Complete Gene Mutation Report for Customer: 0d79f4ea-f737-4621-a8ec-19d7ad8b2349

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

There were 15 homozygous mutations.

There were 3 sex-linked mutations.

There were 36 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	rs1799853	CYP2C9	C	TC: 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	rs1208	NAT2	A	GG: 2/2	14.6514%	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	TT: 2/2	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	CC: 2/2	13.1072%	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	AG: 1/2	35.5447%	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		

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Detoxification	rs182420	SULT2A1	A	TC: 1/2	25.5034%	Catalyze the sulfate conjugation of many hormones, neurotransmitters, drugs, and xenobiotic compounds	Decreased enzyme function	NAC, MSM, Taurine	
Detoxification	rs2910397	SULT2A1	G	TC: 1/2	39.7265%	Catalyze the sulfate conjugation of many hormones, neurotransmitters, drugs, and xenobiotic compounds	Decreased enzyme function	NAC, MSM, Taurine	
Neurotransmitter Levels	rs578776	CHRNA5	T	GG: 2/2	17.0102%	Neuronal acetylcholine receptor subunit alpha-5	Increased nicotine intake		Nicotine
Neurotransmitter Levels	rs4646312	COMT	G	TT: 2/2	50.2164%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Decreased COMT activity	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors
Neurotransmitter Levels	rs933271	COMT	T	CC: 2/2	15.2338%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Decreased COMT activity	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors
Neurotransmitter Levels	rs165722	COMT	A	TC: 1/2	48.9738%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Decreased COMT activity	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors
Neurotransmitter Levels	rs4633	COMT	C	TC: 1/2	48.7173%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Same amino acid sequence, lower expression of gene, less breakdown of catecholamines	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors
Neurotransmitter Levels	rs4680	COMT	G	AG: 1/2	48.2074%	Degrades catecholamines, Phase II, inactivates hydroxy-estrogens	Slower breakdown dopamine, oestrogen, worrier, prone to anxiety, more sensitive to green tea	Hydroxy B12 (hydroxycobalamin)	Methyl B12, Methyl donors, Cannabis
Neurotransmitter Levels	rs2391191	DAOA	G	AA: 2/2	19.4739%	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	TT: 2/2	23.5241%	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

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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	rs6323	MAO-A	G	T: 1/1	N/A	Oxidizes serotonin, dopamine, epinephrine, norepinephrine	Lower expression of MAO A	Progesterone	Curcumin, Estrogens, Androgens
Neurotransmitter Levels	rs1799836	MAO-B	A	C: 1/1	N/A	Oxidizes phenethylamine, benzethylamine, dopamine	Decreased activity MAO B enzyme		Quercetin, Other MAOB inhibitors
Neurotransmitter Levels	rs2283729	MAO-B	G	A: 1/1	7.93250%	Oxidizes phenethylamine, benzethylamine, dopamine	Lower mental energy		Quercetin, Other MAOB inhibitors
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)	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs3741049	ACAT1	G	AG: 1/2	25.7338%	Forms cholesterol esters from cholesterol	3-ketothiolase deficiency, depletes B12	Probiotics, Vitamin B12, Low fat diet	Cholesterol
Folate One-Carbon Metabolism / Methylation (FOCM)	rs9658625	ACAT2	A	AG: 1/2	17.8705%	Responsible for the synthesis of cholesteryl esters which are part of lipoproteins containing apoB	Assess kidney health	Ketogenic diet, Magnesium, Proper hydration	Cholesterol
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)	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	GG: 2/2	0.00710%	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

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Folate One-Carbon Metabolism / Methylation (FOCM)	rs2066470	MTHFR	C	AG: 1/2	16.4288%	Converts folic acid to 5-methyltetrahydrofolate	Possible decreased expression, high homocysteine, low concentrations folate.	L-methylfolate, Vitamin B12, Riboflavin for high blood pressure, Ribo-5-phosphate	Folinic acid, Folate
Folate One-Carbon Metabolism / Methylation (FOCM)	rs6495446	MTHFS	C	TC: 1/2	39.5684%	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)	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	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs1802059	MTRR	G	AG: 1/2	42.7445%	Methylates, recycles vitamin b12	Less active enzyme	Methyl B12	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs7946	PEMT	C	TC: 1/2	48.4137%	Converts phosphatidylethanolamine to phosphatidylcholine	Fatty liver due to low choline	Phosphatidylcholine	

