Back To Chiropractic CE Seminars

Nutrition: Methylation, Neurotransmitters & SNPs ~ 6 Hours

Welcome to Back To Chiropractic Online CE exams:

This course counts toward your California Board of Chiropractic Examiners CE.
(also accepted in other states, check our website or with your Chiropractic State Board)

The California Board requires that you complete all of your CE hours BEFORE the end of your Birthday month. We recommend that you send your chiropractic license renewal form and fee in early to avoid any issues.

Exam Process: Please read all instructions before starting!

1. You must register/pay first. If you haven't, please return to: backtochiropractic.net

2. Open a new window or a new internet tab & drag it so it's side-by-side next to this page.

3. On the new window or new tab you just opened, go to: backtochiropractic.net website.

4. Go directly to the Online section. DON'T register again.

5. Click on the Exam for the course you want to take. No passwords needed.

6. Follow the Exam instructions.

7. Upon passing the exam you'll be able to immediately download your certificate, and it'll also be emailed to you. If you don't pass, you can repeat the exam at no charge.

Please retain the certificate for 4 years.
If you get audited and lose your records, I'll have a copy.

I'm always a phone call away... 707.972.0047 or email: marcusstrutzdc@gmail.com

Marcus Strutz, DC
Back To Chiropractic CE Seminars

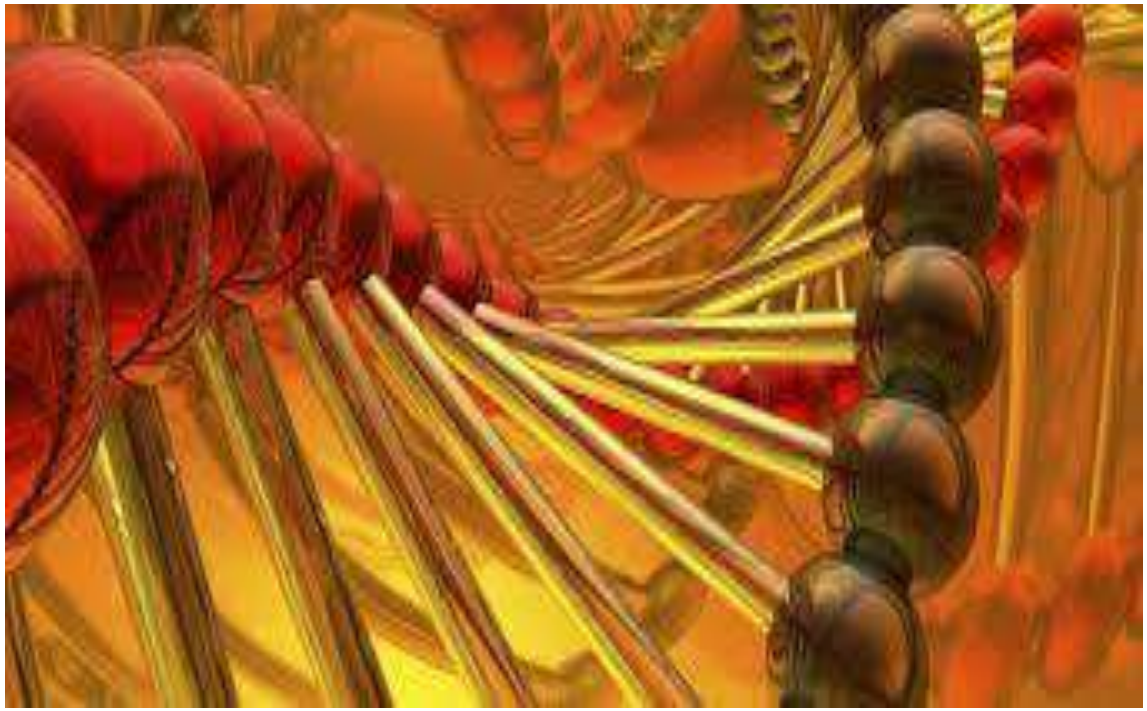
Methylation, Neurotransmitters & SNPs

Resources

Resourced from:

1. Dr. Carl Phieffer: Book,*Nutrition and Mental Illness.*
2. William Walsh: Book, *Nutrient Power*
3. Dr. Ben Lynch: Book, *Dirty Genes*
4. Dr. Brandon Mandell, slide presentation: *Methyaltion Made Simple.*

Neurotransmitters and SNPs



Genes

- While most of us were taught that genes are fixed, we now know that is not the case.
- Genes are dynamic blueprints that may be expressed or not based on exogenous factors, such as diet, lifestyle, beliefs and environmental exposures.

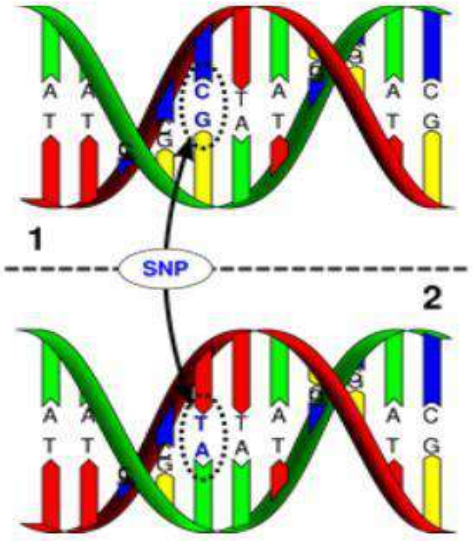
What is a SNP?

- Single-nucleotide polymorphism, or SNP, is a variation in one of the single nucleotides that occur at a specific position in the genome. They underlie our individual susceptibility to express disease. An example is a single base variation in the APOE gene that may manifest as Alzheimer's

SNPs

What are SNPs?

- "SNP" Stands for single nucleotide polymorphism
- It is the most common type of genetic variation in people.
- SNP is when a single base pair is replaced with another.
- For example, the cytosine, guanine pair in the top picture was replaced with the thymine and adenine



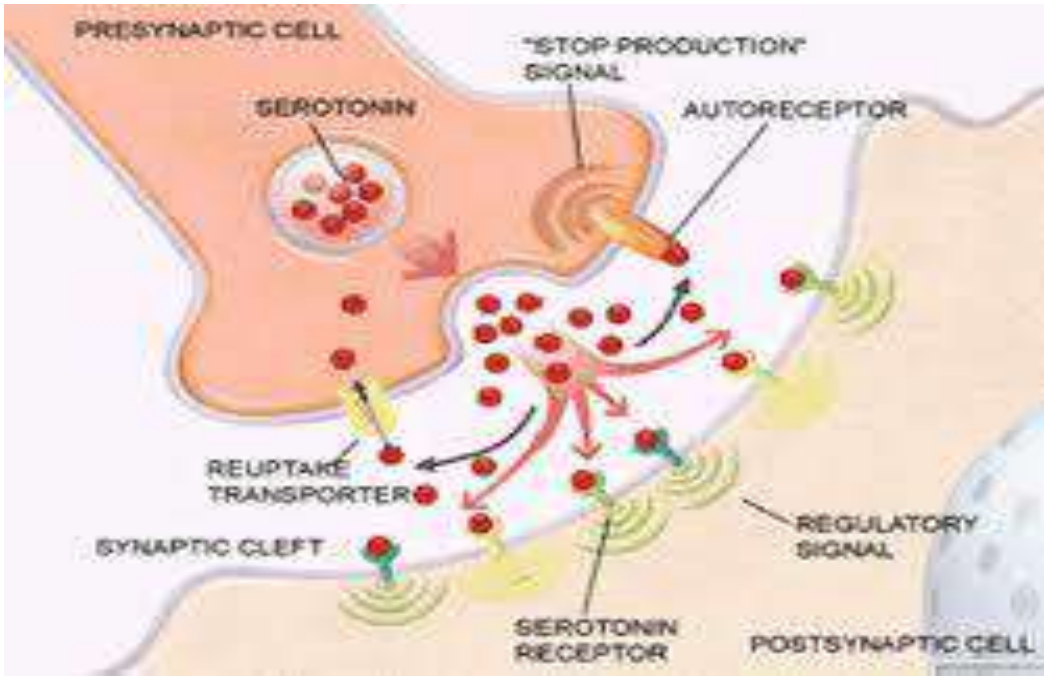
SNPs: Genetic Variation

- We all have thousands of SNPs, but not all create problems for us.
- Some SNP's we are born with and others just act out based on environmental cues.
- The term genetic expression is the way genes express them selves.

What is a neurotransmitter?

- A neurotransmitter is any group of chemical agents released by nerve cells (neurons) to stimulate neighboring neurons, muscle or gland cells, thus allowing impulses to be passed from one cell to the next throughout the nervous system. (Encyclopedia Britannica).
- Neurotransmitters are released into synaptic clefts and picked up by the adjoining cell.
- Neurotransmitters are chemical messengers.

Serotonin in the synapses



Overview

- The following slide is an overview of how methylation, neurotrmsmitters and SNPs influence each other.

