genetic Impact

Unfavourable/Very High	High	Moderate	Low	Very Low/Favourable
	Blood Pressure	Choline Requirements	Cardiovascular Health	Blood Clotting & Coagulation
	Estrogen & Testosterone Metabolism	Structural & Cellular Integrity	Antioxidants Requirements	Iron Balance
	Thyroid Health	Caffeine Sensitivity	Salt Sensitivity	
		Inflammation & Immunity		
		Detoxification Phase I		
		Detoxification Phase II		
		Diabetes & Insulin Resistance		
		Brain Health & Neurotransmitters		
		Energy Regulation		
		Alcohol Sensitivity		
		Methylation Health		
		Vitamin D & Calcium Requirements		
		Oxidative Stress		
		Omega-3		
		Vitamin B9 (Folate) Requirements		
		Vitamin B12 Requirements		
		Gut Health & Digestion		

Recommendations and Comments

Biomarkers & Clinical

5-HIAA: serotonin metabolite (urine)
 Bone Mineral Density Scan
 Cortisol (saliva, 5 to 6 readings: upon awakening, 30min after awakening, 60min after awakening, 12:00, 16:00, between 22:00 - 00:00 (midnight))
 Fasting Insulin, Glucose, HbA1c
 Females: if PCOS is present, test adrenal function; e.g cortisol & ACTH (Adrenocorticotropic Hormone)
 Full Thyroid Profile: TSH, Free T4, Free T3 and Thyroid antibodies
 High sensitivity C-Reactive Protein (hs-CRP) - Ideal: <1 - 1.5mg/L
 Homocysteine (Ideal: 4.5 - 6 umol/l)
 HVA: dopamine metabolite (urine)
 Hydroxy-2-deoxyguanosine (8-OHdG) to measure oxidative stress
 Lipogram
 Oxidative Stress (indirect measure): Ferritin, hsCRP, Platelets, Red Blood Cells, Lymphocytes, Globulin, Uric acid & Bilirubin
 Sex hormones e.g. oestrogen, testosterone & progesterone
 Uric acid
 Vitamin D3 (Ideal 50 - 85ng/ml)
 VMA: nor/adrenaline (urine)

Diet

A gluten-free diet is recommended
 Anti-inflammatory diet eg high in Omega-3
 Avoid charred food (eg the 'black bits' on grilled foods)
 Avoid nitrites (food preservatives that give meat products a pink/red colour)
 Avoid or limit gluten intake
 Ensure high dietary fiber intake (>25g per day)
 Ensure sufficient dietary folate intake
 Give preference to organic produce
 Likely to tolerate lactose
 Limit intake of grilled ('braai') or smoked meats to 1 serving per week (or less)
 Monitor and manage sodium intake (1500-2000mg/day) and follow a diet rich in potassium

Supplements / Nutrients

5-HTP (5-hydroxytryptophan)
 Antioxidant eg GENEWAY™
 Antioxidant: 2-4 caps/d
 Avoid tryptophan supplements
 Calcium-D-Glucarate: 100mg/kg prior to exposure to PAHs
 Curcumin: 500-1500mg/day
 DAO-enzyme eg HistoDAO™
 DIM 100mg/day e.g. GENEWAY™ DIM 1/day
 Fiber: 4-6g/day, mostly soluble
 Glucose & Insulin metabolism e.g. GENEWAY™ Carb Support: 1-4 capsules/day
 Glutathione: 50-100mg/day
 Heavy metal detoxification supplement, if needed
 Magnesium Glycinate 500-1500mg/d e.g. GENEWAY™ Magnesium: 1-4 capsules/day
 Myo-inositol (for high thyroid antibodies)
 N-acetyl cysteine (NAC): 600-1200mg/d (glutathione precursor)
 Nattokinase 100mg/d (avoid with blood thinning agents)
 Nitric Oxide (Arginine: 700-2,100mg/d; Citrulline & glycine propionyl-L-carnitine (GPLC): 500-1,500 mg/twice daily)
 Omega-3 (DHA/EHA)
 Probiotics e.g. GENEWAY™ Probiotic
 Pycnogenol (PQQ): 100mg/day - slows the breakdown of nitric oxide
 Vitamin B (as recommended by healthcare practitioner)

Physical Activity

For weight loss, a target of at least 15 to 20 METs (Metabolic Equivalent for Task) per week, consisting of moderate to high intensity activities (3-6 METs), is recommended. A MET is a unit that estimates the amount of energy used by the body during physical activity, as compared to resting metabolism. The MET unit is standardised so it can apply to people of varying body weight and compare different activities. Resting energy expenditure (sitting) is defined as 1 MET. The MET values can be found here:

Lifestyle

Alcohol avoidance is important
 Alcohol inhibits the MTRR gene (further)
 Avoid any known carcinogens (substances and exposures that can lead to cancer)
 Avoid BPA (Bisphenol A) in plastics, pesticides, pollutants, radiation from mobile phones and genetically modified foods
 Avoid cigarette smoke, including secondary smoke
 Avoid environmental pollutants
 Avoid exposure to BPA (found in plastics, thermal printed receipts, pantyhose)
 Avoid using plastics (e.g. water bottles) with recycling codes 3 & 7 (may contain BPA)
 Ensure sufficient amount of sleep daily (7-9 hours) for better handling oxidative stress
 Stress Management
 Use water only from a filtration system that removed chemicals such as fluoride, ammonia

Pharmaceutical

A combo of T3/T4 is recommended if hypothyroidism is present
 Bupropion (Wellbutrin) is very effective for smoking cessation in the ANKK1 (GG) genotype
 If on oestrogen, consider limiting the therapy to <18 months
 Low-dose diuretic treatment
 Minimize the amount and duration of oestrogen-based hormone therapy
 Requirements folate increase with commonly used medications (MTHFR C677T - see details in rest of the report)
 Unlikely to respond to Ramipril

Other

Highly sensitive to chlorinated water and by-products
 Mutations in the methylation pathway can lead to either over- or undermethylation

Overall Interpretation Summary

Gut Health & Digestion



Based on the selected genes tested only, you have an increased risk of impaired gut health. Gut function is inseparably linked to overall health. The gut's primary function is the digestion and absorption of nutrients. However, it has a major influence on the immune system and brain health, eg 90% of serotonin is produced in the gut.

