Gene Comprehensive Nutrigenomic Report

Accession Number: ##########
Specimen Collected: ##/##/####
Specimen Received: ##/##/####
Report Generated: March 28, 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
Women's Health							
Vitamin Conversion and Delivery							
rs2071010	FOLR1	-/-	Methyltetrahydrofolate (5-MTHF)	**Methyl Folate Plus™ Twice Daily**			
rs651933	FOLR2	+/-					
rs1076991	MTHFD1	+/-					
rs1801131	MTHFR A1298C	+/+					
rs1801133	MTHFR C677T	-/-					
rs1051266	SLC19A1	+/-					
rs526934	TCN1	+/-	Methyl B12, Adenosyl B12	**Methylation Pro Topical™** OR **Methylation Complete Fast Dissolves™** twice daily			Consider Routine Plasma B12 Level
rs1801198	TCN2	+/+					
Clot Risk							
rs6025	FACTOR V	-/-	Potential Increased Risk of Thrombosis				
rs3211719	FACTOR X	-/-					
rs268	LPL	-/-	Increased Risk of Thromboembolisms and Hyperlipidemia				

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Estrogen Metabolism and Clearance							
rs1800440	CYP1B1	+/-	Increased Levels of 4-hydroxy Estrogen, Endometriosis and Osteoporosis	**DIM Pro (Di-indoyl Methane) if Estrogen Dominant**		Be Cautious With High Dose Estrogen Birth Control or Estrogen Supplementation Due To Increased Production of 4-OH Estrogen Metabolites	Consider Estrogen Metabolite Testing
rs1048943	CYP1A1 L4889G	-/-					
rs4680	COMT V158M	+/-					
rs1695	GSTP1 I105V	+/+					
Follicular Sensitivity							
rs6165	FSHR	+/+	Decreased FSH Sensitivity Higher Risk of PCOS, Estrogen Dominance and Premature Ovarian Failure	**D-Chiro Inositol or Metabolic Stimulator™**		Monitor for PCOS and Premature Ovarian Failure. May need supplemental progesterone during pregnancy.	Routine Mid Cycle Fractionated Estrogen, Progesterone, Testosterone
Hormone Metabolism							
rs4646	CYP19A1	+/+	High activity of Aromatase, Higher Risk of Endometriosis and Estrogen Dominance	**Consider DIM Pro ™ or Aromatase Inhibitor if Necessary**		Testosterone Therapy May Produce Higher Levels of Estrogen	Routine Mid Cycle Fractionated Estrogen, Progesterone, Testosterone
rs166050	SRD5A1	-/-	Be Cautious with Estrogen, Testosterone and DHEA therapy due to potential increase in DHT				

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Metabolic Risk Factor							
rs1867277	FOXE1	-/-	Iodine, Selenium				
rs510432	ATG5	+/+	Curcumin, Resveratrol, Sulfuraphane, Ginsing, Catechins, D-Chiro Inositol	**D-Chiro Inositol or Metabolic Stimulator™** **N.A.S Enhancer™**	Metformin may be Beneficial Spironolactone may be Beneficial	Increased Risk of Insulin Resistance, PCOS, Gestational Diabetes 12-15 hour Fasting Routine Exercise	Routine Fasting Blood Sugar, Insulin and Hgb A1c
rs26538	ATG12	+/-					
rs10210302	ATG16L1	+/-					
Hypertension/Risk/Other							
rs4343	ACE	+/-	Increased risk of salt retention and hypertension				
rs699	AGT	+/-					
Vitamin D Transport							
rs731236	VDR Taq	+/-	Vitamin D Vitamin K	**Vitamin D3+K2 Cofactor Complex™** OR **D3+K2 Drops**	Vitamin D3+K2 Cofactor Complex TM OR D3+K2 Drops		Consider Routine Vitamin D
rs2282679	GC or DBP	+/-					