Methylation, Neurotransmitters & SNPs

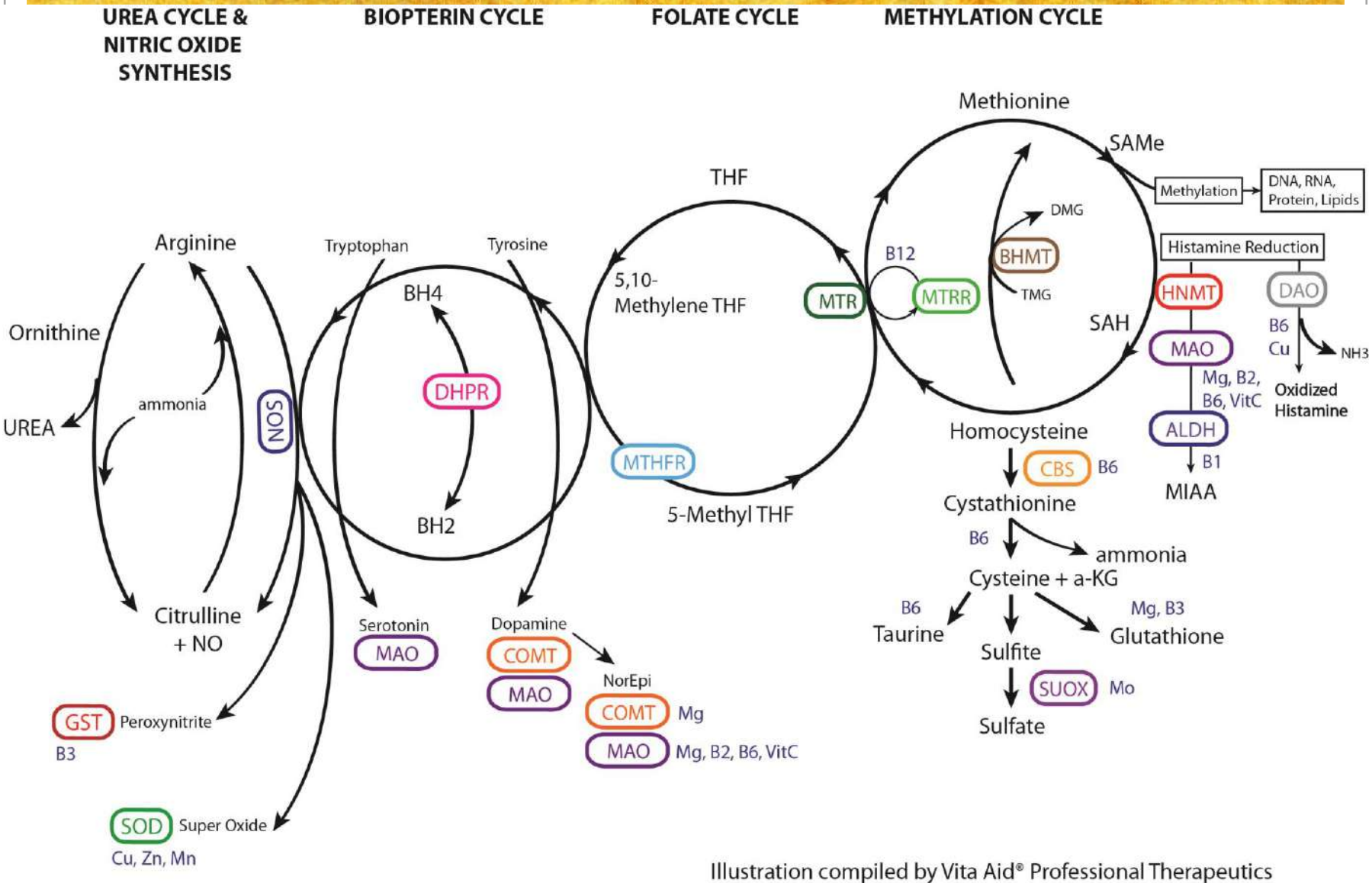


Illustration compiled by Vita Aid® Professional Therapeutics

A few neurotransmitters discussed

- Serotonin
- Dopamine
- Histamine
- Glutathione
- Nirtic oxide, while not a neurotransmitter, causes the release of several neurotransmitters; acetylcholine, catecholamines and neuro-amino acids.
- Phosphatidylcholine

What are Cofactors?

- Cofactors are vitamins, minerals and trace elements.

Serotonin pathway

- Serotonin is the neurotransmitter that facilitates a feeling of calm, confidence and optimism.
- When serotonin is low there are feelings of depression, dark thoughts, helplessness and lack of confidence.
- Precursors to serotonin are tryptophan and 5-HTP, with cofactors of fe, mag, Ca, B6, folate, zinc and vitamin c.
- Serotonin is the precursor to melatonin.
- 70% of serotonin is made in the gut.

Serotonin high or low

- If Serotonin is too high or too low the symptoms are the same:

1. Anxiety
2. Depression
3. Low self esteem
4. Food cravings (carbs)
5. Irritability/snappy
6. Insomnia/sleep issues

Serotonin is involved in:

- Digestion
- Platelets/blood vessels.
- Sleep
- Appetite
- Body temperature

Supporting Serotonin Balance

- Regular sleep hours
- Exercise
- Sunshine/Vitamin D3
- Complex Carbohydrates
- Adequate amounts of Protein
- Regular meals
- No chemicals
- Whole organic food
- No gluten

Balancing your Serotonin

- Research has demonstrated that eating adequate amounts of protein throughout the day will stabilize neurotransmitters and reduce cravings for carbohydrates and sugar; thus stabilizing moods as well as cravings.

Dopamine

- Dopamine is a neurotransmitter involved with the thrills in life, dangers, excitement and falling in love. Dopamine is increased with drugs like cocaine, extreme sports or high risk activities.
- Involved in addictions.
- Dopamine becomes norepinephrine and epinephrine (stress hormones), this conversion requires cofactors of copper, Vitamin C and O2.

Dopamine

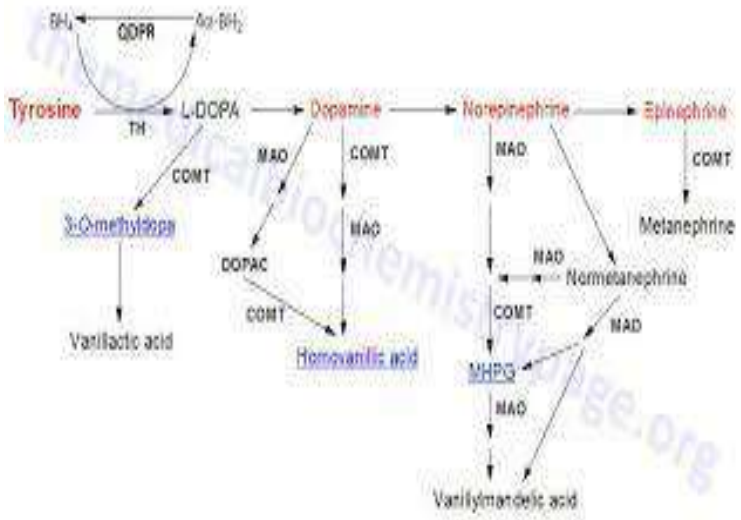
- Ritalin, given to ADD/ADHD patients, increases Dopamine
- Dopamine is both excitatory and inhibitory
- Norepinephrene, fight or flight hormone, revs you up. Calming down after excitement is dependent on how quickly the neurotransmitters are cleared.

Dopamine

- This neurotransmitter is involved in:

1. Behavior
2. Focus
3. Sleep
4. Pleasure
5. Reward
6. Immune health
7. Mood
8. Attention/ADD/ADHD

Dopamine


QDPR
Tyrosine
TH
L-DOPA
Dopamine
Norepinephrine
Epinephrine
COMT
MAO
3-O-methyldopa
DOPAC
Vanillactic acid
Homovanillic acid
NAD
Normetanephrine
Metanephrine
MHPG
Vanillylmandelic acid

Histamine

- Histamine is an organic nitrogenous compound involved in local immune responses, regulates some functions in the gut and acts as a neurotransmitter in the brain, spinal cord and uterus.
- It is a neurotransmitter that affects thought and emotion.

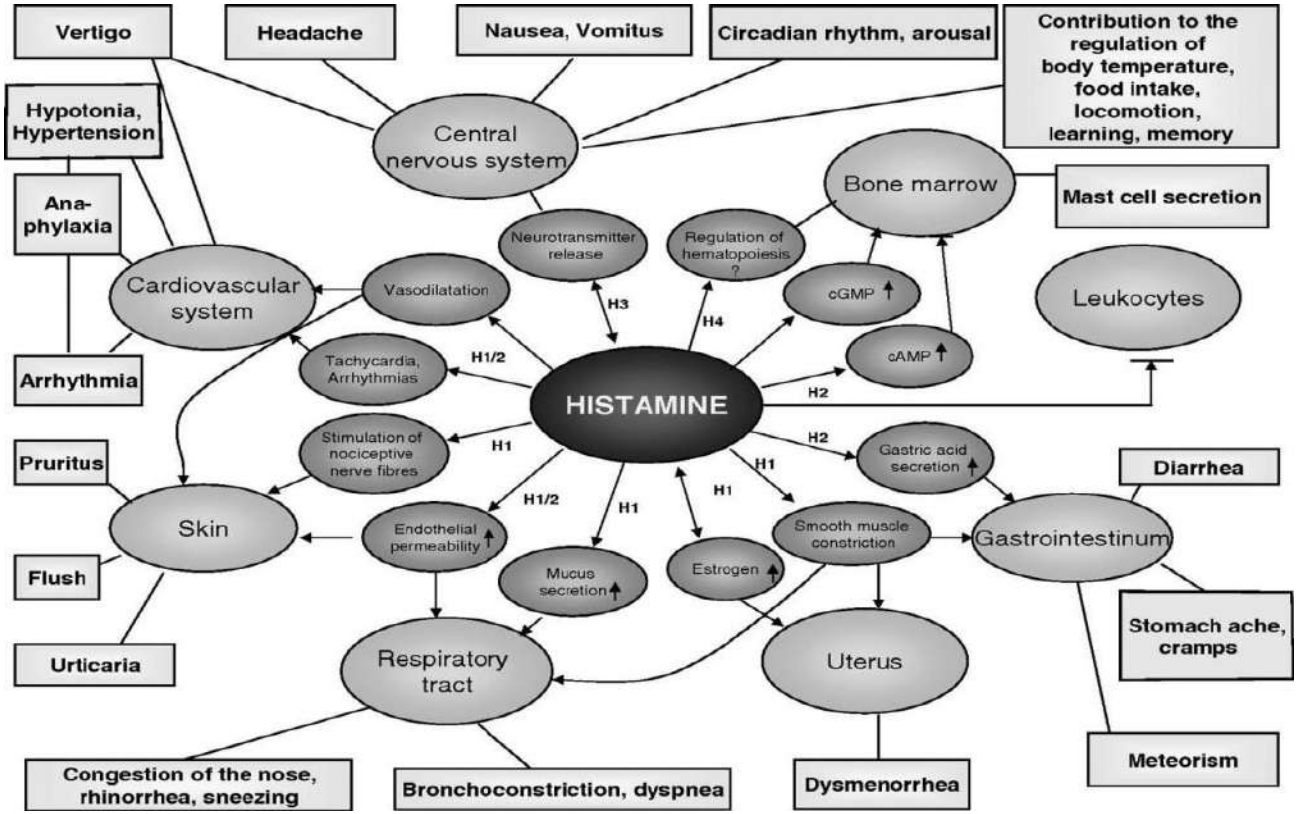
Histamine

- Histamine is usually known as an immune system biochemical, involved in allergic reactions like red eyes, runny nose, migraines and other headaches.
- Histamine is also involved in gut function, and elimination of pathogens.
- It is in various foods like cheese, wine and smoked meats as well as being produced by gut bacteria.
- Its main function is to combat pathogens and assist in gut motility.

Histamine

- Lactobacillus in probiotics produce histamine.
- Histamine levels in left-over food is high, those with allergic reactions should eat only fresh food.
- Histamine is produced by your immune system in response to stress, so chill.