Blood Pressure



You have an increased genetic risk for developing hypertension (high blood pressure). Most people with high blood pressure have no signs or symptoms. Fortunately, high blood pressure can be easily detected and treated.

Blood Clotting & Coagulation



You have a low genetic risk for excessive blood clotting disorders. Blood clots are beneficial when they form in response to an injury or a cut that stops bleeding. The body will naturally dissolve the blood clot after the injury has healed.

Cardiovascular Health



Slight increased genetic risk for heart disease and an abnormal cholesterol profile. Cardiovascular disease generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack and high cholesterol levels. Cholesterol is an essential constituent of cell membranes and precursors of hormones such as testosterone and oestrogen. Non-genetic risk factors for heart disease include lack of exercise and smoking.

Brain Health & Neurotransmitters



Brain health refers to the balancing of neurotransmitters (brain chemicals) within the neuroendocrine systems that are involved in complex processes such as stress tolerance, ADHD, mood disorders, social functioning, addictive tendencies and cognitive wellness (eg memory). Based on the genetic score, you have a moderate predisposition to neuro-imbalances. Implementing certain lifestyle measures can optimise your brain health.

Estrogen & Testosterone Metabolism



The combination of gene variants identified in this analysis indicates you have an impaired oestrogen and androgen (testosterone and DHEA) metabolism. This puts you in the moderate-to-high risk category. Non-genetic causes of hormonal imbalances that may increase the risk further include obesity, liver disease, hormone therapy, certain antibiotics and some herbal remedies.

Diabetes & Insulin Resistance



Based on the genes tested in this analysis, you have a moderately increased risk for type 2 diabetes and insulin resistance. Other factors that increase this risk further include obesity, stress and chronic steroid use. Insulin resistance typically precedes the development of type 2 diabetes. Preventative lifestyle measures are recommended.

Inflammation & Immunity



Moderately increased risk for chronic, low-grade inflammation. Inflammation is a vital part of the immune system's response to injury and infection. It is the body's way of signaling the immune system to heal and repair damaged tissue, as well as defend itself against viruses and bacteria. Chronic inflammation, however, is linked to certain diseases such as heart disease and arthritis. Additional support is recommended.

Structural & Cellular Integrity



Moderately increased risk for impaired bone health (eg osteopenia) and cell membrane integrity. Bone health is crucial for providing structure, anchoring muscles and storing calcium. The cell membrane protects each cell in the body from environmental substances (eg toxins) and regulates the entry of substances (eg nutrients) in and out of cells. Sub-optimal cell membrane integrity makes you vulnerable to many diseases. Additional nutritional support is recommended.

Detoxification Phase I



Genetic variants in Phase I liver detoxification were detected. Overall, your Phase I liver detoxification is considered moderately impaired. Phase I genes are triggered by specific chemicals, causing a mechanism of protection that safeguards against many different kinds of toxins. Avoidance of these toxins and nutritional support can lower the risk significantly.

Detoxification Phase II



Based on the genetic profile, Phase II detoxification in the liver is impaired. This can be managed by lifestyle interventions and nutritional support. During Phase II, toxins are made water soluble, allowing for easy excretion and removal from the body. If a sluggish Phase II is unable to keep up with the demand of Phase I, toxins will accumulate.

Oxidative Stress



Moderately reduced 'natural' anti-oxidative protection. Additional nutritional support is important to overcome this. When oxygen molecules split they become unstable, free radicals causing oxidative stress. Oxidative stress can damage DNA and the body's cells, leading to a range of diseases. Anti-oxidants bind to free radicals to ensure it is no longer available to cause damage.

Thyroid Health



Your genetic profile confers a high risk of thyroid dysfunction. It can relate to either over- or underactive thyroid function. The thyroid gland's primary function is to regulate the body's metabolism - how fast you burn energy. Adequate iodine intake is especially important.

Methylation Health



Based on the genetic analysis, your methylation pathway is moderately impaired. Methylation is essential for the optimal function of almost all the body systems. It occurs billions of times every second. It helps to repair DNA, helps keep inflammation in check, it replenishes the compounds needed for detoxification and helps maintain a stable mood.

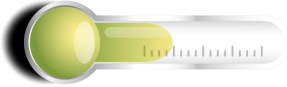
Energy Regulation



Humans derive food energy from carbohydrates, fats and proteins. There are many genes that control how the body converts nutrients into energy. Based on the results of some of the important genes tested, you have overall an impaired energy conversion. This increases your risk of becoming overweight but could easily be controlled with the right diet.

Nutrients and Other Compounds

Antioxidants Requirements



Antioxidants are compounds produced in the body and found in foods. Antioxidants protect cells from oxidative stress that can cause damage by harmful molecules known as free radicals formed during oxygen use. Based on your genetic results your natural antioxidative ability is slightly compromised and therefore your nutritional antioxidant requirements are a bit higher than the recommendations to the general population. While we like to think we can get all the nutrients we need from our food supply, due to modern agricultural practices this is becoming less likely. You may benefit from an antioxidant supplement especially if you are physically very active or exposed to pollution. The best dietary sources are colourful foods. Vitamins A, C and E are examples of antioxidants.

Iron Balance



Iron deficiency is the most common nutrient deficiency in the world. It is associated with fatigue, dizziness, cold hands and feet. Iron overload, on the other hand, is equally detrimental affecting the liver. The DNA tests assessed the balance between the iron deficiency (anemia) and iron overload (haemochromatosis) genes. Your overall genetic profile is associated with normal iron homeostasis. Even so, if you follow a diet very low in iron, e.g. vegan, is a professional athlete or have a bleeding ulcer, you are still at risk for an iron deficiency. Similarly, overuse of iron supplements can cause iron overload. The best dietary source of iron is liver.

