Introduction to Functional Medicine

Dr. Jess Armine

SOLVING THE HEALTH PUZZLE

EMT/P, RN, BSN, DC
Certified Emergency Nurse, CCRN

- Expertise in in epigenetics, forensics, Methylation, Neuro-Endo-Immunology
- Functional Medicine, Nutrigenomics
- Applied Kinesiology, Live Blood Cell Analysis, Nutritional Counseling

"The Neurotransmitter Whisperer"

"The Sherlock Holmes of Chronic Illness"

Financial & Competing Interests disclosure

I am a self-employed, independent Health Care Practitioner in the United States.

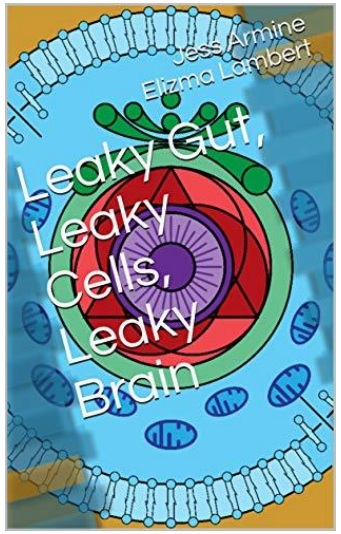
I am not compensated for this webinar.

I have no Financial or Competing Interests with the LDN Research Trust or any other person or entity mentioned herein.

The opinions expressed on my own and do not represent the policies of the LDN Research Trust

Elizma Lambert, ND
(elizmalambert.com)

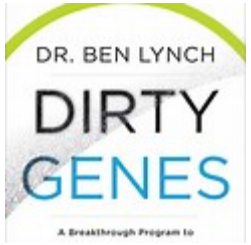
For use of the concepts in her book coauthored with myself *"Leaky Gut, Leaky Cells, Leaky Brain"*



Gilian Crowther,
NT/ND, Fellow of BANT, mNNA, CNHC reg.

aonm.org

For the use of her CDR Slides



Dr Ben Lynch
For the use of Strategene and concepts from his book, "Dirty Genes"

drbenlynch.com
seekinghealth.com

Today's Webinar is Unique

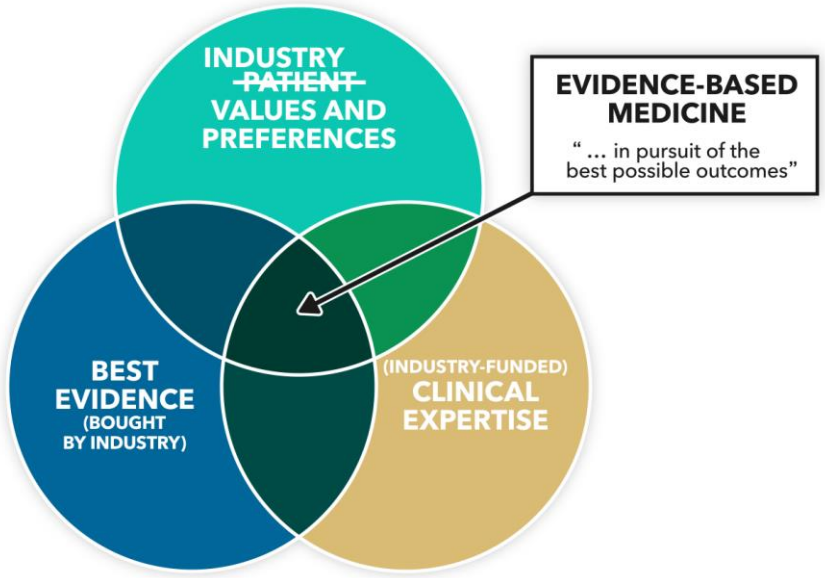
What you can expect today…

For Everyone

- Define what a Functional Medicine Practitioner is and does.
- Discuss the difference between classical and functional medicine.
- Show you how you benefit from true integrative approach
- Put it all together with Case Studies.
- Tips on how to pick a practitioner

For the professionals

- The purpose of today's lecture is to be cohesive not divisive.
- For far too long our professions have been in divergence to the detriment of those who suffer.
- Please do not take anything that I say amiss as I am not being adversarial but will point out simple truths.
- We need to work together for the highest good of those we serve.



Classical (Traditional) vs Functional Medicine*

*Please Note: I will use the term Functional Medicine Practitioner (FMP) to represent any healthcare professional that practices within the parameters that I am about to share with you. These practitioners have varied backgrounds and degrees

Functional Medicine, the view of Classical Medicine

- **Functional medicine** is a form of alternative medicine that encompasses a number of unproven and disproven methods and treatments.
- Its proponents claim that it focuses on the "root causes" of diseases based on interactions between the environment and the gastrointestinal, endocrine, and immune systems to develop "individualized treatment plans."

- It has been described as pseudoscience, quackery, and at its essence a rebranding of complementary and alternative medicine.

Functional medicine - Wikipedia

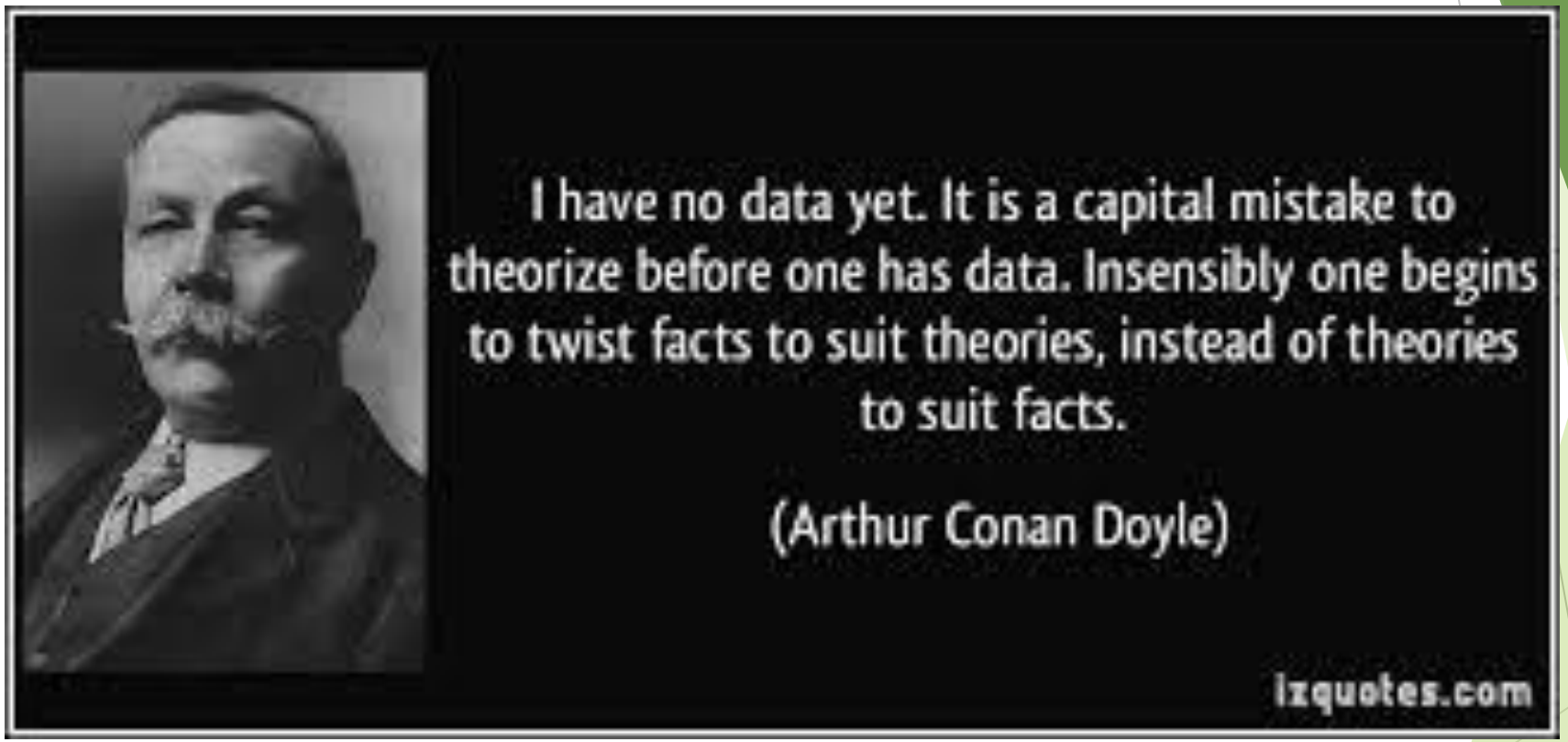
This begs the question…why would

The assessment of root causes.

The proven relationship between environment, endocrine, and the immune system (ex: psychoneuroendocrinology, Neuroendoimmunology, Gut-Brain Axis, etc.)

The development of individualized treatment plans

Be considered quackery?



WORDS TO LIVE BY

Classical (Traditional) Medicine

- Takes sets of symptoms and labels them as diseases for the purpose of identifying a matching pharmaceutical protocol.
- Essentially, treating the result of an illness, not the illness.
- How did it get this way?

1960's and before

- The GP (General Practitioner) was king.
- The GP was the practitioner that knew you, your family, and was your advocate.
- Any specialists would report directly to your GP and he/she would take it from there,

1970's and beyond

- Transition to specialists and the GP was snubbed by the medical community.
- Medical training was done by referring to algorithms with suggested treatment protocols (Little and Brown "spirals").
- Medicine became corporatized.
  - "Suggested Protocols" become standards of care.
  - Diagnoses must be "proven" by tests or treatment not supported.
  - Physicians are given less and less time to be with their patients.
  - Doctors have barely enough time to address the chief complaint and become "hemmed in" to their specialties.

Doctors can't be physicians any longer resulting in treatment according to the Acute Care model. Those with chronic conditions suffer the most.

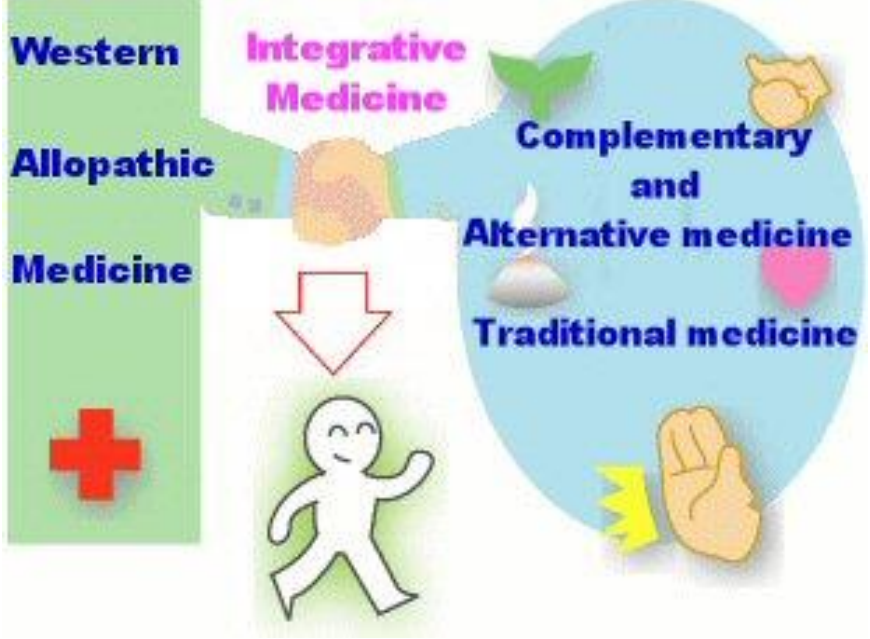
Classical vs Functional Thought Patterns

Acute Care Model

- ***Premise:*** Eradicate the root cause and the body will heal itself
- Results in chronic conditions:
  - Confusion as to why someone will not heal
  - Blaming the patient (histrionic, sx magnification, malingering)
  - Conclusion that certain pathologies cannot be healed.

The FMP Model

- **Premise:** There are root causes and downstream effects (Symptoms created by the root causes)
- Both must be identified and treated
- In chronic conditions, the homeostatic(healing) mechanisms won't "re-boot" w/o intervention.
- Both foundational treatment and targeted root cause treatment are administered.
- In addition, the FMP will delve into the effect of the person's belief systems and coach them into a healthy mindset



Neither Allopathic nor Functional Medicine have all the answers!

Healthcare needs ***TRUE*** Integrative Medicine…
A blending of allopathic and Functional.

Collaborating is the best way. What holds us back? The way we think about things.

Basing	Ignoring	Ignoring	Forgetting
Basing our treatment parameters solely on “scientific proof” as demonstrated by placebo-controlled, double-blind studies	Ignoring observational or anecdotal evidence that may lack enough "scientific" studies	Ignoring intuitive insight	Forgetting the wisdom of Albert Einstein: • The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honors the servant and has forgotten the gift.

Today, Let Agree to Think Differently

- **Today let's:**
  - To not depend on a single source of data
  - Consider data that was heretofore considered unusable because it was "unproven", "alternative", "woo woo", or simply ***unfamiliar*** to us
  - **How will we do this**?
    - Accept a combination of scientific and clinical data utilizing intuitive insight
    - Never, ever say (or think), "That can't happen".
    - Open our minds to what works but saying/thinking, "I wonder how that happened"?

Why has Functional Medicine Flourished?

- When a desperate mother has a suffering child that no one can diagnose or treat successfully.
- It is the FMP that takes up the gauntlet.
- We will think outside the box.
- In other words, *"Who you gonna call?"*

- *https://www.imdb.com/title/tt0087332/**atch***!

FMP shines with Chronic Illnesses

Autoimmune disorders, Fibromyalgia, MS, Parkinson's, Bipolar Disorder, ADD, ADHD, OCD, Depression, Dementia, Alzheimer's, Dysautonomia, Multiple Chemical Sensitivities, etc.

What they are

- Chronic illness have root causes that have resulted in expressions specific to the diagnosis.
- Chronic illnesses are pathophysiologic processes. As such, they can be resolved.
- Chronic illnesses often Require a multidisciplinary approach but most of all:
  - Chronic illnesses require a different point of view on the part of the practitioner.

What they are not

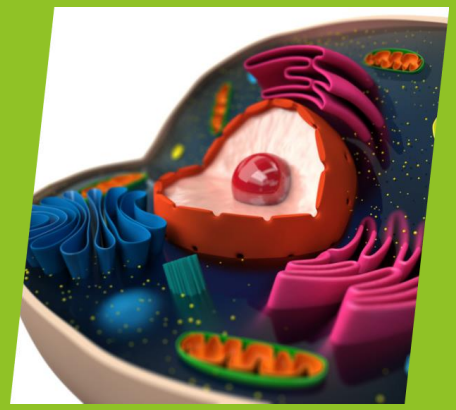
- You are not born with a chronic illness
- Chronic illnesses are not the fault of the patient
- Chronic illnesses are not chance occurrences or "rolls of the cosmic dice".
- Autoimmune disorders are NOT unrecoverable as they have precipitating factors that initiate the pathologic processes

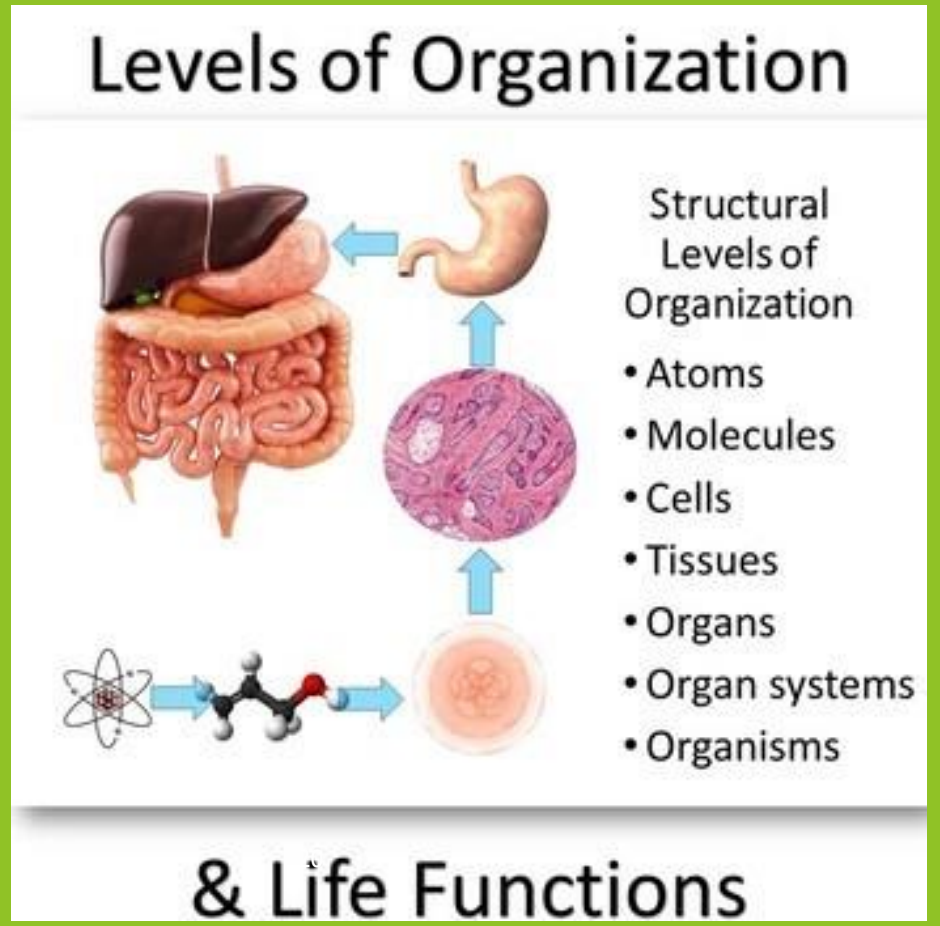
Functional Practitioners Thought Pattern

What does it mean to think “Outside the Box”?

