

Complete Gene Mutation Report for Customer: 2e41333d-68d0-4b9c-9b71-683fce4a2ab5

Instructions:

NutraHacker reports mutations (single nucleotide polymorphisms) in this uploaded genome. Genes not reported in this report are either normal, not actionable, or not currently detected by NutraHacker. The expected allele is the one seen in a normally functioning gene. The high risk alleles reported are the ones measured from the uploaded genome. NutraHacker reports the effects of these mutations as discovered by published empirical data and suggests nutritional supplements that can mitigate potential issues caused by these mutations.

This report is meant to serve as a guide for nutritional supplementation for the owner of the genome and is not applicable to any other individual. Supplement quantities and dosages are not included as they are indicated on the purchased product. Multiple recommendations for the same supplement does not mean that the dosage should be multiplied. In the case of a conflict (such as a particular vitamin being both encouraged and discouraged), the owner of the genome should assess his/her own personal biology to decide whether to include or discard that particular supplement.

NOTICE:

State law allows any person to provide nutritional advice or give advice concerning proper nutrition--which is the giving of advice as to the role of food and food ingredients, including dietary supplements. This state law does NOT confer authority to practice medicine or to undertake the diagnosis, prevention, treatment, or cure of any disease, pain, deformity, injury, or physical or mental condition and specifically does not authorize any person other than one who is a licensed health practitioner to state that any product might cure any disease, disorder, or condition.

NutraHacker reports are for scientific, educational and nutritional information only and are not intended to diagnose, cure, treat or prevent any disease, disorder or condition.

Thank you for using NutraHacker. To your health!

Gender of customer: Male

A total of 59 mutations were detected at this time for your genome out of the 195 polymorphisms assessed.

There were 18 homozygous mutations.

There was 1 sex-linked mutation.

There were 40 heterozygous mutations.

Please continue to the next page to begin your discovery process.

Category	RSID	Gene	Expected	Genotype: Risk	Genotype Freq	Gene Function	Consequences	Encourage	Avoid
Detoxification	rs2606345	CYP1A1	C	AA: 2/2	11.1603%	Phase I xenobiotic metabolism, PAH's, metabolize E2 to 2-hydroxyestradiol	Reduced function of enzyme, effects vary with race	Diindolylmethane	
Detoxification	rs72547513	CYP1A2	C	AA: 2/2	N/A	Hydroxylation or dealkylation of xenobiotics, Phase I, metabolize E2 to 2-hydroxyestradiol	CYP1A2*11 allele with approximately 5% activity of that of the CYP1A2 wild type	Induce with broccoli, Cabbage, Diindolylmethane, Glucarate, NAC, Cardamom, Sulforaphane	Curcumin, Cumin, Grapefruit
Detoxification	rs762551	CYP1A2	A	AC: 1/2	46.8902%	Hydroxylation or dealkylation of xenobiotics, Phase I, metabolize E2 to 2-hydroxyestradiol	Slow to metabolize caffeine, Main liver pathway	Induce with broccoli, Cabbage, Diindolylmethane, Glucarate, NAC, Cardamom, Sulforaphane	Curcumin, Cumin, Grapefruit
Detoxification	rs1056827	CYP1B1	G	AC: 1/2	42.4033%	4-hydroxylation of estrogen	Increased enzyme activity, undesirable 4-hydroxylation of estrogen	Diindolylmethane	
Detoxification	rs1799853	CYP2C9	C	CT: 1/2	16.3208%	Metabolizes coumadin, NSAID's, aspirin, phenytoin and sulfonylureas	20% reduction in activity heterozygous, 40% reduction homozygous		Substrates of this enzyme
Detoxification	rs16947	CYP2D6	G	AG: 1/2	47.4512%	Detoxifies 20% of prescription drugs	Possible ultra metabolizer		Substrates of this enzyme
Detoxification	rs1050450	GPX1	C	AA: 2/2	7.19760%	Glutathione peroxidase functions in the detoxification of hydrogen peroxide, and is one of the most important antioxidant enzymes in humans.	Deficiency in glutathione peroxidase	Selenium, Iodine	
Detoxification	rs1800668	GPX1	C	AA: 2/2	1.65660%	Glutathione peroxidase functions in the detoxification of hydrogen peroxide, and is one of the most important antioxidant enzymes in humans.	Decreased activity of glutathione peroxidase	Selenium	

