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Gene Comprehensive Nutrigenomic Report

Accession Number: ##########
Specimen Collected: ##/##/####
Specimen Received: ##/##/####
Report Generated: March 1, 2019
Specimen Type: Buccal Swab
Provider: ######### #########
Patient Name: ####### #######
Patient DOB: ##/##/####
Patient Gender: Male

Do not make any decisions about your health solely based on the information contained in this report. Always consult with a licensed and experienced health practitioner when you receive this report.

GX Sciences | 844-258-5564 | www.GXSciences.com
Lab | 4150 Freidrich Lane, Ste H | Austin, TX 78744
Laboratory Director: James W. Jacobson, Ph.D

– 34 – Male

(-/-) No clinical abnormality | (+/-) Heterozygous result | (+/+) Homozygous result

rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics / Neurobiologix Formulas	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
Methylation / Foundation Panel							
Methylation and Folate Metabolism							
rs2071010	FOLR1	-/-	Methyltetrahydrofolate (5-MTHF)	**Methyl Folate Plus™ Twice Daily**			
rs651933	FOLR2	+/-					
rs1643649	DHFR	+/-					
rs6495446	MTHFS	-/-					
rs1076991	MTHFD1	+/-					
rs1801131	MTHFR A1298C	+/+					
rs1801133	MTHFR C677T	-/-					
rs1051266	SLC19A1	+/-					
Methylation and B12 Metabolism							
rs1805087	MTR	+/-	L-5-Methyl THF, Methyl Cobalamin, Nicainamide (B3), Methionine		Methylation Pro Topical™ OR Methylation Complete Fast Dissolves™ twice daily Full Focus		Consider Plasma B12
rs1802059	MTRR A664A	-/-	Methyl B12, Adenosyl B12				
rs1801394	MTRR A66G	+/-					
rs558660	GIF	+/-	Methyl B12, Adenosyl B12	**Methylation Pro Topical™ OR Methylation Complete Fast Dissolves™** twice daily **Methyl B12**			Consider Plasma B12
rs526934	TCN1	+/-					
rs1801198	TCN2	+/+					

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Methylation / Foundation Panel							
Vitamin D Transport							
rs731236	VDR Taq	+/-	High Dose Vitamin D Vitamin K	**Vitamin D3+K2 Cofactor Complex** ™ OR **D3+K2 Drops**	Vitamin D3+K2 Cofactor Complex™ OR D3+K2 Drops		Consider Vit D
rs2282679	GC or DBP	+/-					
Mitochondrial							
rs4147730	NDUFS3	-/-	CoQ 10, PQQ, L-Carnitine, Ornithine, Magnesium, NADH, Calcium				
rs809359	NDUFS7	-/-					
rs1051806	NDUFS8	+/-					
rs4850	UQCRC2	-/-					
rs11648723	UQCRC2	-/-					
rs8042694	COX5A	-/-					
rs4626565	COX6C	-/-					
rs1244414	ATP5C1	+/-					
rs6535454	CoQ2	-/-	CoQ 10		Mito Cell PQQ™ OR Mitochondrial Restore™		