Basic Premise:

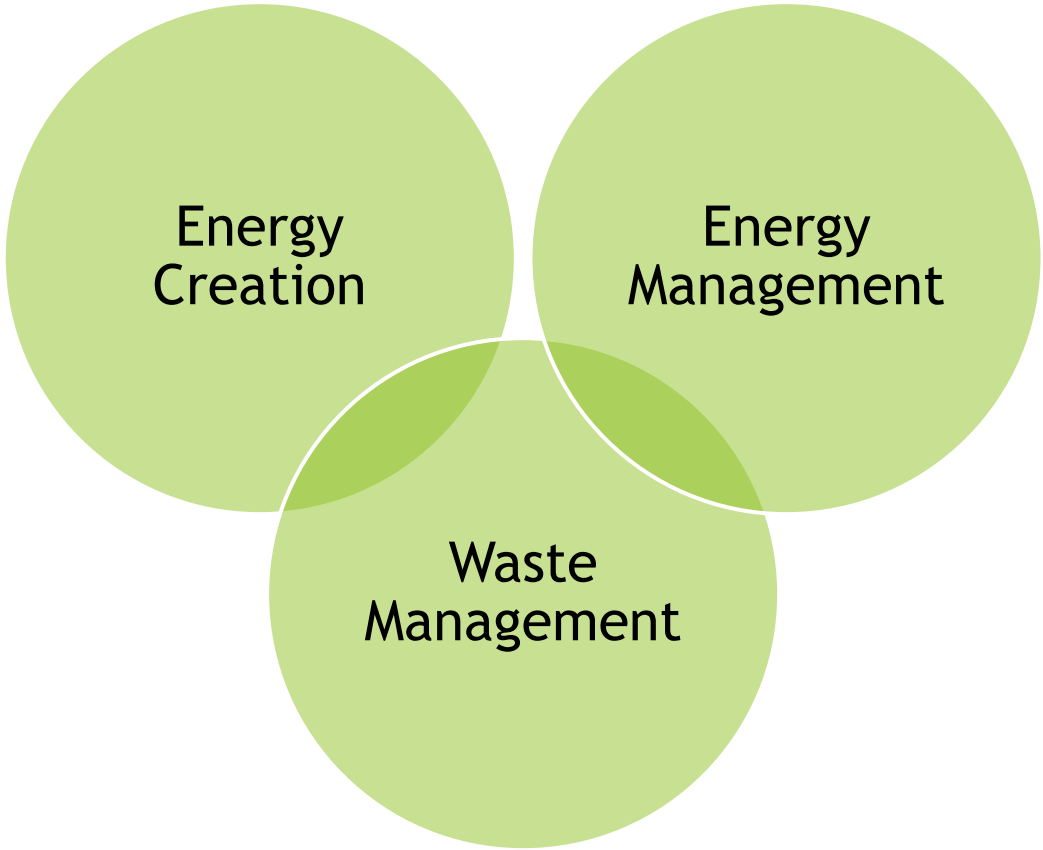
All of life happens within the cell and is protected and supported by the cell membrane





▶Heal the cells and you heal the body!

Basis of Cellular Function…



Bio-Individualized Medicine™

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Bio-Individualized Medicine™ is a ***Thought Paradigm*** that includes consideration of ALL the following parameters

Ever Notice that Many Diseases Have Common Symptoms… Perhaps There is Common Causation?

Symptom	Chronic Lyme	Fibromyalgia	ME/CFS	Dysautonomia
Fatigue	X	X	X	X
Chronic Pain	X	X	X	X
Mood Changes	X	X	X	X
Confusion/ Brain Fog	X	X	X	X
Numbness Tingling	X	X	X	X
Sensitivity to light	X	X	X	X
Inflammation	X	X	X	X

The Cell Danger Response (CDR)

Naviaux, R.K., Metabolic features of the cell danger response, Mitochondrion (2013), http://dx.doi.org/10.1016/j.mito.2013.08.006

What is the Cell Danger Response?

Mitochondrion 16 (2014) 7–17

Contents lists available at ScienceDirect

Mitochondrion

journal homepage: www.elsevier.com/locate/mito

Metabolic features of the cell danger response

Robert K. Naviaux *

The Mitochondrial and Metabolic Disease Center, Departments of Medicine, Pediatrics, and Pathology, University of California, San Diego School of Medicine, 214 Dickinson St., Bldg CTF, Rm C102, San Diego, CA 92103-8467, USA
Veterans Affairs Center for Excellence in Stress and Mental Health (CESAMH), La Jolla, CA, USA

ARTICLE INFO

Available online 24 August 2013

Keywords:
Oxidative stress
Oxidative shielding
Innate immunity
Inflammation
Purinergic signaling
Mitochondria

ABSTRACT

The cell danger response (CDR) is the evolutionarily conserved metabolic response that protects cells and hosts from harm. It is triggered by encounters with chemical, physical, or biological threats that exceed the cellular capacity for homeostasis. The resulting metabolic mismatch between available resources and functional capacity produces a cascade of changes in cellular electron flow, oxygen consumption, redox, membrane fluidity, lipid dynamics, bioenergetics, carbon and sulfur resource allocation, protein folding and aggregation, vitamin availability, metal homeostasis, indole, pterin, 1-carbon and polyamine metabolism, and polymer formation. The first wave of danger signals consists of the release of metabolic intermediates like ATP and ADP, Krebs cycle intermediates, oxygen, and reactive oxygen species (ROS), and is sustained by purinergic signaling. After the danger has been eliminated or neutralized, a choreographed sequence of anti-inflammatory and regenerative pathways is activated to reverse the CDR and to heal. When the CDR persists abnormally, whole body metabolism and the gut microbiome are disturbed, the collective performance of multiple organ systems is impaired, behavior is changed, and chronic disease results. Metabolic memory of past stress encounters is stored in the form of altered mitochondrial and cellular macromolecule content, resulting in an increase in functional reserve capacity through a process known as mitocellular hormesis. The systemic form of the CDR, and its magnified form, the purinergic life-threat response (PLTR), are under direct control by ancient pathways in the brain that are ultimately coordinated by centers in the brainstem. Chemosensory integration of whole body metabolism occurs in the brainstem and is a prerequisite for normal brain, motor, vestibular, sensory, social, and speech development. An under-

“An evolutionarily conserved response activated when a cell encounters a threat that could injure or kill it”

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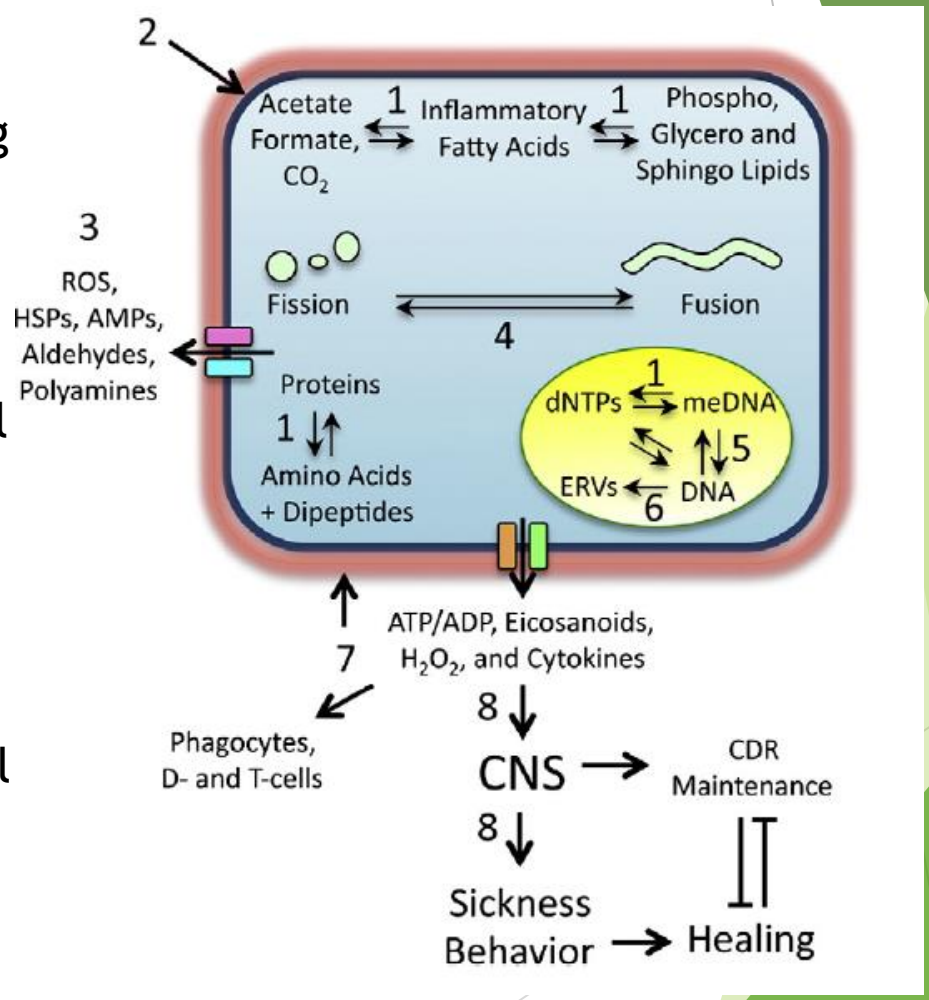
... Our mitochondria downregulate as a protective mechanism

Source: Naviaux RK. Metabolic features of the Cell Danger Response. Mitochondrion. 2014 May;16:7-17

What are the immediate results of acute CDR?

1) Mitochondria decrease oxygen consumption to oxidise the cellular environment, inhibiting assembly of monomeric building blocks into polymers, thus decreasing efficiency of RNA, protein, and DNA synthesis by the infecting pathogen
2) Stiffen cell membranes to limit pathogen egress
3) Release of antiviral and antimicrobial chemicals (HOCL)
4) Increase in autophagy/mitochondrial fission/mitophagy
5) Changes in DNA methylation: SAM is directed to polyamine synthesis to assist ROS and antiviral/antimicrobial polyamine aldehyde synthesis and release, lowering the SAM/SAH ratio



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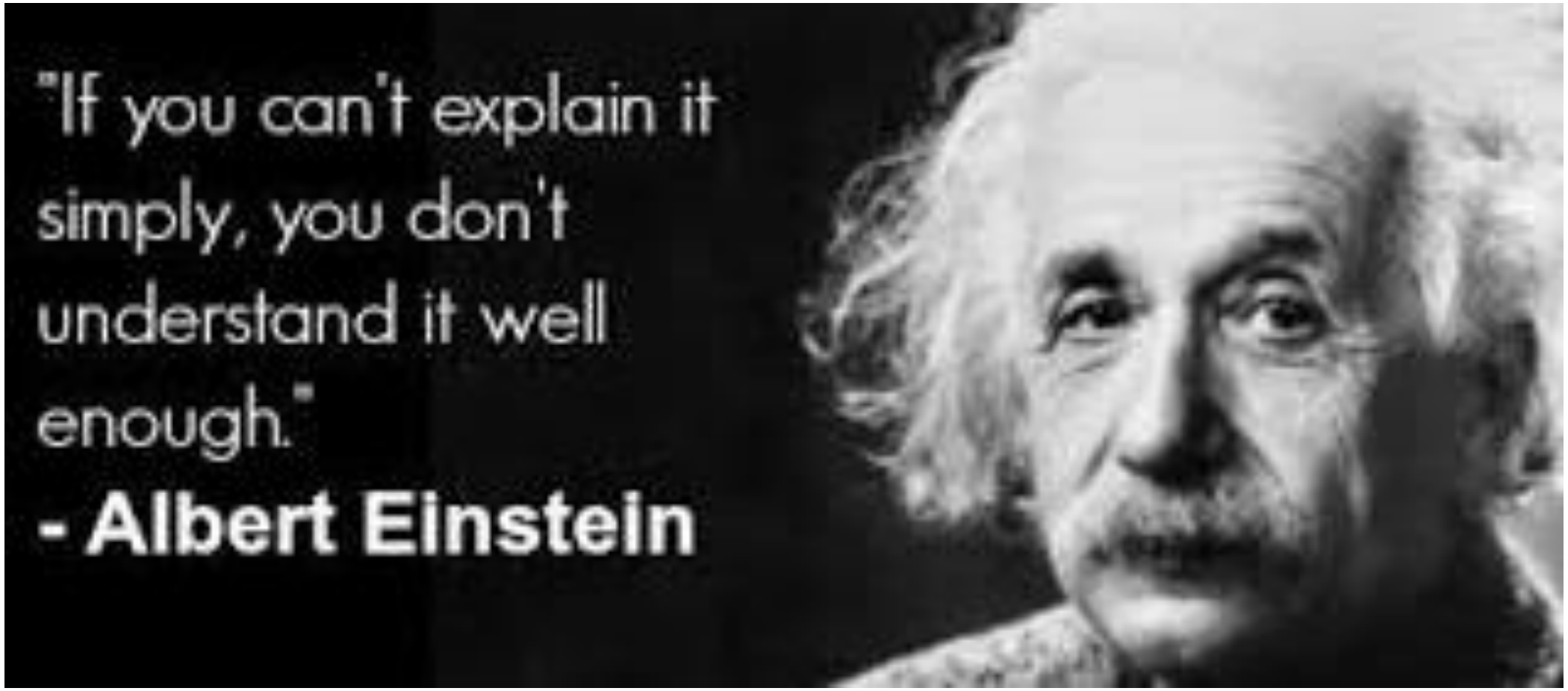
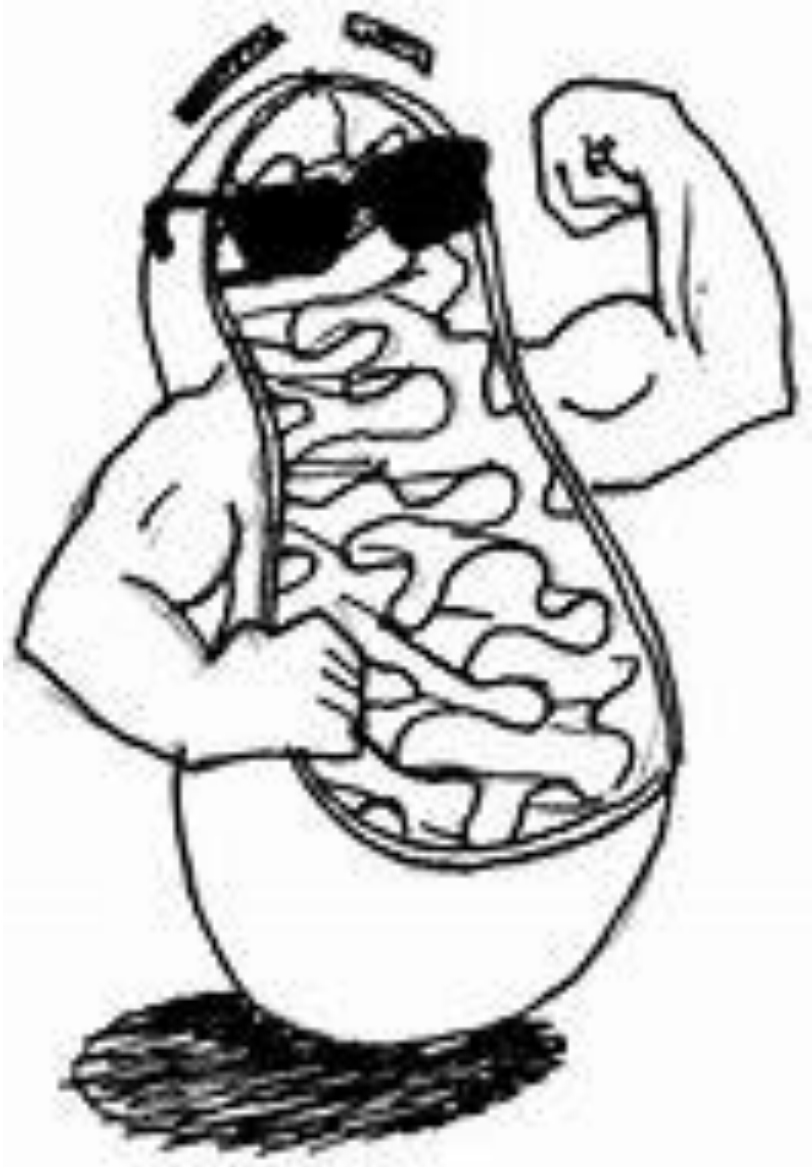
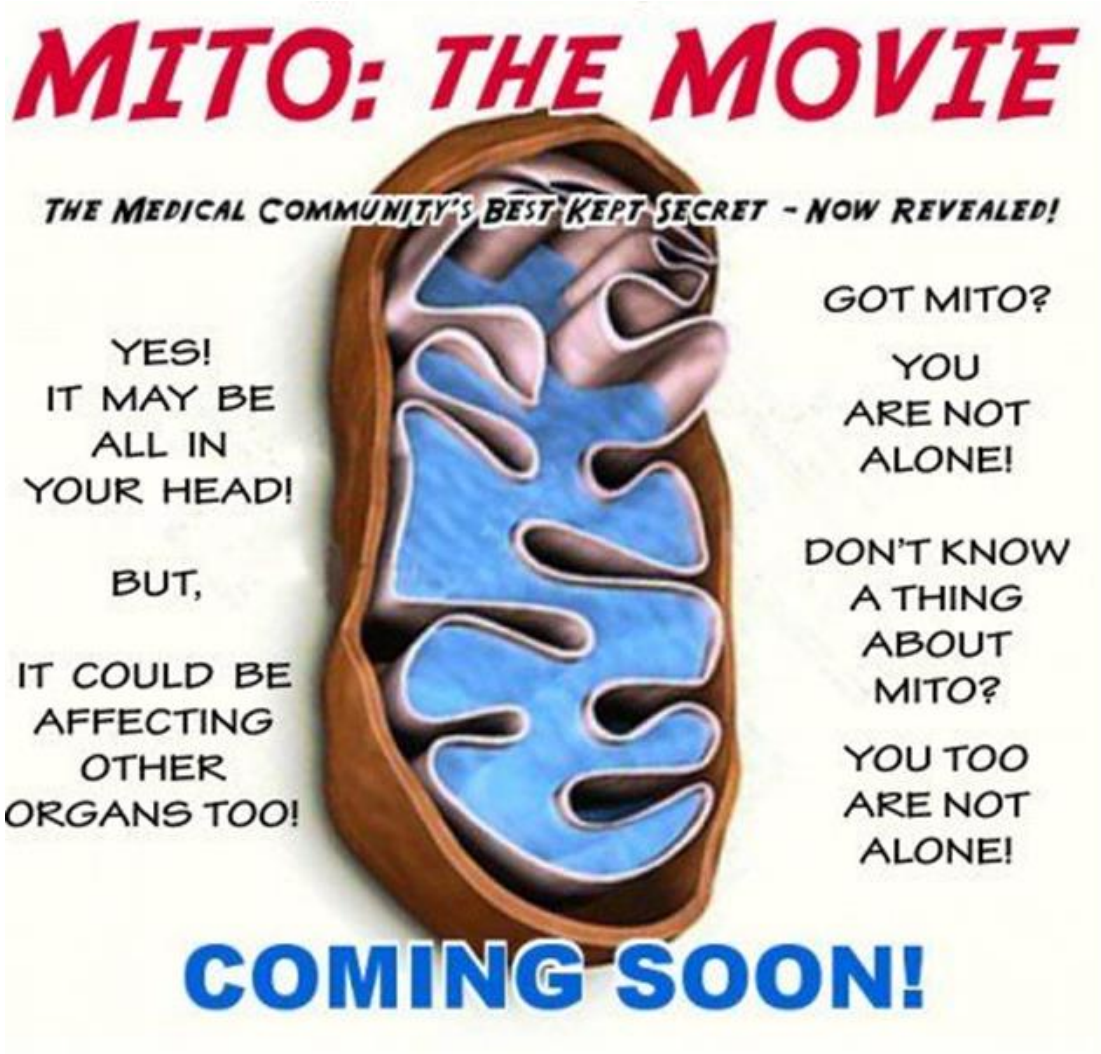


The Cell Danger Response ?
Put Simply:

- Metabolic response of the cell to protect itself (and thereby you) from harm
- The basis of re-establishing homeostasis (normal function)
- It all occurs in the ***Mitochondria***





What *activates* the Cell Danger Response?