Summary for Women's Health

Highly Recommended Therapeutics / Neurobiologix Formulas

- Methyl Folate PlusTM Twice Daily
- Methylation Pro TopicalTM OR Methylation Complete Fast DissolvesTM twice daily
- DIM Pro (Di-indoyl Methane) if Estrogen Dominant
- D-Chiro Inositol or Metabolic StimulatorTM
- Consider DIM Pro TM or Aromatase Inhibitor if Necessary
- N.A.S EnhancerTM
- Vitamin D3+K2 Cofactor ComplexTM OR D3+K2 Drops

Provider Discretion

- Metformin may be Beneficial
- Spironolactone may be Beneficial
- Vitamin D3+K2 Cofactor ComplexTM OR D3+K2 Drops

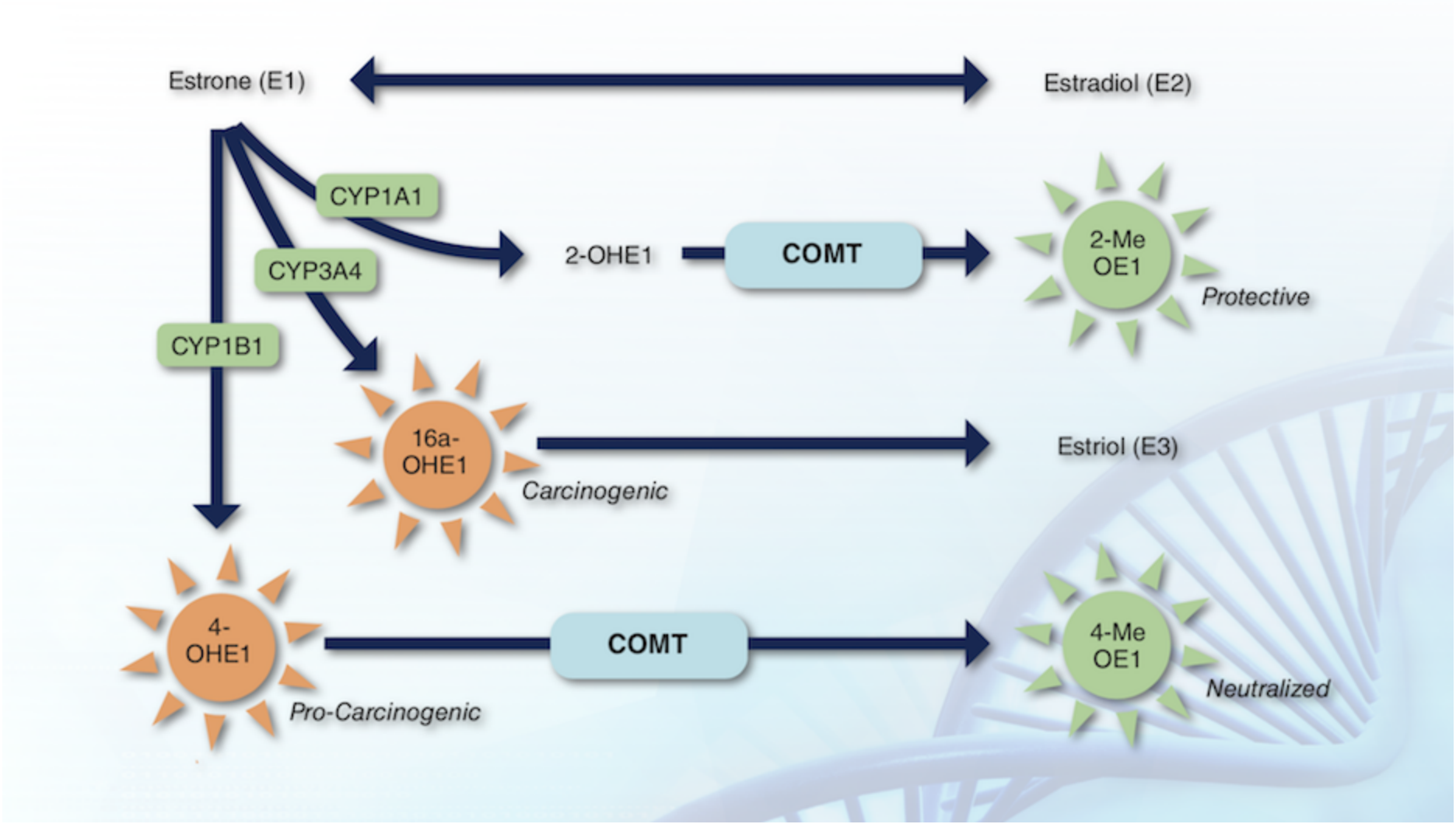
Lifestyle Recommendations

- Be Cautious With High Dose Estrogen Birth Control or Estrogen Supplementation Due To Increased Production of 4-OH Estrogen Metabolites
- Monitor for PCOS and Premature Ovarian Failure.
- May need supplemental progesterone during pregnancy.
- Testosterone Therapy May Produce Higher Levels of Estrogen
- Increased Risk of Insulin Resistance
- PCOS
