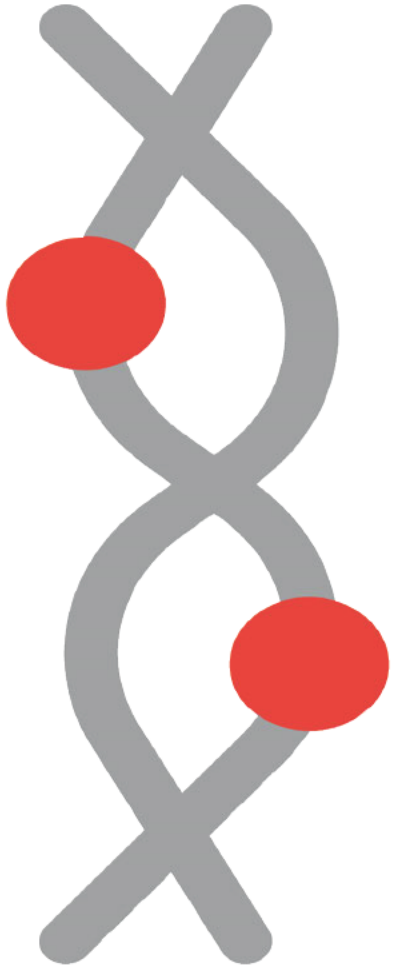
Fagron genomics



Gene Comprehensive Nutrigenomic Report

Accession Number: ##########
Specimen Collected: ##/##/####
Specimen Received: ##/##/####
Report Generated: February 27, 2025
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.

Fagron Genomics US | 844-258-5564 | FagronGenomicsUS.com
Lab | 807 Las Cimas Pkwy, Suite 145 | Austin, TX 78746
Laboratory Director: James W. Jacobson, Ph.D

– 18 – Female

(-/-) Normal Risk | (-/+) Medium Risk | (+/+) High Risk

rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
DEVELOPMENTAL							
Methylation							
	FOLR2	A/G (+/-)	Methyltetrahydrofolate (5-MTHF)	**L-5-MTHF OR Homocysteine Supreme™**			Complete Blood Count Serum and RBC Folate
	MTHFR 1298	G/T (+/-)					
	MTHFR 677	G/A (+/-)					
	TCN2	C/G (+/-)	Methylcobalamin, Adenosylcobalamin		Tricobalamin™ OR Vitamin B12		Serum Vitamin B12

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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
Neurotransmitters							
	COMT	G/G (-/-)	Taurine, Choline, Trimethylglycine (TMG), Dimethylglycine (DMG), Methionine, SAMe, Inositol	**Neurolink™** if Focus Issues Present			Consider Neurotransmitter Metabolite Testing Consider PGx Testing
	MAOA	G/T (+/-)	Riboflavin (B2), Taurine, Choline, Trimethylglycine (TMG), Dimethylglycine (DMG), Methionine, SAMe, Inositol, L-Methionine		**Neurolink™** if Anxiety, Depression, or Focus Issues Present **NeuroCalm™** if Chronic Anxiety or Depression Present		
	MAOB	T/C (+/-)					
	TPH2	G/G (-/-)	L-5-Methyl THF, Niacinamide, 5-HTP				
	HTR2	G/G (+/+)	5-HTP (Hydroxytryptophan)		May Benefit from **NeuroCalm™** if Anxiety or Depression Present		
	SLC6A4	C/C (-/-)					

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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
Neurotransmitters							
	DBH	G/G (-/-)	Vitamin C, Copper				
	GAD1	C/C (-/-)	Prescription Amantadine, Ketamine, Glycine, N-Acetyl-Cysteine (NAC), Zinc, Magnesium, Elderberry, L-Theanine, Melatonin	**Liposomal NeuroCalm™** May Benefit from Melatonin if Sleep Is an Issue		May Need to Avoid Monosodium Glutamate (MSG) Be Cautious with Glutamine Supplementation	Consider Neurotransmitter Metabolite Testing
	GAD1	C/C (+/+)					
Sugar Sensitivity and Mood							
	ADRA2A	C/C (-/-)	Increased Risk of Hyperactivity From Sugar and Anti-Psychotic Induced Weight Gain				
Neurotrophic Factors							
	BDNF	C/C (-/-)	Curcumin, Lithium Orotate, D-Chiro-Inositol, Catechins, Resveratrol, Exercise				
	NGF	G/G (-/-)	Curcumin, Lithium Orotate, D-Chiro-Inositol, Catechins, Resveratrol, Exercise				
	SYN1	A/G (+/-)	Ginsenoside Rg3, Nicotinamide Riboside, Ginseng		**May Benefit from Synapsin Nasal Spray**		

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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
Neuro-Inflammation							
	C3	C/C (-/-)	Anti-Inflammatory Therapy: Curcumin, Omega-3 Fatty Acids, Resveratrol, Quercetin, Low Dose Naltrexone (LDN), CBD Oil	**SPM Supreme™** **C3 Curcumin Complex** **OmegaAvail™ Liquid**		Consider Low Inflammatory Diet	
	CD14	G/G (-/-)					
	IL5	A/G (+/-)					
	IL13	C/T (+/-)					
	STAT4	C/G (+/-)					
	IL6	C/G (+/-)					
	TNF	G/G (-/-)					
	IDO1	C/T (+/-)					
	CTLA4	A/A (-/-)					
	DRD2	C/C (-/-)	Increased Efficacy of Naltrexone				

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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
Autophagy							
	ATG5	T/T (-/-)	Curcumin, Lithium Orotate, D-Chiro-Inositol, Catechins, Resveratrol, Caffeine, 12+ Hour Fasting		Inositol OR Inositol Powder	12-15 Hour Fasting if Appropriate for Age	Routine Blood Sugar, Insulin, and HbA1c
	ATG12	C/C (+/+)					
	ATG16L1	C/T (+/-)					
Detoxification							
	CTH	G/G (-/-)	N-Acetyl Cysteine (NAC), Glutathione				
	GSTP1	A/A (-/-)	N-Acetyl Cysteine (NAC), Glutathione				