Summary for Foundation / Methylation / Wellness

Highly Recommended Therapeutics / Neurobiologix Formulas

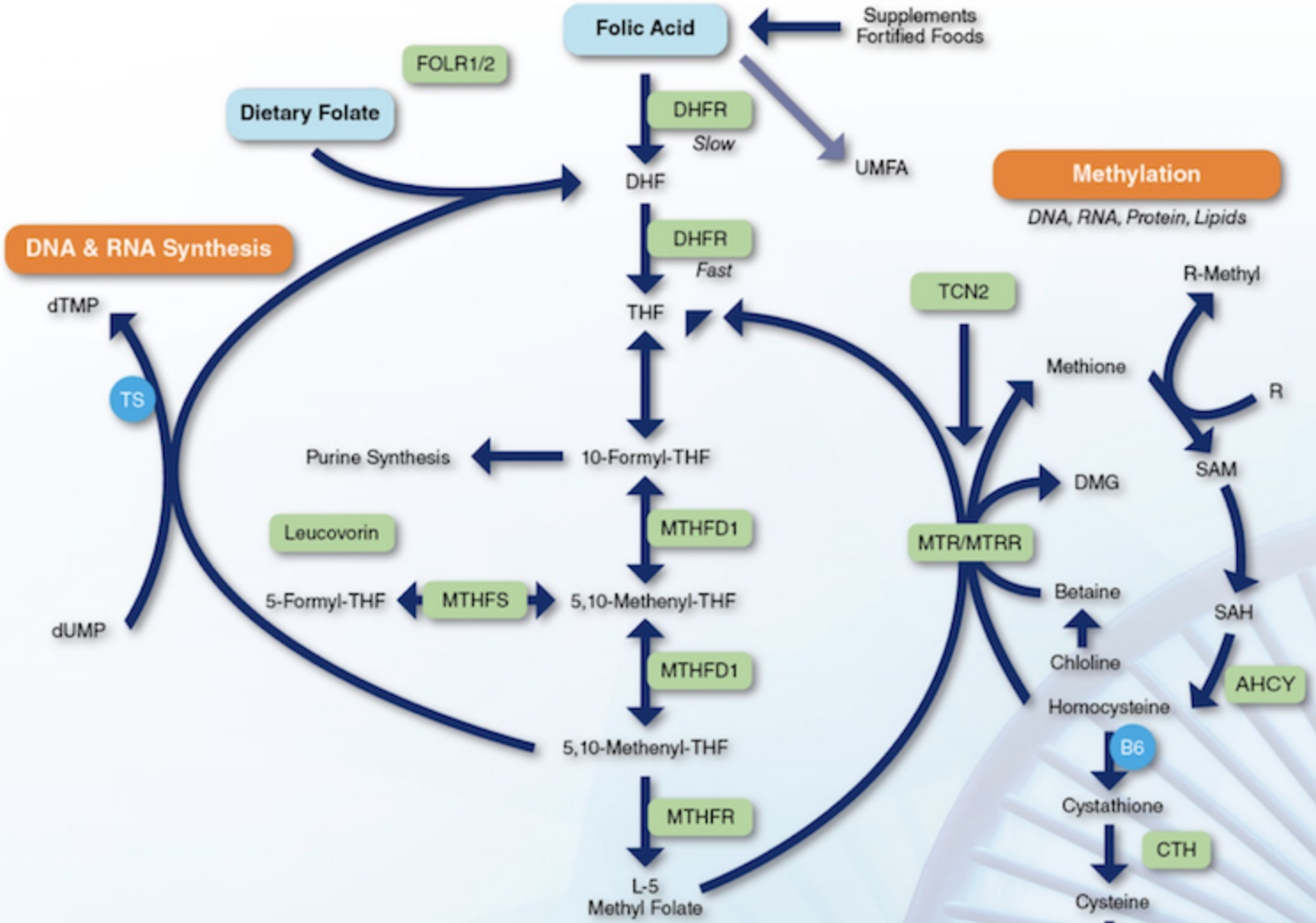
- Methyl Folate PlusTM Twice Daily
- Methylation Pro TopicalTM OR Methylation Complete Fast DissolvesTM twice daily
- Methyl B12
- Vitamin D3+K2 Cofactor ComplexTM OR D3+K2 Drops

Lifestyle Recommendations

Laboratory Recommendations

- Consider Plasma B12
- Consider Vit D

Methylation



Gene Information Key

rsID	Gene	"-" variant	"+" variant
rs1244414	ATP5C1	C	T
rs6535454	CoQ2	A	G
rs8042694	COX5A	A	G
rs4626565	COX6C	T	C
rs1643649	DHFR	T	C
rs2071010	FOLR1	G	A
rs651933	FOLR2	A	G
rs2282679	GC or DBP	T	G
rs558660	GIF	G	A
rs1076991	MTHFD1	C	T
rs1801131	MTHFR:A1298C	T	G
rs1801133	MTHFR:C677T	G	A
rs6495446	MTHFS	C	T
rs1805087	MTR	A	G
rs1802059	MTRR:A664A	G	A
rs1801394	MTRR:A66G	A	G
rs4147730	NDUFS3	G	A
rs809359	NDUFS7	A	G
rs1051806	NDUFS8	C	T
rs1051266	SLC19A1	T	C
rs526934	TCN1	A	G
rs1801198	TCN2	C	G
rs11648723	UQCRC2	G	T
rs4850	UQCRC2	G	A
rs731236	VDR Taq	A	G

