Genetic Mutation	Meaning	Nutritional Recommendations
MTHFR: C677T	Methylenetetrahydrofolate reductase (MTHFR) acodes for an enzyme that converts folic acid to its bioactive form (5-MTHF). Two important gene variants, A1298C and C677T, exist in MTHFR. A1298C causes a 10-20% conversion limitation, while C677T is much more severe with a 40-70% limitation, depending on whether the gene variant copy is homozygous or not. Low MTHF (folate) levels can lead to various issues, such as dopamine and serotonin deficiency, pregnancy complications, nervous system healing problems, weak mitochondrial function, reduced glutathione production, and poor cell turnover and T cell lymphocyte function.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
MTHFR: A1298C	Methylenetetrahydrofolate reductase (MTHFR) acodes for an enzyme that converts folic acid to its bioactive form (5-MTHF). Two important gene variants, A1298C and C677T, exist in MTHFR. A1298C causes a 10-20% conversion limitation, while C677T is much more severe with a 40-70% limitation, depending on whether the gene variant copy is homozygous or not. Low MTHF (folate) levels can lead to various issues, such as dopamine and serotonin deficiency, pregnancy complications, nervous system healing problems, weak mitochondrial function, reduced glutathione production, and poor cell turnover and T cell lymphocyte function.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
MTHFS	Poor conversion of Leucovorin (Folinic Acid), which limits methylation	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
DHFR	Converts Dihydrofolate (DHF) to Tetrahydrofolate (THF);DHF is an enzyme involved in folic acid conversion. A mutation in the genetic code for this enzyme can result in a methylation deficiency, especially in conjunction with an MTHFR mutation.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
MTHFD1	Poor conversion of THF to 5, 10 Methylenetetrahydrofolate, which limits methylation.	Methyl Folate Plus

FOLR1	Folate Receptor 1 (FOLR1) is part of a gene family associated with folate. However, mutations in this gene can lead to inadequate folate transportation to cells, resulting in high plasma folic acid levels and methylation deficiencies. This may have implications for pregnancy.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
FOLR2	Folate Receptor 2 (FOLR2) is part of a gene family associated with folate. However, mutations in this gene can lead to inadequate folate transportation to cells, resulting in high plasma folic acid levels and methylation deficiencies. This may have implications for pregnancy.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
SLC19A1	Responsible for folate uptake via a reduced carrier protein (RFC1) affected by the SLC19A1 gene. Presence of this polymorphism indicates a risk for low folate levels and associated increased homocysteine levels in the blood.	Methyl Folate Plus twice daily
GIF	This gene codes for a protein that supprts Vitamin B12 absorption. Presence of the polymorphism indicates an inadequate ability to absorb vitamin B12, which is necessary for red blood cell growth and development.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
TCN1	This polymorphism is associated with possible low plasma B12 levels due to reduced transport of colbalamin (the bioactive form of B12).	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
TCN2	This gene binds colbalamin to form the bioactive form of B12 (transcolbalamin 2). Individuals with this polymorphism may have increased homocysteine levels and lower B12 bioavailability.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus

References:

https://www.snpedia.com/index.php/Rs1051266

Yee SW, Gong L, Badagnani I, Giacomini KM, Klein TE, Altman RB. SLC19A1 pharmacogenomics summary. Pharmacogenet Genomics. 2010 Nov;20(11):708-15. doi: 10.1097/FPC.0b013e32833eca92. PMID: 20811316; PMCID: PMC2956130.

https://www.ncbi.nlm.nih.gov/gene/2694

https://www.snpedia.com/index.php/Rs526934

Oussalah A, Levy J, Filhine-Trésarrieu P, Namour F, Guéant JL. Association of *TCN2* rs1801198 c.776G>C polymorphism with markers of one-carbon metabolism and related diseases: a systematic review and meta-analysis of genetic association studies. Am J Clin Nutr. 2017 Oct;106(4):1142-1156. doi: 10.3945/ajcn.117.156349. Epub 2017 Aug 16. PMID: 28814397; PMCID: PMC5611783.