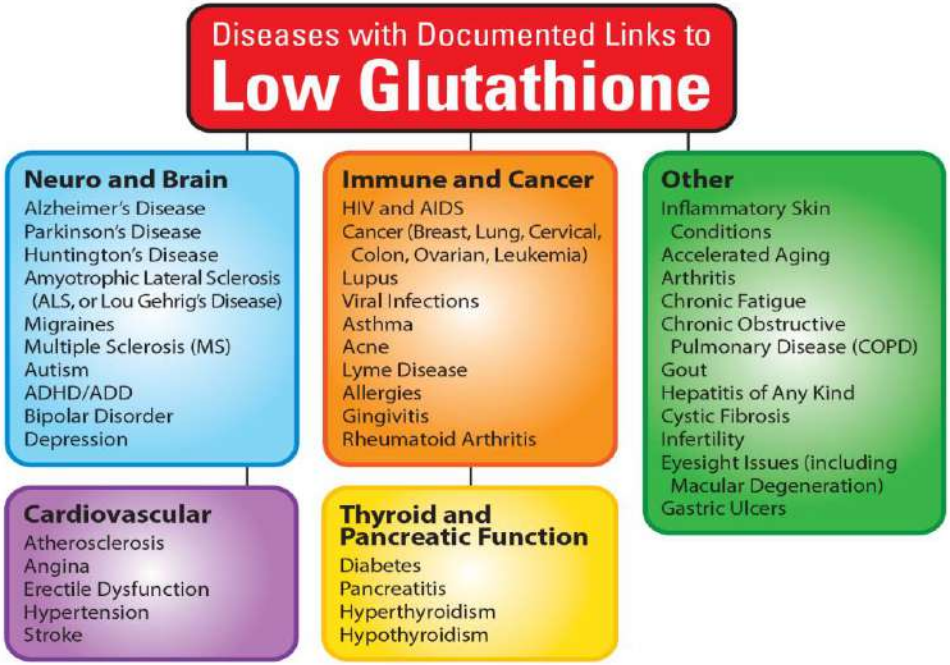
Histamine


Vertigo
Headache
Nausea, Vomitus
Circadian rhythm, arousal
Contribution to the regulation of body temperature, food intake, locomotion, learning, memory
Hypotonia, Hypertension
Central nervous system
Bone marrow
Mast cell secretion
Ana-phylaxia
Neurotransmitter release
Regulation of hematopoiesis ?
Cardiovascular system
Vasodilatation
cGMP
Leukocytes
H3
H4
Tachycardia, Arrhythmias
H1/2
cAMP
Arrhythmia
HISTAMINE
H2
Stimulation of nociceptive nerve fibres
H1
H2
Gastric acid secretion
Diarrhea
Pruritus
H1
H1
H1/2
H1
Skin
Endothelial permeability
Smooth muscle constriction
Gastrointestinum
Flush
Mucus secretion
Estrogen
Stomach ache, cramps
Urticaria
Respiratory tract
Uterus
Meteorism
Congestion of the nose, rhinorrhea, sneezing
Bronchoconstriction, dyspnea
Dysmenorrhea

Histamine producers

- Fermented foods
- Alcohol
- Bone broth
- Fruit juice
- Antacids block histamine receptors but don't fix the underlying problem

Glutathione (GSH)

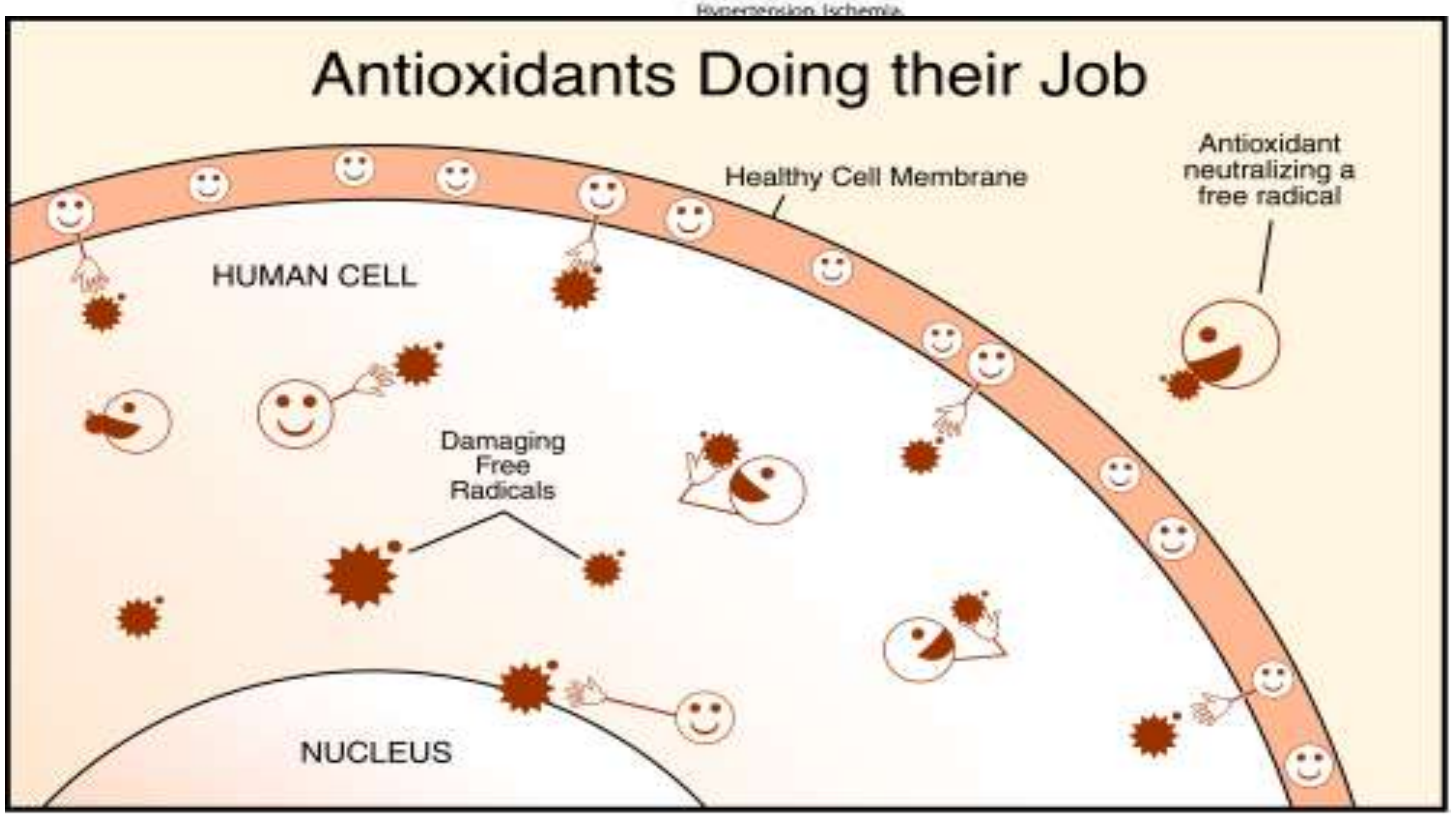


Glutathione

- Glutathione is the major antioxidant in the body.
- High oxidative stress redirects homocystine, in the methylation cycle, down a secondary path to make glutathione.
- Glutathione consists of three amino acids, cystine, glycine and glutamate.
- It is produced by every cell in the body.

Oxidative Stress

CHD, Cardiac Fibrosis,
Hypertension, Ischemia



Oxidative Stress

- According to William Walsh, oxidative stress is a condition of excessive production of peroxides and free radicals that results in undesirable chemical reactions. Glutathione is depleted by oxidative free radicals and is low in the brains of those with schizophrenia.
- Antioxidants protect the brain and body from the ravages of oxidative stress. Antioxidants include selenium, superoxide dismutase (SOD), vitamin C, cysteine, and glutathione.

Glutathione Benefits

- Reduces peroxides.
- Detoxifies fat from the liver.
- Promotes T-cell function.
- Conjugates drugs for detoxification.
- Helps prevent drug resistance.

Glutathione (GSH)

- Fights cancer cells: A study published in 2004, in *Cell Biochemistry and Function* stated that elevated levels of GSH in tumor cells are able to protect these cells in bone marrow, breast, colon, larynx and lung cancers.
- Low GSH causes cells to be vulnerable to oxidative stress.

GSH Sources

- NAC. N-Acetyl cysteine is a precursor to GSH.
- A-Lipoic Acid restore GSH levels.
- B6, B9 and B12: Beans, liver, green leafy veggies, avocados, beets, and broccoli.
- Selenium: Brazil nuts, Fish, Beef, eggs, spinach.
- Vitamin C helps recycle GSH: Citrus, strawberry's, green peppers, kale.
- Vitamin E: Almonds, spinach, sweet potato's, avocados, olive oil and palm oil.

Glutathione Sources

- Because GSH is made in every cell, there is no known evidence of over supplementation.
- Milk Thistle.
- Whey Protein.
- Sulfur containing foods: garlic, onion, broccoli, green leafy, turnip.

.

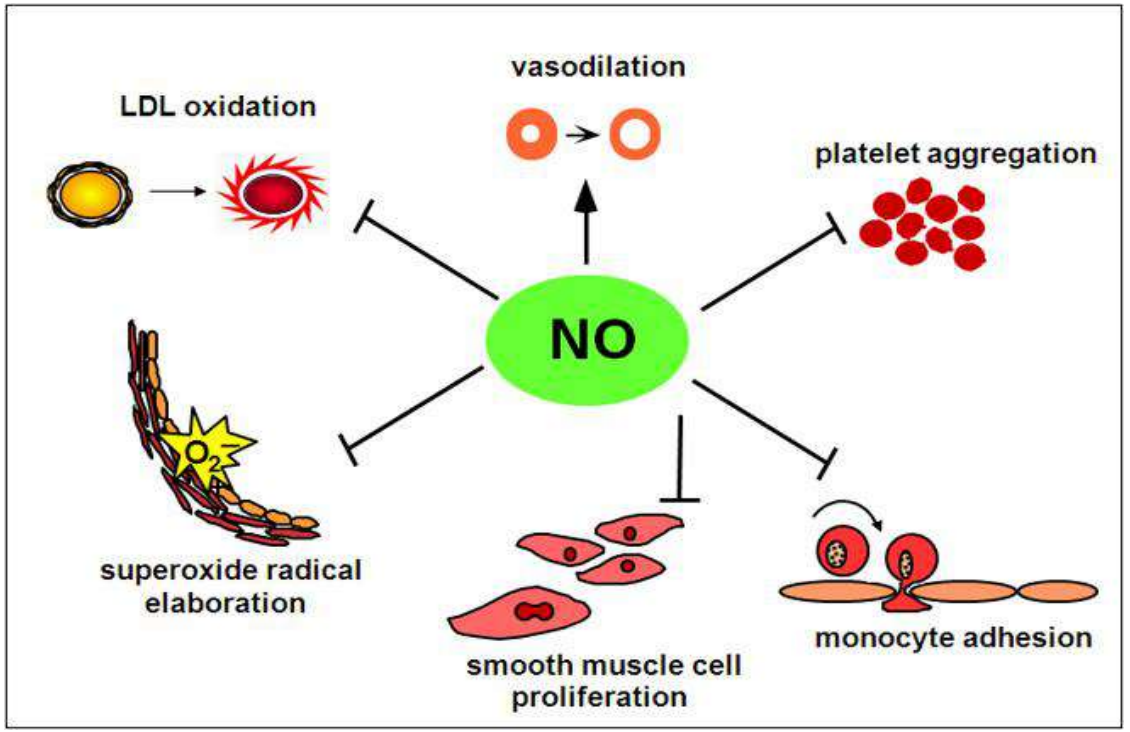
Nitric Oxide

- The endothelium of the arteries produces nitric oxide, plaque build-up in the arteries will decrease the production of NO.
- NO relaxes narrowed blood vessels, increasing O2 and blood flow.

Nitric Oxide (NO)

- It is both beneficial and detrimental to the body.
- It also functions as a neurotransmitter in the brain, impacting cognitive function. i.e. Alzheimer's, parkinson's and depression.

Nitric Oxide



Benefits of NO

- Improves Memory
- Immune function
- Regulates blood pressure
- Decreases inflammation
- Assists in gastric motility
- Improves sleep
- Improves circulation

How to increase NO

- Diet: nuts, seeds, meat, garlic, beets, green leafy veggies, fruits, and beans.
- Supplements: Vit C, Co-Q10, Lipoic acid.
- Increase Arginine, however not by supplementation. According to research printed in the *Journal of American Medical Association* 2006, supplemental Argenine dramatically increased death rates in heart attack victims. Do not take it in isolation.
- Exercise.