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Detoxification	rs1695	GSTP1	G	AG: 1/2	42.4696%	Conjugation toxins to glutathione	Persons having the alleles AA or AG had an increase in inflammatory interleukin-6 (IL-6) upon supplementing alpha-tocopherol (the most common form of Vitamin E in a North American diet) while those with GG saw a decrease.	NAC, Whey	Vitamin E
Detoxification	rs1208	NAT2	A	AG: 1/2	47.2515%	This gene encodes an enzyme that functions to both activate and deactivate arylamine and hydrazine drugs and carcinogens.	Fast metabolizer	NAC, Vitamin B2, Vitamin B3, Vitamin B5, Molybdenum	
Detoxification	rs1799929	NAT2	C	CT: 1/2	N/A	This gene encodes an enzyme that functions to both activate and deactivate arylamine and hydrazine drugs and carcinogens.	Decreased activity	NAC, Vitamin B2, Vitamin B3, Vitamin B5, Molybdenum	
Detoxification	rs1801280	NAT2	T	CT: 1/2	46.1933%	This gene encodes an enzyme that functions to both activate and deactivate arylamine and hydrazine drugs and carcinogens.	Decreased activity	NAC, Vitamin B2, Vitamin B3, Vitamin B5, Molybdenum	
Detoxification	rs1800566	NQO1	C	AA: 2/2	5.34340%	Reduces quinones to hydroquinones (vitamin E alpha-tocopherol quinone, menadione, benzene quinones)	This is a null mutation and removal of carcinogenic quinones is affected negatively		
Detoxification	rs182420	SULT2A1	A	CT: 1/2	25.5034%	Catalyze the sulfate conjugation of many hormones, neurotransmitters, drugs, and xenobiotic compounds	Decreased enzyme function	NAC, MSM, Taurine	
Neurotransmitter Levels	rs6265	BDNF	G	TT: 2/2	3.02170%	Brain-derived neurotrophic factor, supports growth and health of neurons	Associated with mental wellness	Lithium orotate, Curcumin, Theanine	
Neurotransmitter Levels	rs578776	CHRNA5	T	AG: 1/2	48.4664%	Neuronal acetylcholine receptor subunit alpha-5	Increased nicotine intake		Nicotine

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Neurotransmitter Levels	rs165722	COMT	A	CC: 2/2	32.6762%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Decreased COMT activity	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors
Neurotransmitter Levels	rs6269	COMT	A	GG: 2/2	11.4331%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Decreased COMT activity	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors
Neurotransmitter Levels	rs5993882	COMT	T	GT: 1/2	38.0985%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Decreased COMT activity	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors
Neurotransmitter Levels	rs2391191	DAOA	G	AG: 1/2	49.3000%	D-amino acid oxidase activator, which degrades D-serine, a potent activator of NMDA receptors	Associated with cognitive manic symptoms	Idebenone, Piracetam, Magnesium, Taurine, Lithium orotate	
Neurotransmitter Levels	rs701567	DAOA	G	CT: 1/2	49.9551%	D-amino acid oxidase activator, which degrades D-serine, a potent activator of NMDA receptors	Associated with cognitive manic symptoms	Idebenone, Piracetam, Magnesium, Taurine, Lithium orotate	
Neurotransmitter Levels	rs3749034	GAD1	A	GG: 2/2	68.6151%	Catalyzes production of GABA from glutamate	High glutamate, low GABA	Taurine, Theanine, NAC, Glycine, Vitamin B3	MSG
Neurotransmitter Levels	rs3828275	GAD1	G	TT: 2/2	7.46300%	Catalyzes production of GABA from glutamate	High glutamate, low GABA	Taurine, Theanine, NAC, Glycine	MSG
Neurotransmitter Levels	rs3791851	GAD1	A	CT: 1/2	37.0283%	Catalyzes production of GABA from glutamate	High glutamate, low GABA	Taurine, Theanine, NAC, Glycine	MSG
Neurotransmitter Levels	rs3791878	GAD1	C	GT: 1/2	28.3797%	Catalyzes production of GABA from glutamate	High glutamate, low GABA	Taurine, Theanine, NAC, Glycine	MSG
Neurotransmitter Levels	rs701492	GAD1	C	CT: 1/2	40.0246%	Catalyzes production of GABA from glutamate	High glutamate, low GABA	Taurine, Theanine, NAC, Glycine	MSG
Neurotransmitter Levels	rs1137070	MAO-A	C	T: 1/1	N/A	Oxidizes serotonin, dopamine, epinephrine, norepinephrine	Increased expression MAO-A	Curcumin	
Neurotransmitter Levels	rs2769605	NTRK2	C	CT: 1/2	43.9018%	Neurotrophic tyrosine kinase receptor type 2	Decreased BDNF	Theanine, Curcumin, Beta-alanine, Lithium orotate, Phosphatidylserine	
Neurotransmitter Levels	rs2070762	TH	T	AG: 1/2	47.8166%	Tyrosine hydroxylase, produces dopamine from tyrosine	Low dopamine	N-acetyl-tyrosine, Mucuna pruriens (with caution)	