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HPA axis / Endocrine	rs7652589	CaSR	G	AG: 1/2	49.5903%	Calcium sensitive receptor	s7652589 and rs1501899 were also associated with nephrolithiasis in patients with normal citrate excretion	Vitamin K, Magnesium	Calcium
HPA axis / Endocrine	rs560887	G6PC2	T	TC: 1/2	24.9832%	This gene encodes an enzyme belonging to the glucose-6-phosphatase catalytic subunit family. These enzymes are part of a multicomponent integral membrane system that catalyzes the hydrolysis of glucose-6-phosphate, the terminal step in gluconeogenic and glycogenolytic pathways, allowing the release of glucose into the bloodstream. The family member encoded by this gene is found in pancreatic islets.	Fasting blood glucose level higher. This is actually the more common form	Chromium, Vanadium	High carb diets
HPA axis / Endocrine	rs258750	NR3C1	G	AG: 1/2	37.6046%	Glucocorticoid receptor	Mutation associated with generalized glucocorticoid resistance, high cortisol, CFS	Phosphatidylserine, Possibly ketogenic diet	
HPA axis / Endocrine	rs2918419	NR3C1	C	TC: 1/2	21.2346%	Glucocorticoid receptor	Mutation associated with generalized glucocorticoid resistance, high cortisol, CFS	Phosphatidylserine, Possibly ketogenic diet	
HPA axis / Endocrine	rs6188	NR3C1	A	AC: 1/2	38.5099%	Glucocorticoid receptor	Mutation associated with generalized glucocorticoid resistance, high cortisol, CFS	Phosphatidylserine, Possibly ketogenic diet	
HPA axis / Endocrine	rs6196	NR3C1	G	AG: 1/2	25.4717%	Glucocorticoid receptor	Mutation associated with generalized glucocorticoid resistance, high cortisol, CFS	Phosphatidylserine, Possibly ketogenic diet	
HPA axis / Endocrine	rs852977	NR3C1	G	AG: 1/2	37.5797%	Glucocorticoid receptor	Mutation associated with generalized glucocorticoid resistance, high cortisol, CFS	Phosphatidylserine, Possibly ketogenic diet	
Cardiovascular	rs4654748	ALPL	C	TC: 1/2	45.9348%	alkaline phosphatase	Lower concentration b6	Vitamin B6	

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Cardiovascular	rs5882	CETP	G	AA: 2/2	33.5376%	Cholesterol ester transfer protein	Cholesterol levels affected	Low fat diet	
Cardiovascular	rs2070744	NOS3	T	TC: 1/2	29.6035%	In a process dependent on BH4, NOS converts arginine into nitric oxide and assists in ammonia detoxification. In the absence of BH4, NOS will convert Arginine into peroxynitrite or superoxide	Elite power performance but certain risks to health	Omega-3 fatty acids like fish oil	
Cardiovascular	rs662	PON1	A	TC: 1/2	49.3911%	Major antiatherosclerotic component of HDL	Glutamine high activity, arginine low activity, position 192, Low serum PON1 activity in NIDDM may be related to an increased tendency to lipid peroxidation and may also increase susceptibility to toxicity from organophosphate exposure.	Omega-3 fatty acids like fish oil, Fat soluble antioxidants, Vitamin K	High fat diet
Cardiovascular	rs9923231	VKORC1	C	TC: 1/2	47.9961%	Reduces vitamin K 2,3-epoxide to the enzymatically activated form.	Related to vitamin K recycling.	Vitamin K	
Digestion / Elimination	rs6420424	BCMO1	A	AG: 1/2	49.4600%	Key enzyme in beta-carotene metabolism to vitamin A.	reduced catalytic activity by 59%	Vitamin A	
Digestion / Elimination	rs6564851	BCMO1	G	TG: 1/2	49.5664%	Key enzyme in beta-carotene metabolism to vitamin A.	reduced catalytic activity by 48%	Vitamin A	
Digestion / Elimination	rs7501331	BCMO1	C	TC: 1/2	27.3055%	Key enzyme in beta-carotene metabolism to vitamin A.	poor converter	Vitamin A	
Digestion / Elimination	rs492602	FUT2	T	AG: 1/2	49.6357%	Fucosyltransferase 2 enzyme which determines 'secretor status'	Reduced intestinal microbiota diversity but higher vitamin B12 levels	Probiotics	
Digestion / Elimination	rs601338	FUT2	G	AG: 1/2	49.5914%	Fucosyltransferase 2 enzyme which determines 'secretor status'	Reduced intestinal microbiota diversity, non secretor	Probiotics	

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Digestion / Elimination	rs602662	FUT2	G	AG: 1/2	49.7883%	Fucosyltransferase 2 enzyme which determines 'secretor status'	Reduced intestinal microbiota diversity. Interferes with absorption of B12. Individuals on vegetarian diet with GG (homozygous major genotype) have significantly lower levels of vitamin B(12).	Probiotics	
Energy / Oxidation	rs4880	SOD2	A	GG: 2/2	18.1693%	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	TC: 1/2	47.4262%	Manganese superoxide dismutase	Decreased gene function	Vitamin E in tocotrienol form, Manganese	