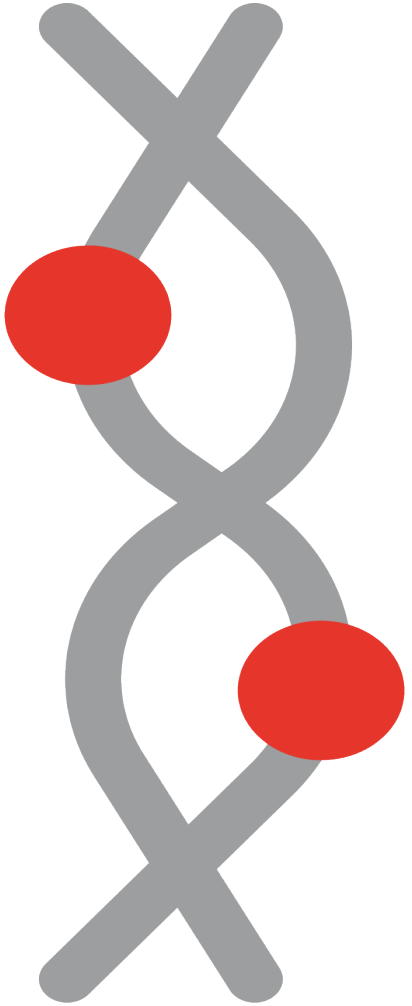
Fagron genomics



Gene Comprehensive Nutrigenomic Report

Accession Number: ##########
Specimen Collected: ##/##/####
Specimen Received: ##/##/####
Report Generated: November 16, 2022
Specimen Type: Buccal Swab
Provider: ######## ########
Patient Name: ###### ######
Patient DOB: ##/##/####
Patient Gender: Female

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

– 35 – Female

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

rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics	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	-/-					

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rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
Estrogen Metabolism and Clearance							
rs1800440	CYP1B1	-/-	Increased Levels of 4-hydroxy Estrogen, Endometriosis and Osteoporosis				
rs1048943	CYP1A1 L4889G	-/-					
rs4680	COMT V158M	+/-	Difficulty with Clearing Estrogen Metabolites Calcium-D-Glucarate		Toxiclear Professional Formula ™ or Calcium-D-Glucarate once daily if Estrogen Dominant	May have Difficulty Clearing Estrogen Metabolites	Consider Estrogen Metabolite Testing
rs1695	GSTP1 I105V	+/+					
Follicular Sensitivity							
rs6165	FSHR	-/-	Decreased FSH Sensitivity Higher Risk of PCOS, Estrogen Dominance and Premature Ovarian Failure Use of D-Chiro-Inositol				
Hormone Metabolism							
rs4646	CYP19A1	+/+	High activity of Aromatase, Higher Risk of Endometriosis and Estrogen Dominance	**Consider DIM Pro ™ if Estrogen Dominant**		Testosterone Therapy May Produce High Levels of Estrogen	Routine Mid Cycle Fractionated Estrogen, Progesterone, Testosterone
rs166050	SRD5A1	-/-	Be Cautious with Testosterone and DHEA therapy due to potential increase in DHT				

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rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
Metabolic Risk Factor							
rs1867277	FOXE1	-/-	Iodine				
rs225014	DIO2	-/-	Selenium				
rs510432	ATG5	+/+	Curcumin, Resveratrol, Sulfuraphane, Ginsing, Catechins, D-Chiro Inositol	**DCI 500mg or Metabolic Stimulator™** **N.A.S Enhancer™**	Metformin may be Beneficial if Insulin Resistance Present	Increased Risk of Insulin Resistance (PCOS) and 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			Recommend Salt Restriction After Age 40 Increased Risk of Hypertension and Pre-eclampsia	
rs699	AGT	+/+					
Vitamin D Transport							
rs731236	VDR Taq	+/-	Vitamin D Vitamin K		Vitamin D3+K2 Cofactor Complex™ if Vitamin D Levels are Low		Consider Routine Vitamin D
rs2282679	GC or DBP	+/-					