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Folate One-Carbon Metabolism / Methylation (FOCM)	rs651852	BHMT08	T	CT: 1/2	48.0752%	Methylates homocysteine to methionine	Downregulation	Phosphatidylcholine, TMG, Phosphatidylserine, Zinc	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs234706	CBS	G	AG: 1/2	39.9436%	Adds l-serine to homocysteine to produce l-cystathionine	Increased responsiveness to homocysteine-lowering effects of folic acid. Marginally increased disposal of homocysteine.	Vitamin B6	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs3758149	GGH	C	AG: 1/2	37.7989%	This gene catalyzes the hydrolysis of folypoly-gamma-glutamates and antifolypoly-gamma-glutamates by the removal of gamma-linked polyglutamates and glutamate	May have functional relevance and result in alterations in plasma homocysteine levels.		
Folate One-Carbon Metabolism / Methylation (FOCM)	rs2236225	MTHFD1	G	AG: 1/2	46.1659%	Three distinct enzymatic activities related to folate	Increased requirement for choline	Choline	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs1801131	MTHFR	A	GT: 1/2	0.06720%	Converts folic acid to 5-methyltetrahydrofolate	Low BH4, excess ammonia, low nitric oxide, does NOT lead to high homocysteine, however high superoxide	L-methylfolate, Vitamin B3, Potassium, Ornithine, Vitamin B6, Vitamin B12, Vitamin C, Rooibos, Manganese	Folinic acid, Folate
Folate One-Carbon Metabolism / Methylation (FOCM)	rs1801133	MTHFR	C	AG: 1/2	39.5976%	Converts folic acid to 5-methyltetrahydrofolate	When homozygous it's functioning at about 30% of normal, leads to high homocysteine, folate concentrations lower.	L-methylfolate, Vitamin B12, Riboflavin for high blood pressure, Ribo-5-phosphate	Folinic acid, Folate

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Folate One-Carbon Metabolism / Methylation (FOCM)	rs6495446	MTHFS	C	TT: 2/2	7.37770%	MTHFS is the only enzyme known to catalyze a reaction with folinic acid.	The problem with this is that folinic acid normally acts as a regulator of folate metabolism by inhibiting enzymes in this metabolism. In particular, it inhibits the serine hydroxymethyltransferase (SHMT) enzyme, which normally is the main enzyme that converts tetrahydrofolate to 5,10 methylene tetrahydrofolate, which in turn is the substrate for making methylfolate. So, a deficiency in MTHFS will allow folinic acid to rise inhibiting SHMT, which will lower 5,10 methylene tetrahydrofolate, and thus will also lower production of methylfolate, which is needed by methionine synthase in the methylation cycle.	Methylfolate, Magnesium	Folate, Folinic acid
Folate One-Carbon Metabolism / Methylation (FOCM)	rs162036	MTRR	A	AG: 1/2	34.8400%	Methylates, recycles vitamin b12	Less active enzyme	Methyl B12	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs1801394	MTRR	A	AG: 1/2	49.3785%	Methylates, recycles vitamin b12	Poor methylation of Vitamin B12 leading to higher homocysteine levels.	Methyl B12, L-methylfolate	
HPA axis / Endocrine	rs1501299	ADIPOQ	C	GT: 1/2	43.8136%	Important adipokine involved in the control of fat metabolism and insulin sensitivity, with direct anti-diabetic, anti-atherogenic and anti-inflammatory activities.	Decreased adiponectin	Omega-3 fatty acids like fish oil, Coffee, Leucine, Magnesium, Fiber, Exercise	
HPA axis / Endocrine	rs2234693	ESR1	T	CT: 1/2	49.5149%	Estrogen receptor alpha	Female health affected	Diindolylmethane	
HPA axis / Endocrine	rs9340799	ESR1	A	AG: 1/2	39.4495%	Estrogen receptor alpha	Female health affected	Diindolylmethane	
HPA axis / Endocrine	rs1256030	ESR2	C	AA: 2/2	15.0505%	Estrogen receptor beta	Female health affected	Diindolylmethane	