Genetic Mutation	Meaning	Nutritional Recommendations
COMT Vall58Met	COMT is an enzyme that breaks down or inactivates neurotransmitters like dopamine, epinephrine, and norepinephrine, mainly through a form of methylation. Individuals with a COMT (+/-) mutation may be slow to distance themselves from feelings of anxiety or depression, while those with a COMT (+/+) mutation may be more susceptible to prolonged episodes of anxiety, depression, and OCD. Val/Val variant catabolizes 400% greater than Val/Met. Met/Met catabolizes 40% slower than Val/Met.	Full Focus OR Advanced Neurotransmitter Support
MAO B	Monoamine Oxidase B (MAO B) codes for an enzyme that breaks down molecules including dopamine, epinephrine, and norepinephrine, and helps stabilize mood in the central nervous system. Its main job is to degrade dopamine. However, individuals with MAO B polymorphisms are at a higher risk of mood disorders and clinical depression.	Full Focus OR Advanced Neurotransmitter Support
GAD 1	Decreased conversion of GABA to glutamic acid. Dysphoria, sleep disorders, low muscle tone, spasticity.	Pro GAD Enhancer 1 -2 times daily.
MAO-A	MAO-A is a key enzyme that breaks down several important neurotransmitters in the brain, including serotonin, dopamine, epinephrine, and norepinephrine. However, mutations in the MAO-A gene can lead to reduced breakdown of these neurotransmitters and may be asspciated with poor mood regulation.	
HTR2	HTR2 encodes a gene associated with a receptor for the neurotransmitter serotonin. A polymorphism on this gene may impact mood.	Mood Plus or 5-HTP

SLC6A4	SLC6A4 encodes a gene that facilitates uptake of the neurotransmitter serotonin. A polymorphism on this gene may impact mood and can contribute to headaches associated with overuse of painkillers such as opioids or NSAIDs	Mood Plus or 5-HTP
TPH2	The TPH2 gene codes for the synthesis of serotonin	Mood Plus or 5-HTP, Niacinimide

References:

https://www.ncbi.nlm.nih.gov/gene/3356

Terrazzino S, Tassorelli C, Sances G, Allena M, Viana M, Monaco F, Bellomo G, Nappi G, Canonico PL, Genazzani AA. Association of haplotype combination of serotonin transporter gene polymorphisms with monthly headache days in MOH patients. Eur J Neurol. 2012 Jan;19(1):69-75. doi: 10.1111/j.1468-1331.2011.03436.x. Epub 2011 May 18. PMID: 21585624.

https://www.snpedia.com/index.php/Rs4570625

Genetic Mutation	Meaning	Nutritional Recommendations
ATP5C1 (ATP Synthesis)	Synthesizes ATP (energy) in the cell. Issues: low tone, immune cell weakness, poor neurological function.	Mito Cell PQQ or Mitochondrial Restore
COX5A / COX6C	Mitochondrial Respiratory Chain Stage IV	Mito Cell PQQ or Mitochondrial Restore
NDUFS7 (NADH-Ubiquinone Oxido-Reductase)	Decrease in Mitochondrial Complex II production. Issues: chronic fatigue, low muscle tone.	Mito Cell PQQ or Mitochondrial Restore
UQCRC2	Decrease in Mitochondrial Complex II production. Creates moderate to severe mitochondrial weakness, low muscle tone, poor immune function, poor neurological function.	Mito Cell PQQ or Mitochondrial Restore
NDUFS3	This gene provides instructions for making an iron-sulfur protein (NADH Dehydrogenase (Ubiquinone) Fe-S Protein 3); a component that heps enable the mitochondria to produce energy. Mutations in this gene, can lead to concerns with mitochondrial complex I in the mitochondrial respiratory chain.	Mito Cell PQQ or Mitochondrial Restore
NDUFS8	This gene provides instructions for making an iron-sulfur protein (NADH Dehydrogenase (Ubiquinone) Fe-S Protein 3); a component that heps enable the mitochondria to produce energy. Mutations in this gene, can lead to concerns with mitochondrial complex I in the mitochondrial respiratory chain.	Mito Cell PQQ or Mitochondrial Restore
CoQ2	The COQ2 gene codes for an enzyme that produces coenzyme Q10, critical for various cellular functions. Within mitochondria, it is crucial for oxidative phosphorylation, which converts food energy intoATP, a form usable in the body.	Mito Cell PQQ or Mitochondrial Restore

References:

https://www.genecards.org/cgi-bin/carddisp.pl?gene=NDUFS3
COQ2 gene: MedlinePlus Genetics

Genetic Mutation	Meaning	Nutritional Recommendations
ATG16L1	Autophagy related genes code for proteins required for autophagy. Polymorphisms in this gene are related to immune and inflammation issues.	May benefit from NAS Enhancer, DCI 500, or Metabolic Stimulator
ATG12	Autophagy related genes are essential for enabling authophagy function.	
ATG5	Autophagy-related 5 protein (ATG5) helps regulate autophagy vesicle formation, innate immune system signaling, consumption of damaged mitochondria, and apoptosis. Autophsghy related gene polymorphisms are associated with several immune and inflammation concerns.	