Summary for Women's Health

Highly Recommended Therapeutics

- Methyl Folate Plus™ Twice Daily
- Methylation Pro Topical™ OR Methylation Complete Fast Dissolves™ twice daily
- Consider DIM Pro ™ if Estrogen Dominant
- DCI 500mg or Metabolic Stimulator™
- N.A.S Enhancer™

Provider Discretion: As Needed Formula Recommendations

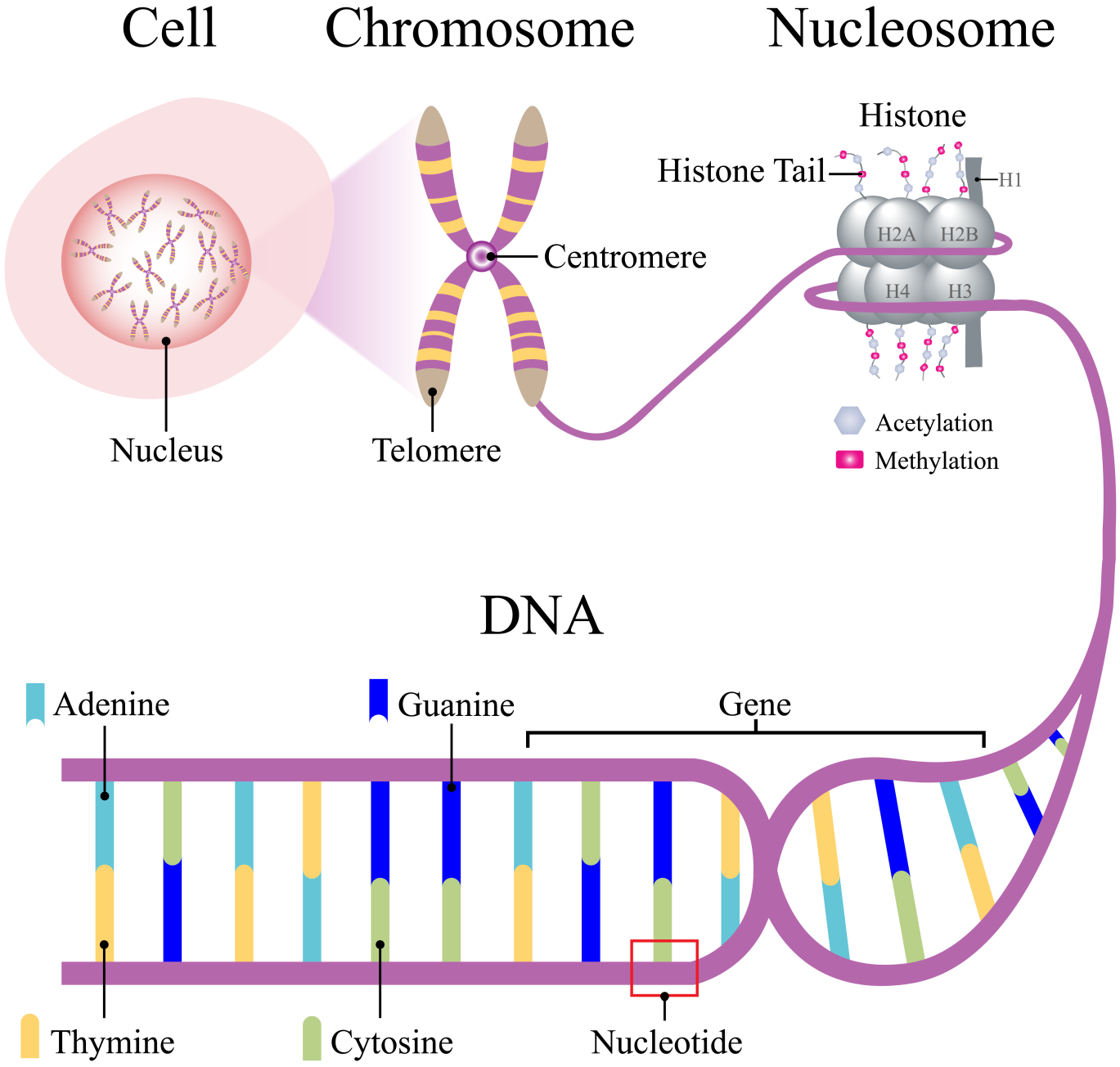
- Toxiclear Professional Formula™ or Calcium-D-Glucarate once daily if Estrogen Dominant
- Metformin may be Beneficial if Insulin Resistance Present
- Vitamin D3+K2 Cofactor Complex™ if Vitamin D Levels are Low