Omega-3



Omega-3's are essential nutrients (your body can not produce it). It is important for heart and brain function and has an anti-inflammatory function. There are 3 types Omega-3's: EPA (eicosapentaenoic acid), DHA (docosahexaenoic acid) and ALA (alpha-linolenic acid) and they have different roles in the body. For healthy individuals with a genetic profile like yours, 1,000mg of combined DHA and EPA are recommended daily, in a ratio of EPA:DHA of 3:1. Read labels of supplements to see how much actual EPA and DHA are in it. The total Omega-3 content does not reflect EPA and DHA content. The best food source of Omega-3 fats is fatty fish: 75g of salmon contains 1.6g DHA/EPA. Good plant food sources include flaxseed and walnuts, but you have to eat a lot to gain the same benefits as you do from fish.

Salt Sensitivity



Your genetic profile shows that you are not very salt-sensitive. That means you have a lower risk of hypertension when your sodium consumption increase. Sodium is an essential mineral in the body, that plays a role in nerve signal transmission, muscle contraction and the maintenance of fluid balance.

Vitamin B9 (Folate) Requirements



Folate (Vitamin B9) is required for numerous processes: DNA maintenance, detoxification and hormone production to mention just a few. Your test result is associated with an increased need for folate, to overcome the genetic deficiencies. Folic Acid is the synthetic, inactive form of folate and should be avoided. Methyl folate is the active form and 400mcg is a common starting point for adults. Folinic acid is an alternative to methylfolate. Folate is found naturally in uncooked leafy green vegetables, but you may not be able to meet your folate requirements via dietary intake due to the volumes required.

Vitamin B12 Requirements



Vitamin B12 (cobalamin) is important for the production of neurotransmitters, energy and blood cells. Since the human body cannot produce vitamin B12, you need to get adequate amounts of it in the correct form through the diet or via supplementation. The type and quantity of vitamin B12 required are determined primarily by genetics and based your profile, you require methylated vitamin B12 (that is already bioactive) in dosages higher than the usual recommendations. Avoid cyanocobalamin (synthetic B12). Some of the symptoms of low vitamin B12 levels include anxiety, fatigue, memory loss and tingling feet.

Vitamin D & Calcium Requirements



Your genetic profile is associated with an increased risk of inadequate Vitamin D concentrations. Vitamin D is crucial for calcium concentrations, bone health, immune function and the reduction of inflammation. Since limited foods supply Vitamin D, supplementation in the D3 form may be required. It is recommended to measure Vitamin D stores regularly (blood tests) and based on those results, supplementation of 1,000 IU vitamin D3 daily, may be the ideal therapeutic dosing.

Caffeine Sensitivity



Your genotype is associated with being a slow metaboliser of caffeine. You may experience side-effects such as sleep disturbances due to caffeine consumption. Caffeine tolerance level: 3-4 mg/kg body mass of caffeine daily, which is about 3 cups of coffee per day. Consumption of vegetables such as broccoli and Brussels sprouts will eliminate caffeine quicker from the body.

Choline Requirements



Based on your genetic profile, you require more choline than the general recommendation. Choline is a vitamin-like essential nutrient and needed in all cell membranes, for fat transport, DNA synthesis, acetylcholine production and muscle movement. The best dietary source is eggs, however, you might need choline and/or phosphatidylcholine supplementation. The PEMT and BHMT genes play an important role in your choline requirements.

Alcohol Sensitivity



Everyone knows alcohol is toxic but your genetic profile is associated with having overall, an increased risk of developing chronic conditions such as various cancers, heart disease, depression and dementia, compared to the general population, with regular alcohol consumption. The best available current evidence shows that regular consumption of alcohol does not improve overall health. The World Health Organisation withdrew its previously "safe" guidelines for alcohol consumption.