(and thereby damages the Mitochondria)

Chemical/ Physical

- Heavy Metals
- BPA, Benzene
- Heat, Salt
- Shock, Radiation
- Trauma

Microbial

- Mold, Fungi
- Bacteria, Viruses Parasites

Psychological Emotional Spiritual

- Yelling, abuse
- Isolation, abandonment
- PTSD

Source: Naviaux RK. Metabolic features of the Cell Danger Response. Mitochondrion. 2014 May;16:7-17

It’s all in your head!

The Relevance of Emotions on Health

The Heart as a Psychoneuroendocrine and Immunoregulatory Organ

Carlo Dal Lin 1, Francesco Tona 1, Elena Osto 2 3

Abstract

The heart can be viewed not just as muscle pump but also as an important checkpoint for a complex network of nervous, endocrine, and immune signals. The heart is able to process neurological signals independently from the brain and to crosstalk with the endocrine and immune systems. The heart communicates with the psyche through the neuro-endocrine-immune system in a highly integrated way, in order to maintain the homeostasis of the whole body with peculiarities specific to males and females.

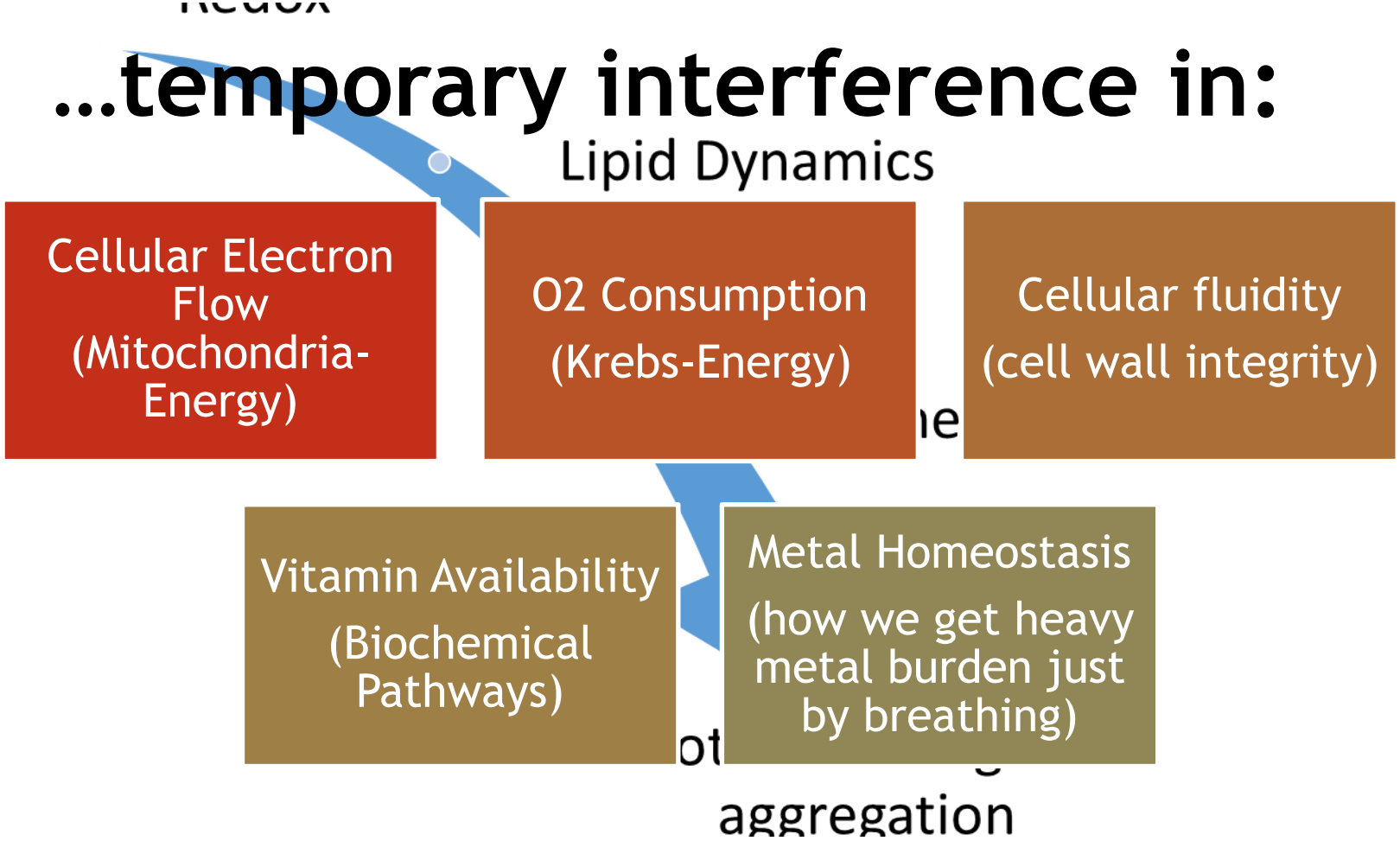
The heart is able to process neurological signals independently from the brain

The heart communicates with the psyche through the neuro-endocrine-immune system in a highly integrated way

Dal Lin C, Tona F, Osto E. The Heart as a Psychoneuroendocrine and Immunoregulatory Organ. Adv Exp Med Biol. 2018;1065:225-239. doi: 10.1007/978-3-319-77932-4_15. PMID: 30051388.

The CDR results in a Cascade of Changes…

…temporary interference in:



When the Danger has Passed…

- Sequence of anti-inflammatory and regenerative pathways are activated to:
  - Reverse CDR
  - Promote Healing
  - The interference is removed, and homeostasis (normal cell function) restored (Think of it as RE-BOOTING).

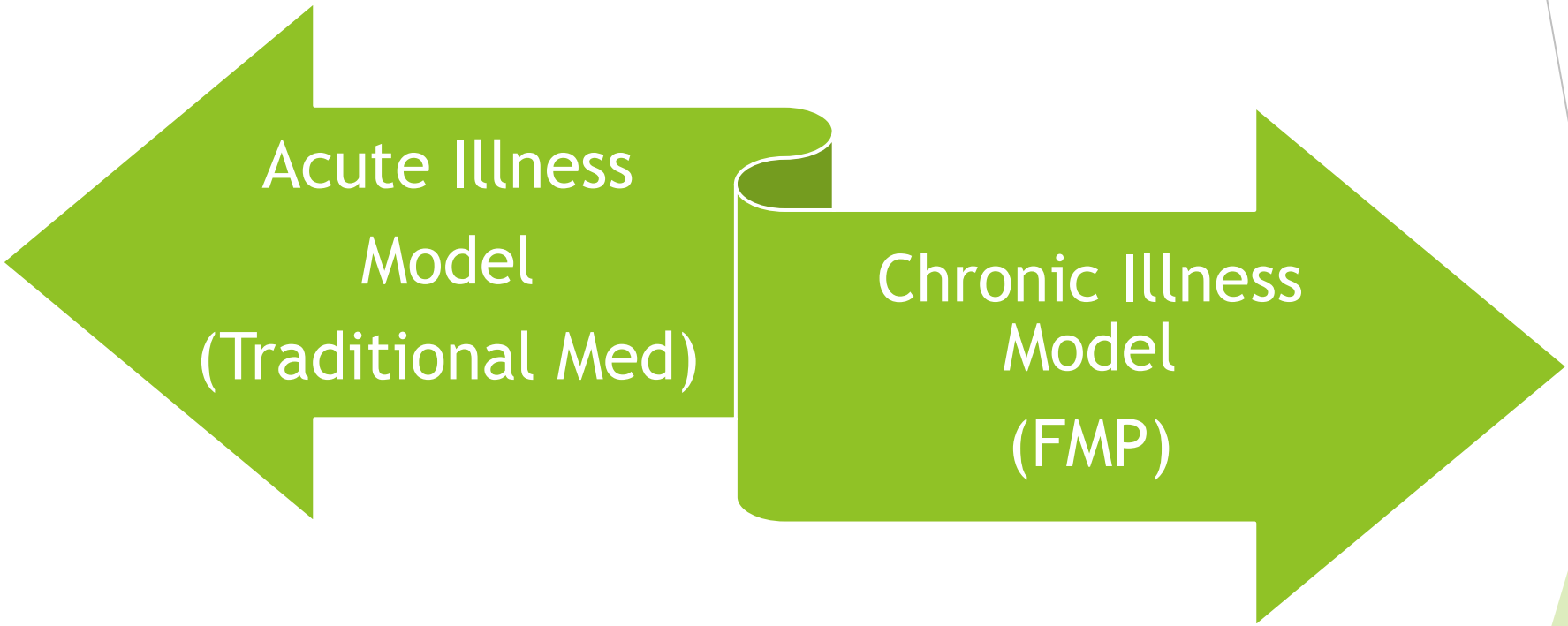
- BUT…

IN CHRONIC OR MULTIPLE CDR THE INTERFERENCE REMAINS AND WORSE, SYNERGIZES!

- Chronic /Multiple CDR
- Numerous Downstream effects (symptoms)
- Healing Mechanisms will not re-boot.
- The Negative Effects on the healing mechanisms synergize
- Healing Becomes Impossible Unless Treating the Root Causes AND Downstream Effects

HERE'S WHERE THE DIVERGENCE BETWEEN ALLOPATHIC AND FMP THINKING OCCURS

There is a significant difference in treating acute vs chronic illness.



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Metabolic features and regulation of the healing cycle—A new model for chronic disease pathogenesis and treatment

Robert K. Naviaux

The Mitochondrial and Metabolic Disease Center, Departments of Medicine, Pediatrics, and Pathology, University of California, San Diego School of Medicine, 214 Dickinson St., Bldg CTF, Rm C102, MC#8467, San Diego, CA 92103, United States

ARTICLE INFO

Keywords:
Cell danger response
Healing cycle
Mitochondrial nexus
Metabolic addiction
Metabolic memory
Purinergic signaling
Metabokines
Antipurinergic therapy
M0, M1 and M2 mitochondria
Ecoalleles
Ecogenetics
Allostasis
Allostatic load
Integrated stress response

ABSTRACT

Without healing, multicellular life on Earth would not exist. Without healing, one injury predisposes to another, leading to disability, chronic disease, accelerated aging, and death. Over 60% of adults and 30% of children and teens in the United States now live with a chronic illness. Advances in mass spectrometry and metabolomics have given scientists a new lens for studying health and
terms and reframes the pathophysiology of chronic
block healing and cause the normal stages of the
injury occurs, active progress through the stages
nergetics and the disposition of oxygen and carbo
covery. > 100 chronic illnesses can be organized i
targetable chemosensory G-protein coupled and io
healing. Metabokines are signaling molecules deriv
the pathogenesis of chronic illness in this way, as a
on remote trigger(s) that *caused* the initial injury,
unblock the healing cycle, and restore health when

1. Introduction

Much of modern Western medicine is based on the principles of acute interventions for poisoning, physical injury, or infection. These principles trace to historical figures like Paracelsus (1493–1541), Ambroise Paré (1510–1590), and Louis Pasteur (1822–1895). These acute care interventions are now widely used in the modern fields of pharmacology, toxicology, urgent care, emergency medicine, and surgery. When caring for acute disruptions in health, the careful identification of the trigger, or cause of the problem, and the anatomical location of the defect, is an important part of good medical care. However, when dealing with chronic illness, treatments based on th
rules of acute care medicine have proven less helpful, and can even cause harm by producing unwanted side-effects (Qato et al., 2018).

In chronic illness, the original triggering event is often remote, and may no longer be present. Emerging evidence shows that most chronic illness is caused by the biological *reaction* to an injury, and not the initial injury, or the agent of injury itself. For example, melanoma can

be caused by su
traumatic stress
bullet wound h
more severe dise
fore complete he
the second injur
even when the
Progressive dysfu
occurs in all org
results when cell
and re-injury, un
every chronic ill
recurrent infecti
diabetic heart a
pulmonary disea
fatigue syndrom
nesses, Alzheime

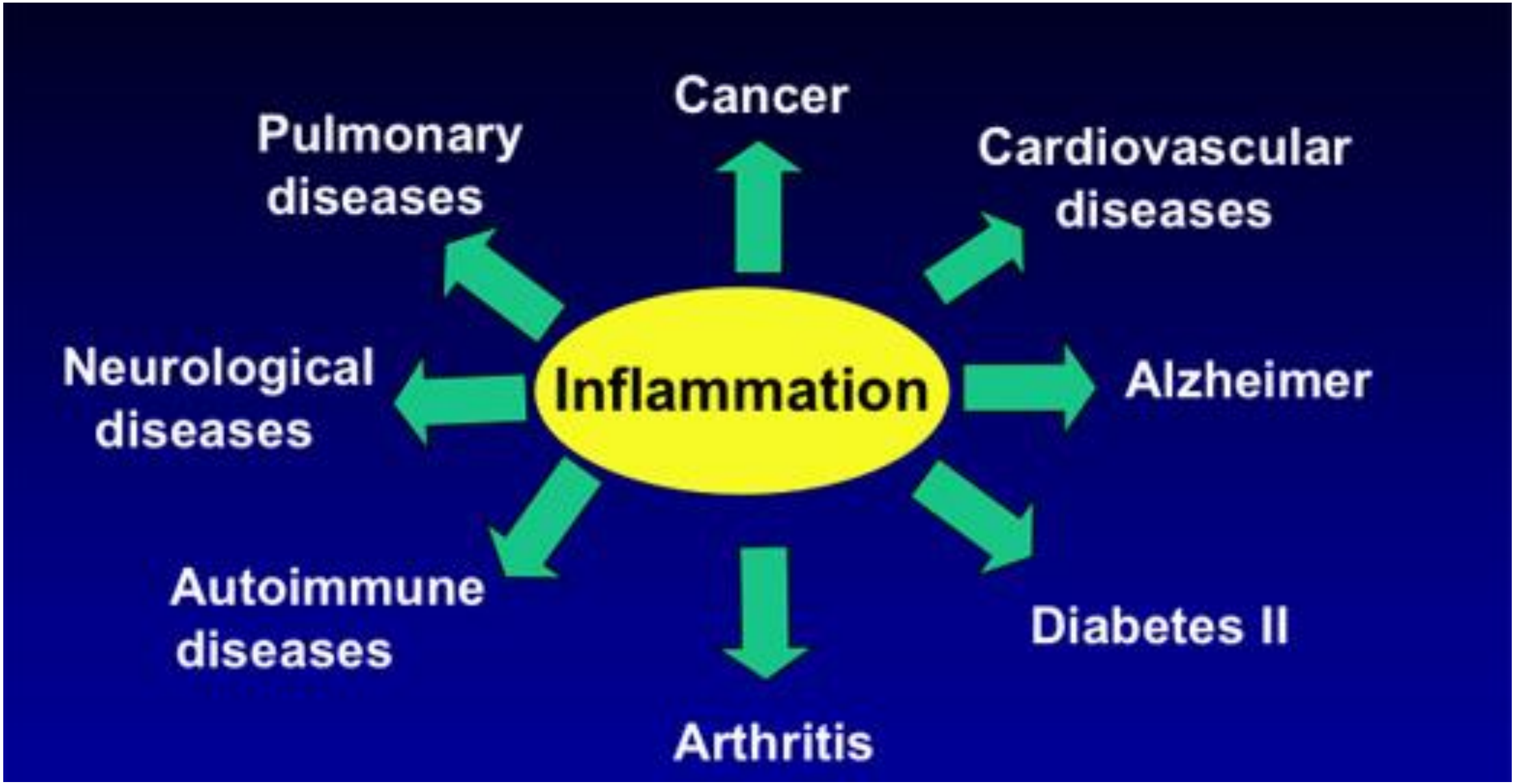
Great strides

- *Robert K. Naviaux , Metabolic features and regulation of the healing cycle—A new model for chronic disease pathogenesis and treatment. Mitoch (2018), doi:10.1016/j.mito.2018.08.001*

When caring for **acute** disruptions in health, the careful identification of the trigger, or cause of the problem, and the anatomical location of the defect, is an important part of good medical care. However, when dealing with **chronic illness**, treatments based on the rules of acute care medicine have proven less helpful, ***and can even cause harm by producing unwanted side-effects (emphasis added)***

Back to CDR… A “STUCK” Cell Danger Response creates

And all the suffering we face…



HOW INFLAMMATION AFFECTS THE BODY

BROUGHT TO YOU BY

WWW.LIVELOVEFRUIT.COM

"Inflammation is at the root of practically all known chronic health conditions"
Find out how to prevent it at www.livelovefruit.com

BRAIN
Pro-inflammatory cytokines cause autoimmune reactions in the brain, which can lead to depression, autism, poor memory, Alzheimer's disease and MS.

SKIN
Chronic inflammation compromises the liver & kidneys, resulting in rashes, dermatitis, eczema, acne, psoriasis, wrinkles & fine lines.

CARDIOVASCULAR
Inflammation in the heart & arterial & venous walls contributes to heart disease, strokes, high blood sugar (diabetes) and anemia.

KIDNEYS
Inflammatory cytokines restrict blood flow to the kidneys. Complications like edema, hypertension, nephritis & kidney failure can result.

BONES
Inflammation interferes with the body's natural ability to repair bone mass, increasing the number of fractures & leading to conditions like osteoporosis.

LIVER
Build-up of inflammation leads to an enlarged liver or fatty liver disease. Increased toxic load build-up in the body.

THYROID
Autoimmunity as a result of inflammation can reduce total thyroid receptor count & disrupts thyroid hormone function.

LUNGS
Inflammation induces autoimmune reactions against the linings of airways. Can result in allergies or asthma.