Lifestyle Recommendations

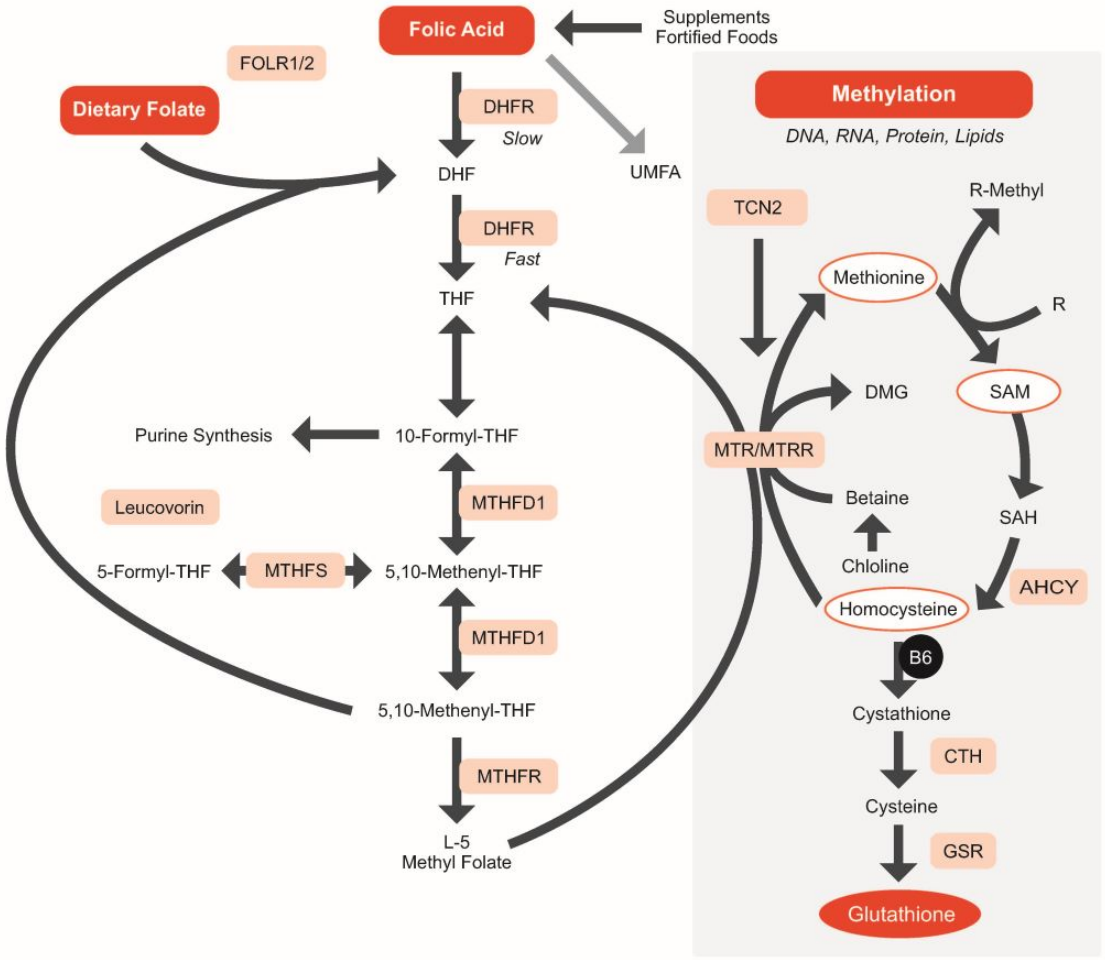
- May have Difficulty Clearing Estrogen Metabolites
- Testosterone Therapy May Produce High Levels of Estrogen
- Increased Risk of Insulin Resistance (PCOS) and Gestational Diabetes
- 12-15 hour Fasting
- Routine Exercise
- Recommend Salt Restriction After Age 40
- Increased Risk of Hypertension and Pre-eclampsia