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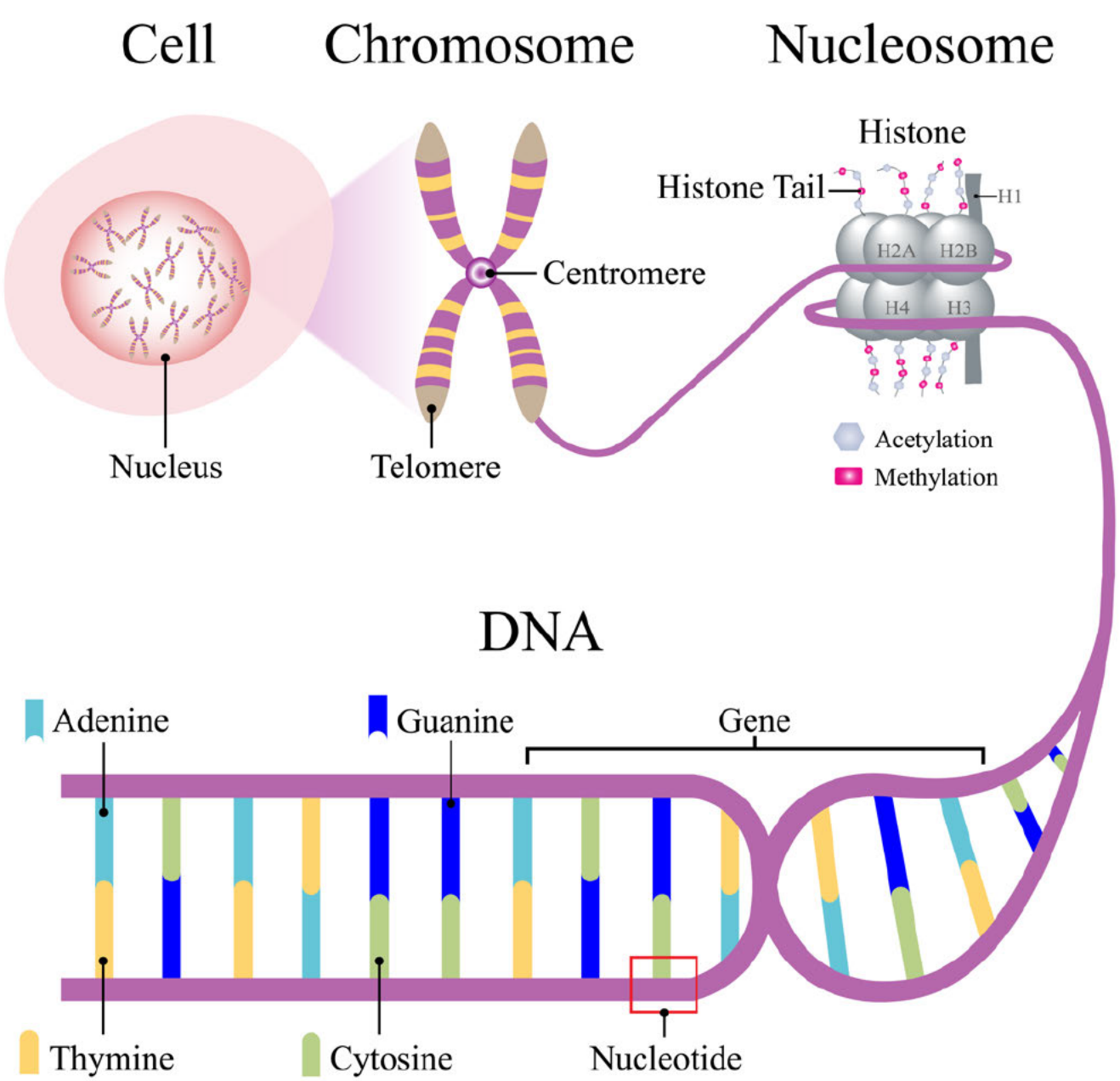
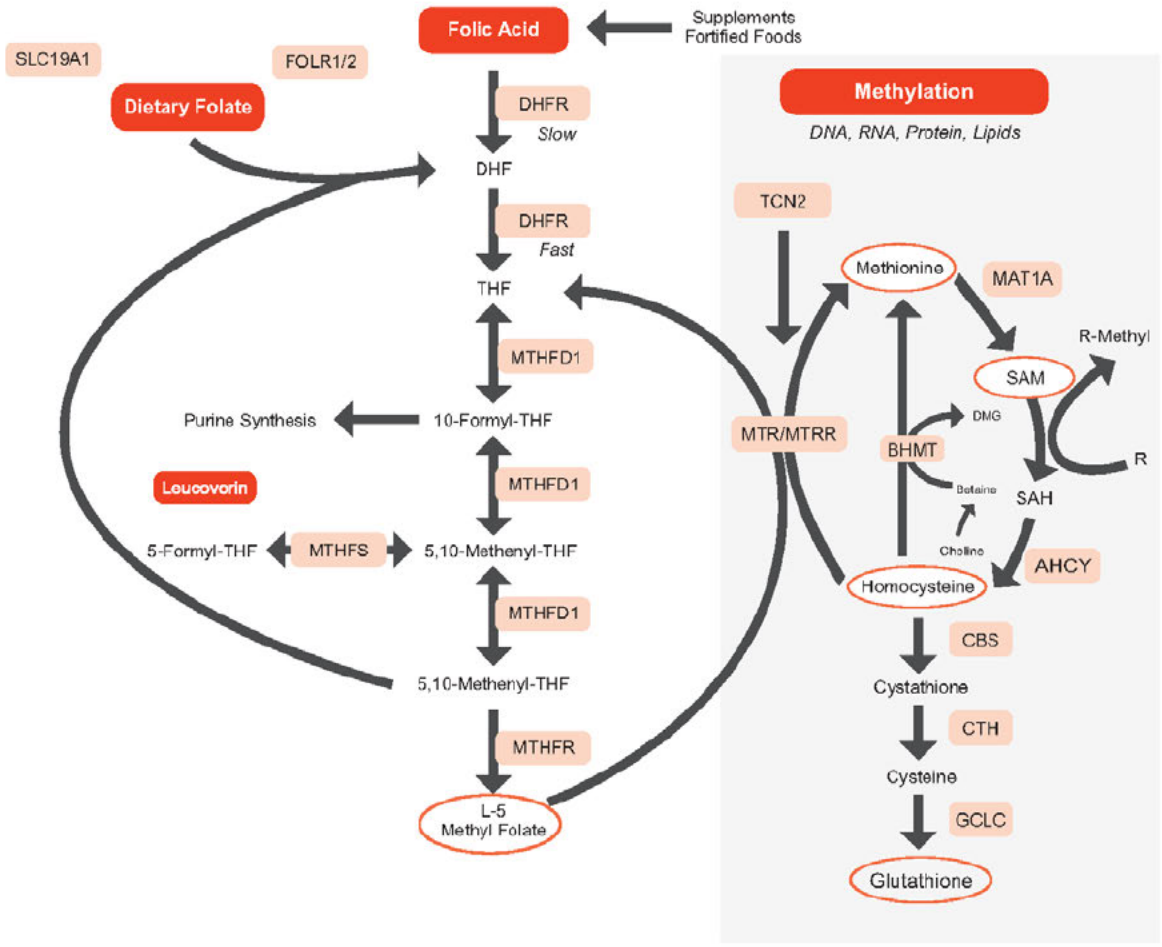
rsID	Gene	Genetic Result	Therapeutics Associated With Positive Result	Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
Environmental Inflammation							
	AOC1	C/T (+/-)	Poor Ability to Break Down Histamine in Foods		HistaGest-DAO™ if Histamine Response Presents after Eating	May Have Difficulty Digesting Foods Containing Histamine	
	HNMT	C/C (-/-)					
	FUT2	A/G (+/-)	Prebiotics and Probiotics Needed		ProBioMed™ Kids IgGI ShieldTM if Intestinal Inflammation Is an Issue	Consider Consumption of Prebiotic and Probiotic Foods	Microbiome Testing, such as **GI Spotlight**, if Digestive Disorders or GI Inflammation Present
	HLA DQA1	C/C (-/-)	High Risk of Gluten and Casein Sensitivity, Broad Spectrum Enzyme				
	HLA DQB1	T/T (-/-)					