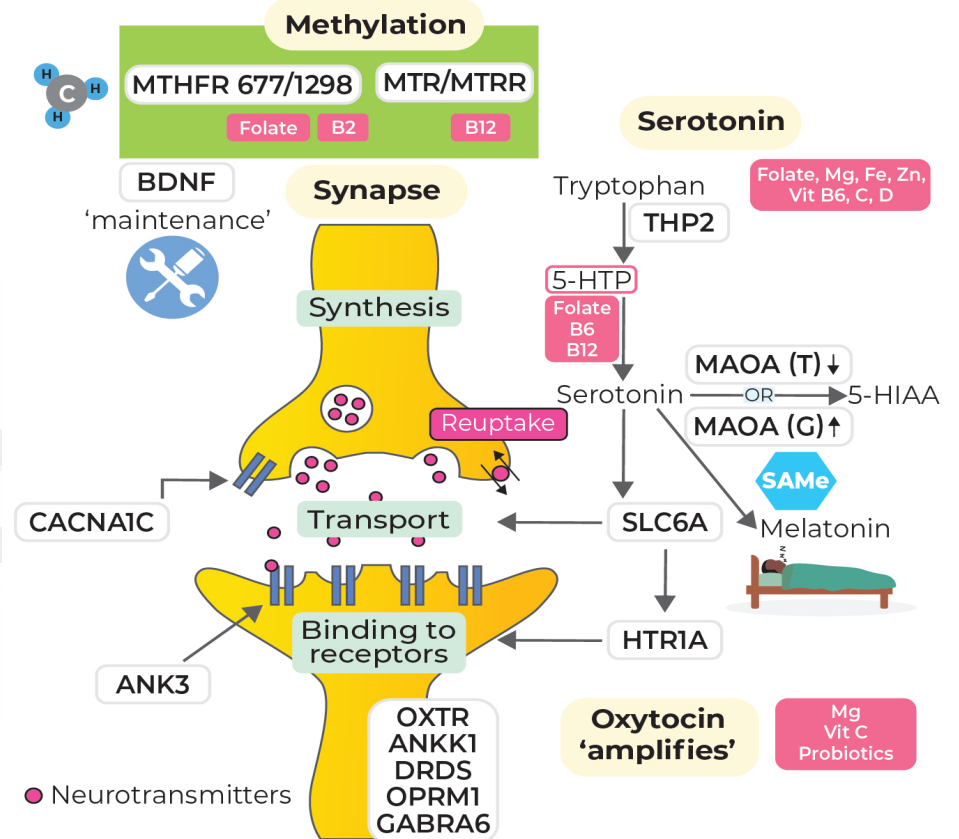
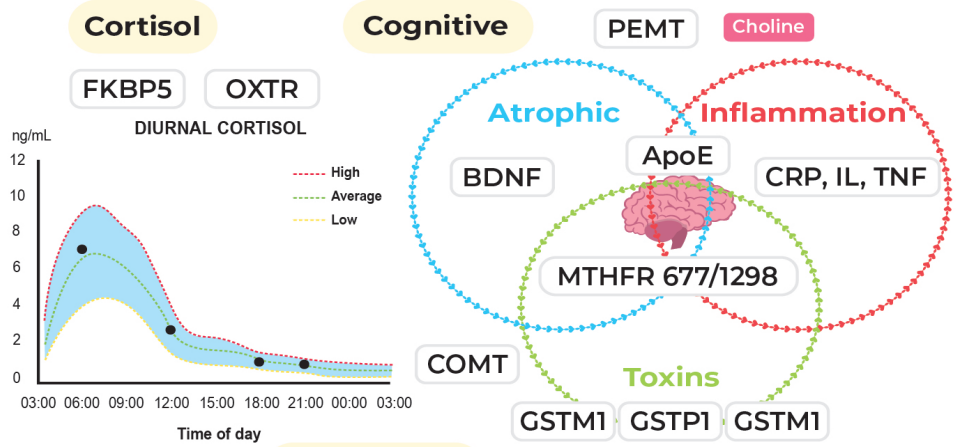
Summary of Genetic Results

Top Health Genes

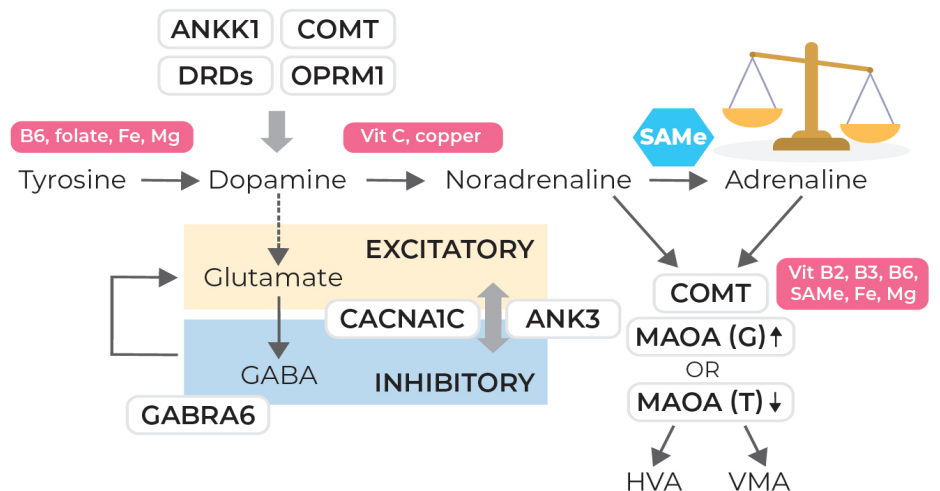
- COMT Val158Met: 'Worrier' ● A/G
versus 'Warrior'.
Metabolises dopamine & oestrogen. Affecting mood, energy level, sleep and focus.
- DAO (T16M): Response to ● C/T
histamine from food & bacteria, susceptibility to allergy symptoms & food intolerances.
- GSTP1 (I105V): ● A/G
Detoxification of smoke, heavy metals, herbicides, pesticides & other xenobiotics.
- MAO-A R297R: Breaks down ● G/T
serotonin ("feel-good" chemical), dopamine (reward-motivation) & norepinephrine (stress hormone)
- MTHFR A1298C: Dopamine ● G/T
& serotonin balance, methylation - the mechanism used by cells to control gene expression.
- MTHFR C677T: Folate ● G/A
metabolism, homocysteine cycle, detoxification & methylation - a key process for genetic expression.
- PEMT G523A: ● T/C
Phosphatidylcholine production to maintain cell membranes, bile flow, muscle health, liver support & brain development.
- GPX C599T: Detoxification of ● C/C
hydrogen peroxide (from stress response) & antioxidant requirements.
- IL6 -174 G>C: Pro- & anti- ● G/G
inflammatory properties & regulates the immune response.

Brain Health & Neurotransmitters

- DRD4 (C-521T): Reward-seeking pathway ● C/C
- TPH2 (G>T): Regulation of serotonin synthesis ● G/G
- ANK3 (C>T): Inhibitory cell signalling (emotional "roller coaster") ● C/T
- CACNA1C: Emotional "roller coaster" & stress-coping behaviour ● A/G
- COMT (Val158Met): Dopamine & nor/adrenaline breakdown ● A/G
- GABRA6 (1519 T>C): Binding to GABA receptors ● C/T
- HTR1A (C>G): Binding to serotonin receptors ● C/G
- MAO-A (R297R): Balancing of dopamine, nor/adrenaline & serotonin ● G/T
- MTHFR (1298A>C): Neurotransmitter synthesis ● G/T
- OXTR (G>A): Stress response via oxytocin ● A/G
- SLC6A4 (IVS9 A-90G): Transport & re-uptake of serotonin in brain ● C/T
- ANKK1 (Taq1A): Reward response & addictive tendencies ● G/G
- APOE: Cognitive Function ● E3/E3
- BDNF (Val66Met): Mood disorders & Memory ● C/C
- FKBP5 (C>T): Cortisol production & sensitivity ● C/C
- OPRM1 (A118G): Reward & stress response ● A/A