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HPA axis / Endocrine	rs1256065	ESR2	A	GG: 2/2	7.53510%	Estrogen receptor beta	Female health affected	Diindolylmethane	
HPA axis / Endocrine	rs1866388	NR3C1	G	AA: 2/2	60.1431%	Glucocorticoid receptor	Mutation associated with generalized glucocorticoid resistance, high cortisol, CFS	Phosphatidylserine, Possibly ketogenic diet	
HPA axis / Endocrine	rs852977	NR3C1	G	AA: 2/2	56.1304%	Glucocorticoid receptor	Mutation associated with generalized glucocorticoid resistance, high cortisol, CFS	Phosphatidylserine, Possibly ketogenic diet	
HPA axis / Endocrine	rs1544410	VDR	G	CT: 1/2	42.7506%	Vitamin D Receptor	Downregulated Vitamin D receptor	Vitamin D3, Sage, Rosemary	Methyl donors
HPA axis / Endocrine	rs731236	VDR	A	AG: 1/2	43.3464%	Vitamin D Receptor	Downregulated Vitamin D receptor, can affect dopamine levels	Vitamin D3, Sage, Rosemary	Methyl donors
Cardiovascular	rs4654748	ALPL	C	TT: 2/2	12.7756%	alkaline phosphatase	Lower concentration b6	Vitamin B6	
Cardiovascular	rs5882	CETP	G	AA: 2/2	33.5376%	Cholesterol ester transfer protein	Cholesterol levels affected	Low fat diet	
Cardiovascular	rs5275	COX2	A	AG: 1/2	47.5291%	Involved in the conversion of arachidonic acid to prostaglandin H2, an important precursor of prostacyclin and thromboxane A2, among others.	Increased response to fish oil	Omega-3 fatty acids like fish oil	

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Cardiovascular	rs174537	FADS1	G	GT: 1/2	35.4912%	Fatty Acid Desaturase 1	Regulation of saturation of fatty acids, significantly associated with lower concentrations of long-chain PUFA. At baseline, men with the rs174537T allele had lower arachidonic acid (AA) and AA/linoleic acid (LA), and higher interleukin (IL)-6 levels than rs174537GG counterparts. After 3 years, rs174537GG men had significantly increased AA (P = 0.022), AA/dihomo-gamma-linolenic acid (DGLA) (P = 0.007), docosapentaenoic acid (DPA), low-density lipoprotein (LDL) cholesterol, and oxidized LDL (ox-LDL), but decreased eicosatrienoic acid. The rs174537T group showed significantly increased gamma-linolenic acid and ox-LDL, and decreased eicosadienoic acid, eicosapentaenoic acid (EPA)/alpha-linolenic acid (ALA), and IL-6.	Omega-3 fatty acids like fish oil, Plant oils	
Cardiovascular	rs854571	PON1	C	CT: 1/2	48.5938%	Major antiatherosclerotic component of HDL	Decreased function	Omega-3 fatty acids like fish oil, Fat soluble antioxidants, Vitamin K	Cholesterol, High fat diet
Cardiovascular	rs2516839	USF1	G	CT: 1/2	49.8381%	Upstream Stimulatory Factor 1	Cholesterol levels affected	Fiber	High fat diet
Cardiovascular	rs9923231	VKORC1	C	CT: 1/2	47.9961%	Reduces vitamin K 2,3-epoxide to the enzymatically activated form.	Related to vitamin K recycling.	Vitamin K	

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Digestion / Elimination	rs7501331	BCMO1	C	CT: 1/2	27.3055%	Key enzyme in beta-carotene metabolism to vitamin A.	poor converter	Vitamin A	
Digestion / Elimination	rs10889677	IL-23R	C	AC: 1/2	47.5499%	Important part of the inflammatory response against infection. It promotes upregulation of the matrix metalloprotease MMP9, increases angiogenesis and reduces CD8+ T-cell infiltration.	Affects intestinal health	Probiotics, Omega-3 fatty acids like fish oil, Vitamin D3	
Energy / Oxidation	rs10370	SOD2	G	GT: 1/2	N/A	Mitochondrial Superoxide Dismutase 2	Decreased gene function. Noise induced hearing loss, rs10370 'TT', rs4880 'GG' diplo-genotype (diplotype) was associated with more gray matter shrinkage in 76 individuals who report chronic high levels of alcohol consumption.	Manganese, Vitamin E in tocotrienol form	Alcohol, Noise (greater chance for hearing loss)
Energy / Oxidation	rs4880	SOD2	A	AG: 1/2	48.9123%	Mitochondrial Superoxide Dismutase 2	Decreased gene function. Noise induced hearing loss, rs10370 'TT', rs4880 'GG' diplo-genotype (diplotype) was associated with more gray matter shrinkage in 76 individuals who report chronic high levels of alcohol consumption.	Manganese, Vitamin E in tocotrienol form	Alcohol, Noise (greater chance for hearing loss)
Energy / Oxidation	rs2855262	SOD3	T	CC: 2/2	14.9428%	Manganese superoxide dismutase	Decreased gene function	Vitamin E in tocotrienol form, Manganese	