Summary for Developmental

Highly Recommended Therapeutics	Provider Discretion: As Needed Formula Recommendations	Lifestyle Recommendations	Laboratory Recommendations
Methylation			
• L-5-MTHF OR Homocysteine SupremeTM			• Complete Blood Count • Serum and RBC Folate
	• TricobalaminTM OR Vitamin B12		• Serum Vitamin B12
Neurotransmitters			
• NeurolinkTMif Focus Issues Present			• Consider Neurotransmitter Metabolite Testing • Consider PGx Testing
	• NeurolinkTM if Anxiety, Depression, or Focus Issues Present • NeuroCalmTM if Chronic Anxiety or Depression Present		
	• May Benefit from NeuroCalmTM if Anxiety or Depression Present		
• Liposomal NeuroCalmTM • May Benefit from Melatonin if Sleep Is an Issue		• May Need to Avoid Monosodium Glutamate (MSG) • Be Cautious with Glutamine Supplementation	
Neurotrophic Factors			
	• May Benefit from Synapsin Nasal Spray		
Neuro-Inflammation			
• SPM SupremeTM • C3 Curcumin Complex • OmegaAvailTM Liquid		• Consider Low Inflammatory Diet	
Autophagy			
	• Inositol OR Inositol Powder	• 12-15 Hour Fasting if Appropriate for Age	• Routine Blood Sugar, Insulin, and HbA1c
Detoxification			
Environmental Inflammation			
	• HistaGest-DAOTM if Histamine Response Presents after Eating	• May Have Difficulty Digesting Foods Containing Histamine	
	• ProBioMedTM Kids • IgGI ShieldTM if Intestinal Inflammation Is an Issue	• Consider Consumption of Prebiotic and Probiotic Foods	• Microbiome Testing, such as GI Spotlight, if Digestive Disorders or GI Inflammation Present


Cell
Chromosome
Nucleosome
Histone
Histone Tail
H1
H2A
H2B
H4
H3
Centromere
Nucleus
Telomere
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