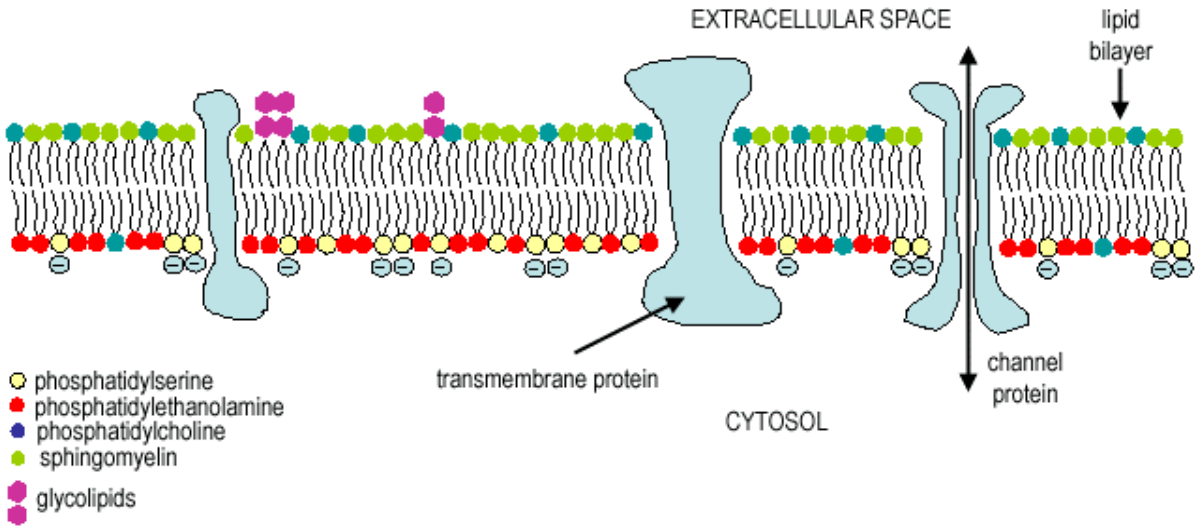
Nitric Oxide too high

- Too high amounts will damage cells.
- Nitric oxide in the endothelium can modulate the protein that is the precursor to amyloids.

Phosphatidylcholine

- Phosphatidylcholine's main function is for cell membrane production. These membranes protect the DNA and cushion the mitochondria.
- The cell membrane is considered by Bruce Lipton to be the brain of the cell. The cell will die rapidly with a weak membrane.
- If you have compromised digestion and a compromised cell membrane, nutrients are challenged to enter the cell.

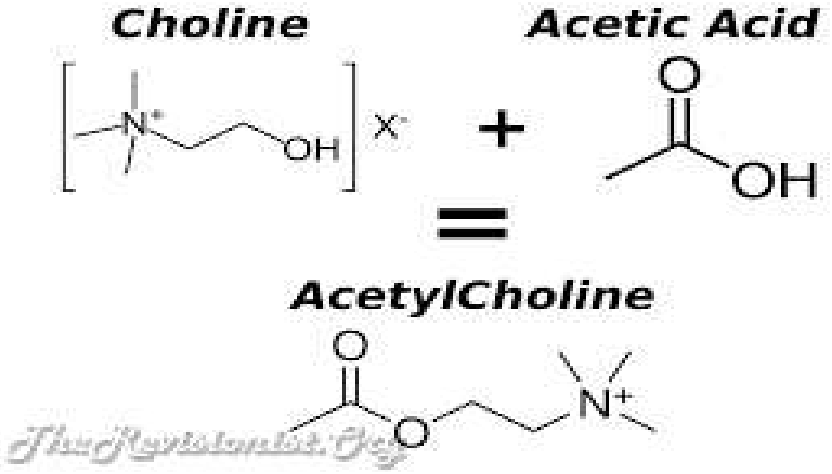
Phosphatylcoline



Phosphatidylcholine

- Phosphatidylcholine is the most prevalent phospholipid making up the cell membrane.
- Neurons use choline to synthesize acetycholine.

Acetylcholine



Phosphatidylcoline

- Low levels of phosphatidylcoline in the brain are associated with Alzheimer's.
- Low levels in the liver are associated with fatty liver.
- Adequate amounts help with inflammation.
- Helps in the breakdown of fats.
- Helps the bile flow more freely.

Phosphatidylcholine

- Phosphatidylcholine keeps the cell membrane fluid and subtle. If the membrane becomes stiff from lack of this important substance, nutrients are unable to move into cell and by-products can not be removed
- Phosphaidylcholine production is dependent on the proper functioning of the methyelation cycle.

.

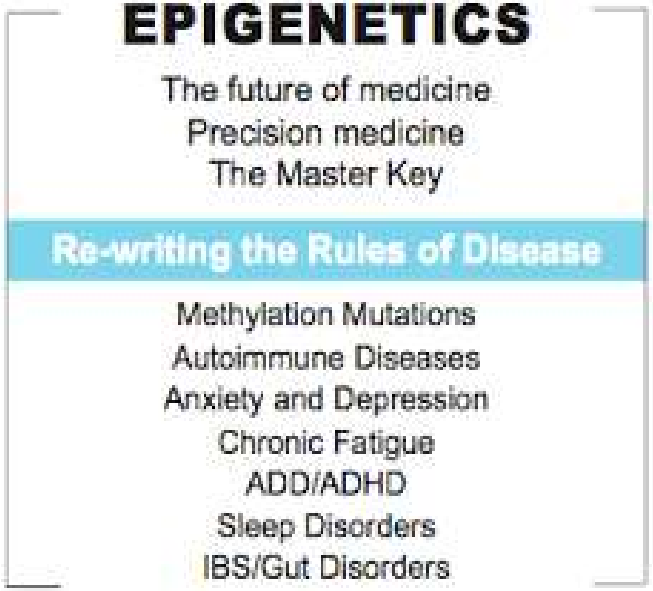
Phosphatidylcoline

- The choline in phosphatidylcholine comes from your food. Major sources are meat, eggs, fish, quinoa and in small amounts broccoli.
- Deficiency of choline can contribute to many health issues and is needed to make the brain neurotransmitter, acetycholine involved in concentration and learning

Phosphatidylcoline

- Maintains cell structure.
- An intricate component of pulmonary surfactant that allows us to breathe.
- Nerve communication in the brain.
- In mucus that lines and protects the gut. Low amounts involved in ulcerative colitis.
- Important for liver health.

Epigenetics



Epigenetics

- According to Dr. Jaffe, 92% of gene expression and long term health is determined by lifestyle.
- Epigenetics is an environmental insult, either emotional or physical.
- There are two distinct occasions when the marks of epigenetics are laid down on the DNA.

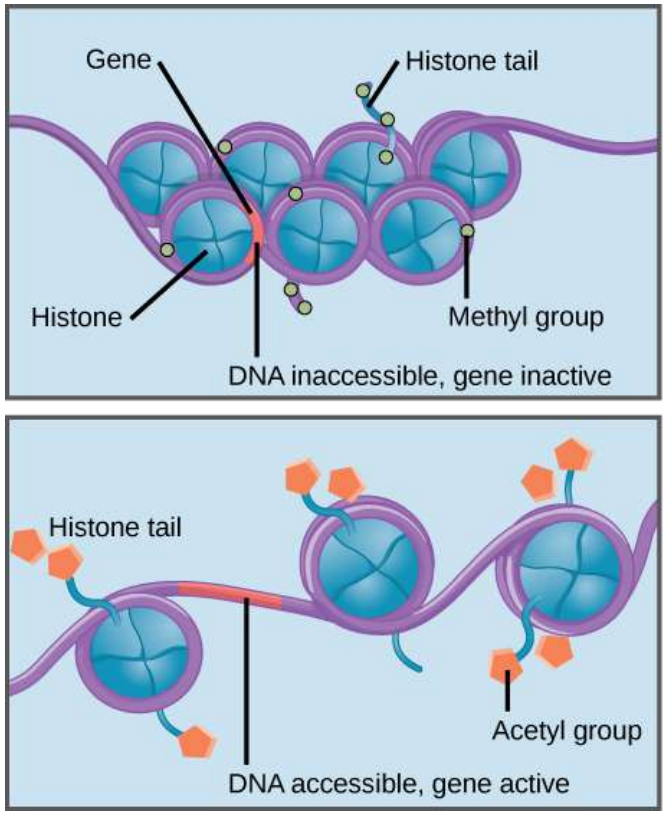
    1.In the early phase of pregnancy, even before the mother is aware she is pregnant.

    2. An environmental insult at any age after birth.

Epigenetics

- The premise is that environmental factors may alter genetic expression.
- There is now an understanding that certain nutrients play a powerful role in determining which genes are expressed and which genes are silenced.
- Methyl groups silence genes and acetyl groups support the expression of genes by opening and closing histones.

Histones



Methylation of DNA and histones causes nucleosomes to pack tightly together. Transcription factors cannot bind the DNA, and genes are not expressed.

Histone acetylation results in loose packing of nucleo-somes. Transcription factors can bind the DNA and genes are expressed.

Histones

- Histones are composed of 8 proteins that twist on themselves like a ball of yarn.
- Depending on whether they are marked by a methyl group or an acetyl group will determine if the gene is expressed or silenced.
- Acetyl groups cause expression of the gene by changing the pH, causing uncoiling of the histone.
- Methyl groups usually inhibit expression.

Epigenetics

- Epigenetic insults may cause mental disorders because of there influence on neurotransmitters.
- Can cause any number of emotional and physical diseases from autism to cancer.

Epigenetics

- Methylation is a dominant factor in epigenetic processes.
- More than 60% of ADHD, depression, psychosis exhibit serious methylation problems.
- Epigenetics effect neurotransmitters in synaptic cleft.
- During pregnancy chemical “bookmarks” attach to DNA to enhance or inhibit gene expression in each tissue.
- Gene is a blueprint for proteins.

Pulling back the curtain on Methylation

Methylation

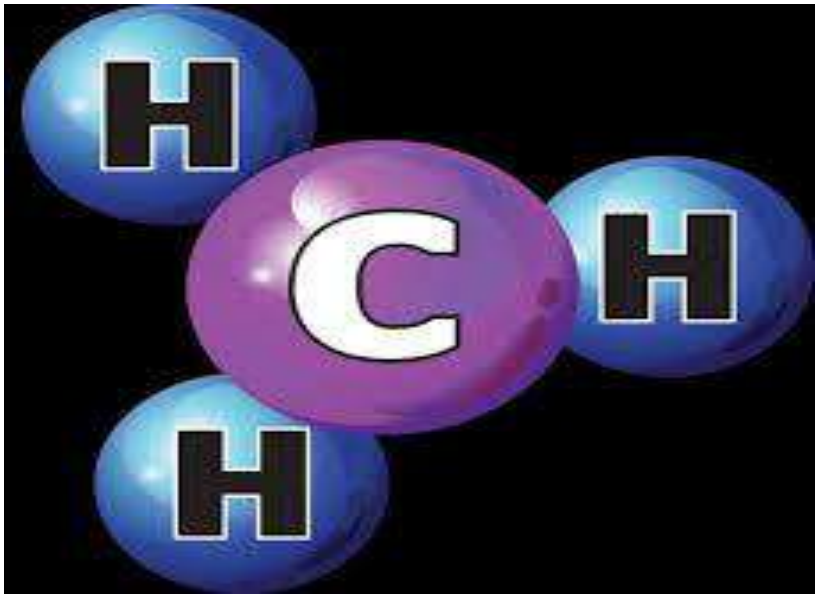
- More than 200 vital bodily functions are dependent on proper methylation.
- A carboxyl group, one carbon and three hydrogen's, are passed off via SAMe.
- Here are a few functions Methyl dependent: 1. Detoxification. 2.Digestion, 3. Skin repair, 4. Mood, 5. Inflammation

  7. Estrogen methylation for removal from the body.
- Methylation of homosystine is dependent on methylfolate and methylcobalamine,.

