



## Gene Comprehensive Nutrigenomic Report

Accession Number: #####

Specimen Collected: ##/##/####

Specimen Received: ##/##/####

Report Generated: November 17, 2022

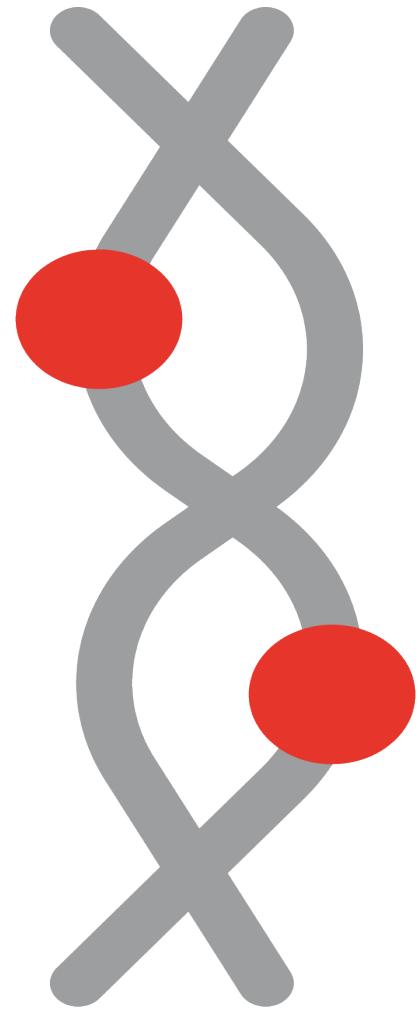
Specimen Type: Buccal Swab

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.

##### - 36 - Male

(-/-) 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
Men's Health							
Testosterone Metabolism							
rs4646	CYP19A1	+/-	Aromatase Inhibitor Indole-3-Carbinal (I3C) Di-Indole Methane (DIM)		Consider Aromatase Inhibitor, Indole-3-Carbinal (I3C) or Di-Indole Methane (DIM) if Estradiol is Elevated when taking Testosterone Supplementation	Recommend Professional Education on the Potential Side Effects of High Estrogen Conversion	Routine Plasma Estradiol
rs1800440	CYP1B1	-/-	Indole-3-Carbinal (I3C) Di-Indole Methane (DIM)				
rs4680	COMT V158M	+/-					
rs166050	SRD5A1	-/-	Saw Palmetto Beta-Sitosterol Stinging Nettle				

##### - 36 - Male

(-/-) 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
Metabolic Risk Factor							
rs1867277	FOXE1	-/-	Iodine  Increased Risk of Hypothyroidism				Routine Thyroid Panel
rs225014	DIO2	+/-	Selenium	<b>Selenomethionine 200 mcg per day</b>			
rs510432	ATG5	+/ +/-				May have Increased Risk of Diabetes Type 2	
rs26538	ATG12	+/-	Curcumin, Resveratrol, Sulforaphane, Ginseng, D-Chiro-Inositol	<b>DCI 500mg or Metabolic Stimulator™</b>  <b>NAS Enhancer™</b>		Routine Exercise Highly Recommended  12-15 Hour Fasting	Routine Testing of Glucose, Insulin and Hgb A1c
rs10210302	ATG16L1	+/-					
Hypertension Risk							
rs4343	ACE	+/-				Salt Restriction recommended after age 40  Increased Risk of Hypertension  Routine Stress Test After Age 45	
rs699	AGT	+/-				Monitor Blood Pressure Closely after age 40	

# Summary for Men's Health

Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
<ul style="list-style-type: none"><li>• Selenomethionine 200 mcg per day</li><li>• DCI 500mg or Metabolic Stimulator™</li><li>• NAS Enhancer™</li></ul>	<ul style="list-style-type: none"><li>• Consider Aromatase Inhibitor Indole-3-Carbinal (I3C) or Di-Indole Methane (DIM) if Estradiol is Elevated when taking Testosterone Supplementation</li></ul>	<p>Recommend Professional Education on the</p> <ul style="list-style-type: none"><li>• Potential Side Effects of High Estrogen Conversion</li><li>• May have Increased Risk of Diabetes Type 2</li><li>• Routine Exercise Highly Recommended</li><li>• 12-15 Hour Fasting</li><li>• Salt Restriction recommended after age 40</li><li>• Increased Risk of Hypertension</li><li>• Routine Stress Test After Age 45</li><li>• Monitor Blood Pressure Closely after age 40</li></ul>	<ul style="list-style-type: none"><li>• Routine Plasma Estradiol</li><li>• Routine Thyroid Panel</li><li>• Routine Testing of Glucose</li><li>• Insulin and Hgb A1c</li></ul>

# IODINE

## WAYS TO INCREASE LEVELS



## 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
- Meats & seafood – fish (tuna, halibut, sardines), ham, shrimp, beef, liver, chicken, turkey
- Whole grains (unless gluten free)

- Low-fat milk products
- Boiled eggs
- Wheat germ, Brewer's yeast
- 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

# TESTOSTERONE METABOLISM

## RELEVANT GENES

### CYP1B1, CYP1A1, COMT & GSTP1

Variants produce higher estrogen levels.

### SRD5A1

Sensitivity to hormone replacement therapy.  
Increased risk for androgenic symptoms.

## FUNCTIONS OF TESTOSTERONE



Regulates libido



Role in the production of red blood cells and sperm



Regulates bone mass,  
fat distribution, muscle  
mass & strength

## SYMPTOMS OF EXCESS ESTROGEN



Gynecomastia



Loss of  
muscle mass



Mood changes



Sexual dysfunction



Fatigue

## RECOMMENDATIONS & WAYS TO IMPROVE



Natural Aromatase Inhibitors (DIM, IC3, Crysin, Quercetin, Resveratrol)



Prescriptive Aromatase Inhibitors (Anastrozole, Letrozole)



Be cautious with Testosterone therapy



Natural DHT Blockers (Saw Palmetto, Biotin, Pygeum Bark, Pumpkin Seed Oil, Rosemary Oil)



Prescriptive DHT Blockers (Propecia, Avodart, Minoxidil, Spironolactone)

# 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)

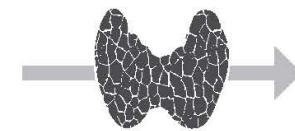
**Variants have been associated with:**



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



Olive oils high in polyphenols



Low-fat or fat-free dairy products



## 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
rs1800440	CYP1B1	T	C
rs225014	DIO2	T	C
rs1867277	FOXE1	G	A
rs166050	SRD5A1	A	G

# Definitions

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.
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
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.
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.
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.
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: TY

## 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](https://www.gxsciences.com/kb_results.asp)

## DISCLAIMER:

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# GX Sciences SNP References

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## HYPERTENSION SNP References

### AGT

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