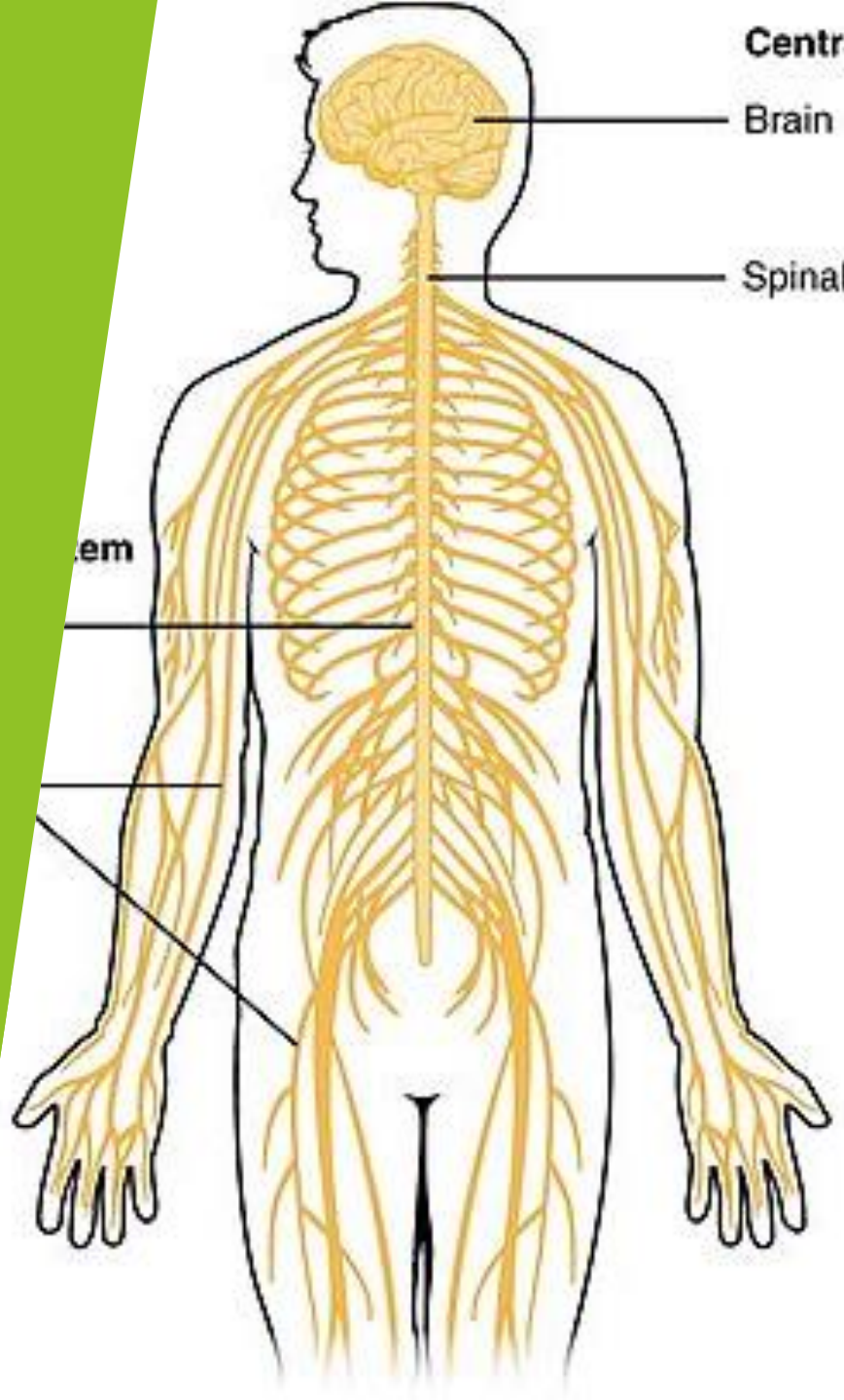
GI TRACT
Chronic inflammation damages our intestinal lining and can result in issues like GERD, Chron's disease and Celiac disease.

MUSCLE
Inflammatory cytokines can cause muscle pain & weakness. Can manifest as carpal tunnel syndrome, or polymyalgia rheumatica, to name a few.

Chronic Inflammation Has Caused a Rise In Health Issues

- Cardiovascular Issues
- GI (stomach) issues
- Diabetes
- Metabolic Disorders
- “Adrenal Fatigue”

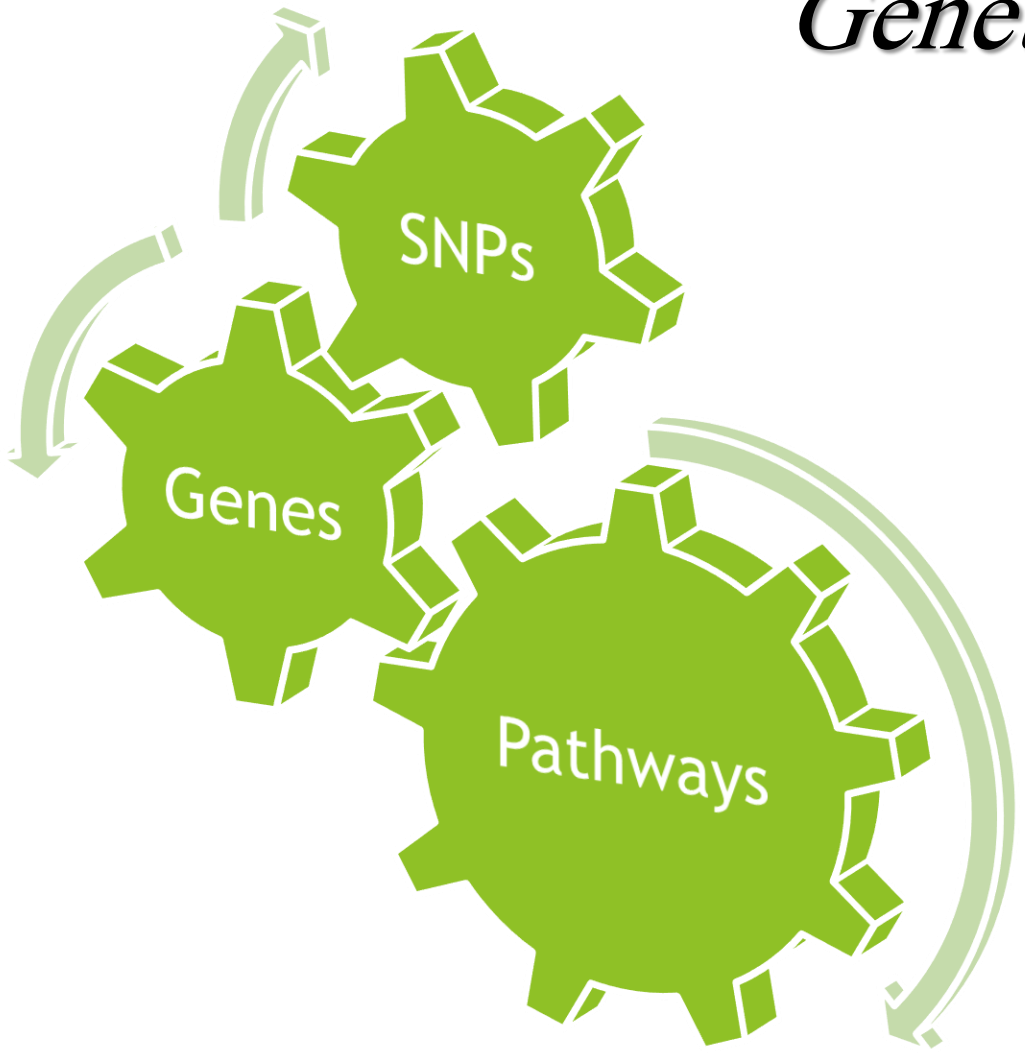
- But The #1 Target For CIRS (Chronic Inflammatory Response Syndrome AKA Chronic Inflammation) Is In The…..

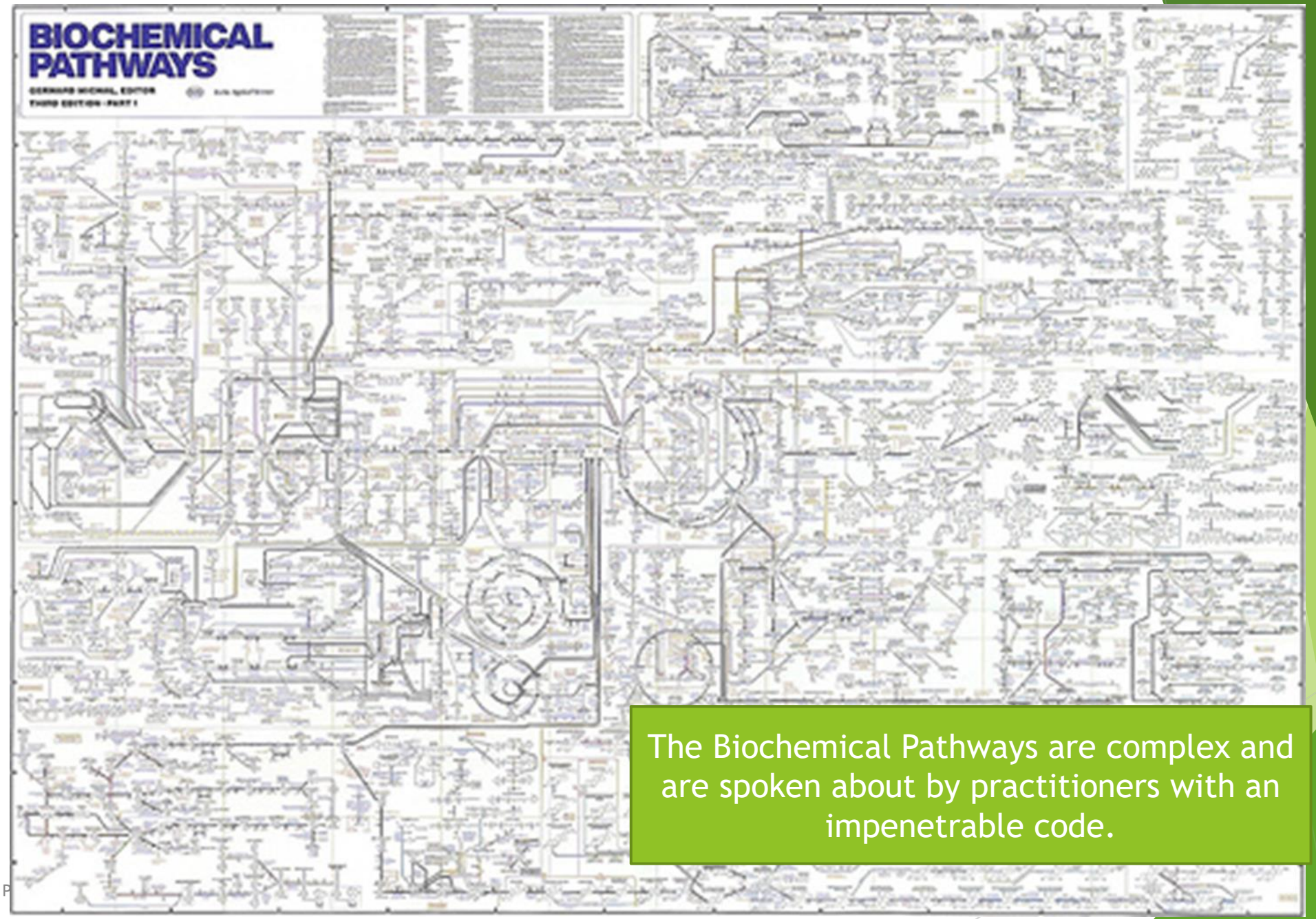


Nervous System

- ASD
- Anxiety
- OCD
- Migraines/Headaches
- Addictions/Cravings
- Behavioral Issues
- Dysautonomia (POTS, etc.)
- Neuropathies
- PMS/Menopausal disorders
- ADD/ADHD
- Depression
- Many More…

The Role and Relevance of Genetics





The Biochemical Pathways are complex and are spoken about by practitioners with an impenetrable code.

http://biochemical-pathways.com/#/map/1

SNP's (AKA Polymorphisms)…What Do They Mean?

They are an Estimate of the Enzyme's Function
Think of highways of differing widths

-/-

Normal
Usual Enzyme Function

+/-

Heterozygous
60% Enzyme Function

+/+

Homozygous
20% Enzyme Function

Traffic Will Slow Down the Pathway's Function*

+/-

+/+

*Traffic = bacteria, heavy metals, viruses, parasites, food allergens, candida, Leaky Gut Syndrome, lack of substrate, lack of cofactors, and coenzymes, presence of factors that will speed up or slow down enzymatic activity, etc.

Timeless Wisdom

- The presence of a polymorphism does not mean you're ill

- The lack of a polymorphism does not mean you're well

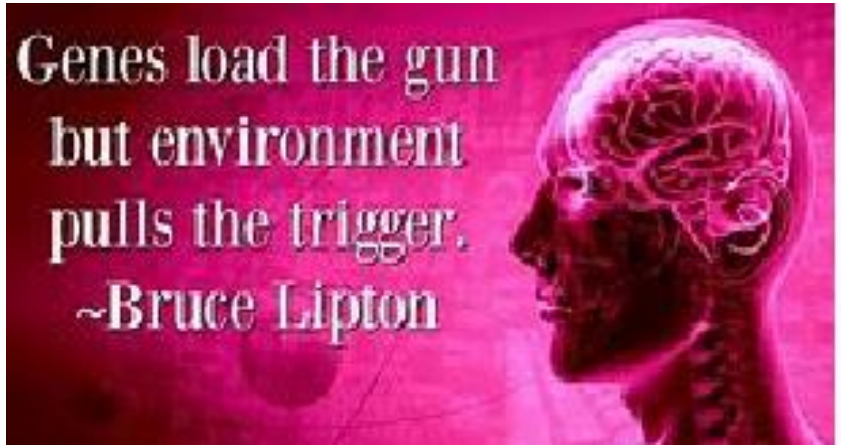
  - Dr. Jess

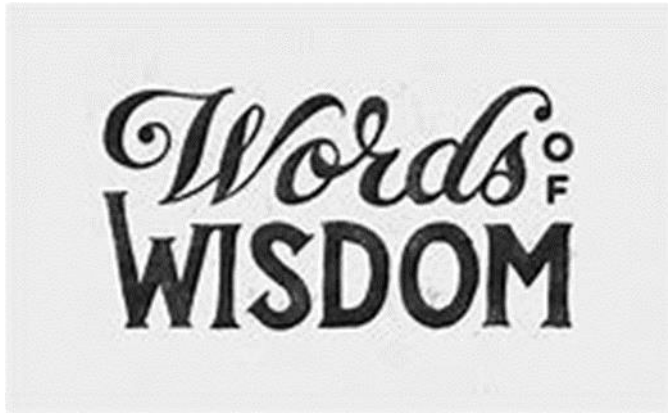
The lack of a polymorphism (SNP) is not a guarantee that the pathway will work adequately.

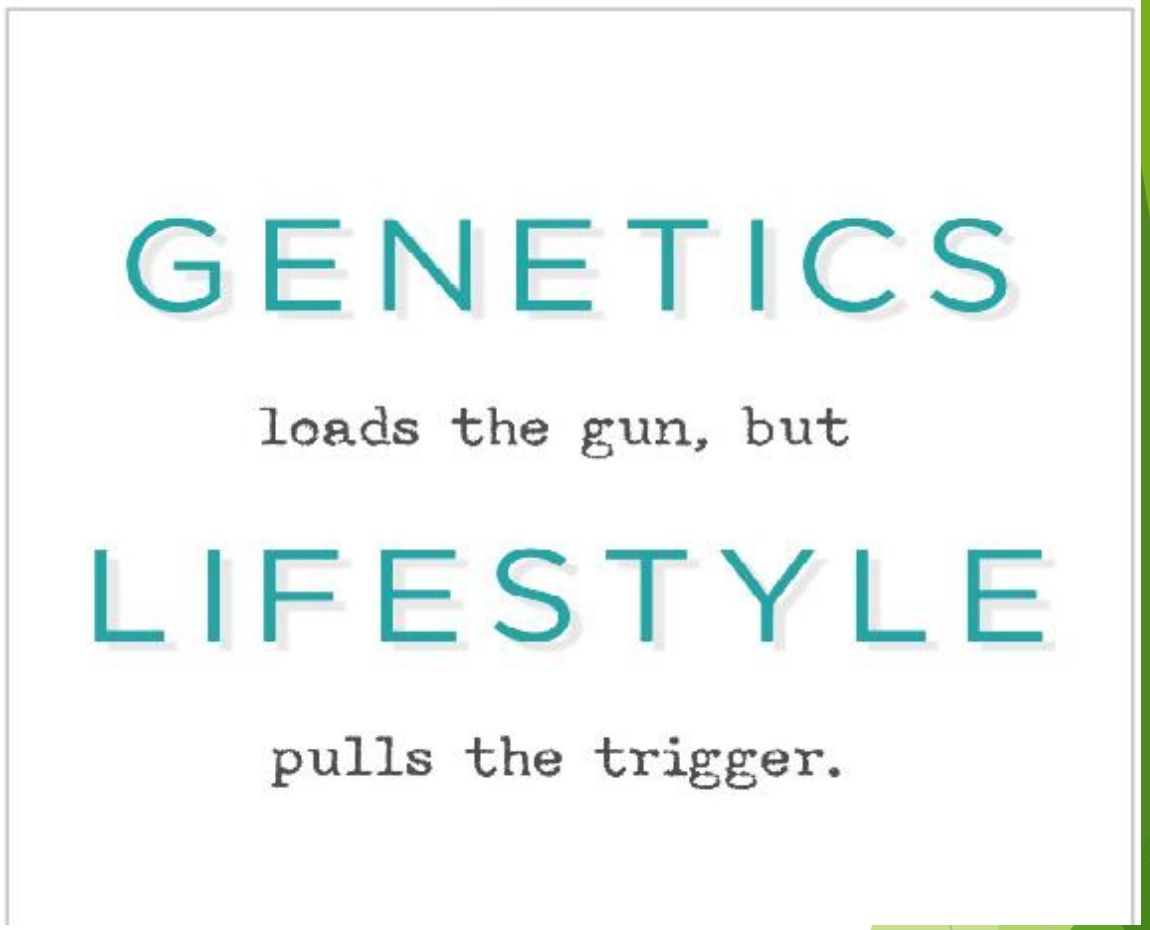
- / -

Think about it. Can you put enough traffic into an 8-lane highway to slow it down?