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


Cell
Chromosome
Nucleosome
Nucleus
Telomere
Centromere
Histone
Histone Tail
H1
H2A
H2B
H4
H3
Acetylation
Methylation
DNA
Adenine
Guanine
Gene
Thymine
Cytosine
Nucleotide

METHYLATION



Methylation

- Involves the addition of a methyl group (CH3)
- Regulates gene expression and repression
- Reduces or removes toxins that eliminate essential nutrients
- Provides nutrients needed for processes such as detoxification, immune regulation, gut health

Methionine

- Used in protein formation and stabilization
- Elevated levels are associated with risk for coronary heart disease, stroke & neurological diseases

Glutathione

- Important for chemical detoxification & proper mitochondrial functioning
- Genes relevant for production include: AHCY, CTH, CGTP1, GSTM1, GSTM3, GSR, MTRR & MTR

5-Methyl Folate

- Important for dopamine and serotonin formation, detoxification and mitochondrial strength
- Genes relevant for production include: DHFR, FOLR1/2, MTHFD1, MTHFR, MTHFS

Homocysteine

- Elevated levels are associated with risk for coronary heart disease, stroke, neurological diseases
- Variants in the methylation pathway can be associated with increased/decreased levels

FOLATE

FOOD SOURCES


Eggs


Citrus Fruits

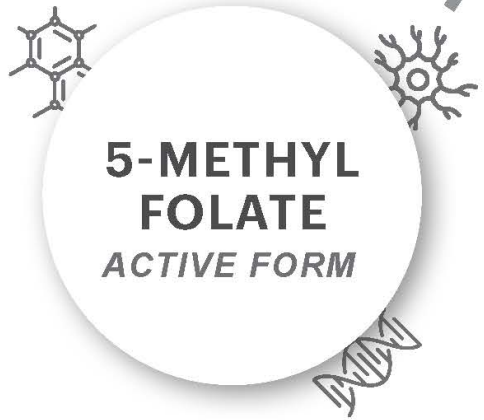

Leafy Greens


Legumes


Broccoli


Brussel Sprouts


Breads, Cereal, Pastas, Rice



FUNCTIONS (OR BENEFITS AS YOU AGE)

- Maintains structure & function of proteins
- Maintains structure & function of DNA
- Facilitates DNA replication, neurotransmitter production & detoxification

DEFICIENCY CAUSES

- Neural tube defects
- Cardiovascular disease
- Memory problems
- Depression
- Insomnia
- Irritability

IODINE

WAYS TO INCREASE LEVELS

Seafood – fish (tuna, cod), shrimp

Vegetables/Legumes – green peas, lima beans, corn

Seaweed

Iodized salt

Dairy products

Eggs

Whole grains (unless gluten free)

Supplements

Fruits – prunes, bananas

FUNCTIONS

Synthesizes thyroid hormones (T3 & T4) for metabolic pathways

Role in growth & development

Role in immune response

DEFICIENCY VS HIGH INTAKE

Deficiency

- Developmental issues
- Improper thyroid hormone production
- Fertility issues

High intake

- Thyroid disorders
- Acute poisoning
  - Burning in mouth & throat
  - Fever
  - Abdominal pain
  - Nausea
  - Vomiting
  - Diarrhea

SELENIUM

WAYS TO INCREASE LEVELS

Brazil nuts

Low-fat milk products

Meats & seafood – fish (tuna, halibut, sardines), ham, shrimp, beef, liver, chicken, turkey