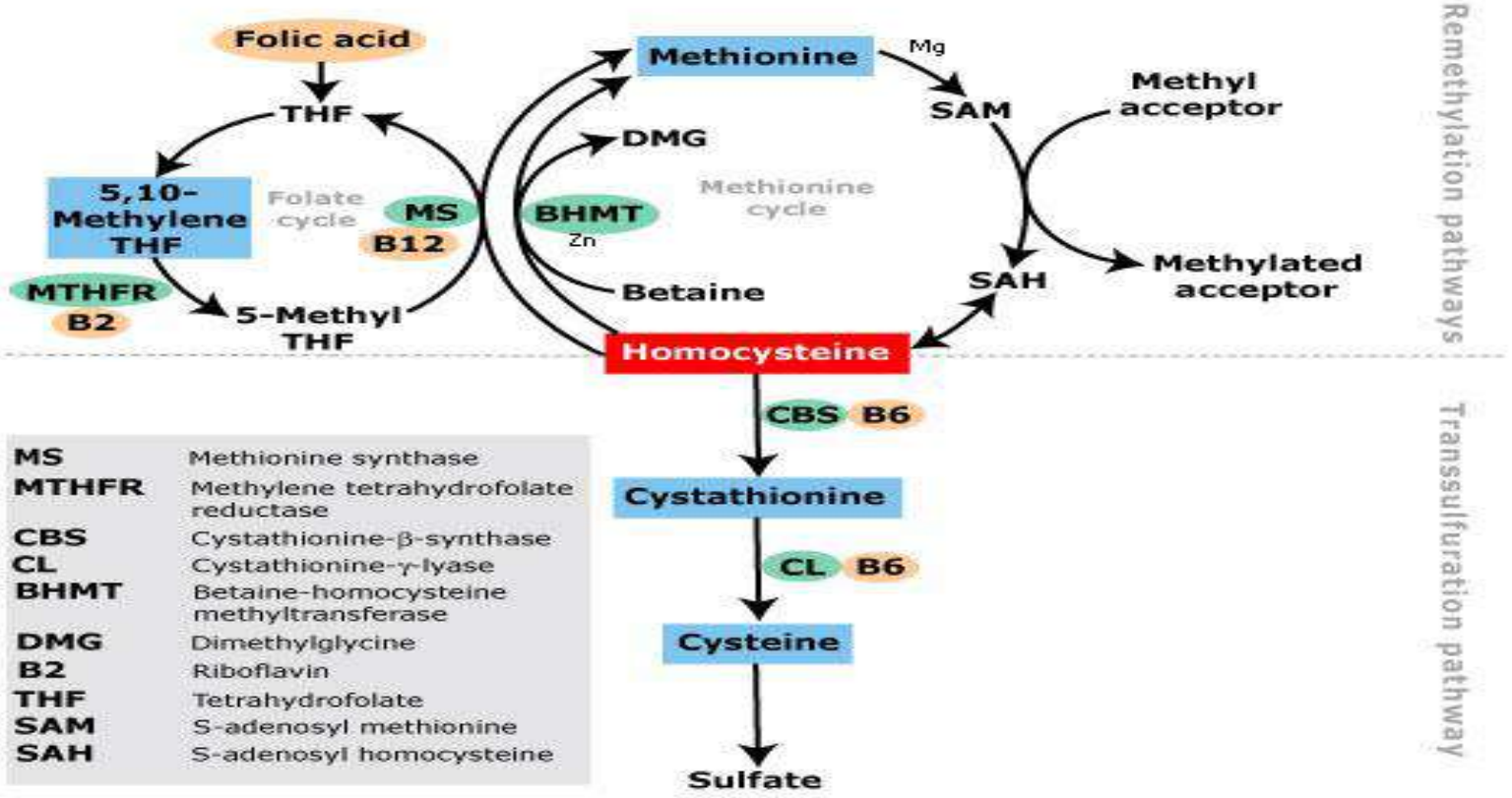
Methylation and Neurotransmitters

- Neurotransmitters in the pre-synaptic cell caused by gene expression: amount of neurotransmitter depends on methyl/acetyl competition at the DNA regions.
- With nutrient therapy we can adjust neurotransmitter amounts, thus activity.
- The enzymes involved in the attachment of methyl or acetyl groups can be influenced by nutrient therapy.

Methyl Group



Methylation Cycle



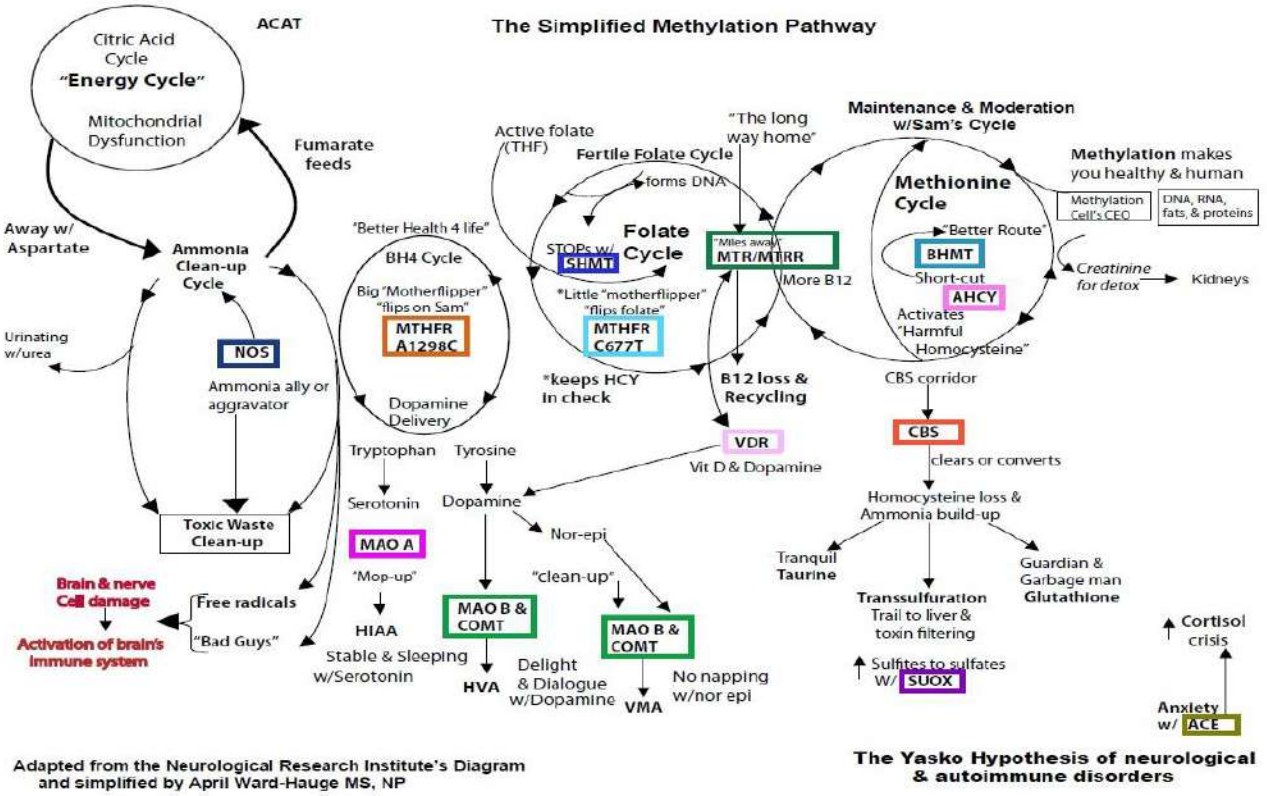
Methylation

- When SAMe passes off its Carboxyl group it becomes homocystine, the end product and the beginning of the cycle of methylation. Once homocystine is methylated it then re-enters the cycle to become SAMe again.
- The methyltion of homocystine is dependent on folate and methycobalamine.

Histones

- Methylation increases PH causing coiling of the histone, thus suppressing gene expression.
- Acetyl groups cause uncoiling of the histone, thus allowing for expression of the gene.
- Nutrition can alter methyl/acetyl ratios, thus altering the expression of genes.

Overview


The Simplified Methylation Pathway
ACAT
Citric Acid Cycle
"Energy Cycle"
Mitochondrial Dysfunction
Fumarate feeds
Away w/ Aspartate
Ammonia Clean-up Cycle
Urinating w/urea
NOS
Ammonia ally or aggravator
Toxic Waste Clean-up
Brain & nerve Cell damage
Activation of brain's immune system
Free radicals
"Bad Guys"
"Better Health 4 life"
BH4 Cycle
Big "Motherflipper" "flips on Sam"
MTHFR A1298C
Dopamine Delivery
Active folate (THF)
Fertile Folate Cycle
forms DNA
STOPs w/ SHMT
Folate Cycle
*Little "motherflipper" "flips folate"
MTHFR C677T
*keeps HCY in check
"The long way home"
"Miles away"
MTR/MTRR
More B12
B12 loss & Recycling
VDR
Vit D & Dopamine
Maintenance & Moderation w/Sam's Cycle
Methionine Cycle
"Better Route"
BHMT
Short-cut
AHCY
Activates "Harmful Homocysteine"
Methylation makes you healthy & human
Methylation Cell's CEO
DNA, RNA, fats, & proteins
Creatinine for detox
Kidneys
CBS corridor
CBS
clears or converts
Homocysteine loss & Ammonia build-up
Tranquil Taurine
Transsulfuration Trail to liver & toxin filtering
Guardian & Garbage man Glutathione
Sulfites to sulfates W/ SUOX
Cortisol crisis
Anxiety w/ ACE
Tryptophan
Tyrosine
Serotonin
Dopamine
Nor-epi
MAO A
"Mop-up"
HIAA
Stable & Sleeping w/Serotonin
MAO B & COMT
"clean-up"
HVA
Delight & Dialogue w/Dopamine
MAO B & COMT
VMA
No napping w/nor epi
Adapted from the Neurological Research Institute's Diagram and simplified by April Ward-Hauge MS, NP
The Yasko Hypothesis of neurological & autoimmune disorders

Undermethylation

- Most undermethylators, are depressives with low serotonin activity and are intolerant to folates.
- Undermethylators should not supplement with folate or methylcobalomine, if they get too much of these in a supplement form they may experience anxiety.
- Niacin will knock this feeling out if too much of either of these supplements are taken.

Un-dermethylation Signs and symptoms

- Strong willed
- Competitive
- Obsessive/Compulsive tendencies
- Seasonal allergies
- Addictive tendency
- High Libido
- Calm demeanor, high inner tension
- High fluidity (tears, saliva, etc)
- Non-compliance with therapies

Over-methylation signs & symptoms

- High anxiety
- Sleep disorder
- Artistic/Musical Ability
- Talk a lot
- Empathetic
- Non-competitive
- Food and chemical sensitivities

Signs and symptoms of over- Methylation

- Intolerant to antihistamines
- No seasonal allergies
- Low libido
- Dry eye/mouth
- Adverse reaction to SSRI's

SAMe

- 70% of SAMe goes to creatine synthesis.
- 30% to all the other reactions.
- Impaired creatine synthesis can cause over methylation.