References:
https://medlineplus.gov/genetics/gene/atg16l1/
https://www.medicaljournals.se/acta/content/html/10.2340/00015555-1183

Genetic Mutation	Meaning	Nutritional Recommendations
TTPA	The TTPA gene is integral for distributing vitamin E throughout the body. The α-tocopherol transfer protein is found in the liver and the brain.	Vitamin E
BCQM1	BCOM1 is a gene that converts beta-carotene to vitamin A. Almost half of the population carries significant variants of the BCMO1 gene, which can weaken the conversion to vitamin A. Two genetic variations of the gene decrease conversion by 69% or 32%. Vitamin A has several different forms, including retinyl palmitate found in animal sources, and carotenes found in plant sources like carrots. The body stores 80-90% of retinoids in the liver and uses them in various cells throughout the body.	Vitamin A
SLC30A8	The SLC30A8 polymorphism leads to a less efficient zinc efflux transporter, causing the build-up of zinc in intracellular vesicles	If negative, Zinc
SLC23A1	This gene is responsible for encoding one of the two sodium-dependent vitamin C transporters necessary for the absorption of vitamin C into the body and its distribution to organs. The protein product of this gene is involved in bulk vitamin C transport across epithelial surfaces.	Vitamin C 1000
SLC5A6	SLC5A6 (Solute Carrier Family 5A6) produces an enzyme that transports pantothenate (B5) and biotin (B7). Variations on this gene can affect vitamin uptake, intestinal absorption, cellular delivery, and transport. Pantothenate and biotin play a crucial role in fat and carbohydrate metabolism, carbon dioxide transport, and gluconeogenesis. Weakness in this enzyme can be associated with hair and nail concerns, skin issues, and tingling of the extremities.	Biotin and Pantothenic Plus

CoQ2	The COQ2 gene codes for an enzyme that enables the coenzyme Q10 (ubiquinone), critical for various cellular functions. This enzyme, which is part of the coenzyme Q10 pathway, catalyzes the prenylation of parahydroxybenzoate with an all-trans polyprenyl group. Mutations in this gene cause coenzyme Q10 deficiency. Polymorphisms in this gene can lead to fatigue, muscle weakness, exercise difficulty and general mitochondrial weakness.	CoQ 10, Mito Cell PQQ, or Mitochondrial Restore
VDR	The Vitamin D Receptor(VDR) is part of the nuclear receptor family. VDR gets activated by vitamin D, which can affect the production of proteins in the cell. If vitamin D doesn't work properly, it may weaken the immune system, or promote early bone loss, cognitive issues or mood concerns.	D3 + K2 Cofactor Complex, Vitamin D3 + K2 Drops, Liposomal Vitamin D3 + K2, Vitamin D
GC	The GC (or DBP) gene creates the Vitamin D Binding Protein, which binds to all forms of Vitamin D and is responsible for transporting it between different parts of the body.It transports vitamin D metabolites between the skin, liver and kidneys, and target tissues. Genetic variations can reduce its effectiveness in responding to Vitamin D therapy. As a result, patients with these variations may need higher doses of Vitamin D supplementation.	D3 + K2 Cofactor Complex, Vitamin D3 + K2 Drops, Liposomal Vitamin D3 + K2, Vitamin D
TCN2	The TCN2 gene produces a protein called TCN2, which attaches to the active form of Vitamin B-12. People who have two copies of the G allele at rs1801198 have lower levels of B-12 in their blood and higher levels of homocysteine compared to those who have two copies of the C allele.	Methylation Complete or Methylation Pro Topical

FOXE1	FOXE1 is a gene that produces a protein critical for making thyroid hormones. Genetic variations in this gene may reduce the ability to produce enough thyroid hormones.	Consider foods high in iodine.
DIO2	This gene produces a protein that's part of a group called "iodothyronine deiodinase". It helps convert an inactive hormone called thyroxine (T4) into an active hormone called triiodothyronine (T3) by removing an iodine molecule from its outer ring. This protein is found in many parts of the body, including the thyroid gland and the brain. It's believed to be important for producing T3 locally, which helps control the effects of thyroid hormones in these areas. It is classified as a selenoprotein.	Selenomethionine