Boiled eggs

Wheat germ, Brewer's yeast

Whole grains (unless gluten free)

Supplements

FUNCTIONS

Role in proper thyroid function & thyroid hormone metabolism

Role in DNA synthesis

Role in reproduction

Protection from infection & oxidative damage

DEFICIENCY VS HIGH INTAKE

Deficiency

- Cardiovascular disorders
- Developmental issues
- Thyroid disorders
- Joint & bone issues
- Infertility issues
- Cancers

High intake

- Metallic taste in mouth
- Garlic odor of breath
- Hair and nail loss or brittleness
- Nervous system abnormalities
- Nausea
- Diarrhea
- Skin rashes
- Fatigue
- Irritability

ESTROGEN METABOLISM & CLEARANCE

A 2-PART PROCESS THAT INVOLVES THE BREAKDOWN OF ESTROGREN BY CYP1B1, CYP1A1 & COMT

CYP1B1 & CYP1A1 genes have been associated with increased levels of pro-carcinogenic 4-OHE1, endometriosis & osteoporosis
COMT & GSTP1 genes have been associated with difficult clearance of estrogen metabolites (i.e. E1, E2, E3)
CYP1B1 has been correlated with weight gain, breast tenderness/fullness, swelling & a much worse PMS

RELEVANT FUNCTIONS OF ESTROGEN:

- Estradiol (E2): main estrogen produced in premenopausal women
- Estriol (E3): main estrogen produced during pregnancy
- Estrone (E1): main estrogen made after menopause

RELEVANT FUNCTIONS OF ESTROGEN:


Role in reproduction


Helps regulate the menstrual cycle


Helps control inflammation


Role in the development of secondary sexual characteristics (i.e. breasts, wider hips & hair)