Dopamine, Noradrenaline, Adrenaline, GABA & Glutamate
Reward, Concentration, Fight/Flight, Calming & Stimulation



Detoxification Phase I

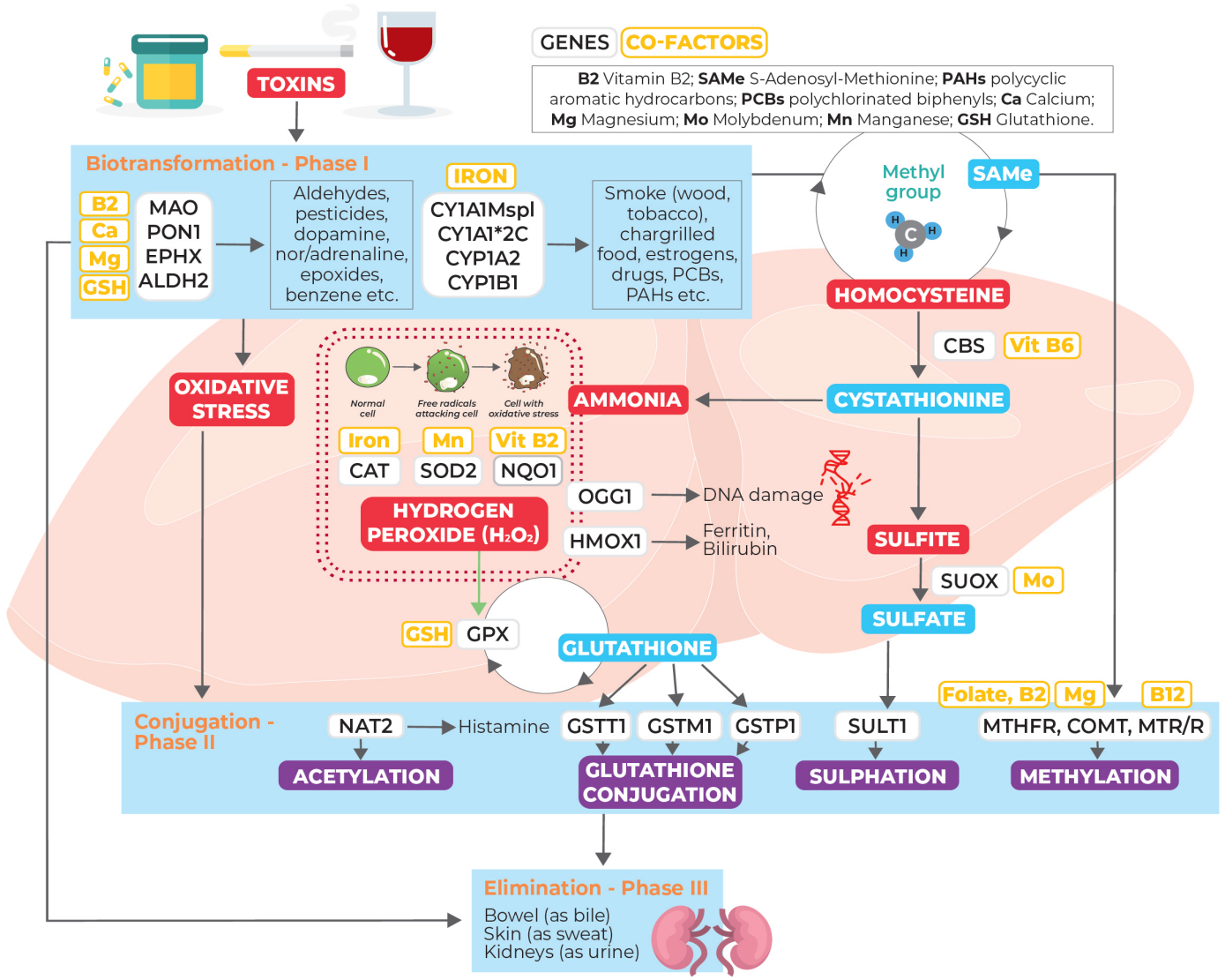
- CYP1B1 (Val432Leu): ● G/G
Detoxification
- CYP1A2 *1F (-164A>C): ● C/A
Caffeine metabolism
- CYP1A1 (Ile462Val): ● T/T
Estradiol & estrone
metabolite degradation
- CYP1A1 (MspI): ● T/T
Environmental carcinogens

Detoxification Phase II

- GSTM1 (Lys173Gln): ● ABS
Glutathione conjugation
- GSTP1 (Ile105Val): ● A/G
Glutathione conjugation
- NAT2*12A: Acetylation ● A/G
- SULT1A1*2 (638 G>A): Sulfation ● A/G
- GSTT1 (Val169Ile): ● PRS
Glutathione conjugation
- NQO1*2 (C609T): ● G/G
Degradation of toxins