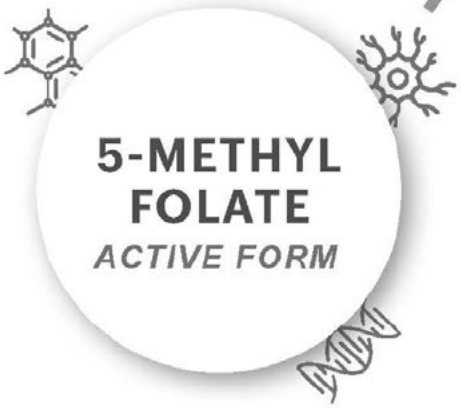

Leafy Greens


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

VITAMIN B12

FOOD SOURCES


Eggs


Seafood – clams, trout, salmon, tuna


Meats – liver, beef, ham, chicken


Fortified Foods


Swiss cheese


Nori/Seaweed


Nutritional Yeast

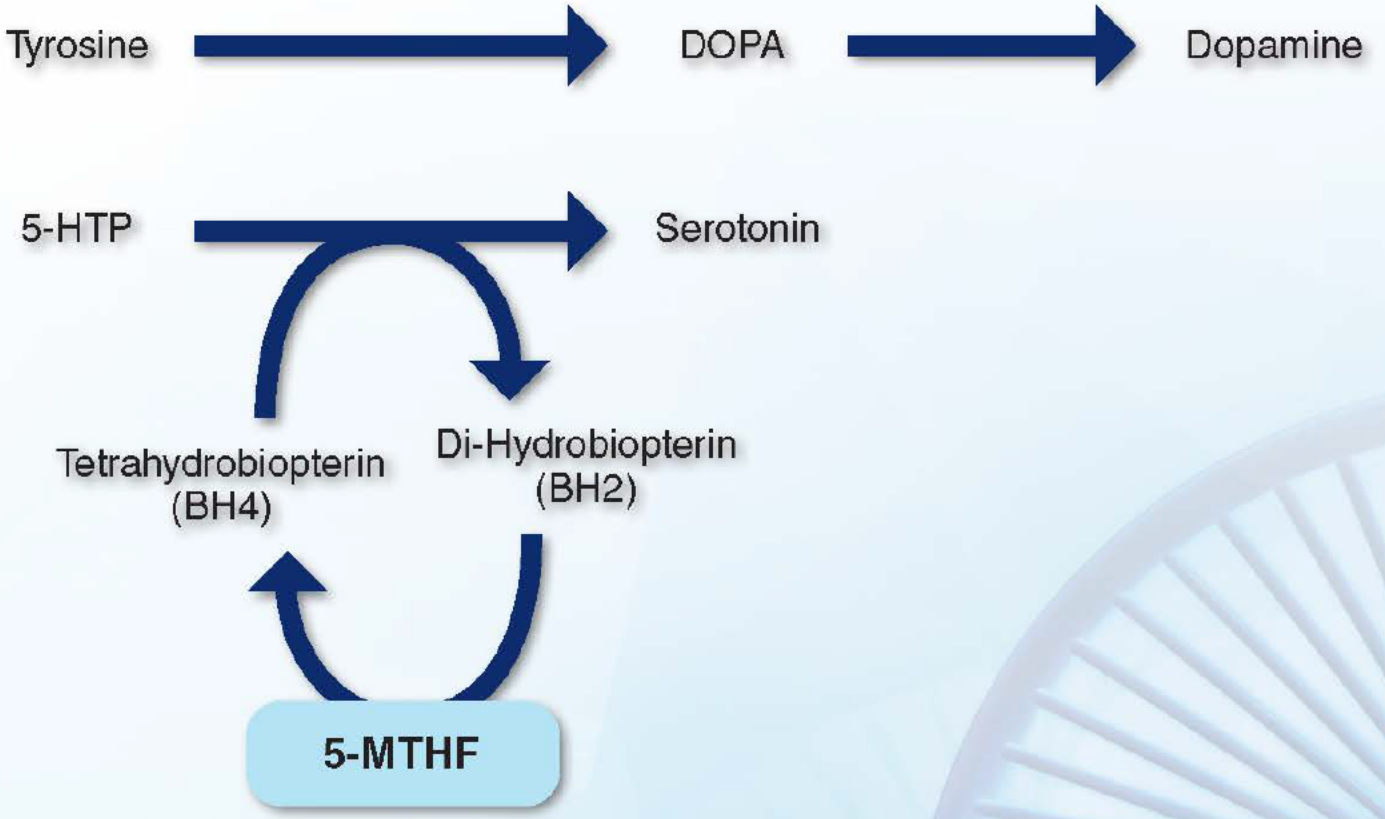
FUNCTIONS (OR BENEFITS AS YOU AGE)

- Formation and maintenance of red blood cells (RBCs)
- Facilitates DNA synthesis
- Regulates homocysteine levels (decreases)
- Facilitates neurological functionting

DEFICIENCY & PATHWAY ALTERATIONS

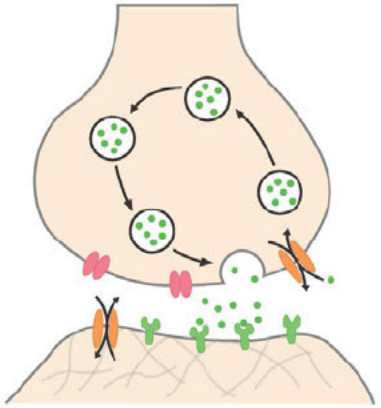
- Increased production of homocysteine
- Decreased breakdown of homocysteine
- Circadian Rhythm Problems
- Cancers
- Memory-related disorders
- Cardiovascular diseases
- Fatigue
- Poor balance
- Mood disorders

5-MTHF & Neurotransmitter Production



NEUROTRANSMITTERS & PATHWAY

TRANSMIT INFORMATION FOR ESSENTIAL PROCESSES SUCH AS DIGESTION, BREATHING, HEARTBEAT, MOVEMENT, PAIN REGULATION ETC.



RELEVANT GENES

- **HTR2, TPH2, SLC6A4, MAO-A** genes are important in the synthesis, breakdown, transport and/or functioning of serotonin
- **COMT, MAO-A, MAO-B** genes are important for the breakdown of serotonin, norepinephrine and/or dopamine
- The **DBH** gene is important for norepinephrine synthesis
- The **GAD1** gene is important for GABA synthesis
- Variants in **COMT, MAO-A, MAO-B and GAD1** genes have been associated with mood, anxiety and focus issues

WAYS TO INCREASE LEVELS

Aerobic Exercise

Dietary Factors

Mediation/Yoga

Increase Sun Exposure

NEURO-INFLAMMATION

WHAT IS IT?