Maintains bone density


Role in brain functioning

SYMPTOMS OF EXCESS ESTROGEN

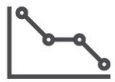

Weight gain


PMS


Fibrocystic breasts


Heavy periods


Fibroids


Loss of sex drive


Fatigue


Mood changes

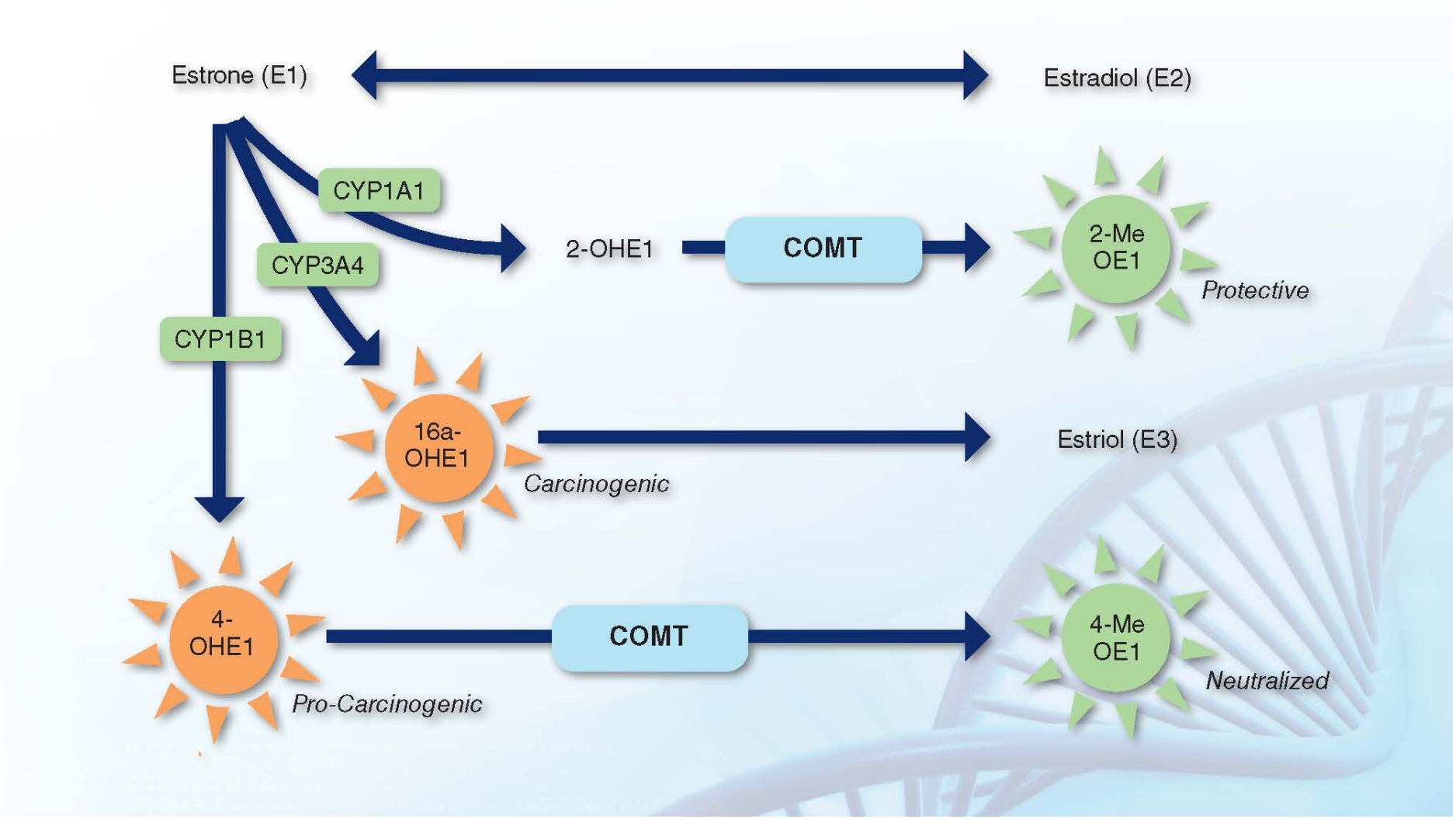
WAYS TO IMPROVE

Di-indolymethane (DIM) & Calcium-D Glucarate


Cruciferous Vegetables (ex. cabbage, broccoli, cauliflower, kale, collards & brussel sprouts)