Homocystine

- High homocystine has been associated with schizophrenia. (Encephale 2011).
- Exercise lowers homocystine better than supplementation alone.

Tests to determine Methylation status

- SAME/SAH ratio
- Homocystine/Healthy range 7-8 males or 6-7 females (The higher the homoystine the lower the glutothione)
- Intrinsic factor antibodies
- CBC

  1. High MCV indicates B12 deficiency
  2. Low thyroid
  3. Elevated liver enzymes/high or low (low is B6 deficiency)
  4. Creatine: low mild/high severe

- MTHFR

A Few SNP's to Consider

- MTHFR
- COMP
- DOA
- MAOA
- GST/GPX
- NOS3
- From Dr. Ben Lynch's Book, Dirty Gene's.

SNPs

- We will be covering just a few SNPs, but remember there are thousands of SNPs and you are not abnormal having numbers of them. However they may be creating problems in your health if they are activated via epigenetic, or environmental, factors.
- This is actually the good news, because by making lifestyle changes such as diet, exercise, stress reduction and supplementation when needed, you can either express or deactivate these genes.

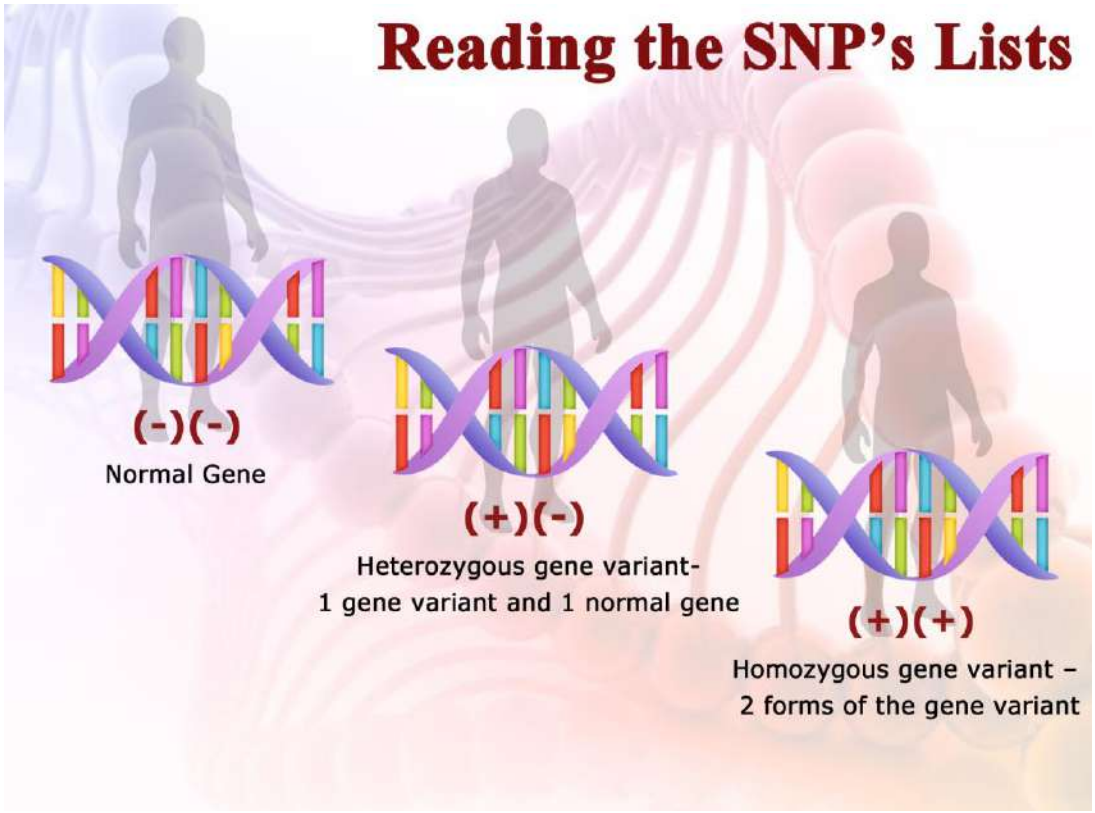
SNP's

- The influence of SNP's can change rather quickly. Dr. Ben Lynch in his book *Dirty Genes*, talks about cleaning them up in as little as a few weeks and then maintaining the upgraded lifestyle for continued healthy gene expression.
- At the end of this presentation there will be a few suggestions for lifestyle changes to help you reach these goals.

SNP s

- Gene mutations have developed over thousands of years.
- Only 0.1% make us different
- There are over 10 million SNP's identified.
- Don't be surprised if you have a lot of SNP's. Most people have over 1000 SNPs, this is not unusual.
- Enzyme SNP's can weaken enzyme function.

Reading SNPs



SNPs

MTHFR SNP

- The MTHFR SNP is involved in proper methylation, and as such effects the role of other SNPs entering into the methylation cycle.

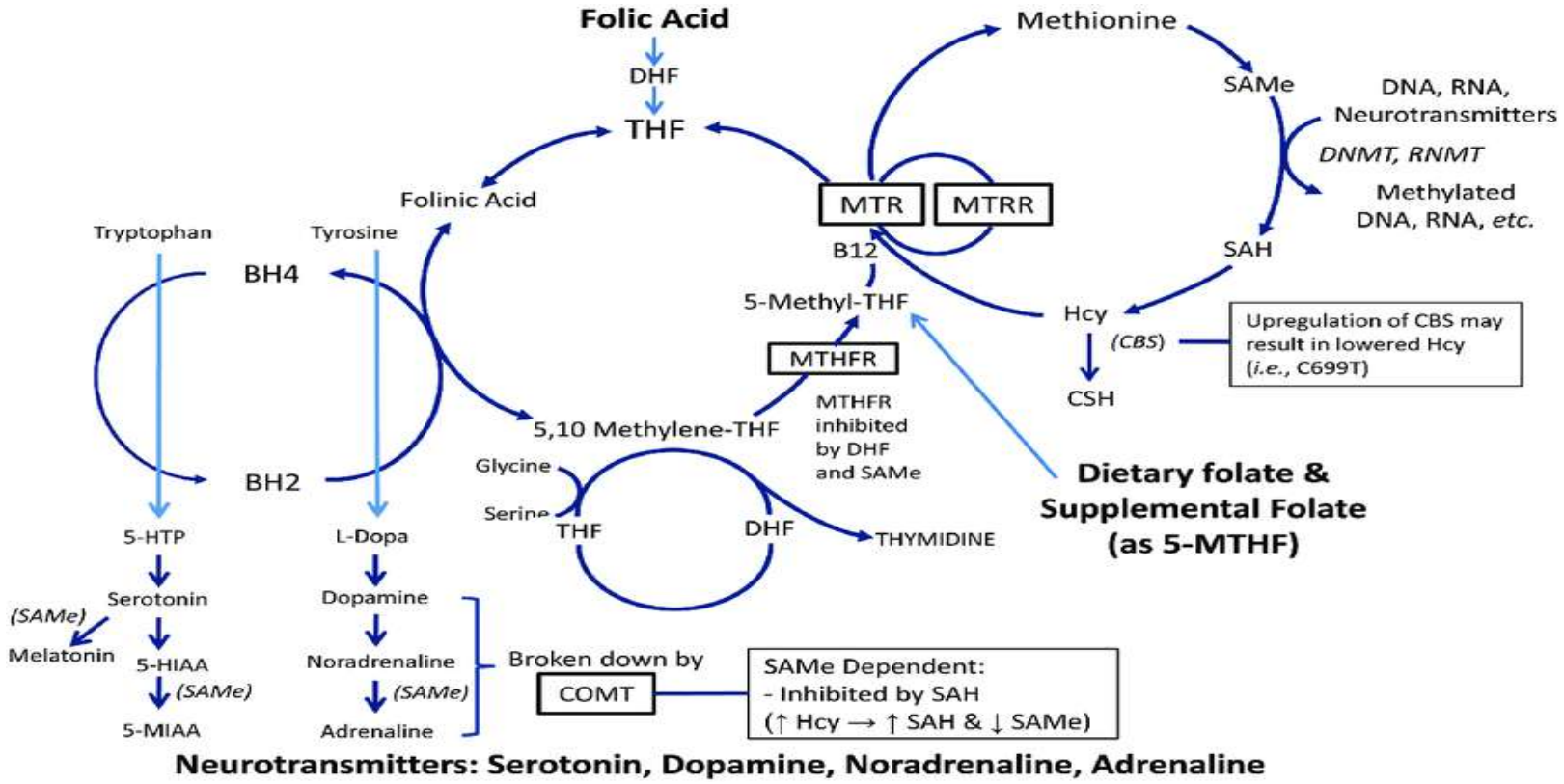
MTHFR

- The MTHFR gene makes the enzyme methylenetetrahydrofolate which makes L-methyltetrahydrofolate.
- The MTHFR SNP mutation is the inability to process folate (B9, inactive form) into L-methyltetrahydrofolate (active form).
- L-methyltetrahydrofolate is essential for methyation to occur by donating a methyl group to cobalamine, making methylcobalamine.

MTHFR

- Methylcobalamine then donates to homocystine that donates to methionine and it then donates a methyl group to SAMe, that donates to over 200 processes in the body.

Methyation, Nurotrasmitters & SNPs



Symptoms of MTHFR SNP

- Heart murmurs
- High Blood Pressure
- IBD
- Male infertility
- MS
- Schizophrenia
- Thyroid issues

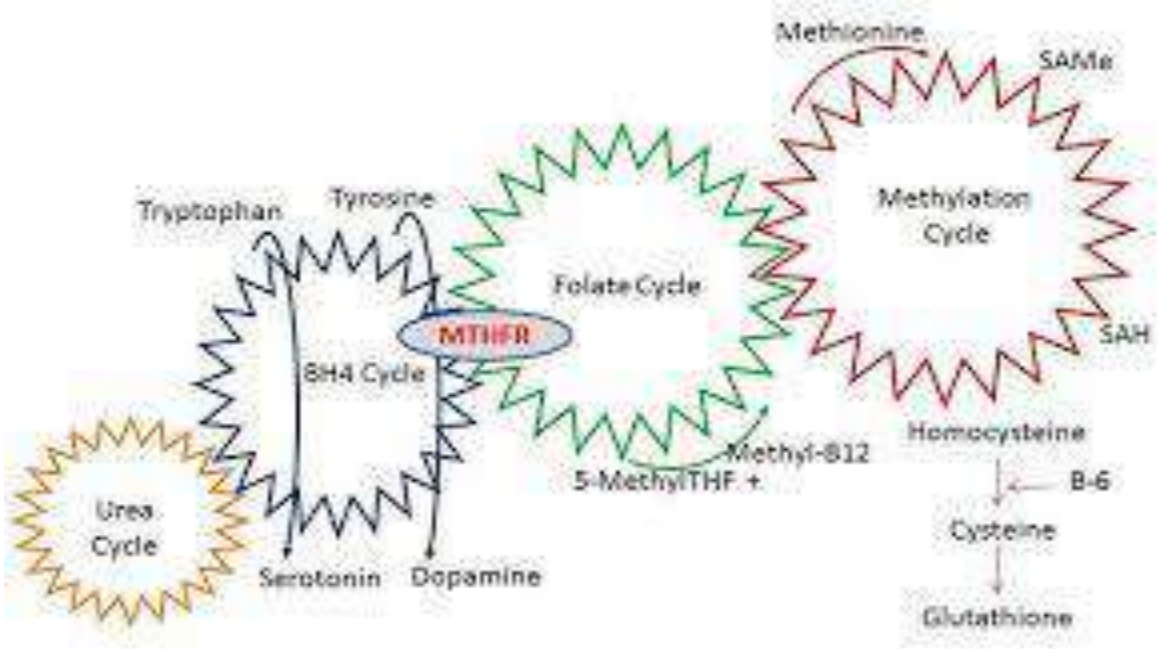
Birth Defects associated with MTHFR

- Cleft palate
- Congenital heart defects
- Spina Bifida
- Tongue tie
- Downs syndrome
- Anything that affect the central part of the body

Testing for SNPS

- 23andme.com.To have your SNPs tested

The interplay of cycles



Tests for B12

- Serum methycobalamin, a healthy range is between 600-1000, especially if MTHFR is positive. Anesthesia depletes B12, check before surgery, will increase likelihood of dementia.
- Parietal Cell Antibody tests for pernicious anima, the most common cause of B12 deficiency.
- A1C, test for diabetes. A 2009 study published in the *Journal of the American Board of Family Medicine*, Sept-Oct., Vol. 22 no. 5 528-534, found that the use of Metformin may cause B12 deficiency.