Definitions

INFLAMMATORY	This enzyme category has significant effects on the inflammatory state of a person's body. Polymorphisms in these specific enzymes will significantly increase the levels of inflammation in the body. By supplementing these enzyme deficiencies, the patient will effectively reduce inflammatory damage to the body.
VDR Taq1	The Vitamin D (calcitriol) Receptor is a member of the nuclear receptor family. Upon activation by vitamin D (a secosteroid), the VDR causes the activation or deactivation of protein production by the cell. Impaired vitamin D function can result in signigicant immune weakness and increased cancer risk, as well as, early bone loss, an increased risk of cognitive decline and mood disorders.
METHYLATION	Methylation is a primary biochemical process in the body that involves the addition of a "methyl" chemical group to a vitamin or neurotransmitter. The addition of the "methyl" group allows for very specific biochemical interactions. Poor "methylation" function alters the effectiveness, delivery and function of many vitamins and important chemicals in the cell.
DHFR	Dihydrofolate reductase, or DHFR, is an enzyme that reduces dihydrofolic acid to tetrahydrofolic acid. This enzyme is the second enzyme in the folic acid conversion chain. Having a mutation in this enzyme can create a methylaiton deficiency with a MTHFR mutation.
FOLR1	Folate Receptor 1 (FOLR1) is a member of the folate receptor (FOLR) family. Members of this gene family have a high affinity for folate. Polymorphisms in this gene allow for poor delivery of folate to the interior of cells. This can create a high plasma folic acid. This polymorphism does create a methylation deficiency. This polymorphism is associated with many disorders of pregnancy.
FOLR2	Folate Receptor 2 (FOLR2) is a member of the folate receptor (FOLR) family. Members of this gene family have a high affinity for folic acid. Polymorphisms in this gene allow for poor delivery of folic acid to the interior of cells. This can create a high plasma folic acid. This polymorphism does create a methylation deficiency. This polymorphism is associated with many disorders of pregnancy. This receptor is found in high quantities on the placenta, thymus and bone marrow. Can be affiliated with immune disorders.
GIF	The glycoprotein product of the Gastric Intrinsic Factor (GIF) gene is secreted by the stomach lining. GIF protein is required for absorption of Vitamin B12. B12 is necessary for normal red blood cell maturation.
MTHFD1	Methylenetetrahydrofolate Dehydrogenase 1 enzyme handles 2 significant enzymes conversions in the production of L-MTHF. This common polymorphism causes a significant methylation deficiency due to the fact that it is utilized in two steps in methyl-folate production.
MTHFR	Methylene tetrahydrofolate reductase (MTHFR) catalyzes the conversion of 5,10-methylenetetrahydrofolate to 5-methyltetrahydrofolate, the bioactive form of folic acid. Two significant polymorphism variants exist in this gene, the A1298C and the C677T. The 1298 confers a conversion weakness of 10% for one copy and approximately 20% for two copies. In contrast, the 677 variant is much more severe and conveys a 40% conversion weakness for one copy and 70% for two copies. A reduced level of MTHFolate produces significant biochemical effects including poor production of dopamine and serotonin, pregnancy complications, poor healing of the nervous system, weak mitochondrial function, reduced production of glutathione, poor cell turnover and poor function of T cell lymphocytes.
MTHFS	The MTHFS gene encodes an important enzyme in the folate cycle. MTHFS catalyzes the conversion of 5-formyltetrahydrofolate to 5,10 methenyltetrahydrofolate (5,10 MTHF).
MTR	MTR (Methionine Synthase) codes for the enzyme that catalyzes the final step in methionine biosynthesis. Polymorphisms in this gene lead to poor recycling of methionine from homocysteine. This enzyme work in coordination with MTRR and requires both MTHF and B12 for proper functioning. Deficiencies in Methionine leads to poor methylation that is associated with numerous neurological, cardiovascular and immunological disease states, as well as, infertility and birth defects.
MTRR	Methionine Synthase Reductase is a enzyme responsible for production of methionine, a very important amino acid. Polymorphisms in this enzyme requires an increased amount of Methyl B12 to help this reaction.
SLC19A1	The SLC19A1 gene encodes the reduced folate carrier (RFC) protein. Mutations in the RFC are associated with reduced plasma folate.
TCN1	The protein product of the transcobalamin 1 (TCN1) gene binds Vitamin B12 and protects it from the low pH environment of the human stomach. Individuals homozygous for the G allele of the TCN1 SNP, rs526934, are predicted to have lower serum B12.
TCN2	The protein product of the Transcobalamin 2 gene, TCN2, binds the active form of vitamin B-12. Individuals with the G/G phenotype at rs1801198 have decreased serum B-12 and increased homocysteine when compared to individuals with the C/C phenotype.
MITOCHONDRIA	The mitochondrial enzymes are responsible for energy production from the mitochondria. The mitochondria is known as the "powerhouse" of the cell and produces over 90% of the energy for a cell. The mitochondrial respiratory chain (also known as the electron transport chain) is where these 4 protein complexes are found. Polymorphic alterations in these enzymes reduce the energy output of the mitochondria and leads to symptoms of chronic fatigue, cognitive deficiency, exercise intolerance, low metabolic rate, muscle weakness, poor healing and higher rates of sleep disorders and mood abnormalities.
ATP5C1	ATPase 5c1 (ATP5C1) is an enzyme responsible for producing ATP (the energy component) in the mitochondria. This protein is known as Complex V (the 5th protein) in the mitochondrial respiratory chain. Polyorphisms in the gene confer a weakened energy production by the mitochondria.