- Gestational Diabetes
- 12-15 hour Fasting
- Routine Exercise

Laboratory Recommendations

- Consider Routine Plasma B12 Level
- Consider Estrogen Metabolite Testing
- Routine Mid Cycle Fractionated Estrogen
- Progesterone
- Testosterone
- Routine Fasting Blood Sugar
- Insulin and Hgb A1c
- Consider Routine Vitamin D

Phase I and II - Estrogen Metabolism



Gene Information Key

rsID	Gene	"-" variant	"+" variant
rs4343	ACE	A	G
rs699	AGT	A	G
rs26538	ATG12	T	C
rs10210302	ATG16L1	C	T
rs510432	ATG5	C	T
rs4680	COMT V158M	G	A
rs4646	CYP19A1	C	A
rs1048943	CYP1A1 L4889G	T	C
rs1800440	CYP1B1	T	C
rs6025	FACTOR V	C	T
rs3211719	FACTOR X	A	G
rs2071010	FOLR1	G	A
rs651933	FOLR2	A	G
rs1867277	FOXE1	G	A

rsID	Gene	"-" variant	"+" variant
rs6165	FSHR	C	T
rs2282679	GC or DBP	T	G
rs1695	GSTP1:I105V	A	G
rs268	LPL	A	G
rs1076991	MTHFD1	C	T
rs1801131	MTHFR:A1298C	T	G
rs1801133	MTHFR:C677T	G	A
rs1051266	SLC19A1	T	C
rs166050	SRD5A1	A	G
rs526934	TCN1	A	G
rs1801198	TCN2	C	G
rs731236	VDR Taq	A	G