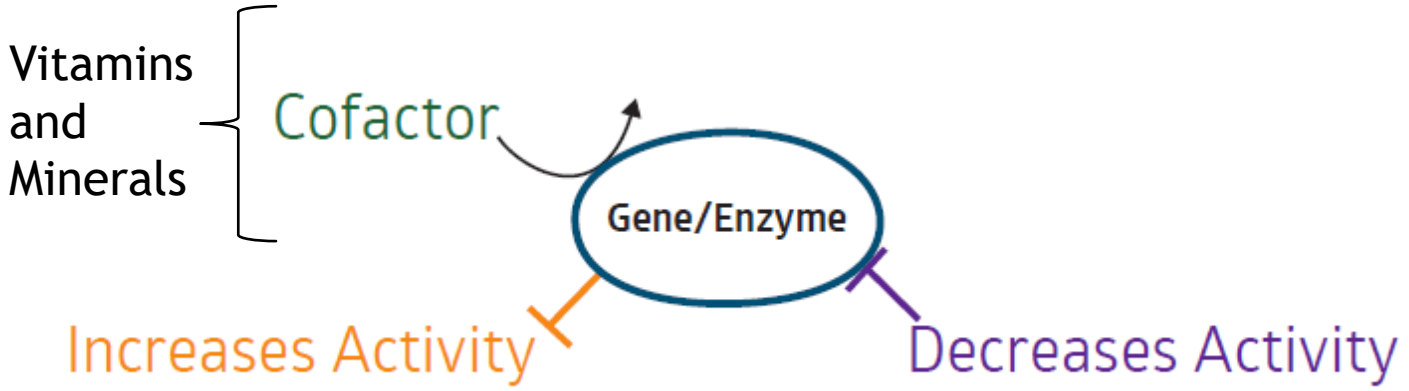
YA THINK?

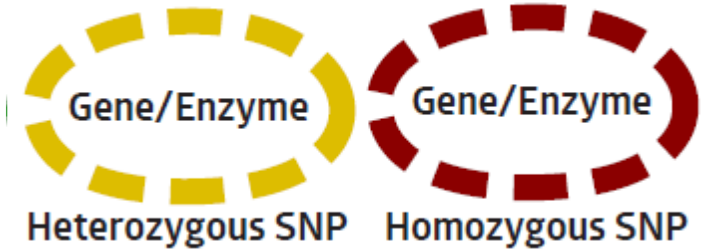






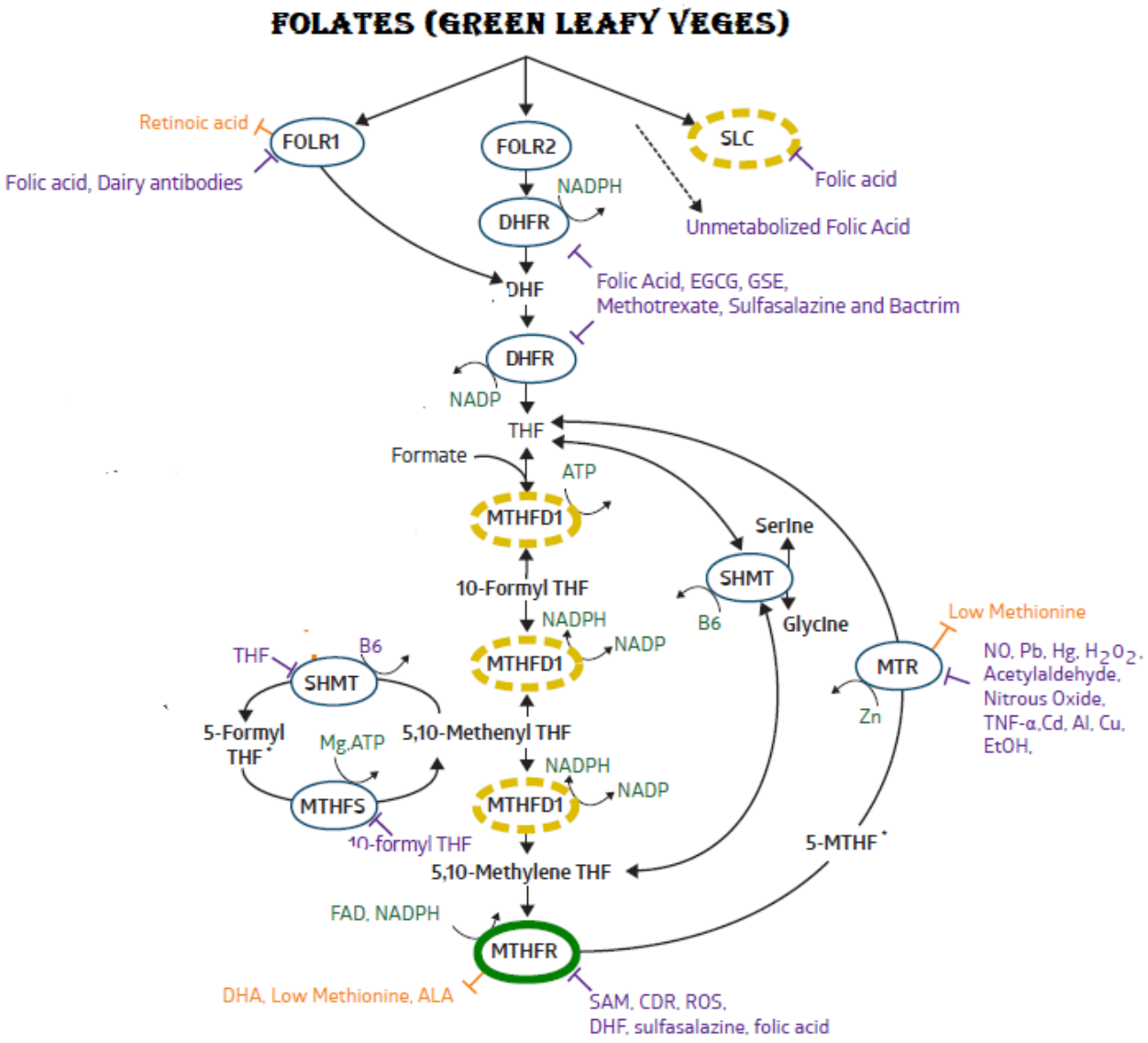
The role of nutrition In optimizing pathway ***function***

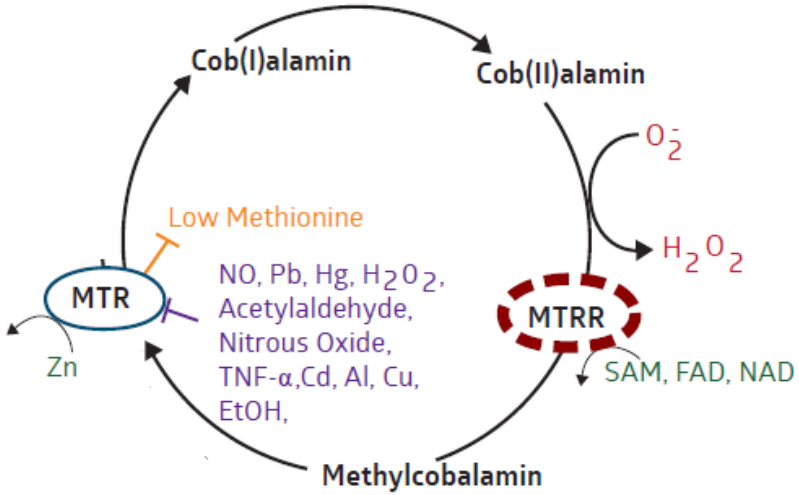




Courtesy of Dr Ben Lynch. Used with permission

The role of nutrition and supplementation





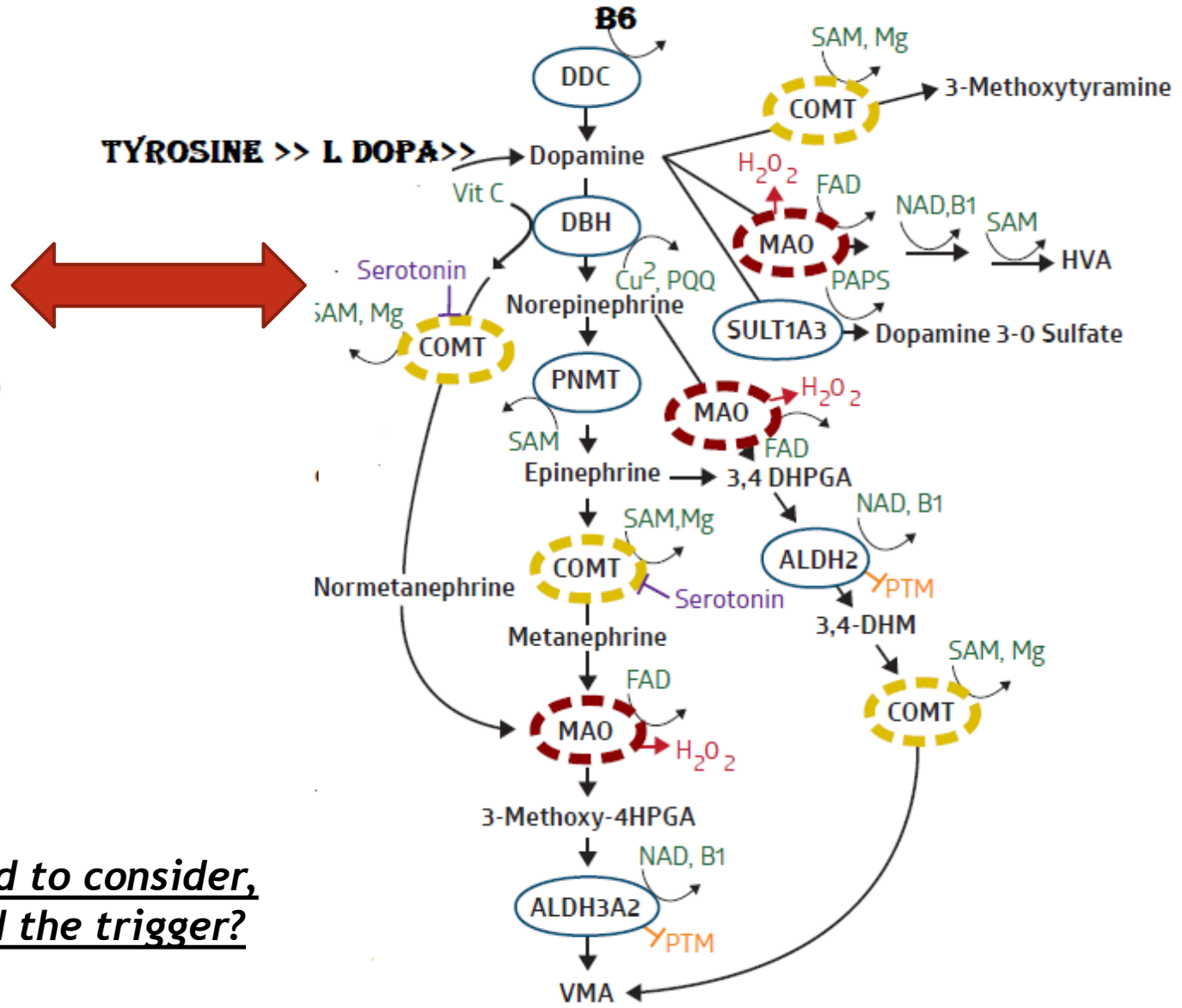
Absorbable Folate and Cobalamin (B12)

NAD (B3), FAD (B2)
B6
Mg, Zn
SAMe

Most Important: ATP (your energy)

What Predispositions?

- Excitation as expressed by Anxiety, OCD, ADD, etc.
- Pathway needs:
- Inhibitory support (Serotonin, GABA)
  - SAM
  - B6, Vit C
  - B1, B2 B3
  - Mg, Cu
  - PQQ



Always need to consider, what pulled the trigger?

rs1049748	ABP1 P574P	T	CT	+/-
rs1049793	ABP1/DAO H664A	G	CG	+/-
rs1049742	ABP1/DAO S332P	T	CC	-/-
rs10156191	ABP1/DAO T16M	T	CT	+/-
rs6911472	CNR1 A88853143C	C	AA	-/-
rs6928813	CNR1 A88861698G	G	AA	-/-
rs806380	CNR1 A88864653G	G	AG	+/-
rs806381	CNR1 A88865901G	C	AG	-/-
rs7752758	CNR1 A88866376G	G	AA	-/-
rs12528858	CNR1 A88867488G	G	AA	-/-
rs806378	CNR1 C88859551T	T	CT	+/-
rs9450898	CNR1 C88864063T	T	CC	-/-
rs4707436	CNR1 G88851751A	A	GG	-/-
rs6454673	CNR1 G88871049A	G	GG	+/+
rs1049353	CNR1 T453T	T	CC	-/-
rs806368	CNR1 T88850100C	C	TT	-/-
rs12720071	CNR1 T88851181C	C	TT	-/-
rs806369	CNR1 T88856178C	T	TT	+/+
rs806374	CNR1 T88857320C	T	TT	+/+
rs806376	CNR1 T88858648C	C	CT	+/-
rs806377	CNR1 T88858723C	T	CT	+/-
rs6454672	CNR1 T88861570C	C	TT	-/-
rs12205430	CNR1 T88867925C	C	TT	-/-
rs6454674	CNR1 T88872930G	T	TT	+/+
rs2502993	CNR2 A282A	A	AG	+/-
rs2501431	CNR2 G155G	A	AG	+/-
rs16828926	CNR2 G24215130A	A	AG	+/-
rs2501432	CNR2 G63A	T	CT	+/-
rs2229579	CNR2 H316T	A	GG	-/-
rs4649124	CNR2 L251L	A	AG	+/-
rs9424398	CNR2 T24221834G	G	GT	+/-
rs3741775	DAO A14747C	C	AC	+/-
[illegible]347	DAO A24464G	G	AA	-/-
[illegible]4086	DAO C109286399T	T	CC	-/-
[illegible]	DAO G109284478T	G	GG	+/+
rs2070586	DAO G8864A	A	GG	-/-
rs7980427	DAO S93S	A	GG	-/-
rs2070587	DAO T887G	T	TT	+/+
rs2111902	DAO T9891G	T	TT	+/+

rs2073440	HDC A1932C	G	TT	-/-
rs17740607	HDC C92T	A	GG	-/-
rs854158	HDC T10086C	G	AG	+/-
rs16963486	HDC T1657C	G	AA	-/-
rs1800708	HFE 10795T>C	C	TT	-/-
rs2071302	HFE 11622T>C	C	TT	-/-
rs2794719	HFE 6382T>G	G	GT	+/-
rs9366637	HFE 8590C>T	T	CC	-/-
rs2071303	HFE 8828T>C	C	TT	-/-
rs1800562	HFE C282Y	A	GG	-/-
rs1799945	HFE H63D	G	CC	-/-
rs1050900	HNMT A*218T	T	AA	-/-
[illegible]21	HNMT A47507G	G	AA	-/-
[illegible]	HNMT C29232A	A	CC	-/-
rs6430764	HNMT C3616T	T	TT	+/+
rs1050891	HNMT T939C	G	AA	-/-
rs347591	HRH1 G11290122T	G	GT	+/-
rs2067466	HRH1 G57C	C	GG	-/-
rs7851620	HRH1 G809A	A	GG	-/-
rs346070	HRH1 T*1687C	T	CT	+/-
rs901885	HRH1 T-17C	T	CT	+/-
rs11662595	HRH4 A617G	G	AG	+/-
rs11665084	HRH4 C413T	T	CT	+/-
rs4800573	HRH4 G*2144A	A	GG	-/-
rs1421125	HRH4 G*385T	T	GG	-/-
rs16940765	HRH4 T3537649C	C	TT	-/-
rs7997012	HTR2A T64185C	G	AG	+/-

Histamine

Extracellular **Intracellular**

WHY IS HISTAMINE IMPORTANT?

Adv Exp Med Biol. 2010;709:95-107.

Histamine in neurotransmission and brain diseases.

Nuutinen S[1], Panula P.

Author information

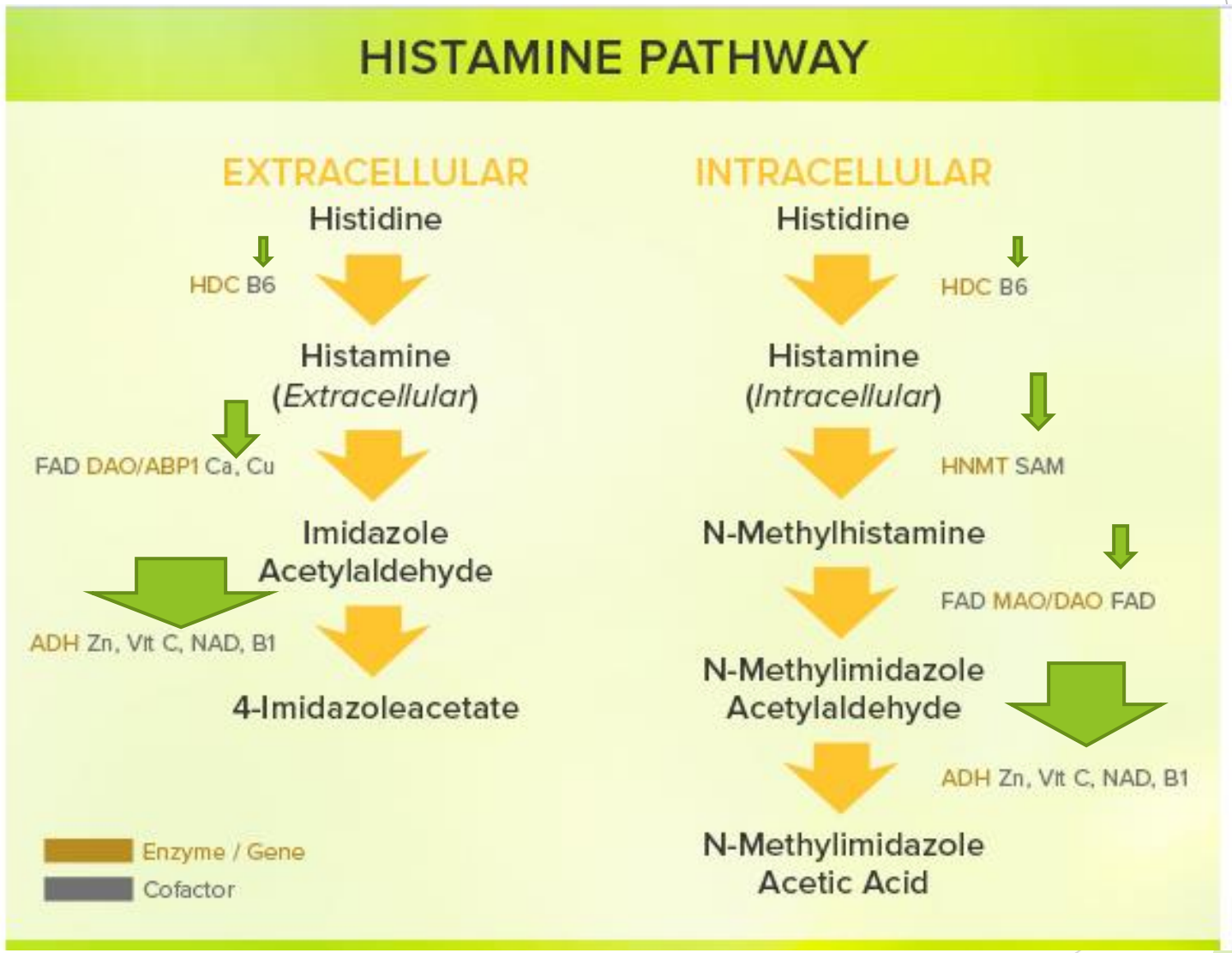
Abstract

Apart from its central role in the mediation of allergic reactions, gastric acid secretion and inflammation [illegible] histamine serves an important function as a neurotransitter in the central nervous system. The histaminergic neu[illegible] originate from the tuberomamillary nucleus of the posterior hypothalamus and send projections to most parts of the brain. The central histamine system is involved in many brain functions such as arousal, control of pituitary hormone secretion, suppression ofeating and cognitive functions. The effects of neuronal histamine are mediated via G-protein-coupled H1-H4 receptors. The prominent role of histamine as a wake-promoting substance has drawn interest to treat sleep-wake disorders, especially narcolepsy, via modulation of H3 receptor function. Post mortem studies have revealed alterations in histaminergic system in neurological and psychiatric diseases. Brain histamine levels are decreased in Alzheimer's disease patients whereas abnormally high histamine concentrations are found in the brains of Parkinson's disease and schizophrenic patients. Low histamine levels are associated with convulsions and seizures. The release of histamine is altered in response to different types of brain injury: e.g. increased release of histamine in an ischemic brain trauma might have a role in the recovery from neuronal damage. Neuronal histamine is also involved in the pain perception. Drugs that increase brain and spinal histamine concentrations have antinociceptive properties. Histaminergic drugs, most importantly histamine H3 receptors ligands, have shown efficacy in many animal models of the above-mentioned disorders. Ongoing clinical trials will reveal the efficacy and safety of these drugs in the treatment of human patients.