- Inflammation of the brain and spinal cord
- Main causes: disease, injury, infection, acute/chronic stress
- **Variants have been associated with increased inflammatory aggression and the inability to "shut down" neuro-inflammation**
  - Interleukins (IL-1B, IL5, IL6, IL13) stimulate the immune response
  - C3 & STAT4 activate, form and/or differentiate T-cells
  - CTLA4 & CD14 are involved in the suppression of T-cells
  - TNF triggers inflammation
  - DRD2 suppresses neuroinflammation

WAYS TO DECREASE NEUROINFLAMMATION

Meditation & breathing exercises

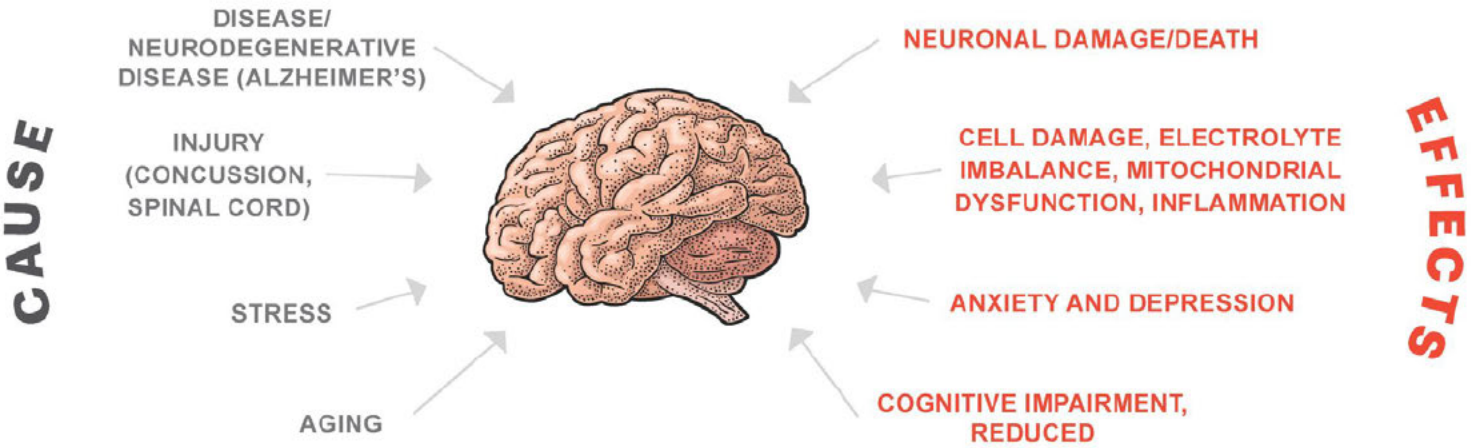
Therapeutic massages with herbalized oils (ex. Sesame oil)

Mediterranean Diet

Yoga

Curcumin, Bacopa herb

Anti-inflammatory Diet



NEUROTROPHIC FACTORS

VARIANTS IN THE SYN1, NGF & BDNF GENES CAUSE DECREASED NEURON SYNTHESIS

Promote growth, development, survival, synaptic plasticity (strengthening) and repair of neurons

Regulate the development of the peripheral and central nervous systems

Regulate the formation of long-term memories

LOW LEVELS ARE CORRELATED WITH

- Neurodegenerative disorders
- Aging
- Chronic stress
- Mood disorders

WAYS TO INCREASE LEVELS

Exercise (physical or cognitive)