COX5A	Cytochrome c oxidase subunit 5a (COX5A) is a protein in a subunit of the cytochrome c oxidase complex, also known as Complex IV of the mitochondrial electron transport chain. Polymorphisms in this enzyme produce a weakened energy production by the mitochondria.
COX6C	Cytochrome c oxidase subunit 6c (COX6C) is a protein in a subunit of the cytochrome c oxidase complex, also known as Complex IV of the mitochondrial electron transport chain. Polymorphisms in this enzyme produce a weakened energy production by the mitochondria.
NDUFS3	The NDUFS3 genes encodes a mitochondrial enzyme, NADH Dehydrogenase (Ubiquinone) Fe-S Protein 3. Like other NDUFS proteins, NDUFS3 is thought to require ubiquinone for full activity.
NDUFS7	NADH Dehydrogenase [ubiquinone] iron-sulfur protein 7 (NDUFS7) is a mitochondrial protein also know as Complex I of the mitochondrial respiratory chain. It is located in the mitochondrial inner membrane and is the largest of the five complexes of the electron transport chain. Polymorphisms in this enzyme produce a weakened energy production in the mitochondria.
NDUFS8	NADH Dehydrogenase (Ubiquinone) Fe-S Protein 8 (NDUFS8) encodes an enzyme in the mitochondrial respiratory chain. Mutations in the NDUFS8 gene are associated with Leigh Syndrome, osteoporosis, and mitochondrial complex I deficiency.
UQCRC2	Ubiquinol Cytochrome c Reductase (UQCR, Complex II) is a mitochondrial enzyme protein also known as Complex III of the electron transport chain. Polymorphisms in this enzyme produce a weakened energy production by the mitochondria.
VITAMIN / MINERAL ESSENTIAL	
CoQ2	CoQ2 (Para-hydroxybenzoate—polyprenyltransferase, mitochondrial) codes for an enzyme that functions in the final steps in the biosynthesis of CoQ10 (ubiquinone).. 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 severe fatigue, muscle weakness, exercise intolerance and general mitochondrial weakness.
GC or DBP	GC aka DBP (Vit. D Binding Protein) gene codes for Vit. D binding protein. This protein belongs to the albumin family and is a multifunctional protein found in plasma, ascitic fluid, cerebrospinal fluid and on the surface of many cell types. It is manufactured in the hepatic parenchymal cells. DBP is capable of binding to all forms of Vit D including ergocalciferol (vitamin D2) and cholecaldiferol (vitamin D3), the 25-hydroxylated forms (calcifediol) and the active hormonal product, 1,25-dihydroxyvitamin D (calcitriol). The major proportion of vitamin D in blood is bound to this protein. It transports vitamin D metabolites between skin, liver and kidney, and then on to the various target tissues. It binds to vitamin D and its plasma metabolites and transports them to target tissues. Polymorphisms in this gene decrease the affinity of the protein to Vit. D which reduces the response rate to Vit. D therapy. Patients with these polymorphisms require high doses of Vit D supplementation.

Disclaimers

METHODOLOGY AND LIMITATIONS:

Testing for genetic variation/mutation on listed genes was performed using ProFlex PCR and Real-Time PCR with TaqMan® allele-specific probes on the QuantStudio 12K Flex. All genetic testing is performed by GX Sciences, 4150 Freidrich Lane, Ste H, Austin, TX. 78744. This test will not detect all the known alleles that result in altered or inactive tested genes. This test does not account for all individual variations in the individual tested. Test results do not rule out the possibility that this individual could be a carrier of other mutations/variations not detected by this gene mutation/variation panel. Rare mutations surrounding these alleles may also affect our detection of genetic variations. Thus, the interpretation is given as a probability. Therefore, this genetic information shall be interpreted in conjunction with other clinical findings and familial history for the administration of specific nutrients. Patients should receive appropriate genetic counseling to explain the implications of these test results. Details of assay performance and algorithms leading to clinical recommendations are available upon request. The analytical and performance characteristics of this laboratory developed test (LDT) were determined by GX Sciences' laboratory pursuant to Clinical Laboratory Improvement Amendments (CLIA) requirements.
CLIA #: 45D2144988

DISCLAIMER:

This test was developed and its performance characteristics determined by GX Sciences. It has not been cleared or approved by the FDA. The laboratory is regulated under CLIA and qualified to perform high-complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research. rsIDs for the alleles being tested were obtained from the dbSNP database (Build 142).

DISCLAIMER:

UND Result: If you have received the result Variant undetermined (UND) this indicates that we were not able to determine your carrier status based on your raw data. Please refer to the GX Sciences genetic knowledge database for more information: https://www.gxsciences.com/kb_results.asp

DISCLAIMER:

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GX Sciences SNP References

INFLAMMATORY SNP References

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METHYLATION SNP References

DHFR

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