PMID: 21618891

The central histamine system is involved in many brain functions such as arousal, control of pituitary hormone secretion, suppression of eating and cognitive functions.

The prominent role of histamine as a wake-promoting substance has drawn interest to treat sleep-wake disorders, especially narcolepsy, via modulation of H3 receptor function.


HISTAMINE PATHWAY
EXTRACELLULAR
Histidine
HDC B6
Histamine
(Extracellular)
FAD DAO/ABP1 Ca, Cu
Imidazole
Acetylaldehyde
ADH Zn, Vit C, NAD, B1
4-Imidazoleacetate
INTRACELLULAR
Histidine
HDC B6
Histamine
(Intracellular)
HNMT SAM
N-Methylhistamine
FAD MAO/DAO FAD
N-Methylimidazole
Acetylaldehyde
ADH Zn, Vit C, NAD, B1
N-Methylimidazole
Acetic Acid
Enzyme / Gene
Cofactor

An Excellent example of how genetics can help us

Newborn screening for autism: in search of candidate biomarkers

Background: Autism spectrum disorder (ASD) represents a wide range of neurodevelopmental disorders characterized by impairments in social interaction, lang
is usually diagnosed in children 3–5 years of age using b
birth would be beneficial for early initiation of treatm
newborns at risk for ASD utilizing bloodspot specimens i
study utilized stored frozen specimens from ASD child
newborn specimens and controls were analyzed by immu
biomarkers and subjected to statisical analysis. **Results:** Three sets of five biomarkers associated with ASD were found that differed from control groups. The 15 candidate biomarkers were then discussed regarding their association with ASD. **Conclusion:** This study determined that a statistically selected panel of 15 biomarkers successfully discriminated presumptive newborns at risk for ASD from those of nonaffected controls.

Aim: This retrospective study sought to identify newborns at risk for ASD

Mizejewski, G. J., Lindau-Shepard, B., & Pass, K. A. (2013). *Newborn screening for autism: in search of candidate biomarkers. Biomarkers in Medicine, 7(2), 247–260.* doi:10.2217/bmm.12.108

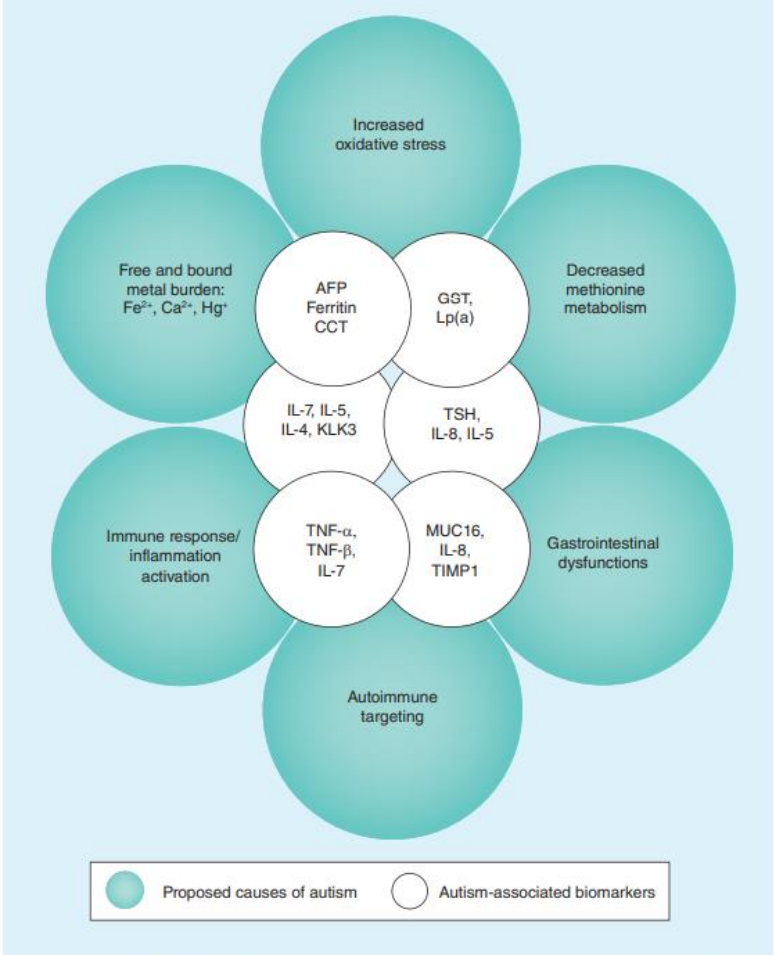


Figure 3. A circle model of proposed causes of autism versus screen-selected biomarkers.
A circle model of the proposed six causes of autism is shown on the outer circles, while the inner overlapping circles indicate the biomarkers associated with the causative metabolic or immune response/inflammation events. The overlap of the outer and inner circles indicates the degree of association of the two agents.

The proper use of epigenetics here is to raise your "Index of Suspicion" of pathways that would be compromised under an oxidative stress load.

The benefit of this type of research is that the epigenetics point to possible specific dysfunctions under an oxidative stress load.

These dysfunctions are identified as root causes of autism. All very true.

The knowledge of these will allow you to intervene in the presence of the pathology.

Of great benefit is to know the probabilities so that you can prevent the occurrence of pathology.

Mizejewski, G. J., Lindau-Shepard, B., & Pass, K. A. (2013). *Newborn screening for autism: in search of candidate biomarkers. Biomarkers in Medicine, 7(2), 247–260.* doi:10.2217/bmm.12.108

Is this premise correct??.....NO

Newborn screening for autism: in search of candidate biomarkers

Background: Autism spectrum disorder (ASD) represents a wide range of neurodevelopmental disorders characterized by impairments in social interaction, language, communication and range of interests. Autism is usually diagnosed in children 3–5 years of age using behavioral characteristics; thus, diagnosis shortly after birth would be beneficial for early initiation of treatment. **Aim:** This retrospective study sought to identify newborns at risk for ASD utilizing bloodspot specimens in an immunoassay. **Materials & methods:** The present study utilized stored frozen specimens from ASD children already diagnosed at 15–36 months of age. The newborn specimens and controls were analyzed by immunoassay in a multiplex system that included 90 serum biomarkers and subjected to s
were found that differed from
their association with ASD. **Conc**
successfully discriminated presu

*"**diagnosis** shortly after birth would be beneficial for early initiation of treatment"*

Presumption is that *you are born* with Autism. Although this entire paper refutes that premise, it is a commonly held belief.

Mizejewski, G. J., Lindau-Shepard, B., & Pass, K. A. (2013). *Newborn screening for autism: in search of candidate biomarkers. Biomarkers in Medicine, 7(2), 247–260.* doi:10.2217/bmm.12.108

GLITCH: The Definition of "DIAGNOSIS"

"*investigation or analysis of the **cause** or nature of a condition, situation, or problem*"*

SYMPTOM(S)

- Sore throat
- IBS
- "Hyperacidity"
- Effects of root causes

DIAGNOSIS

- Strep Throat
- Celiac Disease
- H.Pylori induced gastritis
- Root Causes

A descriptive "diagnosis" of the syndrome often leads to suboptimal clinical results as the investigation into root causes ceases.

"Diagnosing" an infant at birth with autism based on genetic polymorphisms may have the *counterproductive effect of labeling, the feeling that nothing can be done, and the parents may be dissuaded from making healthy choices for the child that would prevent Autism.*

*https://www.merriam-webster.com/dictionary/diagnosis

*"Newborn screening for autism: in search of candidate biomarkers"** The Learning Points.

The authors prove, on an acceptable scientific basis:

- That autism has root causes.
- There may be predictive power in determining the genetic SNPs.
- In so doing, within their pathways, the SNPs provide a map for the clinician in either treatment or prevention.

*Mizejewski, G. J., Lindau-Shepard, B., & Pass, K. A. (2013). *Newborn screening for autism: in search of candidate biomarkers. Biomarkers in Medicine, 7(2), 247–260.* doi:10.2217/bmm.12.108

What have we learned?

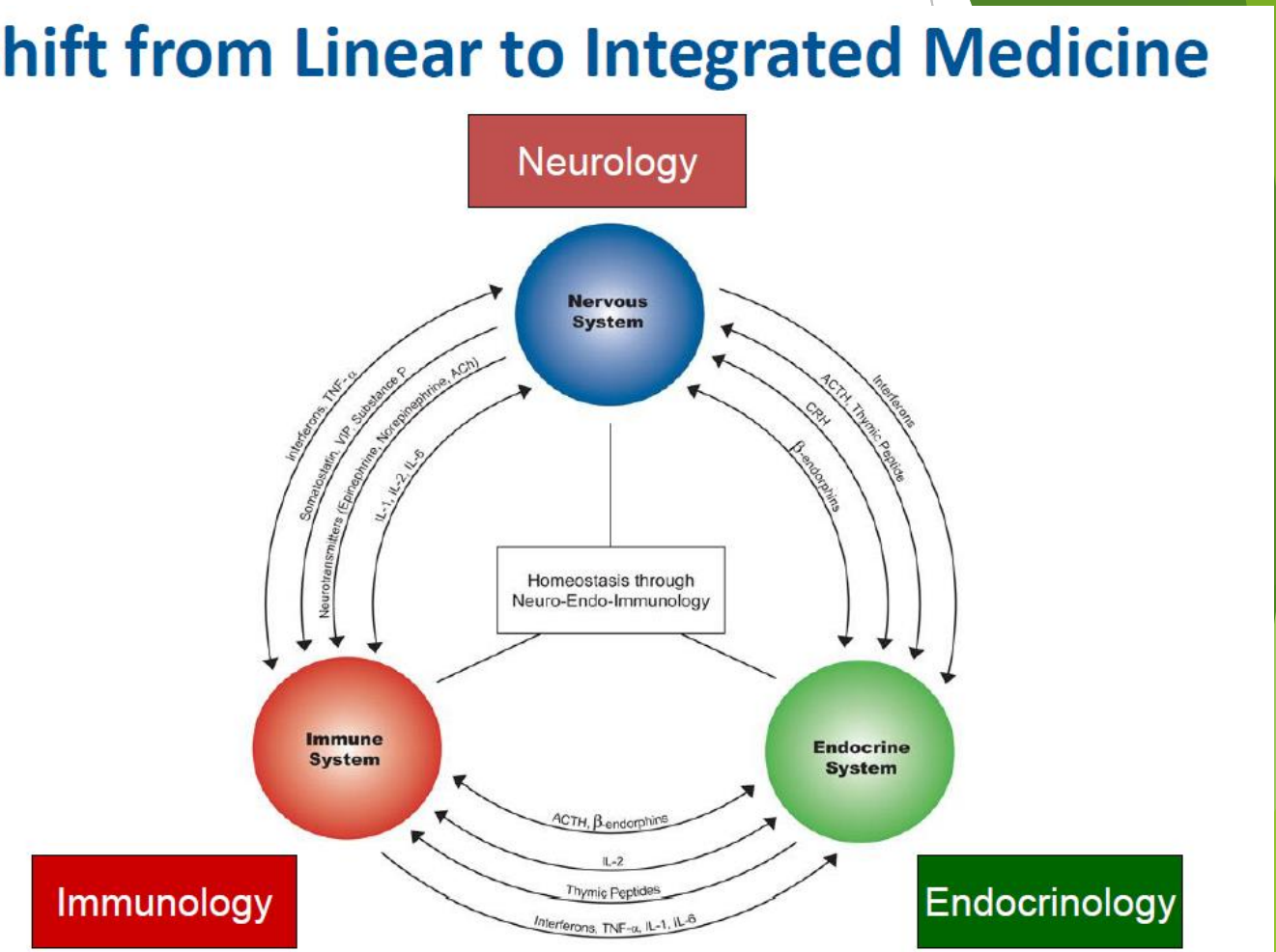
Your genes are not your destiny

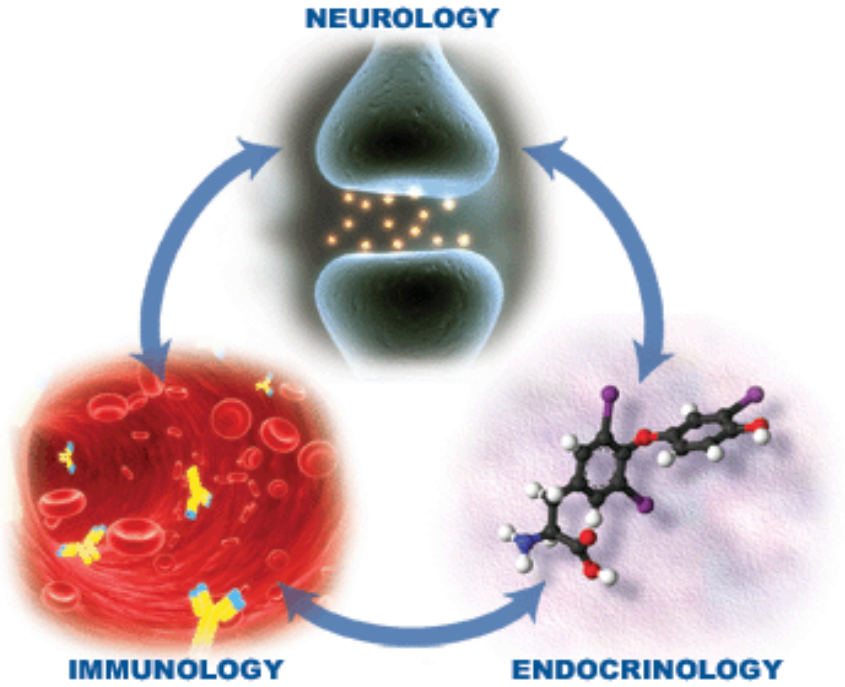
Proper knowledge of SSNPs will raise your index of suspicion for certain types of pathology. Knowledge of the necessities of the biochemical pathways give you actionable treatment possibilities.

It’s simply one set of data.

Neuro-Endo-Immunology
The "NEI Supersystem"

Not separate systems





Each System has Unique Biomarkers

The Neurological System's Biomarkers:

Neurotransmitters (Serotonin, GABA, Glutamate, Dopamine, Epinephrine, Norepinephrine, PEA)

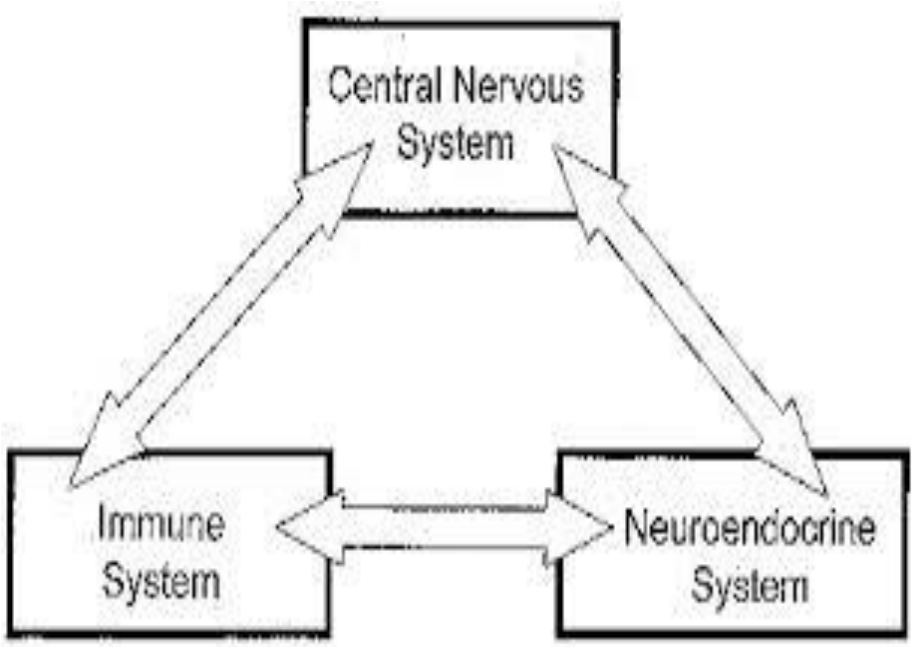
Endocrinology (glands, etc.) biomarkers:

Hormones (estrogen, progesterone, insulin, thyroxine, etc.)