References

https://medlineplus.gov/genetics/gene/ttpa/
DIO2 Gene - GeneCards | IOD2 Protein | IOD2 Antibody
https://www.ncbi.nlm.nih.gov/gene/9963

Genetic Mutation	Meaning	Nutritional Recommendations
MCM6	This gene codes for LP or lactose persistance and indicates if a person has the genetic mutation for lactose tolerance.	Enxymix GFCF or Enxymix Complete Chewables. Avoid lactose if negative
CYP1A2	This gene influences the metabolism of caffeine and other substances. This gene produces an enzyme from the cytochrome P450 family, which is typically located in the liver. These enzymes play a key role in metabolism, as well as in producing cholesterol, steroids, lipids, and caffeine.	Caffeine may assist with metabolism and weght loss.
DRD2	Some people possess a genetic mutation (SNP) on the DRD2 gene that improves the response rate to Chromium Picolinate.	Metabolic Stimulator
COMT	COMT is an enzyme that helps break down neurotransmitters in the brain, including dopamine and norepinephrine. It is particularly important in the prefrontal cortex, which is involved in personality, planning, inhibition, abstract thinking, emotion, and working memory. The COMT gene produces two versions of the enzyme: membrane-bound (MB-COMT) and soluble (S-COMT). MB-COMT is chiefly produced by nerve cells in the brain, while S-COMT helps control hormone levels in other tissues. COMT is also important in the metabolism of catechols, which can impact hypertension, asthma, and possibly weight loss.	Beneficial response from EGCG (epigallocatechin gallate) or catechins for weight loss. EGCG can be found in green coffee bean or green tea extracts.
ACE	The most studied variation in the ACE gene (rs4343) is associated with many different human conditions, including kidneyes, chronic illness, and athletic ability.	Limit salt intake.

AGT	The AGT gene produces the angiotensinogen protein, which plays an important role in regulating blood pressure and maintaining the balance of body fluids. People who have two copies of the rs699 C allele have a higher risk of hypertension-related concerns, including pre-eclampsia.	Limt salt intake.

References:

rs4343 - SNPedia

rs4988235 - SNPedia

rs4680 - SNPedia

COMT gene: MedlinePlus Genetics

COMT catechol-O-methyltransferase [Homo sapiens (human)] - Gene - NCBI (nih.gov)

Genetic Mutation	Meaning	Nutritional Recommendations
FOLR1	Folate Receptor 1 (FOLR1) is part of a gene family associated with folate. However, mutations in this gene can lead to inadequate folate transportation to cells, resulting in high plasma folic acid levels and methylation deficiencies. This may have implications for pregnancy.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
FOLR2	Folate Receptor 2 (FOLR2) is part of a gene family associated with folate. However, mutations in this gene can lead to inadequate folate transportation to cells, resulting in high plasma folic acid levels and methylation deficiencies. This may have implications for pregnancy.	Methylation Complete OR Methylation Pro Topical AND Methyl Folate Plus
CYP1B1	This gene influences the metabolism of estrogen and other substances. This gene produces an enzyme from the cytochrome P450 family, which is typically located in the liver. These enzymes play a key role in metabolism, as well as in producing cholesterol, steroids, lipids, and caffeine.	DIM Pro
CYP1A1	This gene influences the metabolism of estrogen and other substances. This gene produces an enzyme from the cytochrome P450 family, which is typically located in the liver. These enzymes play a key role in metabolism, as well as in producing cholesterol, steroids, lipids, and caffeine.	DIM Pro
FSHR	This gene codes for a protein that is part of a family called G-protein coupled receptors and functions as the receptor for Follicle stimulating hormone (FSH). It helps with the development of reproductive organs. FSH is important for reproductive health and menstrual cycles because it stimulates the growth of follicles. A mutation in this gene can affect follicular sensitivity.	DCI-500 or Metabolic Stimulator
SRD5A1	Steroid 5-alpha-reductase (EC 1.3.99.5) catalyzes the conversion of testosterone into the more potent androgen, dihydrotestosterone (DHT)	DIM Pro
FOXE1	FOXE1 is a gene that produces a protein critical for making thyroid hormones. Genetic variations in this gene may reduce the ability to produce enough thyroid hormones.	Selenomethionine