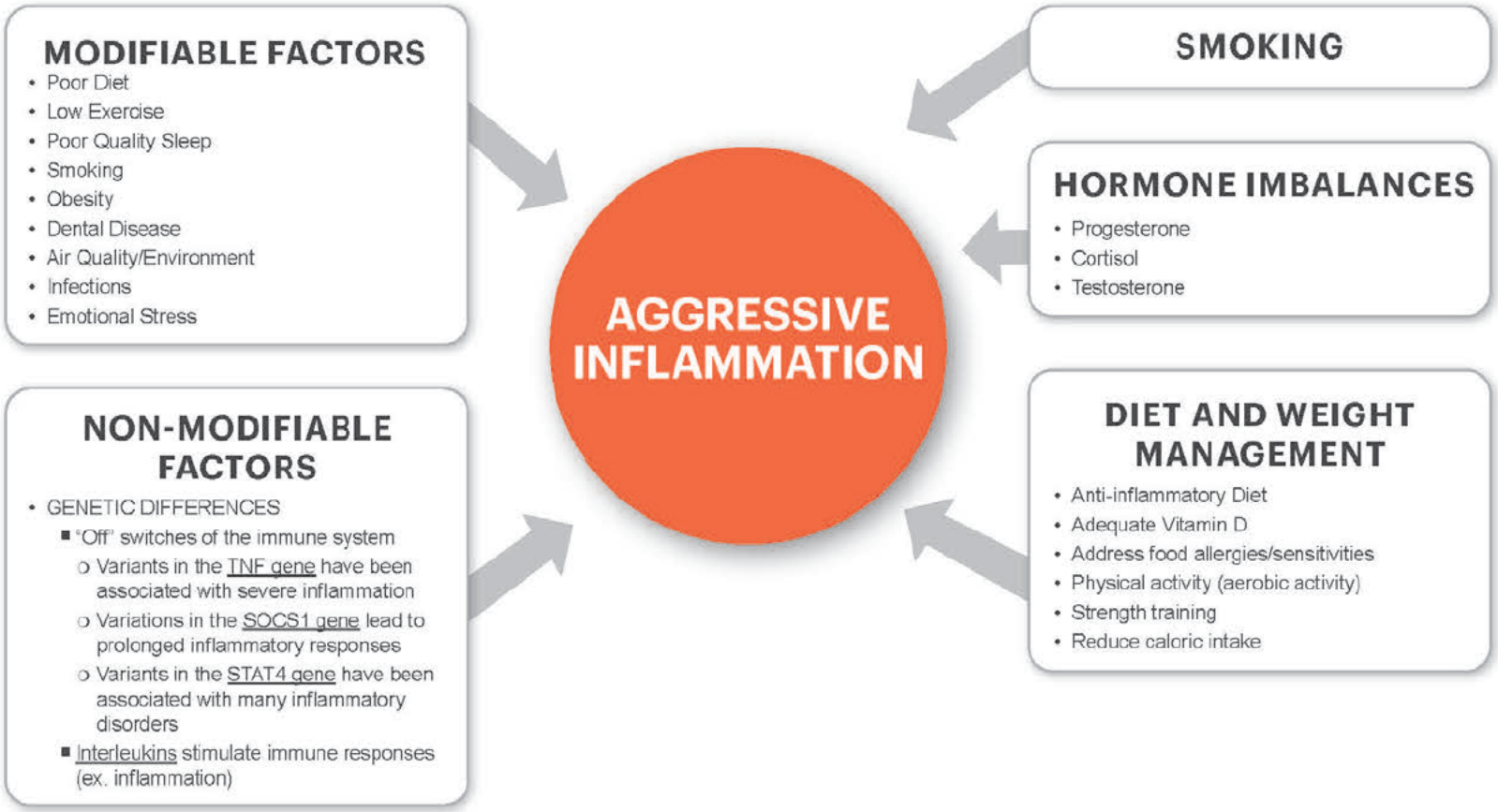
Social interactions

Reduce stress via breathing exercises and/or meditation

ANTI-INFLAMMATORY

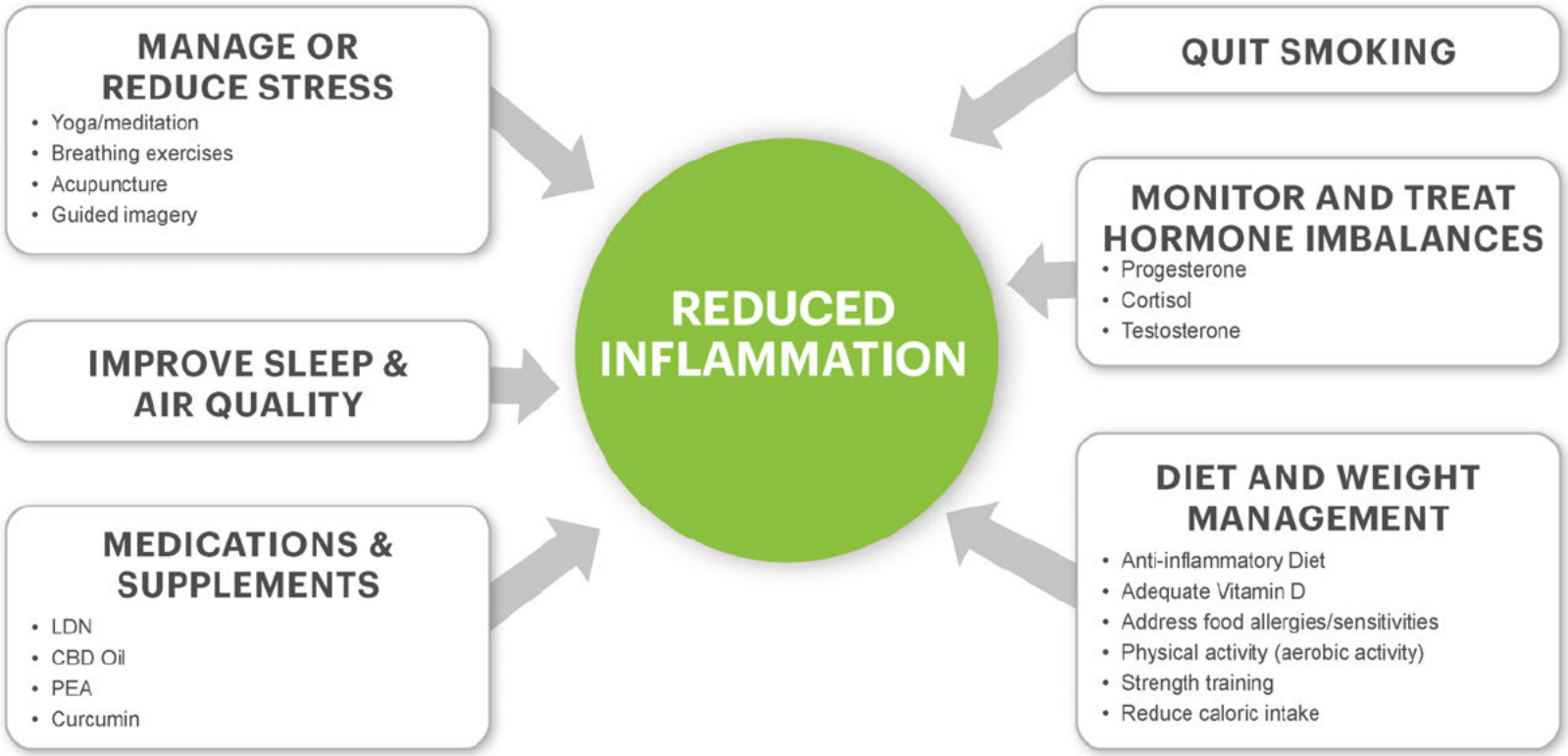
AN IMMUNE SYSTEM RESPONSE TRIGGERED BY HARMFUL STIMULI (EX. PATHOGENS, DAMAGED CELLS, TOXIC COMPOUNDS, IRRADIATION)

DRIVERS OF INFLAMMATION



ANTI-INFLAMMATORY

WAYS TO REDUCE INFLAMMATION

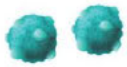


THE IMMUNE SYSTEM & AUTOIMMUNITY

WHAT DOES THE IMMUNE SYSTEM DO?