Choline bipass

- If there is a deficiency of either methyfolate or methycobalamin, choline picks up the homocyctime and recycles it temporarily.
- This may deplete choline which is needed to make phosphaytidylcholine, involved in may life enhancing processes and synthesis of acetylcholine.

Healthy Living

COMP SNP

- COMP gene is involved in the processing of catechols, estrogens, dopamine, norepinephrine and epinephrine.
- COMP gene can manifest as too fast or too slow.
- Fast: The above mentioned substances are cleared too fast from the system. The symptoms include increased sense of confidence, energy, strong sexual function, increased estrogen, sleep problems and difficulty slowing down. Very sensitive to caffeine, chocolate and green tea.

COMP-slow and fast

- COMP methylates dopamine, converting it to norepinephrine. If this can not occur either because of a snp that is slowing the process, instead of producing dopamine it will produce dopamine quinone, a substance detrimental to the brain.
- Even excess levels of dopamine will agitate and make one irritable, responding poorly to stress. It can cause you to freeze under stress, panic and become totally overwhelmed.

Slow-COMP

1. Low SAMe.

2. Low homocystine levels.

3. Consumes excessive coffee and chocolate.

4. Stress causes a build up of stress neurotransmitters.

Slow-COMP

- Weight gain or excess fat build-up from estrogens in the body; susceptible to estrogen cancers.
- Xenoestrogens, like plastics, shampoos, detergents, can also cause a build up of estrogens.
- Unable to clear catechols, estrogen, dopamine, norepinephrine, and epinephrine from the system.

Fast-COMT

- In this case there is too much SAMe.
- Elevated homocystine levels in the blood.
- Low B12/ folate B9/and magnesium needed for methylation and COMT.
- MTHFR SNP acting out.
- Does not tolerate caffeine.

Healthy COMP

- Because COMP depends on the methylation cycle, it depends on all the same nutrients.
- Magnesium is important for proper COMP functioning, found in leafy greens, nuts, seeds, fish and avocados.
- Caffeine will lower magnesium levels in the body, as will antacids.

Health conditions COMP *

- Fibromyalagia
- IBS
- Migraine
- Panic
- Parkinson's
- Schizophrenia

*DR. Ben Lynch, Dirty Genes

Healing COMP

- Body fat creates estrogen, so finding a good weight will help.
- Removing xenoestrogens.
- Remove all plastics.
- Meditate.
- Deep breathing.

Healing COMP SNP

- Regular sleep patterns. Every hour before midnight is worth two after.
- Get the chemicals out. No pesticides, eat organic. No household cleaners that are toxic and no personal care products with chemicals.
- Filter your air and your water.

Healing Fast-COMP

- Eat protein with every meal.
- No sugar or grains.
- Regular sleep.
- Cross word puzzles, learn a new language, engage the mind.
- Cut down on the caffeine and chocolate. Both raise dopamine.

Being Healthy

DAO/Histamine

- DAO SNP is an oversensitivity to histamine.
- When DAO is overwhelmed a second gene steps in that is dependent on methyl groups from SAMe. Thus improper functioning of the methylation cycle will effect histamine levels.

DAO/Histamine

- Gut pathogens trigger the histamine response, they need to be identified and eliminated. Digestive enzymes and Betaine HCL will help with this.
- People with the DAO SNP often will experience food allergies.
- Even rotating foods does not help, just release antibodies to the new food and histamine continues to be released, must fix leaky gut first.
- While I usually recommend fermented foods to fix the microbiome in the case of DAO that can not be used.

Histamine

- According to Carl Pfeiffer, MD, PHd, Histamine deficiency and copper overload are responsible for paranoid schizophrenia which he treated with folate, B12, niacin, and zinc.

DAO SNP

- DAO genes acting out do not tolerate fermented foods, dried fruits, most nuts, smoked fish and even some fresh fish and citrus fruits.
- Once the gut begins to heal it can tolerate more of these foods.

DAO SNP signs

- Hives, runny nose, itchy eyes and other allergy symptoms.
- Many food sensitivities.
- Motion/car sickness.
- SIBO
- Pregnancy complications.
- If histamine gets too high it can get into your blood and cause neurological symptoms.

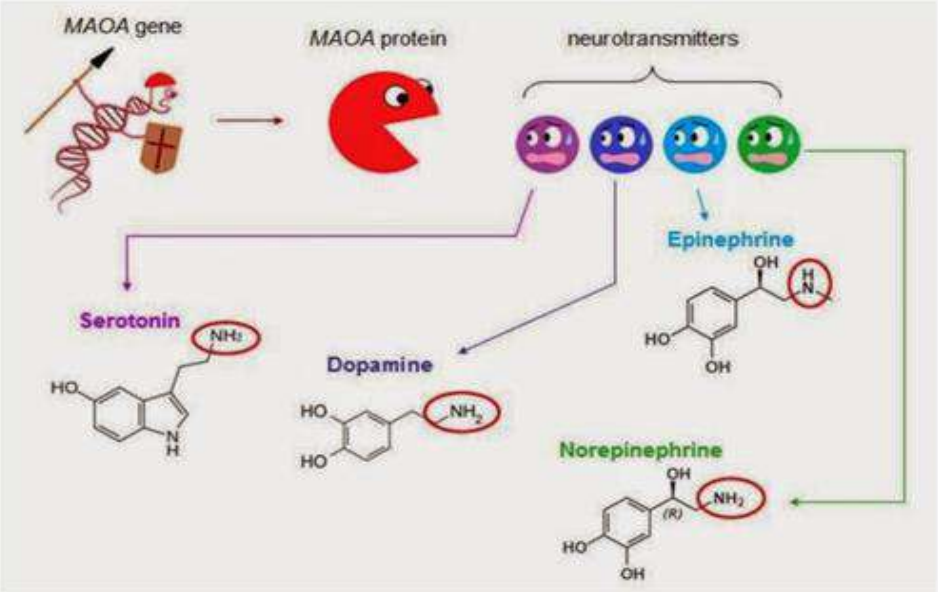
Health Conditions with DAO

- Diarrhea/constipation
- Heart racing.
- Joint pain.
- Sneezing and wheezing.
- Can't fall asleep.
- History of ulcerative colitis.
- Low blood pressure.

Fix DAO

- Diet: Kale, cruciferous veggies, almonds sprouted grains.
- Copper: Calf's liver, seeds, almonds, asparagus and greens.
- You also need to balance PH with alkalizing food,
- Optimize your sleep.
- Meditate/reduce stress.

MAOA SNP


MAOA gene
MAOA protein
neurotransmitters
Epinephrine
Serotonin
Dopamine
Norepinephrine

MAOA SNP

- MAOA, monoamineoxidase A gene, encodes for the MAOA enzyme involved in metabolism of serotonin, dopamine and norepinepherine in the brain.
- Like COMT there is slow MAOA and fast MAOA.
- Too fast will have lower levels, and too slow will have higher amounts of this enzyme.
- Slow MAOA is associated with violence, aggression and anxiety.

MAOA SNP

- MAOA is inducible, meaning it can increase secondary to environmental signals regardless of genetics.
- The alleles connected with aggression are carried by approximately 33% of the population. *Gene Food*, Nov. 17, 2017.

Health conditions MAOA SNP

- Alcohol addiction
- ADHD/ADD
- Alzheimer's
- Autism
- Bipolar
- Depression

MAOA SNP

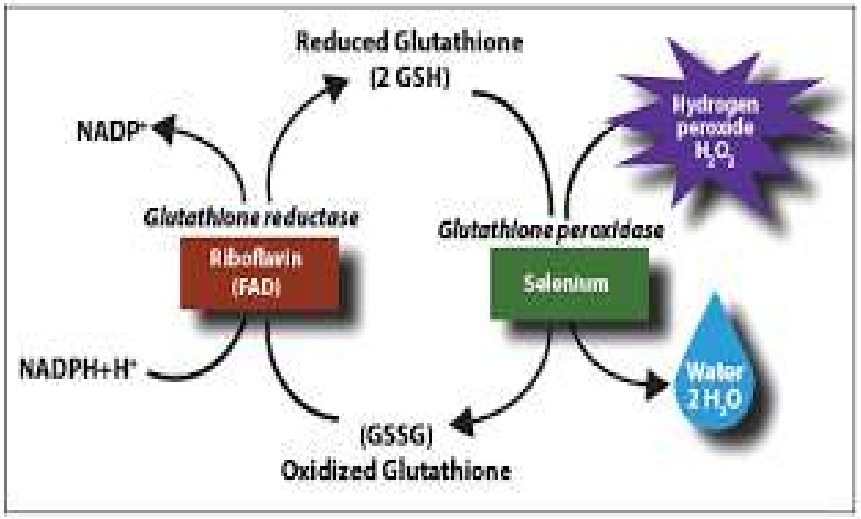
Everyday


Exercise Regularly
Eat Healthy
Healthy Life
Reduce Stress
Drink Plenty of Water

GST/GPX SNP

- These genes are involved in activating the primary antioxidant in the body, glutathione, to eliminate chemicals and toxins from the body.
- The body requires cysteine, a sulfur amino acid, to synthesize GSH.

Glutathione



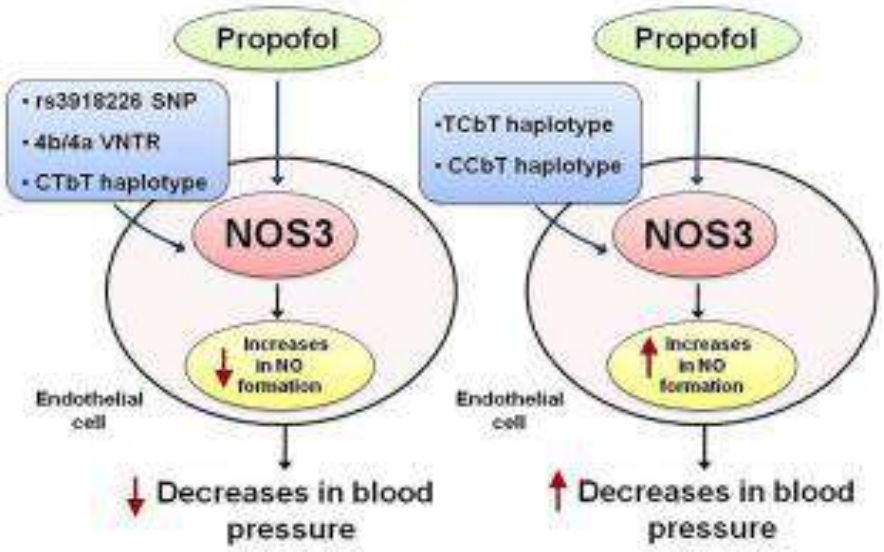
High hydrogen peroxide

- Low GSH increases hydrogen peroxide in the body causing premature graying of the hair.
- GHS is depleted by stress.