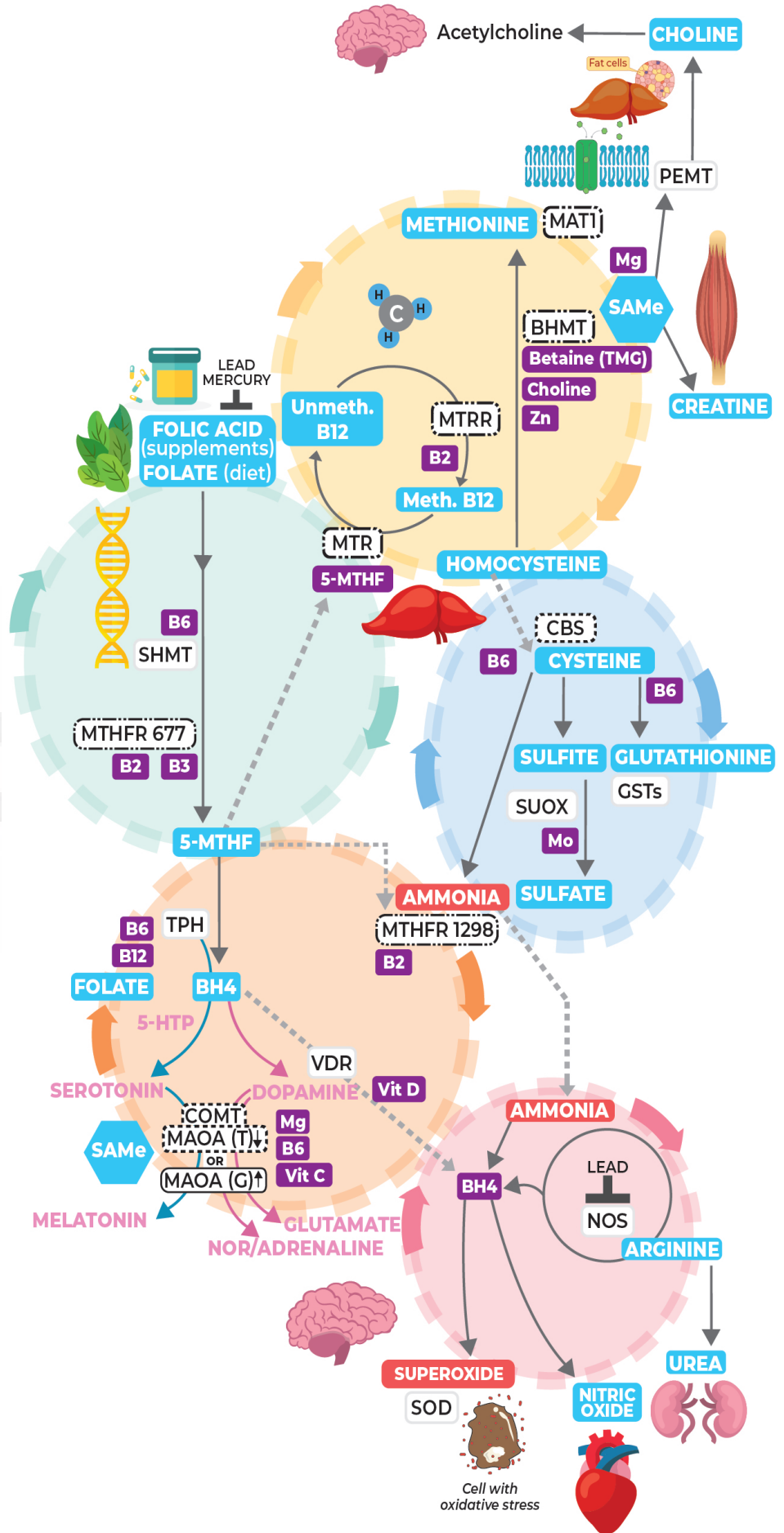
Oxidative Stress

- EPHX1 (Tyr113His): ● T/T
Oxidative stress defense
- OGG1 (Ser326Cys): Base excision repair (BER) ● C/G
- SOD2 (Val16Ala): ● A/G
Mitochondrial free radicals cleanup
- CAT (C-262T): Reactive oxygen species (ROS) defense ● C/C
- GPX (Pro199Leu): ● C/C
Glutathione production & Selenium needs