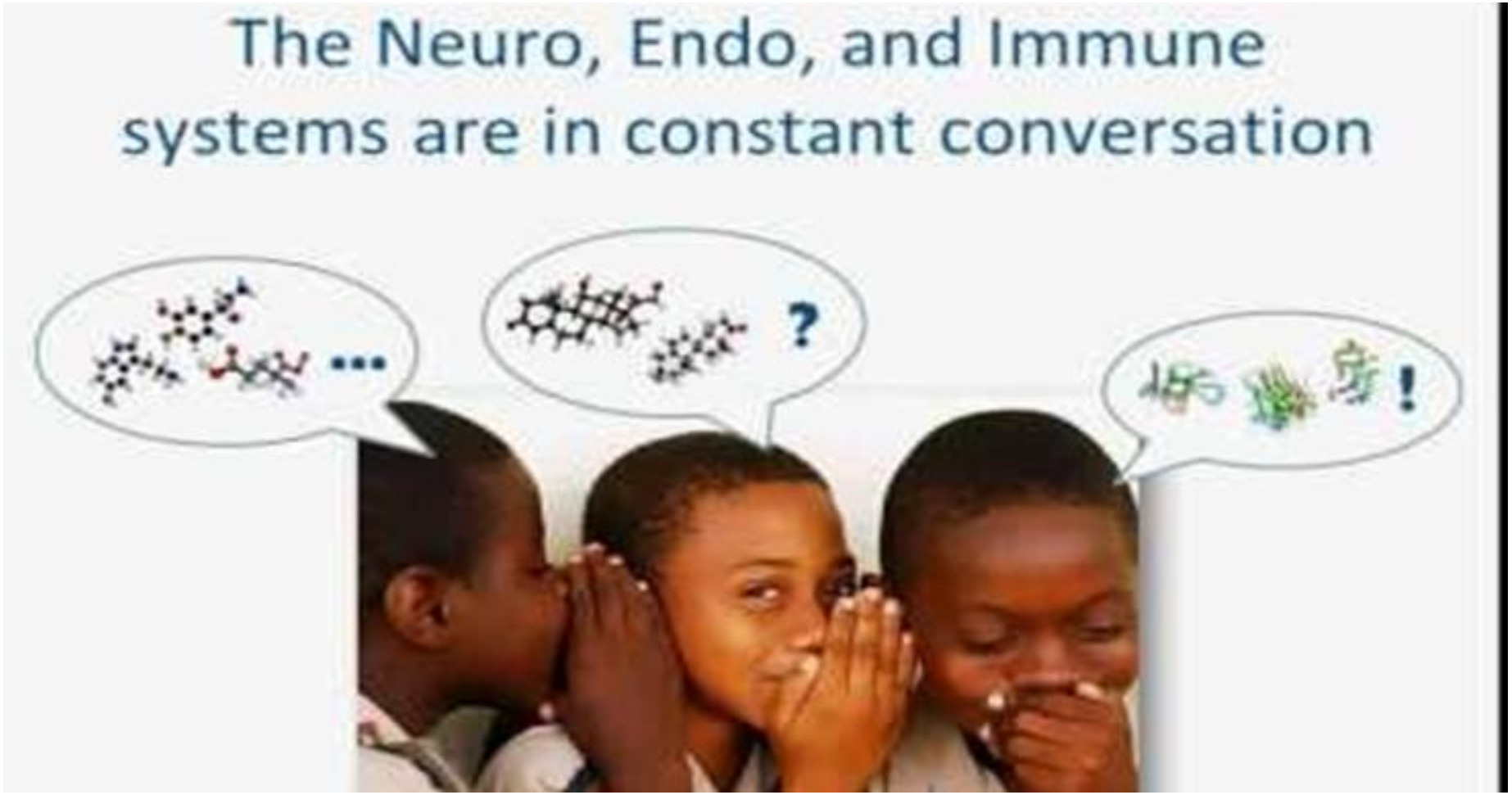
The Immune system's biomarkers:

Cytokines (Il-12, TNF-α, TGF-β, Il-4, IFN-Y)

All systems have receptors for each others' systems



- Neuro system has receptors for cytokines and hormones
- Endo system has receptors for neurotransmitters and cytokine
- Immune system has receptors for neurotransmitters and hormones



Neuroendocrine Interactions in the Immune System

Dennis D. Taub†

▸ Author information ▸ Copyright and License information Disclaimer

The publisher's final edited version of this article is available at Cell Immunol
See other articles in PMC that cite the published article.

Abstract

Substantial evidence now exists supporting the bidirectional communication betwee
and immune systems. A number of hormonal and neuropeptide mediators have bee
immune development and function in healthy, aged and diseased individuals. Immun
receptors for many of these ligands and similarly, receptors for cytokines and growth factor
identified on cells within the central nervous and endocrine systems. During times of stress or injury,
of these systems come into play and transmits messages to one another. The lines of communication
between the immune system and these various neuronal and endocrine organ systems constitute specific
axes of interactions, which have been shown to have a profound impact on immune function, disease
development and susceptibility to infections and disease. In this Special Issue, experts in neuroendocrine
immunology have provided comprehensive reviews on the current advances in this area of research as well
as commentary on relevance of the various axes in controlling immunity and disease development.

Keywords: Neuroendocrine, Immunity, Hormones, Neuropeptides, Hypothalamic-Pituitary-Adrenal (HPA), Stress, Thymus, Sympathetic Nervous System

Substantial evidence now exists supporting the bidirectional communication between the neuroendocrine and immune systems.

Taub DD. Neuroendocrine interactions in the immune system. Cell Immunol. 2008;252(1-2):1–6. doi:10.1016/j.cellimm.2008.05.006

Psycho-Neuro-Endocrine-Immunology (P.N.E.I.) is a scientific field of study that investigates the link between bidirectional communications among the nervous system, the endocrine system, and the immune system and the correlations of this cross-talk with physical health.

Format: Abstract

Adv Exp Med Biol. 2017;996:123-134. doi: 10.1007/978-3-319-56017-5_11.

Psycho-Neuro-Endocrine-Immunology: A Psychobiological Concept.

França K[1,2], Lotti TM[3].

Author information

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2 Institute for Bioethics & Health Policy; Department of Dermatology & Cutaneous Surgery; Department of Psychiatry & Behavioral Sciences, University of Miami Miller School of Medicine, Miami, FL, USA.
3 Centro Studi per la Ricerca Multidisciplinare e Rigenerativa, Universita Degli Studi "G. Marconi", Rome, Italy. professor@torellolotti.it.

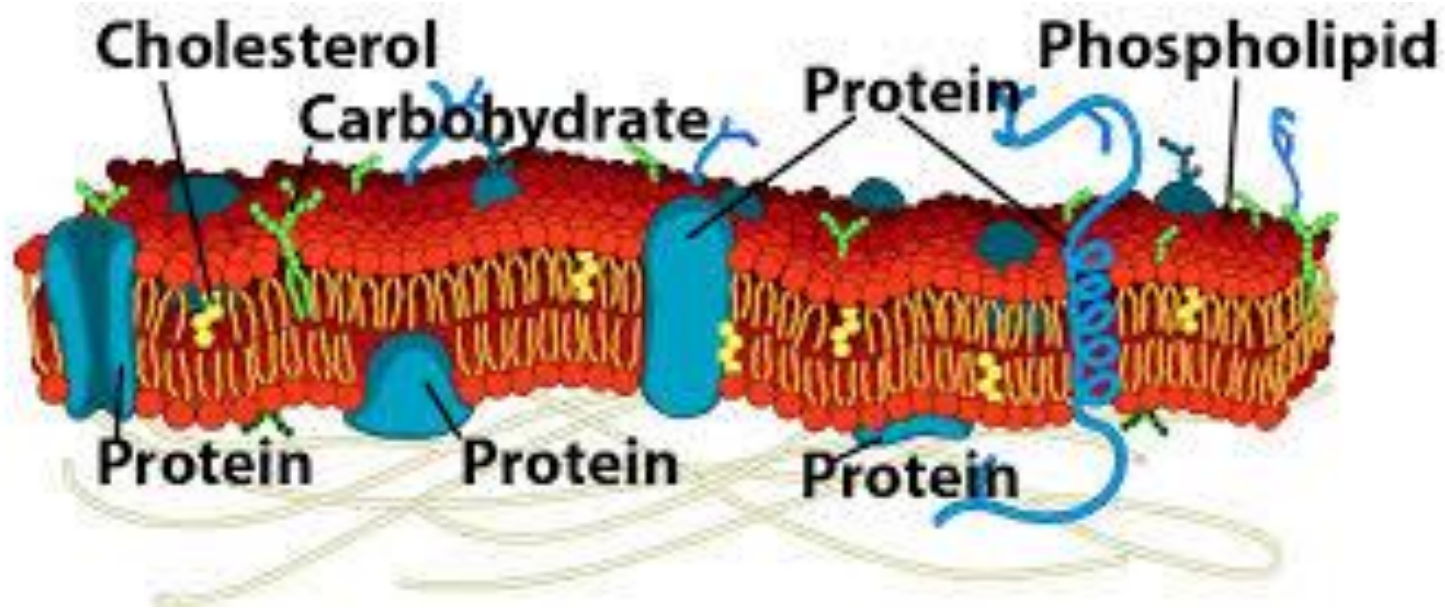
Abstract

Psycho-Neuro-Endocrine-Immunology (P.N.E.I.) is a scientific field of study that investigates the link between bidirectional communications among the nervous system, the endocrine system, and the immune system and the correlations of this cross-talk with physical health. The P.N.E.I. innovative medical approach represents a paradigm shift from a strictly biomedical view of health and disease taken as hermetically sealed compartments to a more interdisciplinary one. The key element of P.N.E.I. approach is represented by the concept of bidirectional cross-talk between the psychoneuroendocrine and immune systems. The Low Dose Medicine is one of the most promising approaches able to allow the researchers to design innovative therapeutic strategies for the treatment of skin diseases based on the rebalance of the immune response.

https://www.ncbi.nlm.nih.gov/pubmed/29124696

What have we learned about the NEI supersystem

- We have learned that the neurological, endocrine, and immune systems constantly communicate with one another.
- The mechanism of this is the fact that each system has the receptors for the other systems' biomarkers.
- When one system is compromised it will affect the other systems.
- The NEI super system removes diagnosis and treatment from a single discipline to a more multidisciplinary approach. Dare I say, a more holistic approach?



Cell Membrane Integrity

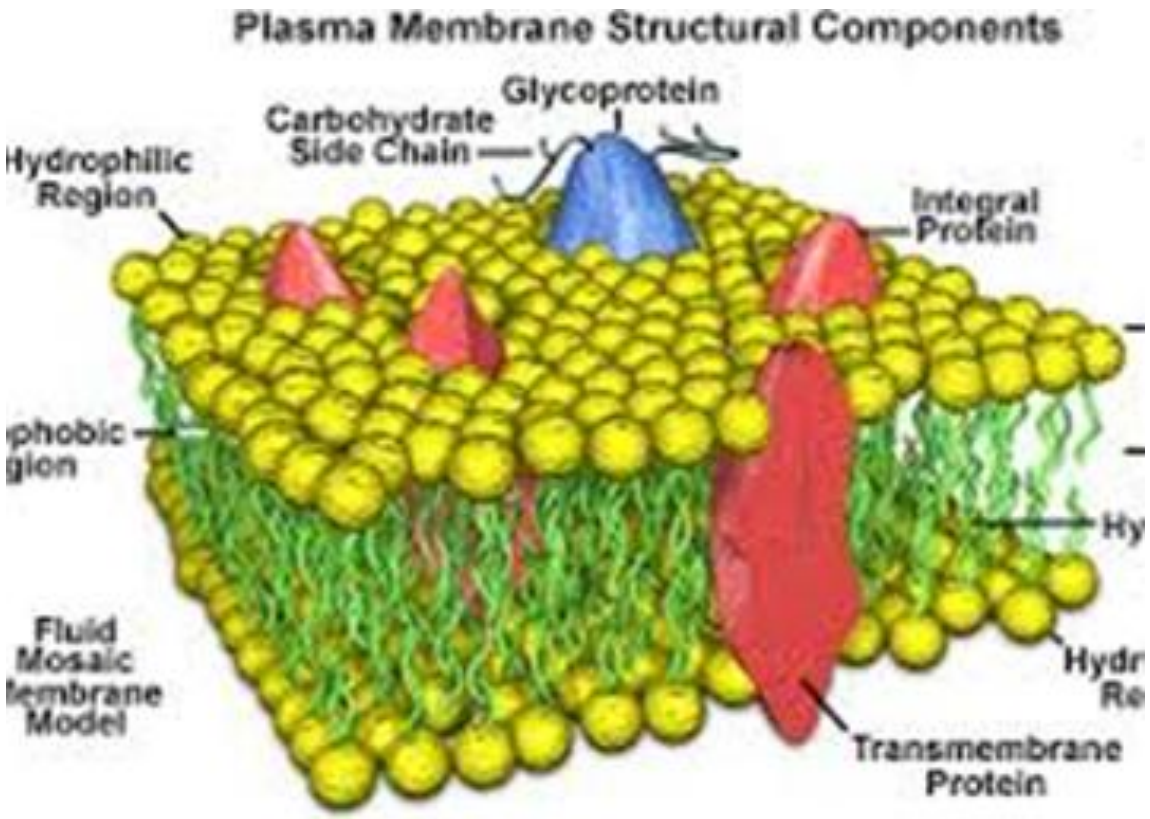
Important and often overlooked!

Source: sciencemusicvideos.com

The "Master" of the Cell Physiology The Cell Membrane

- The cell membrane is selectively permeable protecting homeostasis.
- Allows for the sending of messages throughout the body (depolarization/repolarization of neural impulses)
- Contains integral proteins, transmembrane proteins (acting as pumps or channels)
- Contains receptors that provide for the signaling of various biological functions.
- Please a key role in the immune process.

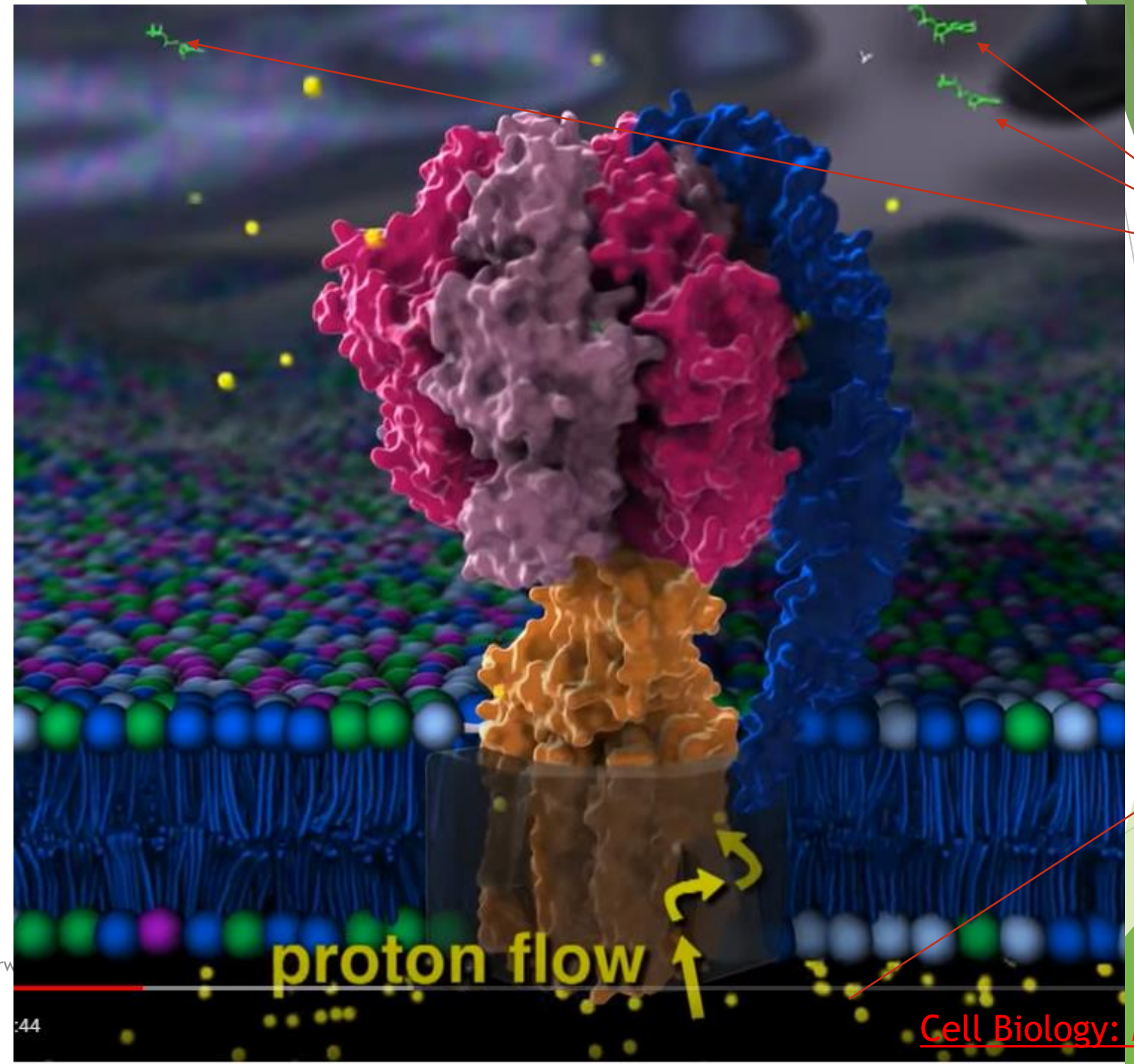
“Leaky” Cell Membranes



- Interrupts all physiological processes including:
- Neural transmission, integral and transmembrane protein function.
- Most importantly, interferes with the immune system's ability to differentiate between self and non-self.