Supplements

Phase I and II - Estrogen Metabolism

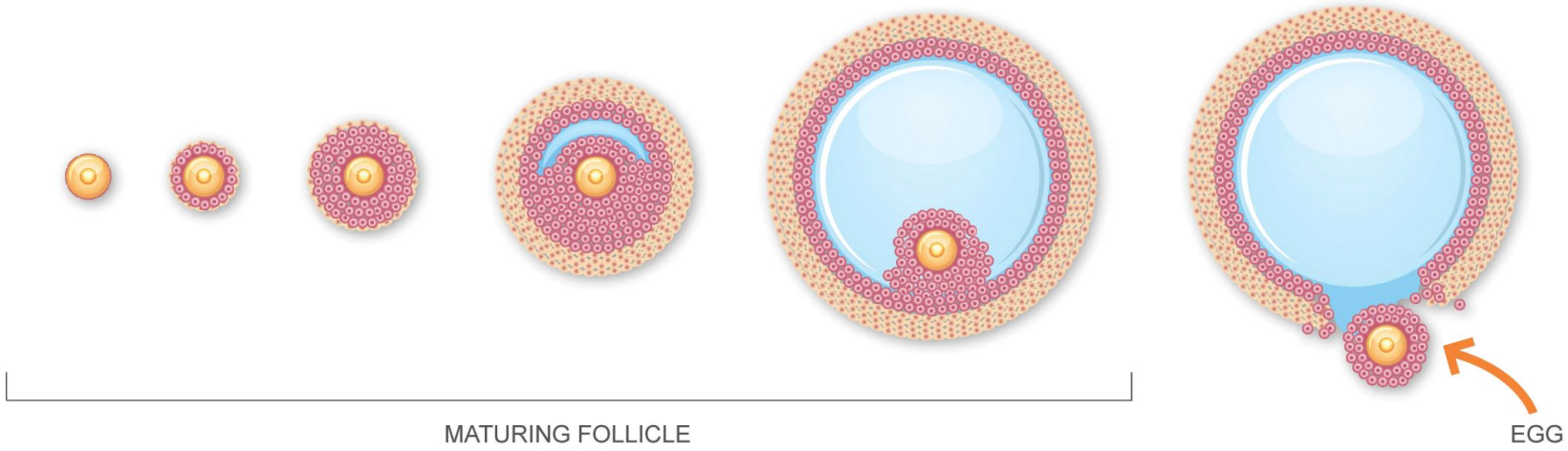


FOLLICULAR SENSITIVITY

THE FSHR GENE HAS BEEN ASSOCIATED WITH DISRUPTION IN DEVELOPMENT & RELEASE OF EGGS

Variants show an increased risk for PCOS, estrogen dominance, premature ovarian failure & poor ovarian response

FOLLICULAR STAGE OF MENSTRUATION



FSHR GENE

- Follicle stimulating hormone, FSH, causes the growth of a follicle
- Follicle: Cluster of cells that contains one immature egg
- Growth of follicles causes the lining of the uterus to thicken for possible pregnancy

WAYS TO IMPROVE

Progesterone supplementation (during pregnancy)

D-chiro-Inositol

HORMONE METABOLISM

Hormones are chemical substances that controls and regulate body processes such as digestion, metabolism, growth, reproduction and mood

THE SRD5A1 GENE

Responsible for the conversion of testosterone to potent, DHT

Variants have been associated with:

Sensitivity to hormone replacement therapy (estrogen, testosterone, DHEA)

Acne

Male Baldness Pattern

Hair loss

THE CYP19A1 GENE

Responsible for the conversion of androgens to estrogen

Variants have been associated with estrogen-sensitivity effects such as:

Breast cancer risk

Female Pattern Hair Loss

Endometriosis

Estrogen Dominance

Toxicity of Aromatase Inhibitors

WAYS TO IMPROVE

Aromatase inhibitor or DIM (Di-Indoyl Methane)

Testosterone Therapy (to increase estrogen levels)

DHT (Di-Hydro Testosterone) Blocker if DHT is elevated

METABOLIC RISK FACTOR

METABOLISM

THE BODY'S CONVERSION OF FOOD TO ENERGY WHICH IS REGULATED BY THE THYROID HORMONE

ATG GENES

Reduced clearance of cellular blockage, insulin resistance, diabetes, PCOS and fatty liver disease

FOXE1 GENE

Responsible for the production of thyroid hormone (TH)

Variants have been associated with:

Increased risk for hypothyroidism

DIO2 GENE

Variants have been associated with:

Responsible for selenium-dependent conversion of thyroid hormones

RECOMMENDATIONS & WAYS TO IMPROVE

Iodine and Selenium

Routine thyroid screenings

Intermittent fasting or low-calorie diet

Routine exercise

Ketogenic diets (high fat, low carbs)

Medications & supplements: D-Chiro Inositol or Metformin

HYPERTENSION RISK FACTOR

HIGH BLOOD PRESSURE

- Ranges
  - Normal: 120/80
  - Range of concern: 140/90 or higher
- Risk factors: high salt diet, high alcohol intake, stress, little potassium intake, alcohol & tobacco use, obesity, genetics/family history, age, lack of physical activity
- Uncontrolled high blood pressure has been associated with an increased risk for cardiovascular diseases and stroke

AGT & ACE GENES

Variants have been associated with an increased risk for:

Salt retention

Kidney issues

Preeclampsia

Poor sports performance

Hypertension & other cardiovascular issues

LIFESTYLE CHANGES

Limit salt intake

Angiotensin II Receptor Blockers (“sartans”)

Weight management & routine exercise

Mediterranean diet

Quit smoking

Heart-healthy diet/ Low-sodium diet/ DASH diet

DASH DIET

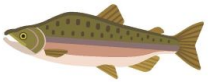
FOOD TO EAT

Fruits & vegetables

Egg whites

Whole grains (unless gluten free)