DIO2	This gene produces a protein that's part of a group called "iodothyronine deiodinase". It helps convert an inactive hormone called thyroxine (T4) into an active hormone called triiodothyronine (T3) by removing an iodine molecule from its outer ring. This protein is found in many parts of the body, including the thyroid gland and the brain. It's believed to be important for producing T3 locally, which helps control the effects of thyroid hormones in these areas. It is classified as a selenoprotein.	Selenomethionine
VDR	The Vitamin D Receptor(VDR) is part of the nuclear receptor family. VDR gets activated by vitamin D, which can affect the production of proteins in the cell. If vitamin D doesn't work properly, it may weaken the immune system, or promote early bone loss, cognitive issues or mood concerns.	D3 + K2 Cofactor Complex
GC	The GC (or DBP) gene creates the Vitamin D Binding Protein, which binds to all forms of Vitamin D and is responsible for transporting it between different parts of the body.It transports vitamin D metabolites between the skin, liver and kidneys, and target tissues. Genetic variations can reduce its effectiveness in responding to Vitamin D therapy. As a result, patients with these variations may need higher doses of Vitamin D supplementation.	D3 + K2 Cofactor Complex
ACE	The most studied variation in the ACE gene (rs4343) is associated with many different human conditions, including kidneyes, chronic illness, and athletic ability.	Limit salt intake
AGT	The AGT gene produces the angiotensinogen protein, which plays an important role in regulating blood pressure and maintaining the balance of body fluids. People who have two copies of the rs699 C allele have a higher risk of hypertension-related concerns, including pre-eclampsia.	Limit salt intake

References:

https://www.genecards.org/cgi-bin/carddisp.pl?gene=FSHR
FSHR follicle stimulating hormone receptor [Homo sapiens (human)] - Gene - NCBI (nih.gov)
https://www.ncbi.nlm.nih.gov/gene/6715
https://medlineplus.gov/genetics/gene/cyp1b1/

Genetic Mutation	Meaning	Nutritional Recommendations
CYP1A1	This gene influences the metabolism of estrogen and other substances. This gene produces an enzyme from the cytochrome P450 family, which is typically located in the liver. These enzymes play a key role in metabolism, as well as in producing cholesterol, steroids, lipids, and caffeine.	DIM Pro
SRD5A1	Steroid 5-alpha-reductase (EC 1.3.99.5) catalyzes the conversion of testosterone into the more potent androgen, dihydrotestosterone (DHT)	
FOXE1	FOXE1 is a gene that produces a protein critical for making thyroid hormones. Genetic variations in this gene may reduce the ability to produce enough thyroid hormones.	Consider iodine support.
DIO2	This gene produces a protein that's part of a group called "iodothyronine deiodinase". It helps convert an inactive hormone called thyroxine (T4) into an active hormone called triiodothyronine (T3) by removing an iodine molecule from its outer ring. This protein is found in many parts of the body, including the thyroid gland and the brain. It's believed to be important for producing T3 locally, which helps control the effects of thyroid hormones in these areas. It is classified as a selenoprotein.	Selenomethionine
VDR	The Vitamin D Receptor(VDR) is part of the nuclear receptor family. VDR gets activated by vitamin D, which can affect the production of proteins in the cell. If vitamin D doesn't work properly, it may weaken the immune system, or promote early bone loss, cognitive issues or mood concerns.	NAS Enhancer, DCI- 500, or Metabolic Stimulator
GC	The GC (or DBP) gene creates the Vitamin D Binding Protein, which binds to all forms of Vitamin D and is responsible for transporting it between different parts of the body.It transports vitamin D metabolites between the skin, liver and kidneys, and target tissues. Genetic variations can reduce its effectiveness in responding to Vitamin D therapy. As a result, patients with these variations may need higher doses of Vitamin D supplementation.	NAS Enhancer, DCI- 500, or Metabolic Stimulator

ACE	The most studied variation in the ACE gene (rs4343) is associated with many different human conditions, including kidneyes, chronic illness, and athletic ability.	D3 + K2 Cofactor Complex
AGT	The AGT gene produces the angiotensinogen protein, which plays an important role in regulating blood pressure and maintaining the balance of body fluids. People who have two copies of the rs699 C allele have a higher risk of hypertension-related concerns, including pre-eclampsia.	D3 + K2 Cofactor Complex
ATG16L1	Autophagy related genes code for proteins required for autophagy. Polymorphisms in this gene are related to immune and inflammation issues.	May benefit from NAS Enhancer, Metabolic Stimulator, or DCI 500
ATG12	Autophagy related genes are essential for enabling authophagy function.	
ATG5	Autophagy-related 5 protein (ATG5) helps regulate autophagy vesicle formation, innate immune system signaling, consumption of damaged mitochondria, and apoptosis. Autophsghy related gene polymorphisms are associated with several immune and inflammation concerns.	