GST/GPX

- With this SNP, glutathione is unable to attach to xenobiotics.
- Vulnerable to chemicals, unable to detox them.
- Can't convert hydrogen peroxide to water.
- Ability to clear toxins, heavy metals and chemicals from the body is compromised.

NOS3 SNP


Propofol
• rs3918226 SNP
• 4b/4a VNTR
• CTbT haplotype
NOS3
Increases in NO formation
Endothelial cell
Decreases in blood pressure
Propofol
•TCbT haplotype
• CCbT haplotype
NOS3
Increases in NO formation
Endothelial cell
Decreases in blood pressure

NOS3 and Nitric Oxide

- NOS3: when Nitric Oxide (NO) is not made as a result of the malfunctioning of NOS3, the blood vessels will become constricted, depriving adequate amounts of oxygen delivery to the blood.
- Low NO causes platelets to become “sticky”, clumping, increasing the potential for stroke.

Signs and symptoms of NOS3 SNP

- Erectile dysfunction
- Heart issues
- Vessel formation
- Blood flow
- High blood pressure

NOS3

- Both arginine and BH4 are need for NOS3 to work.
- Arginine sources: Turkey, pork, pumpkin seeds, spirulina, lentils.
- Calcium: dark leafy greens, almonds, green beans.

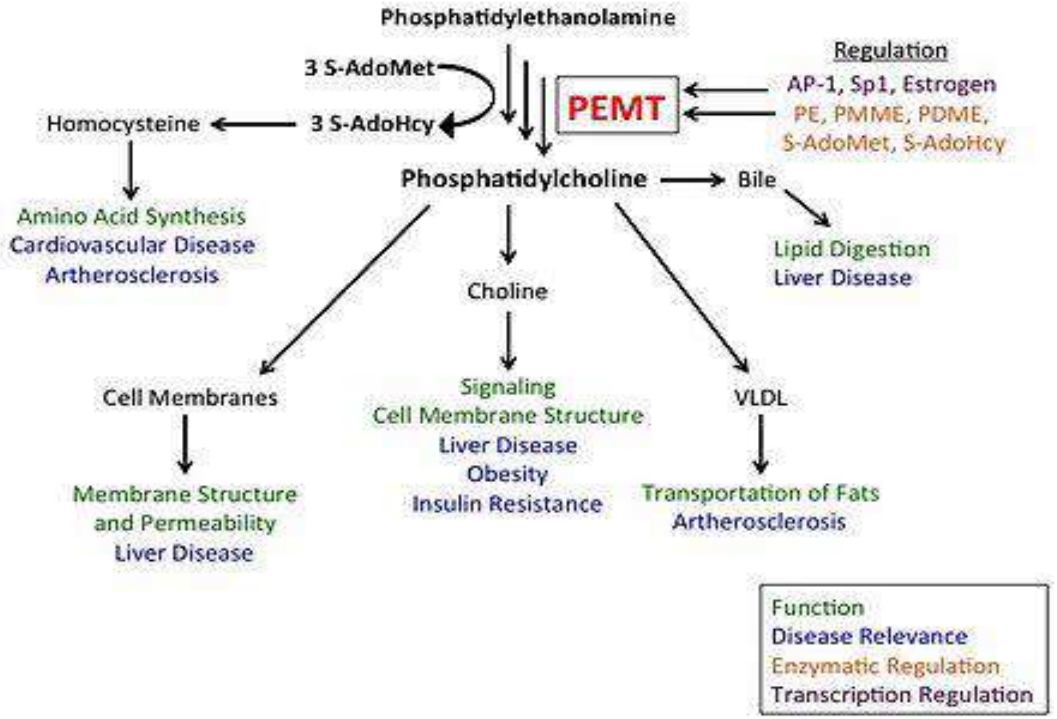
NOS3 SNP

- Iron: seeds, clams, oysters, beef, lamb, white beans and dark leafy veggies.
- Riboflavin (B2): Liver, lamb, mushrooms, almonds, dark greens, wild salmon and eggs.
- O2, exercise and deep breathing.

Testing Nitric Oxide

- While there are strips on that market that claim to test nitric oxide levels, there is, according to *Nitric Oxide: Biology and Chemistry* 2006, no valid, reliable test available to the public to test nitric oxide.
- Currently all testing measures have their pros and cons.

PEMT SNP


Phosphatidylethanolamine
3 S-AdoMet
PEMT
Regulation
AP-1, Sp1, Estrogen
PE, PMME, PDME,
S-AdoMet, S-AdoHcy
Homocysteine
3 S-AdoHcy
Phosphatidylcholine
Bile
Amino Acid Synthesis
Cardiovascular Disease
Artherosclerosis
Lipid Digestion
Liver Disease
Choline
Cell Membranes
Signaling
Cell Membrane Structure
Liver Disease
Obesity
Insulin Resistance
VLDL
Membrane Structure
and Permeability
Liver Disease
Transportation of Fats
Artherosclerosis
Function
Disease Relevance
Enzymatic Regulation
Transcription Regulation

PEMT SNP

- PEMT makes phosphatidylcholine, one of the primary components in cell membranes.
- Your body needs choline, from your diet to make phosphatidycholine. Sources of choline are: Meat, fish, poultry and eggs.

PEMT SNP

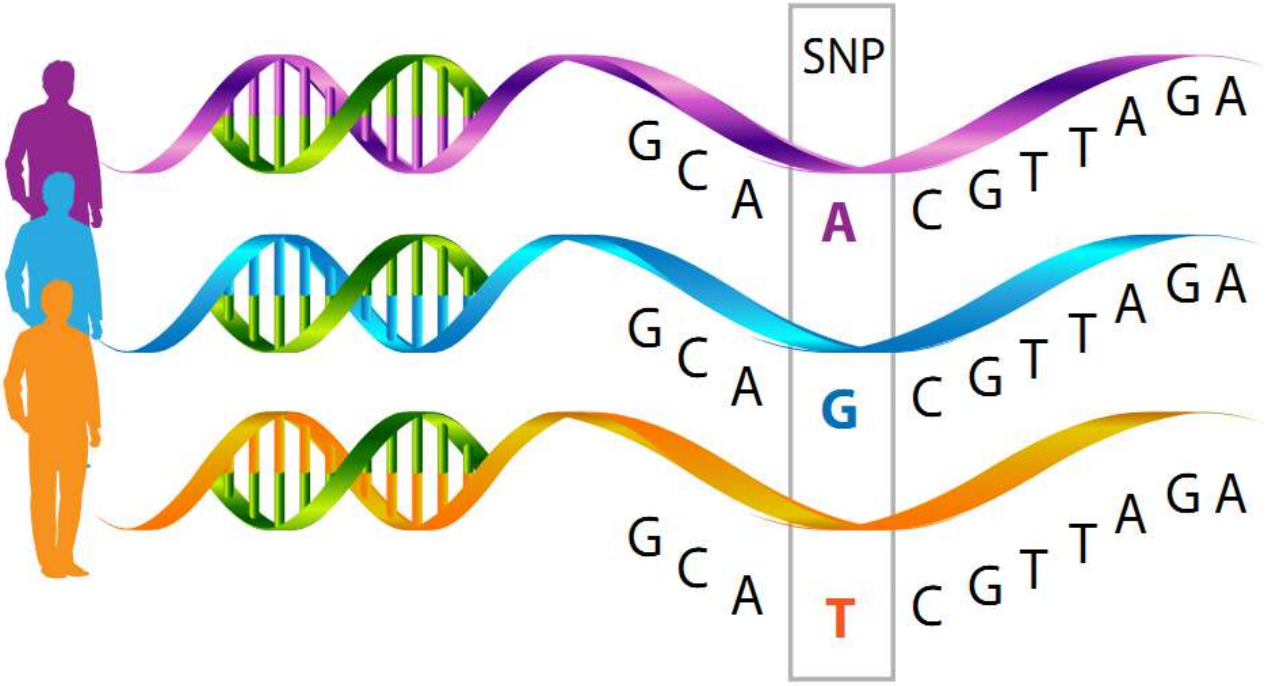
- Phosphatidyle thanolamine n-methyltransferase is the enzyme responsible for the conversion of phosphtidyleamine (PE) into phosphatudylcholine (PC) in the liver. PC is the component of flexible cell membranes.
- Part of the activity of PEMT is that it produces homocyctine, as stated, homocystine plays an important role in methylation.

Health Issues & PEMT

- Fatty Liver
- Brain fog
- Muscle weakness and movement
- Bile /gallbladder problems.
- Brain development nerve function
- Choline is a secondary pathway for methylation
- SIBO

Healing

Single-nucleotide polymorphism-SNP



Fixing your SNPS

- Avoid dairy completely, any sensitivity to dairy will produce antibodies that will block the folate receptors. (*Dirty Genes*, by Dr. Ben Lynch)
- No Gluten/grains
- Eat B12 from food: Grass fed meats, eggs, fish and liver.
- Filter drinking water, by removing the chemicals in water you reduce the work for the MTHFR gene.

Healing SNP Expression

- Eat no food with folic acid. Folic acid is synthetic and binds to the folate receptor sites but is not methyelated. One of the functions of methylfolate is to donate a methyl group to B12. Folic acid has no methyl group so can actually create a methylcabolomine deficiency.

Turning off the expression of SNP's

- Meditate every day. A study showed that meditating for 20 minutes for 8 weeks will change the expression of the MTHFR SNP.
- Spend time in nature/stress reduction
- Exercise 20-40 minutes per day.
- Do not eat left-over's, they are high in Histamines.

Healing snp expression

- Eat only Organic.
- Avoid household toxic cleaning products.
- Avoid chemicals in personal skin care products and shampoos.
- Remove heavy metals and silver fillings.

Fixing your SNPs

- Install an air filter in your home. Inside air in more polluted than outside air.
- Eat lots of Greens, especially green leafy veggies. Green leafy are high in natural folates. Greens also alkalize your system which allows vitamins, minerals and cofactors to be utilized more efficiently.
- Take HCL after each meal. Betaine HCL is a methyl donor in its own right, will also assist in the breakdown of proteins and kills pathogens.

Healing your SNPs

- Follow your dreams.
- Surround yourself with loving relationships.
- Do what you love.

Healthy for life

Thanks for taking CE Seminars with Back To Chiropractic.

I hope you enjoyed the course. Please feel free to provide feedback.

Check out: Back To Chiropractic Resources

Free Materials: Notes & Forms hundreds of files ~ posters, newsletters & more

Services & Listings People helping people for free

Marcus Strutz DC

Back To Chiropractic CE Seminars

marcusstrutzdc@gmail.com

707.972.0047