Complete Gene Mutation Report for Customer: 46ec5e21-bb5a-4097-81bc-343d176062d6

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

There were 18 homozygous mutations.

There were 4 sex-linked mutations.

There were 38 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	AC: 1/2	44.4935%	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	rs1056827	CYP1B1	G	AC: 1/2	42.4033%	4-hydroxylation of estrogen	Increased enzyme activity, undesirable 4-hydroxylation of estrogen	Diindolylmethane	
Detoxification	rs1800440	CYP1B1	A	CT: 1/2	21.5369%	4-hydroxylation of estrogen	Probable increased enzyme function, increased deleterious estrogen metabolism and activation of pro-carcinogens	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	rs1065852	CYP2D6	C	AG: 1/2	30.2957%	Detoxifies 20% of prescription drugs	Poor metabolizer		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	rs3892097	CYP2D6	G	CT: 1/2	17.5214%	Detoxifies 20% of prescription drugs	CYP2D6*4 - nonfunctioning variant; the most common variant		Substrates of this enzyme
Detoxification	rs1050450	GPX1	C	AG: 1/2	39.2615%	Glutathione peroxidase functions in the detoxificationof hydrogen peroxide, and is one of the most important antioxidant enzymes in humans.	Deficiency in glutathione peroxidase	Selenium, Iodine	

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Detoxification	rs1800668	GPX1	C	AG: 1/2	22.4286%	Glutathione peroxidase functions in the detoxificationof hydrogen peroxide, and is one of the most important antioxidant enzymes in humans.	Decreased activity of glutathione peroxidase	Selenium	
Detoxification	rs1138272	GSTP1	C	CT: 1/2	9.72320%	Conjugation toxins to glutathione	Probable decreased function, increased oxidative stress	NAC, Whey	Smog
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	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	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	CT: 1/2	28.7226%	Brain-derived neurotrophic factor, supports growth and health of neurons	Associated with mental wellness	Lithium orotate, Curcumin, Theanine	
Neurotransmitter Levels	rs578776	CHRNA5	T	GG: 2/2	17.0102%	Neuronal acetylcholine receptor subunit alpha-5	Increased nicotine intake		Nicotine
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

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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	rs2072743	MAO-A	T	C: 1/1	N/A	Oxidizes serotonin, dopamine, epinephrine, norepinephrine	Increased expression MAO-A	Curcumin	
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	rs3027452	MAO-B	G	A: 1/1	1.47140%	Oxidizes phenethylamine, benzethylamine, dopamine	Lower mental energy		Quercetin, Other MAOB inhibitors
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	GG: 2/2	15.6433%	Tyrosine hydroxylase, produces dopamine from tyrosine	Low dopamine	N-acetyl-tyrosine, Mucuna pruriens (with caution)	
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)	rs1801181	CBS	G	AG: 1/2	38.8293%	Adds l-serine to homocysteine to produce l-cystathionine	Upregulation, high taurine, high ammonia, high sulfates, decrease in glutatione synthesis	Ornithine/Arginine, Manganese, Molybdenum, Zinc, SAMe inhibits, CoQ10	Methyl donors, Vitamin B6 (P-5-P form ok), Taurine, Sulfates, BCAA
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	

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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)	rs6922269	MTHFD1L	G	AG: 1/2	30.5454%	MTHFD1L is an enzyme involved in THF synthesis in mitochondria	Mitochondrial folate abnormality	Vitamin B12, 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)	rs6495446	MTHFS	C	CT: 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

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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	
Folate One-Carbon Metabolism / Methylation (FOCM)	rs7946	PEMT	C	TT: 2/2	16.8872%	Converts phosphatidylethanolamine to phosphatidylcholine	Fatty liver due to low choline	Phosphatidylcholine	
HPA axis / Endocrine	rs2241766	ADIPOQ	T	GT: 1/2	18.9810%	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	rs560887	G6PC2	T	CT: 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	rs1866388	NR3C1	G	AG: 1/2	34.8177%	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	

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HPA axis / Endocrine	rs5522	NR3C2	A	CT: 1/2	19.1509%	Mineralocorticoid receptor, mediates aldosterone actions on salt and water balance	Increased amygdala reactivity to stress, decreased cortisol binding	Multiple minerals, Phosphatidylserine	
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	
Cardiovascular	rs2073658	USF1	G	TT: 2/2	3.25180%	Upstream Stimulatory Factor 1	Association higher cholesterol, metabolic syndrome	Fiber	High fat diet
Cardiovascular	rs2516839	USF1	G	TT: 2/2	22.2355%	Upstream Stimulatory Factor 1	Cholesterol levels affected	Fiber	High fat diet
Cardiovascular	rs9923231	VKORC1	C	TT: 2/2	15.9922%	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	GT: 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	CT: 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	
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	TT: 2/2	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	rs2855262	SOD2	T	CC: 2/2	14.9428%	Manganese superoxide dismutase	Decreased gene function	Vitamin E in tocotrienol form, Manganese	
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)