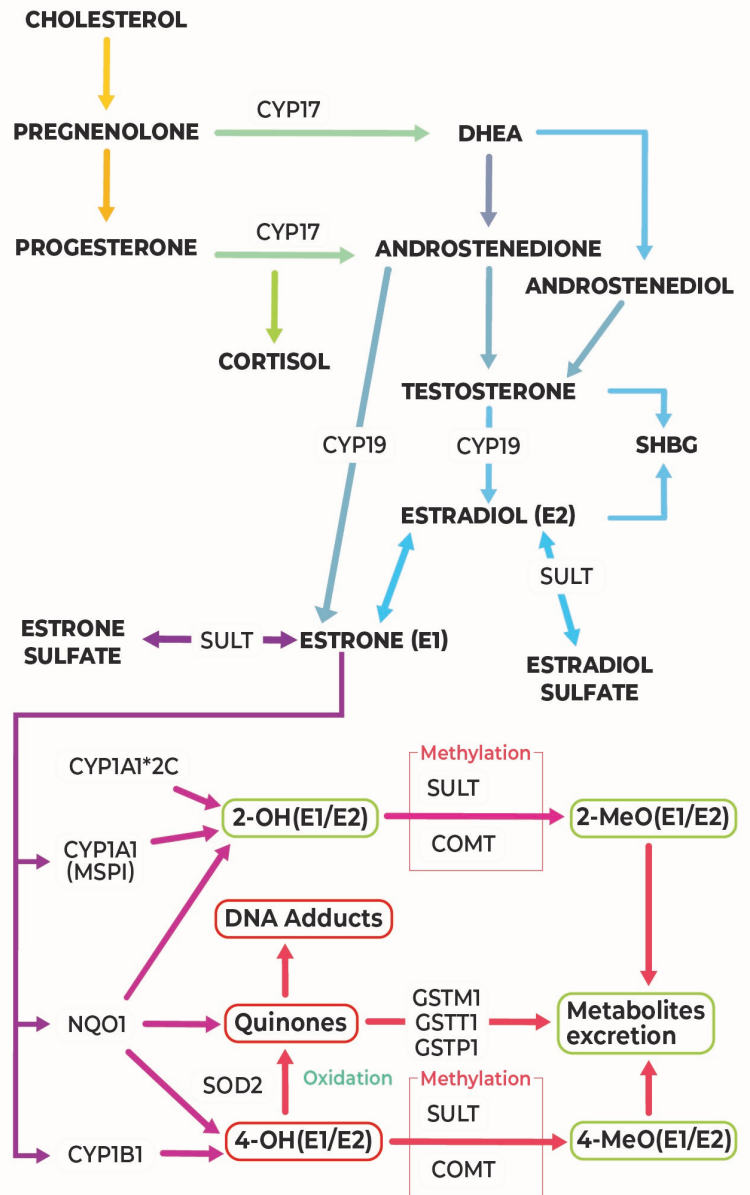
Methylation

- eNOS (G894T): Ammonia detoxification ● T/T
- VDR Taq1: Type of Vitamin B12 for dopamine production ● A/A
- BHMT-O2 (+52C>T): Conversion of homocysteine to methionine ● C/T
- CBS (C699T): 1st priority treatment: Ammonia accumulation ● A/G
- COMT (Val158Met): Dopamine breakdown ● A/G
- MAO-A R297R: Neurotransmitter balance ● G/T
- MTHFR (A1298C): Methylated folate requirements ● G/T
- MTHFR (C677T): Methylated folate requirements ● G/A
- MTR (A2756G): Methylated vitamin B12 requirements ● A/G
- MTRR (A66G): Methylated vitamin B12 requirements ● A/G
- PEMT (G523A): Choline requirements ● T/C
- MAT1A (T*1297C): Conversion of methionine to SAmE ● A/A
- SHMT (C1420T): 1st priority treatment: Folate availability & DNA synthesis ● G/G
- SUOX (S370S): Sulfur Metabolism ● T/T



Estrogen & Testosterone Metabolism

- CYP1B1 (Val432Leu): ● G/G
Estrone conversion into 4-OH metabolites
- GSTM1: Binds glutathione to estrogen metabolites ● ABS
- COMT (Val158Met): ● A/G
Breakdown of estrone metabolites
- CYP17A1 (34T>C): ● A/G
Progesterone conversion into DHEA & testosterone
- CYP19A1 (+1531 A/G): ● A/G
Estrogen synthesis
- GSTP1: Binds glutathione to estrogen metabolites ● A/G
- SOD2: Antioxidant function ● A/G
- SULT1A1*2: Binds estrone metabolites to sulfur for excretion ● A/G
- CYP1A1 (Ile462Val): Estrone conversion into protective 2-OH metabolites ● T/T
- CYP1A1 (Msp1): Estrone conversion into protective 2-OH metabolites ● T/T
- GSTT1: Binds glutathione to estrogen metabolites ● PRS
- NQO1*2: Quinone conjugation & removal ● G/G



	COMT	CYP1A1	CYP1B1	CYP17	CYP19	GSTs	NQO1	SULT
Variations cause:	↑ Procarcinogenic E1 (Estrone)	Reduce protective E1	↑ Procarcinogenic E1 (Estrone)	↓ Progesterone & ↑ testosterone	Excess E2 (Estradiol)	↓ Elimination of estrogens	↑ DNA adducts	↑ Procarcinogenic E1 (Estrone)
Upregulation	B vitamins Betaine Magnesium SAmE	Berries Caffeine Crucifers DIM / I3C Flaxseed Soy	Char-grilled foods Inflammation PAHs Smoke	Alcohol ↑ Glucose ↑ Insulin Obesity PCB toxicity PCOS	Forskolin Genistein Inflammation ↑ Insulin Licorice root Obesity	Allium vegetables Antioxidants Crucifers DIM Glutathione Vit C	CoQ10 Ubiquinol	Caffeine Sulfur rich foods eg broccoli Sulfur rich supplements eg α-Lipoic Acid
Downregulation	Catechins (green tea) Phthalates Rhodiola rosea	Moderate alcohol consumption ↑ Omega-6 intake Pterostilbene Resveratrol ↑ Sugar intake	Chrysin Antioxidants Crucifers eg Brussel sprouts DIM Resveratrol I3C	↑ Glucose Dioxin toxicity Ketoconazole Apigenin Polyphenols	Aromatase inhibitors Genistein Grape seed extract White button mushrooms	Heavy metals eg mercury, lead Toxins eg solvents, herbicides, fungicides PAHs	Benzene eg glues, paints, furniture wax Smoking	High intake of phenols eg resveratrol and green tea Cannabis

ABBREVIATIONS

▶ DIM Di-Indolyl-Methane

▶ PAHs Polycyclic aromatic hydrocarbons
▶ I3C Indole-3-Carbinol

▶ PCBs Polychlorinated biphenyls
▶ SAmE S-Adenosyl Methionine

Summary of Genetic Results

Gut Health & Digestion (Assimilation)	Circulatory System: Blood Pressure	Circulatory System: Blood Clotting & Coagulation
HMOX1 (A-413T): "Leaky Gut" & Inflammation in intestinal tract ● T/T	ADD1 (G460W): Blood pressure control ● T/T	Factor II (G20210A): Blood clotting ● G/G
TNF (-308 G>A): Non-Celiac Gluten Sensitivity ● A/A	eNOS (G894T): Vasodilation & platelet aggregation ● T/T	Factor V (R506Q): Blood clotting ● C/C
BHMT-02 (+52C>T): "Gut brain connection" ● C/T	AGT (M235T): Blood flow regulation ● A/G	PAI-1 (4G/5G): Blood clotting ● G/G
DAO (T16M): Histamine & gluten tolerance ● C/T	ACE (G>C): Blood pressure control ● C/C	
FUT2 (G>A): Prebiotic production and vitamin B12 ● A/G		
MCM6 (-13910C/T): Lactose Tolerance ● A/A		
SHMT (C1420T): Gut inflammation ● G/G		
SUOX (S370S): Sulfite detoxification ● T/T		
Circulatory System: Cardiovascular	Inflammation & Immunity	Structural & Cellular Integrity
CETP (I405V): HDL-cholesterol ● A/A	HMOX1 (A-413T): Anti-inflammatory & antioxidative protection ● T/T	GDF5 (+104T/C): Osteoarthritis ● A/A
PON1 (Q192R): Antioxidant HDL-linked gene ● C/T	TNF- (-308 G>A): Pro-inflammatory ● A/A	MMP1 (2G/2G): Collagen breakdown ● I/I
APOC3 (C3238G): Triglycerides ● C/C	CRP4 (G3872A): Low grade chronic inflammation ● C/T	DBP (Glu416Asp): Bone health and Vitamin D transport ● A/C
APOE: Cholesterol Metabolism & Heart Disease ● E3/E3	IL-1A (4845G>T): Inflammatory response ● A/C	DBP (T>G): Vitamin D transport ● G/T
LIPC (250 G>A): Cholesterol metabolism ● G/G	IL-1A (-889 C/T): Acute inflammatory response ● A/G	IL-1RN (2018 C>T): Osteoarthritis ● C/T
LPL (1421 C>G): Triglycerides clearance and HDL-cholesterol ● C/C	IL-1RN (2018C>T): Active inflammatory response ● C/T	PEMT (G523A): Cell membrane integrity ● T/C
	IL-1 (3954C>T): Active inflammatory response ● G/A	VDR Fok1: Vitamin D requirements ● A/G
	IL-1 (-511A>G): Active inflammatory response ● G/A	TIMP4 (-55C/T): Osteoarthritis ● C/C
	IL6 (-174 G/C): Pro- & anti-inflammatory ● G/G	VDR Bsml: Regulation of collagen formation ● G/G
	IL6R (481A>C): Acute inflammatory response ● A/A	VDR Taq1: Bone density ● A/A