Definitions

CLOT RISK	
Factor V	A single nucleotide polymoprhism in the F5 gene (rs6025) leads to a mutant Factor V protein. This mutant protein is associated with increased clotting, especially in the veins.
Factor X	The F10 gene encodes a protein, Factor X, involved in coagulation and wound healing. Mutations in the F10 gene predict for clot risk and anticoagulant drug sensitivity.
LPL	The lipoprotein lipase (LPL) gene encodes a protein involved in the breakdown of triglycerides into fatty acids. Mutations in the LPL gene are associated with many disorders of metabolism
DETOXIFICATION	Detoxification enzymes are responsible for clearing environmental chemicals and metabolites from our body. Accumulation of these chemicals and by-products can damage intracellular biochemical functions. Alterations in these systems can have a significant negative effect on the nervous system and immune systems functions. These polymorphisms can result in decreased "quality of life" and even decreased "life-span".
GSTP1	Glutathione S-transferases (GSTs) are a family of enzymes that play an important role in detoxification. The glutathione S-transferase pi gene (GSTP1) functions in chemical clearance and anti-inflammatory properities. High concentration of GST-p are found in the skin, lungs, sinuses, bladder and the intestinal tract. Polymorphisms of this enzyme allow for increased inflammatory activity in these areas that include eczema, asthma, chronic sinusitis, IBS, "leaky" gut and interstitial cystitis.
DEVELOPMENTAL	
ATG12	Autophagy-related 12 protein is part of the core autophagy machinery inside the cell. Autophagy, a form of cellular "recycling" is necessary for many cell functions. ATG12 is specifically involved in turning off the innate immune response. Mutations in the ATG12 gene are predicted to lead to increased activity of the innate immune response, and overall inflammation.
ESTROGEN METABOLISM AND CLEARANCE	
CYP1A1	The CYP1A1 gene encodes a member of the cytochrome P450 family of enzymes. CYP1A1, also known as the aryl hydrocarbon hydroxylase, is essential for detoxifying xenobiotics and normal hormonal metabolism.
CYP1B1	The CYP1B1 gene encodes a member of the cytochrome P450 family of enzymes. CYP1B1 is involved in metabolizing lipids, fats, cholesterol, and steroid hormones. SNPs in the CYP1B1 gene predict risk of hormone dependent diseases and efficacy of treatments of such diseases.
HORMONE METABOLISM	
CYP19A1	The CYP19A1 gene encodes a special member of the cytochrome P450 family of enzymes: aromatase. Aromatase is a membrane-bound enzyme that converts androgens to estrogen. By controlling when and where aromatase is expressed during development, the genome carefully sculpts tissue-specific estrogen-responsive phenotypes. SNPs in aromatase (rs4646) are thought to predict a wide range of estrogen-sensitivity effects such as breast cancer risk, toxicity of aromatase inhibitors, and even female pattern hair loss.
HYPERTENSION	
ACE	Angiotensin-converting enzyme (ACE) is an important target for therapeutic drugs treating hypertension and heart failure. The best studied single nucleotide polymorphism in the ACE gene (rs4343) has been linked to a wide variety of human phenotypes: nephropathy and renal disease, cancer, and even sports performance. Interestingly, rs4343 is a member of a large family of human mutations called Alu elements.
AGT	The AGT gene codes for the angiotensinogen protein, a key regulator of blood pressure and body fluid homeostasis. Individuals carrying two copies of the rs699 C allele are at increased risk of hypertension-related disorders such as pre-eclampsia.
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.
ATG16L1	The ATG16L1 gene encodes a protein that is a vital component of a protein complex necessary for the cellular phenomena known as autophagy. Autophagy is the process of degrading and cleaning of inert debris of the cell. Weakness in autophagy leads to abnormal accumulation of cellular “garbage” that will eventually affect the cellular function and lead to autophagy related disease states in including many neurological and immunological diseases, DM Type 2 and fatty liver disease.
ATG5	Autophagy-related 5 protein (ATG5) is an important intracellular mediator of the autophagy response. ATG5 is involved in a wide range of "quality control" features inside the cell: autophagy vesicle formation, innate immune system signaling, consumption of damaged mitochondria, and apoptosis. Mutations in the ATG5 gene are associated with numerous neurological, immunological and endocrine syndromes.

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.
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.
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.
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.
NEUROTRANSMITTER	Neurotransmitters are chemicals that are used to produce specific effects in the nervous system. These specific neurotransmitter genomics assess a person's risk for anxiety, depression and dysphoria.
COMT V158M	Catechol-O-methyltransferase (COMT) is one of several enzymes that degrade catecholamine neurotransmitters such as dopamine, epinephrine, and norepinephrine. COMT's main function is to inactivate neurotransmitters (dopamine, epinephrine, and norepinephrine) by the addition of a methyl group to the catecholamine. Normal COMT function allows people to rapidly reverse feelings of anxiety or depression. COMT (+/-) patients have sluggish ability to alter anxiety or depression episodes. COMT (+/+) patients are more prone to prolonged episodes of anxiety, depression and OCD.
VITAMIN / MINERAL ESSENTIAL	
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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DISCLAIMER:

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GX Sciences SNP References

CLOT RISK SNP References

LPL

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ATG12

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ESTROGEN METABOLISM AND CLEARANCE SNP References

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CYP1B1

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