Prevent or limit infections by distinguishing between healthy and unhealthy cells

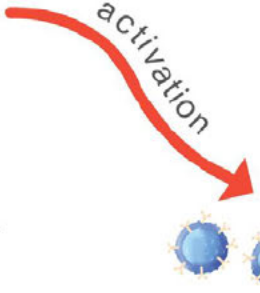
KEY PLAYERS & RELEVANT GENES



CYTOKINES

(ex. IL family, TNF-a)

- Helps with immune cell growth, activation, and function
- Interleukins (IL2, IL4, IL5, IL6, IL13, IL23R, IL2RA) stimulate the immune response
- SOCS1 & TNF are involved in cytokine signaling for the inflammatory response



LYMPHOCYTES

(ex. B, T & Natural Killer cells)

- Identify & kill infected cells
- Produces antibodies to fight future infections
- IDO1, CTLA4 & CD14 are involved in the suppression of T-cells
- C3, STAT4 & TRAF1 activate, form and/or differentiate T-cells

IMMUNE AGGRESSION

The immune system begins to attack healthy tissue

COMMON SYMPTOMS

MALFUNCTIONS LEAD TO

- Chronic inflammation
- Allergic reactions
- Immune aggressive diseases (Inflammatory bowel disease, skin & neurological disorders)

LOW-INFLAMMATORY

FOODS TO EAT

Fruits: strawberries, blueberries, cherries, oranges

Fatty fish: salmon, mackerel, tuna, sardines

Spices - turmeric, ginger

Green leafy vegetables & tomatoes

Dark chocolate

Olive oil

FOODS TO AVOID

Soda & other sugar-sweetened drinks

Dairy products

Fried foods

Red & Processed meats (hotdogs, sausage)

Refined carbohydrates: white bread, pastries

Margarine, shortening, lard

BENEFITS

Reduces inflammation

Reduces risk for cardiovascular disease & Type II diabetes

DETOXIFICATION

GLUTATHIONE IN DETOXIFICATION

Relevant genes for production are AHCY, CTH, GSTP1, GSTM1, GSTM3, GSR, MTRR & MTR

WHY IS IT IMPORTANT?

Maintains health by protecting the body from toxins

Regulates cell production and programmed cell death

Critical role in chemical detoxification

Vital for proper mitochondrial function

WAYS TO INCREASE GLUTATHIONE

- Limit alcohol intake
- N-acetyl-cysteine (NAC)
- Glutathione therapies
- (ie. IV Glutatione, Glutatione suppository, Lipsomal Glutatione)
- Include whey in diet, unless allergic or intolerant
- Methylation Support - if necessary

SUPEROXIDES & ANTIOXIDANTS

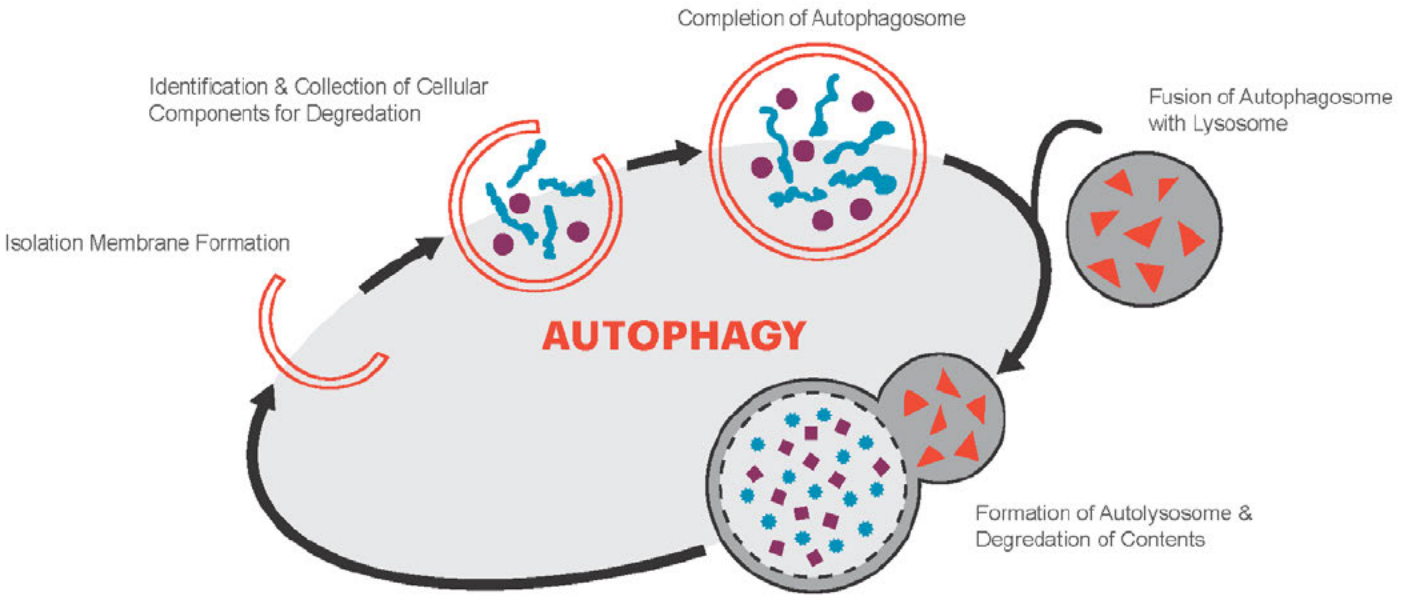
- SOD1, SOD2, SOD3 genes are important to transform superoxides to protect against mitochondrial damage
- Reactive Oxygen Species (ROS) can damage mitochondria and cause cell death.
- Antioxidants such as Vitamin A, Vitamin C and Vitamin E act as a defense against ROS

DEFICIENCY CAUSES

- Auto-immune diseases
- Cardiovascular diseases
- Neurodegenerative diseases
- Cell death
- Poor mitochondrial function

AUTOPHAGY: Cellular Housekeeping

VARIANTS IN THE ATG GENES HAVE BEEN ASSOCIATED WITH CELLULAR BLOCKAGE



DEFECTS LEAD TO:

- Neurodegenerative Diseases
- Aging
- Heart Disease
- Developmental Disorders
- Type II Diabetes
- Insulin Resistance
- Fatty Liver
- Cancers