Nuts & nut butters



Lean, skinless meat & fish (salmon, trout, herring)

Legumes

Low-fat or fat-free dairy products

Olive oils high in polyphenols

BENEFITS

Improves heart health

Improves and/ or reduces risk for hypertension, heart disease and stroke

FOODS TO AVOID AND/OR LIMIT

Red meat

Fried foods

Sweets

Processed meats - deli meat, hotdogs, sausage, bacon

Sugar-sweetened beverages

Fats/oils - Butter, margarine, tropical oils (coconut, palm)

High-salt foods

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
rs225014	DIO2	T	C
rs6025	FACTOR V	C	T
rs3211719	FACTOR X	A	G
rs2071010	FOLR1	G	A
rs651933	FOLR2	A	G
rs1867277	FOXE1	G	A
rs6165	FSHR	C	T
rs2282679	GC or DBP	T	G
rs1695	GSTP1:I105V	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	The SNPs in this category define some areas of potential concern in the clotting mechanisms of the body. Polymorphisms in these proteins may need to be considered during pregnancy, surgery, trauma and/or certain forms of birth control
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.
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	The SNPs in this category have been identified as potential areas of weakness in the recovery of developmental disorders.
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.
ESSENTIAL VITAMINS	The polymorphisms in this panel will identify any potential weakness of absorption, conversion or delivery or your essential vitamins.
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.
ESTROGEN METABOLISM AND CLEARANCE	The conversion of estrogen and its' metabolites is essential to effective safe estrogen treatment. These SNPs will identify your potential for increased production of possible carcinogenic forms of estrogen
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.
FSHR	The FSHR gene encodes for a protein belonging to family 1 of G-protein coupled receptors. It is the receptor for follitropin (follicle stimulating hormone) and functions in gonadal development. Mutations in this gene cause ovarian hyperstimulation syndrome. Alternative splicing results in multiple transcript variants.
HEALTH PRECAUTIONS	
DIO2	DIO1 (Deiodinase 1) codes for an enzyme in the iodothyronine deiodinase family. It catalyzes the activation, as well as the inactivation of thyroid hormone by outer and inner ring deiodination, respectively. Specifically, it is responsible for the selenium-dependent conversion of T4 thyroid to T3 thyroid.
HORMONE METABOLISM	The conversion of estrogen and its' metabolites is essential to effective safe estrogen treatment. These SNPs will identify your potential for increased production of possible carcinogenic forms of estrogen.
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.
SRD5A1	The SRD5A and SRD5A1 genes encode different versions of 5-alpha-reductase. 5-alpha-reductase is an enzyme that converts testosterone to the more potent androgen, dihydrotestosterone (DHT). Common SNPs in the SRD5A genes predict for sensitivity to hormone replacement therapy.
HYPERTENSION	The polymorphisms in this category will increase the risk of developing 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 rs10210302	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.
METABOLIC RISK FACTOR	The polymorphisms in this category relate to increase risk of developing metabolic syndromes including diabetes, fatty liver, hypothyroidism and insulin resistance.
FOXE1	FOXE1 (Forkhead Box Protein E1) is a gene that codes for a protein that is intimately involved in thyroid hormone synthesis. Polymorphisms in this gene most commonly lead to an increased risk of hypothyroidism due to a weakened ability to synthesize thyroid hormone.
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 A1298C	Methylenetetrahydrofolate 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.
MTHFR C677T	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.
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.

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.

Disclaimers

TESTING:

Testing Performed By: AMH

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 Laboratory Director: James Jacobson, PhD

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:

Report contents and report recommendations are created and approved by GX Sciences. Sole responsibility for the proper use of the information on the GX Sciences report rests with the user, or those professionals with whom the user may consult. Nutrigenomic Testing and Dietary Supplements are not "Designated Health Services" covered by Medicare or Medicaid and may not be reimbursed under any state or Federal health care program.

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