References:
https://www.genecards.org/cgi-bin/carddisp.pl?gene=FSHR
FSHR follicle stimulating hormone receptor [Homo sapiens (human)] - Gene - NCBI (nih.gov)
https://www.ncbi.nlm.nih.gov/gene/6715

Genetic Mutation	Meaning	Nutritional Recommendations
NOS 2	Decreased activity in metabolizing nitric oxide. Variety of issues: poor neural regeneration, smooth muscle weakness, poor macrophage, exercise intolerance.	Mito Cell PQQ, Immune Restore+
VDR Fok1/Taq1	Decreased activity in receptor that transports Vitamin D. Variety of issues: poor intestinal calcium absorption, poor T cell proliferation, decreased cytokine secretion.	Vitamin D3+K2 capsules OR Micellized D3+K2 drops

Genetic Mutation	Meaning	Nutritional Recommendations
AHCY 1, 2, 19	Homozygous decrease activity which results in low homocysteine and low glutathione.	Glutathione Plus Topical, Mito Cell PQQ, NADH (Nicotinamide Riboside)
CBS c699t	Increased activity which results in low homocysteine and low glutathione. Avoid ammonia provocation such as B6, high protein, taurine, NAC/ALA, epsom salts.	Support Methylation cycle, L-Carnitine, Glutathione Plus Topical, Mito Cell PQQ
GSTM1 or GSTM3	Polymorphism results in reduced glutathione function.	Glutathione Plus Topical, Mito Cell PQQ
GSTP1	Polymorphism results in reduced glutathione function.	Glutathione Plus Topical, Mito Cell PQQ
SOD 1	This gene makes a protein that binds to copper and zinc ions. It's one of two isozymes that destroy free superoxide radicals in the body. The protein is soluble and found in the cytoplasm, where it forms a homodimer. This structure helps convert harmful superoxide radicals into molecular oxygen and hydrogen peroxide. The other isozyme is found in mitochondria	NAS Enhancer
SOD 2	SOD2 is a type of superoxide dismutase that belongs to the iron/manganese mitochondrial superoxide dismutase family. It helps transform harmful superoxide, which is produced during the mitochondrial electron transport chain, into hydrogen peroxide and oxygen. This helps clear away reactive oxygen species (ROS) in the mitochondria and protects against damage and cell death.	NAS Enhancer
SOD 3	SOD2 is a type of superoxide dismutase that belongs to the iron/manganese mitochondrial superoxide dismutase family. It helps transform harmful superoxide, which is produced during the mitochondrial electron transport chain, into hydrogen peroxide and oxygen. SOD3 supports SOD 2 function. Extracellular / Protects brains and lungs	Mito Cell PQQ, Glutathione Plus Topical OR Glutathione Ultra capsules
NAT2	Homozygous decreased activity that causes chemical avoidance. Must assist paitent with high dose of glutathione and Vitamin C.	Toxiclear Professional Formula

CTH	Glutathione is made with the help of an enzyme called cystathionine gamma-lyase (CTH). This enzyme converts cystathionine to cysteine. A mutation in the CTH gene may limitthe ability for detoxification using glutathione.	N-Acetyl Cysteine, Glutathione
GSR	The glutathione reductase (GSR) gene encodes a protein involved in metabolizing glutathione. Mutations in this gene are associated with impaired cellular redox homeostasis.	NAS Enhancer, Glutathione
GPX3	This gene makes a protein that's part of the glutathione peroxidase family. These proteins help reduce organic hydroperoxides and hydrogen peroxide (H2O2) using glutathione, which protects cells from oxidative damage. One type of this protein, GPX3, is found in high levels in plasma and inside cells. In many human diseases, the expression of this gene is reduced due to promoter hypermethylation.	NAS Enhancer, Glutathione

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https://www.snpedia.com/index.php/Rs4570625