WAYS TO INCREASE

Intermittent fasting or low-calorie diet

Routine Exercise

Ketogenic diets (high fat, low carbs)

Medications & Supplements
D-Chiro Inositol (B8)
Metformin

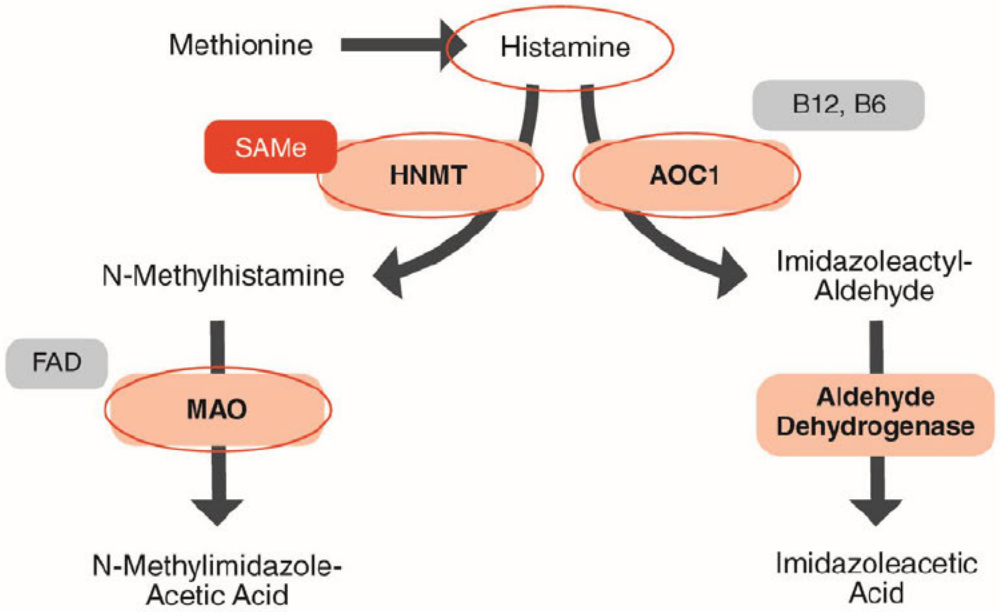
HISTAMINE

HISTAMINE

- Natural substance found in various foods

IMPLICATIONS

- Metabolic Enzymes: amine oxidases (ex. AOC1, MAO, DAO) & HNMT
- High histamine & low amine oxidase activity is associated with:
  - Diarrhea
  - Headaches
  - Nose congestion
  - Asthma
  - Hypotension
  - Arrhythmia
  - Flushing
  - Urticaria (hives)
  - Pruritus (itchy skin)
- Dietary histamine can be rapidly detoxified by amine oxidases, whereas persons with low amine oxidase activity are at risk of histamine toxicity



AOCI & HNMT POLYMORPHISM HISTAMINE

LOW HISTAMINE LEVEL FOODS

Meats & Fish
fresh meat (ex. chicken, turkey,pork and red meat),fresh fish (ex. hake, trout, plaice)

Egg yolk

Fresh fruits
(with the exception of strawberries)

Fresh vegetables

Grains

Milk substitutes
(Coconut milk, rice milk)

Cream cheese, butter

Most cooking oils

Most leafy greens and herbs

Beverages
(non-citric fruit juices, herbal teas)

HIGH HISTAMINE LEVEL FOODS

Egg whites

Processed, cured, smoked and fermented meats/fish (lunch meat, bacon, sausage, pepperoni, canned tuna)

Leftover meat
(After meat is cooked, the histamine levels increase due to microbial action as the meat sits)

Dairy products: All fermented milk products (ex. aged cheeses, yogurt, buttermilk, kefir)

Chocolate, cocoa

Bone broth

Fruits (oranges, grapefruit, lemons, lime, berries, dried fruit)

Vegetables (spinach, tomatoes, eggplant)

Artificial food colors and preservatives

Fermented & vinegar-containing foods
(sauerkraut, kombucha, pickles, relishes, ketchup, prepared mustard)

Spices (cinnamon, chili powder, cloves, nutmeg, curry powder, cayenne)

Beverages (Black Tea, alcohol)

Gene Information Key

rsID	Gene	"-" variant	"+" variant
	ADRA2A	C	G
	AOC1	C	T
	ATG12	T	C
	ATG16L1	C	T
	ATG5	T	C
	BDNF	C	T
	C3	C	T
	CD14	G	A
	COMT	G	A
	CTH	G	T
	CTLA4	A	G
	DBH	G	A
	DRD2	C	A
	FOLR2	A	G
	FUT2	A	G
	GAD1	C	T
	GAD1	G	C
	GSTP1	A	G
	HLA-DQA1	C	T
	HLA-DQB1	T	C

rsID	Gene	"-" variant	"+" variant
	HNMT	C	T
	HTR2	A	G
	IDO1	T	C
	IL13	C	T
	IL5	A	G
	IL6	C	G
	MAOA	T	G
	MAOB	C	T
	MTHFR:	T	G
	MTHFR:	G	A
	NGF	G	A
	SLC6A4	C	A
	STAT4	C	G
	SYN1	A	G
	TCN2	C	G
	TNF	G	A
	TPH2	G	T

Definitions

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

Disclaimers

TESTING:

Testing Performed By: AC

METHODOLOGY AND LIMITATIONS DISCLAIMER:

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, LLC d/b/a Fagron Genomics US (“Fagron Genomics US”) (807 Las Cimas Pkwy, Suite 145, Austin, TX. 78746). 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 Fagron Genomics US’s laboratory (Laboratory Director: James Jacobson, PhD) pursuant to Clinical Laboratory Improvement Amendments (CLIA) requirements (CLIA #: 45D2144988).

MEDICAL DISCLAIMER:

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UND RESULT DISCLAIMER:

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. You may request your sample to be run again by emailing info@fagrongenomicsus.com

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