Summary of Genetic Results

Energy	Diabetes & Insulin Resistance	Pharma & Hormone Therapy
TCF7L2 (C>T): Benefit of restricting fat intake ● C/C	ADRB2 (A16G): Carbohydrate sensitivity ● G/G	CYP1B1 (Val432Leu): HT, breast & prostate health ● G/G
FABP2 (Ala54Thr): Benefit of restricting carb intake for weight management ● C/T	PPARG (Pro12Ala): Insulin resistance ● C/C	COMT (Val158Met): Stress Hormones Breakdown, Methylation & Oestrogen Metabolism ● A/G
IRS1 (T>C): Benefit of restricting fat intake for weight loss ● C/T	IRS1 (T>C): Insulin resistance ● C/T	CYP17A1 (34 T>C): Use of oestrogen containing HTs ● A/G
PPARG (Pro12Ala): Benefit of restricting certain types of fat intake for weight loss ● C/C	SLC2A2 (Thr110Ile): Glucose 'carrier' ● G/G	MAO-A (R297R): Monoamine oxidase inhibitors ● G/T
ACE (I/D): Benefit of restricting carb intake for weight loss ● C/C	TCF7L2 (C>T): Type 2 diabetes risk ● C/C	NAT2*12A: Acetylation ● A/G
SLC2A2 (Thr110Ile): Benefit of restricting carb intake ● G/G		SOD2 (Val16Ala): HT recommendation ● A/G
		SULT1A1*2 (638 G>A): Sulfation ● A/G
		VDR Fok1: HT and breast health ● A/G
		ANKK1 (Taq1A): Dopamine receptor function ● G/G
		APOE: HT-associated thrombosis ● E3/E3
		BDNF (Val66Met): Antidepressants ● C/C
		Factor II (G20210A): Use of oestrogen containing HTs ● G/G
		Factor V (R506Q): Use of oestrogen containing HTs ● C/C
		NQO1*2 (C609T): Quinones ● G/G
		OPRM1 (A118G): Pain management ● A/A
		PAI-1 (4G/5G): HT recommendation ● G/G
		VDR BsmI: HT and osteoporosis prevention ● G/G
Thyroid Health	Iron Metabolism	Circadian Rhythms
TNF (-308 G>A): Risk of autoimmune thyroid diseases ● A/A	HFE (C282Y): Iron overload risk ● G/G	CLOCK (3111 T>C): Circadian Rhythms e.g. blood pressure, hormone secretion, diabetes & stress ● A/G
DIO2 (Thr92Ala): Hypothyroidism (T4/T3 hormone conversion) ● C/T	HFE (H63D): Iron overload risk ● C/C	
FOXE1 (A>G): Hypothyroidism ● A/G	TMPRSS6 (V736A): Iron deficiency risk ● G/G	

Additional Information

Methodology

SNP (Single Nucleotide Polymorphism) detection takes place using a biomedical technology called polymerase chain reaction (PCR). During this process, a few copies of a piece of DNA are amplified generating an exponential number of copies of a DNA sequence. Variations in the genes, called polymorphisms, are detected and feedback on the possible (disease) associations of these variations are provided in a report format.

Glossary

Amino acids - Organic compounds that combine to form a protein.
 Carrier - An individual who carries gene variants but usually does not display that trait or show symptoms of the disease.
 DNA (deoxyribonucleic acid) - The molecule that encodes genetic information.
 DNA sequence - The relative order of base pairs.
 Gene - The fundamental physical and functional unit of heredity.
 Gene expression - The process by which a gene's coded information is converted into the structures present and operating in the cell.
 Gene product - The biochemical material - either RNA or protein - resulting from the expression of a gene.
 Genome - All the genetic material in the chromosomes of an organism.
 Heterozygote - An individual with two different alleles at one locus (position) on the chromosome pair.
 Homozygote - An individual with two identical alleles at one locus (position) on the chromosome pair.
 Locus (pl. loci) - The position of a gene on a chromosome.
 Mitochondrial DNA - DNA inherited only from your mother.
 Mutation - Any heritable change in the DNA sequence. See also polymorphism.
 Nucleotide - A subunit of DNA consisting of a base: adenine, guanine, thymine or cytosine.
 Polygenic disorders - Genetic disorders resulting from the combined action of alleles of more than one gene (e.g. heart disease, obesity).
 Polymorphism - A difference in DNA sequence among individuals.
 Protein - A large molecule composed of amino acids in a specific order - of which the order is determined by the sequence of nucleotides in the gene coding for the protein.

GENEWAY™ Disclaimer

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