Genetic Mutation	Meaning	Nutritional Recommendations
C3	Essential for the immune response, C3 is a protein involved in initiation of the complement system. C3 polymorphisms are associated with susceptibility to asthma and other	PEA Soothe Support, Omega-3, CBD
CD14	CD14 is a receptor found on the surface of macrophages that binds to components of bacterial cell walls. It plays a key role in initiating the innate immune response and is essential for responding to potential pathogens. Mutations in the CD14 gene have been linked to an increased risk of developing asthma and other inflammatory processes triggered by allergens.	PEA Soothe Support, Omega-3, CBD
IL2	This gene is part of the IL2 cytokine subfamily, producing a vital cytokine for T and B lymphocyte proliferation. Its IL2R receptor shares a gamma chain with IL4 and IL7. Its monoallelic expression in mature thymocytes is an unusual regulatory mode, and its targeted disruption in mice leads to an ulcerative colitis-like disease, highlighting its essential role in the immune response.	PEA Soothe Support, Omega-3, CBD

IL4	This gene encodes a pleiotropic cytokine produced by activated T cells, acting as a ligand for the interleukin 4 receptor. Along with IL13, the interleukin 4 receptor also binds to this cytokine, contributing to overlapping functions. STAT6 mediates the immune regulatory signal of this cytokine. It is part of a cytokine gene cluster on chromosome 5q with IL3, IL5, IL13, and CSF2. IL4 plays a crucial role in tissue repair and allergic airway inflammation, regulating human host responses such as allergic, anti-parasitic, wound healing, and acute inflammation. It promotes resolution of neutrophil-mediated acute lung injury but also plays a significant role in the production of allergen-specific immunoglobin (Ig) E in allergic responses. IL-4 is increased in COVID-19 patients, but its association with severe COVID-19 pathology remains unclear.	PEA Soothe Support, Omega-3, CBD
IL5	This gene encodes a cytokine that promotes growth and differentiation for both B cells and eosinophils. It plays a significant role in regulating eosinophil formation, maturation, recruitment, and survival, and increased production may contribute to eosinophil-dependent inflammatory diseases. The cytokine binds to its receptor, which is a heterodimer sharing a beta subunit with the receptors for IL3 and CSF2/GM-CSF. Located on chromosome 5, this gene is part of a cytokine gene cluster including IL4, IL13, and CSF2. Long-range regulatory elements spread over 120 kilobases on chromosome 5q31 may coordinate regulation of this gene, IL4, and IL13.	PEA Soothe Support, Omega-3, CBD

IL6	This gene produces a cytokine that plays a role in inflammation and B cell maturation, and also acts as an endogenous pyrogen that can induce fever in people with autoimmune diseases or infections. The protein is mainly produced at sites of acute and chronic inflammation, where it is secreted into the serum and activates an inflammatory response through interleukin 6 receptor alpha. This gene is involved in various inflammation-related diseases, such as diabetes mellitus and systemic juvenile rheumatoid arthritis. Higher levels of the cytokine have been detected in viral infections.	PEA Soothe Support, Omega-3, CBD
IL13	IL13 (Interleukin 13) is a member of the interleukin family of chemical messengers of the immune system. Polymorphisms in this gene are associated with changes in IL13 gene expression and increase the risk of more severe inflammatory responses to allergens.	PEA Soothe Support, Omega-3, CBD
STAT4	The protein encoded by the STAT4 gene acts as a transcription factor, which means it binds to specific regions of DNA to regulate the activity of certain genes. Immune system cytokines activate the STAT4 protein, which then enhances the expression of genes that promote the maturation of T-cells into specialized Th1 cells. These Th1 cells produce cytokines and stimulate other immune cells to eliminate pathogens within the cell.	PEA Soothe Support, Omega-3, CBD

TNF	The encoded protein from this gene is a proinflammatory cytokine that belongs to the tumor necrosis factor (TNF) superfamily, which includes members classified by primary sequence, function, and structure. Initially synthesized as a type-II transmembrane protein, it can be cleaved into multiple products with distinct biological functions. This protein is vital for the innate immune response and homeostasis regulation but is also associated with chronic inflammation-related diseases.	PEA Soothe Support, Omega-3, CBD
TRAF-1	This gene encodes a protein that belongs to the TNF receptor-associated factor (TRAF) family. TRAF proteins are known to associate with and transmit signals from various receptors of the TNF receptor superfamily.	PEA Soothe Support, Omega-3, CBD
IL23R	The IL23R gene contains instructions for producing a protein called the interleukin 23 (IL-23) receptor. This receptor is present on the surface of different types of immune cells, including T cells, natural killer (NK) cells, monocytes, and dendritic cells, which detect foreign substances and protect the body against infections and diseases.The IL-23 receptor interacts with a cytokine called IL-23 at the cell surface, with the two proteins acting like a lock and key. Upon binding, IL-23 triggers a series of chemical signals inside the cell that promote inflammation and coordinate the immune system's response to bacterial and viral pathogens.	PEA Soothe Support, Omega-3, CBD

IL2RA	The high-affinity receptor for interleukin 2 (IL2) is made up of three different chains: the alpha chain (IL2RA), the beta chain (IL2RB), and the common gamma chain (IL2RG). When the alpha chain is paired with the gamma chain, the resulting receptor has low affinity for IL2. When the beta chain is paired with the gamma chain, the resulting receptor has medium affinity for IL2. Normally, IL2RA is a protein found in cell membranes, but it can be cleaved by enzymes to produce a soluble form of the protein.	PEA Soothe Support, Omega-3, CBD
SOCS-1	The intracellular protein Suppressor of Cytokine Signaling 1 (SOCS1)belongs to the STAT (Signal Transducer and Activator of Transcription) family. It plays a critical role in regulating pro-inflammatory cytokine signaling. When SOCS1 is mutated, it is thought to lead to prolonged inflammatory responses, which mahy require additional assistance to control inflammation.	PEA Soothe Support, Omega-3, CBD
CTLA4	This gene encodes an immunoglobulin superfamily protein that inhibits T cell activity. It has alternate isoforms and mutations linked to various autoimmune diseases.	PEA Soothe Support, Omega-3, CBD
AOC1	The gene codes for a metal-binding membrane glycoprotein that breaks down putrescine, histamine, and similar compounds through oxidative deamination. The protein is sensitive to inhibition by amiloride, a diuretic that works by blocking epithelial sodium ion channels	GI Hist Support

HMNT	The HNMT gene provides instructions for making the histamine degradative enzyme called histamine N-methyltransferase. Unlike AOC1, HNMT needs S-adenosylmethionine and a complete methylation pathway for proper function. Changes in the expression or protein coding of HNMT due to genetic variations may extend the pro-inflammatory effects of histamine signaling.	GI Hist Support
FUT2	Fucosyltransferase 2 (FUT2) is responsible for producing specific sugar groups that are secreted by the intestinal cells into the bowel to attract "good bacteria" . Polymorphisms in this gene produce "poor secreter" status. Lack of these sugars allows for gut dysbiosis and a higher risk of inflammatory bowel disease.	Biotic Blend Pro (Probiotic)
NOS2	Decreased activity in metabolizing nitric oxide. Variety of issues: poor neural regeneration, smooth muscle weakness, poor macrophage, exercise intolerance.	Mito Cell PQQ, Neuro Immune Infection Control
HLA-DQA1	The HLA-DQA1 gene is part of a family of genes called the human leukocyte antigen (HLA) complex, which helps the immune system distinguish the body's own proteins from foreign invaders. The HLA-DQA1 gene belongs to a group of genes called MHC class II, which provide instructions for making proteins that display foreign peptides to the immune system. The protein produced by HLA-DQA1 binds to the protein produced by HLA-DQB1 to form a functional protein complex that displays foreign peptides to trigger the body's immune response.	Enxymix GFCF, Enxymix Complete Chewables

HLA-DQA2	This gene is part of the HLA class II alpha chain family and produces a protein that combines with a class II beta chain to form a heterodimer. The protein is located within intracellular vesicles and plays a crucial role in loading peptides onto MHC class II molecules by assisting in the removal of the CLIP molecule from the peptide binding site. These class II molecules are expressed in antigen-presenting cells such as B lymphocytes, dendritic cells, and macrophages. They are responsible for presenting antigenic peptides on the cell surface to be recognized by CD4 T-cells.	Enxymix GFCF, Enxymix Complete Chewables
HLA-DRB1	The HLA-DQA1 gene is crucial for the function of the immune system, as it codes for a cell surface receptor. Individuals with a genetic variation in this gene have an increased susceptibility to autoimmune inflammatory concerns, such as Celiac disease, Crohn's disease, Ulcerative Colitis, and gluten sensitivity.	Avoid gluten
HLA-DRB2	The HLA-DQA2 gene is crucial for the function of the immune system, as it codes for a cell surface receptor. Individuals with a genetic variation in this gene have an increased susceptibility to autoimmune inflammatory concerns, such as Celiac disease, Crohn's disease, Ulcerative Colitis, and gluten sensitivity.	Avoid gluten

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