Source: “Leaky Gut, Leaky Cells, Leaky Brain” Used with permission of the authors

ATP Synthase Complex V

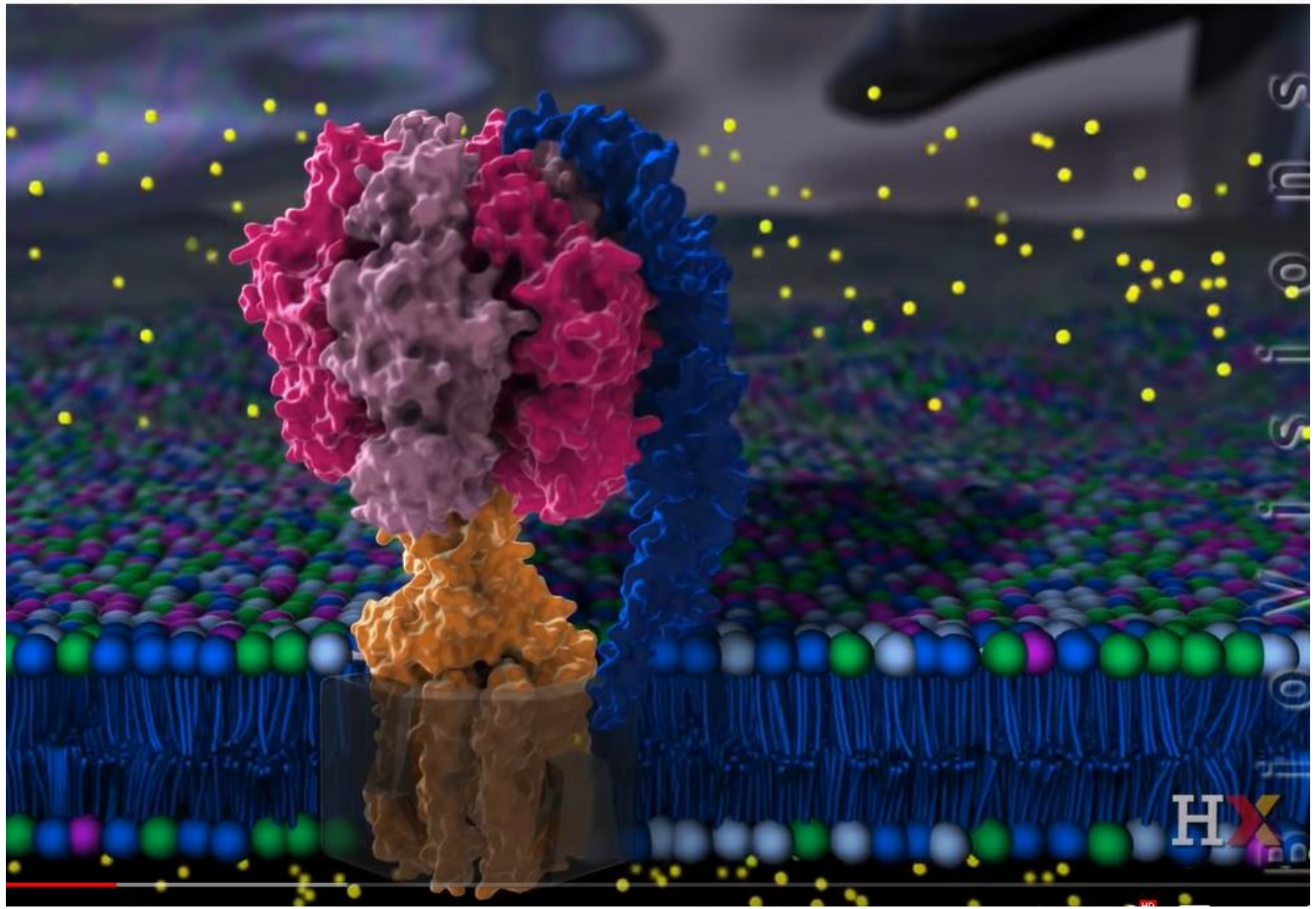


ATP (energy)

High Energy Protons

Patent Cell Membrane

Cell Biology: Mitochondria | edX



Leaky Membrane

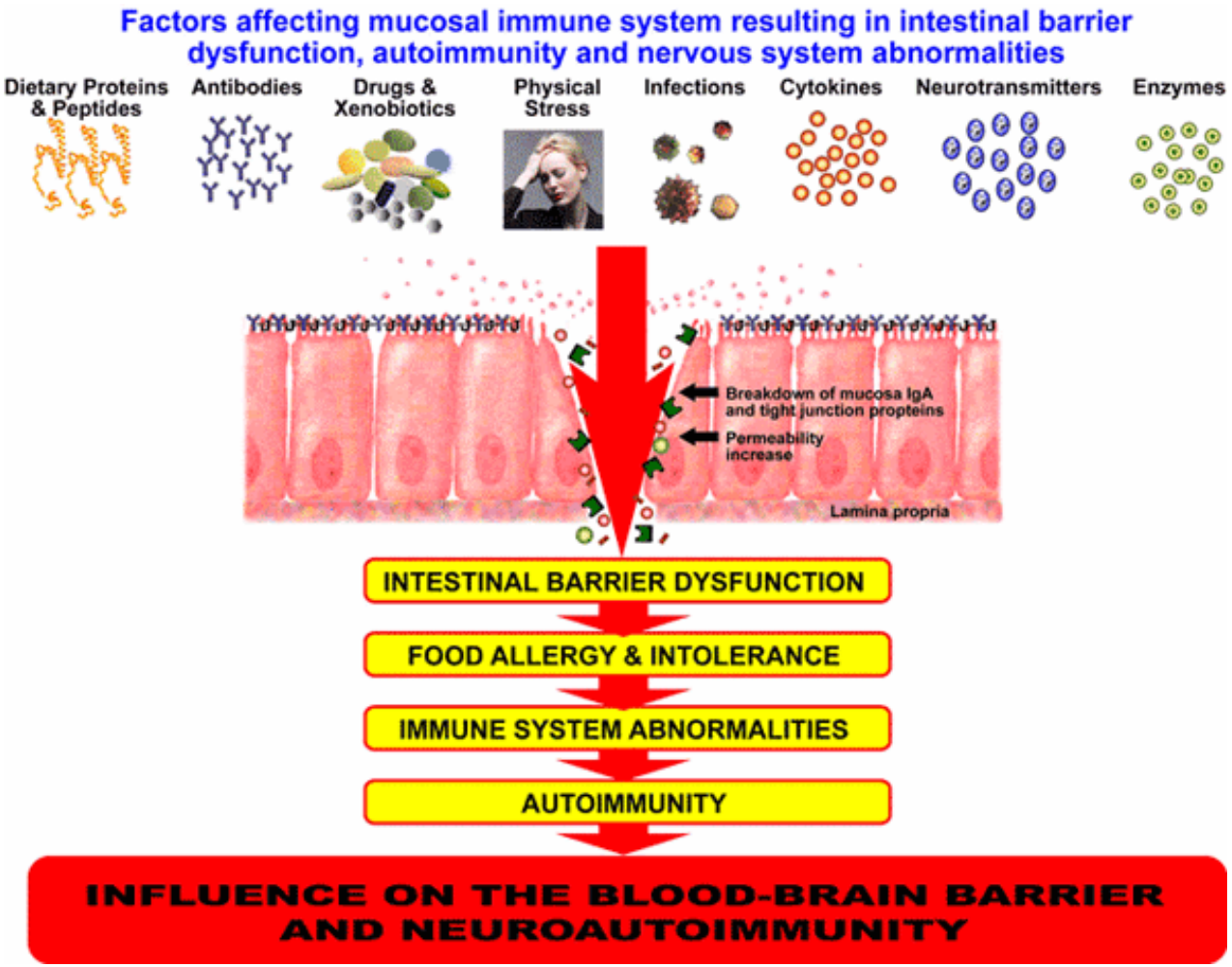
Protons Leak Through

Energy production stops and cell death occurs

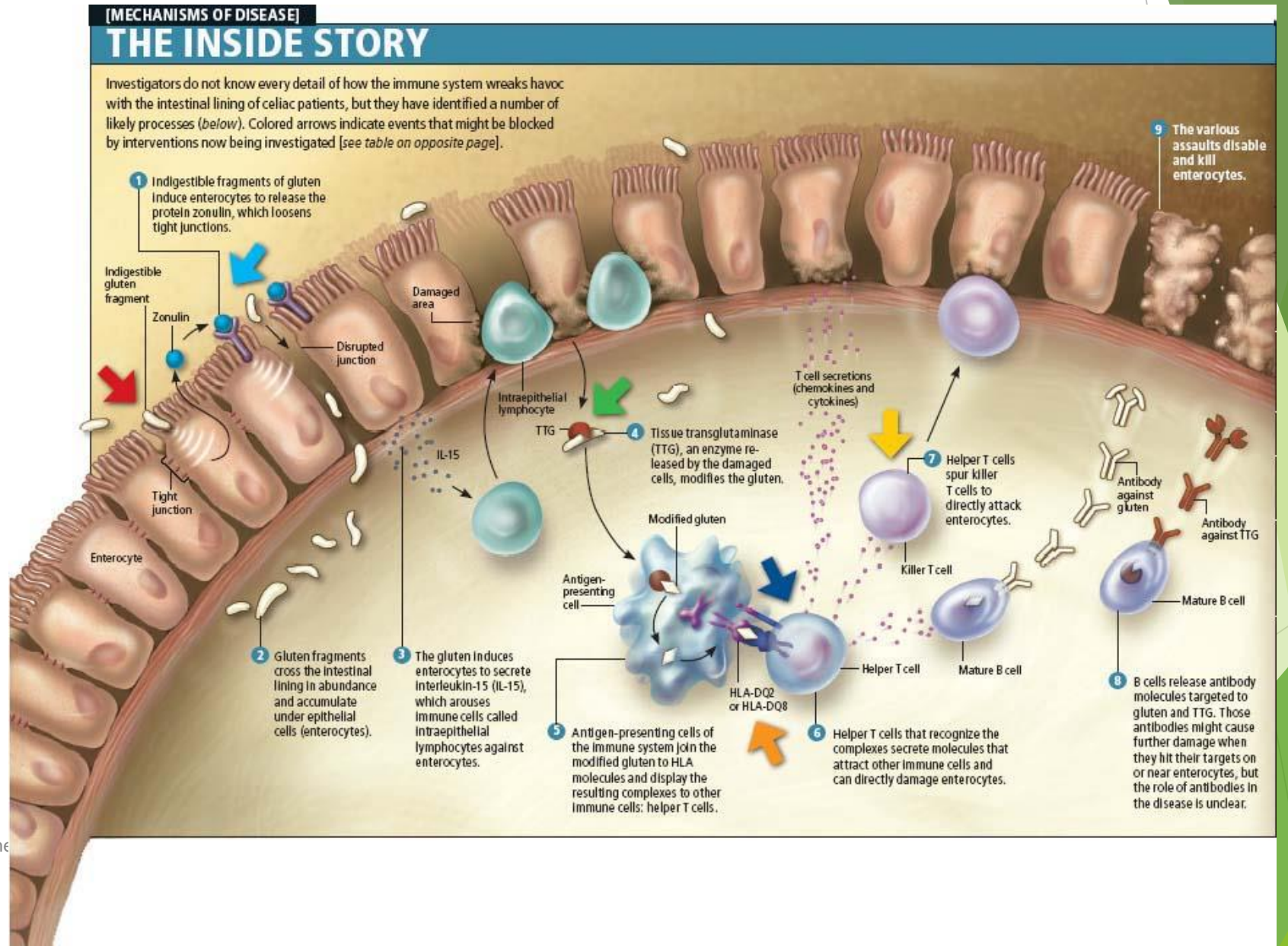
Cell Biology: Mitochondria | edX

- Leaky Gut Syndrome
  - The most common causation of chronic inflammation
  - AND
  - The easiest to fix.

- http://www.glutenfreesociety.org/gluten-free-society-blog/leaky-gut-syndrome-is-gluten-at-the-root



For Those who like things complex ☺



Gut–brain axis: how the microbiome influences anxiety and depression

Jane A. Foster ✉, Karen-Anne McVey Neufeld

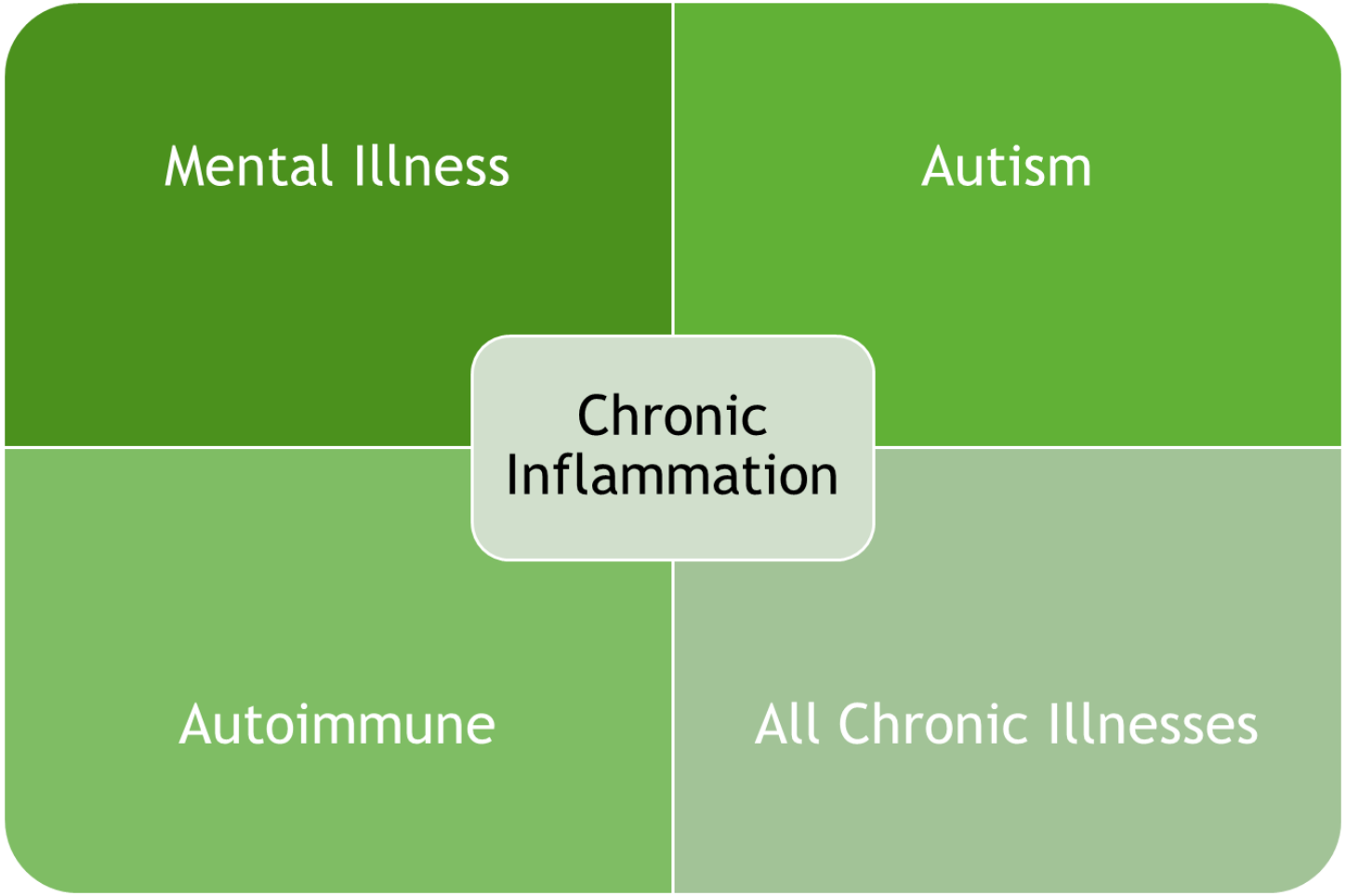
⊞ Show more

https://doi.org/10.1016/j.tins.2013.01.005 Get rights and content

Within the first few days of life, humans are colonized by commensal intestinal microbiota. Here, we review recent findings showing that microbiota are important in normal healthy brain function. We also discuss the relation between stress and microbiota, and how alterations in microbiota influence stress-related behaviors. New studies show that athogenic bacteria, in pathways and central ng and future animal and robiota–gut–brain axis d treatment of mental

New studies show that bacteria, including commensal, probiotic, and pathogenic bacteria, in the gastrointestinal (GI) tract can activate neural pathways and central nervous system (CNS) signaling systems.

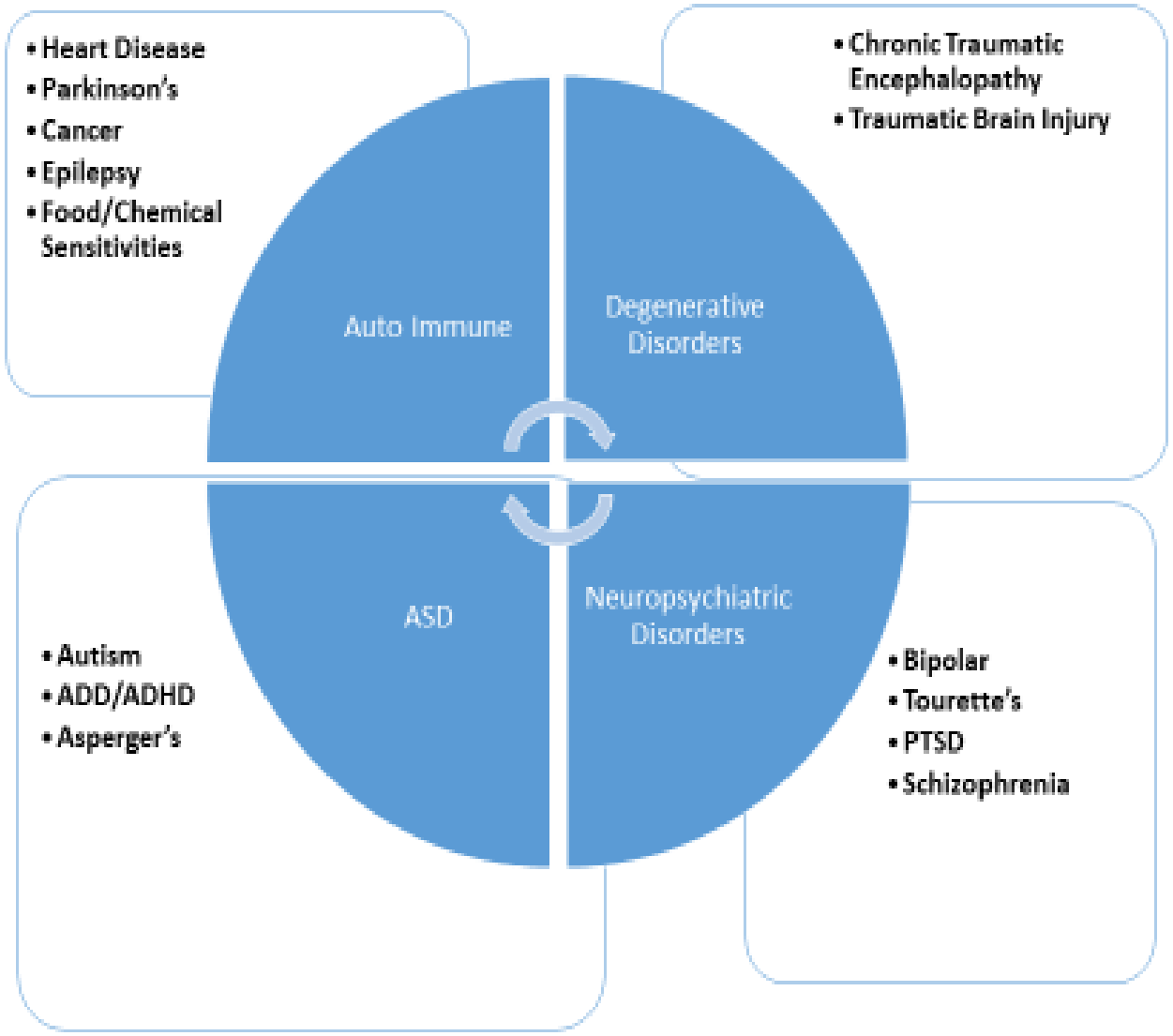
Jane A. Foster, Karen-Anne McVey Neufeld, Gut-brain axis: how the microbiome influences anxiety and depression, Trends in Neurosciences, Volume 36, Issue 5, 2013,Pages 305-312, ISSN 0166-2236,



Chronic Inflammation and CIRS (Chronic Inflammatory Response Syndrome) are equivalents

Source: "Leaky Gut, Leaky Cells, Leaky Brain" Used with permission of the authors

Reference for the last slide



Source:
Robert K. Naviaux,
Metabolic features of the cell danger response,
Mitochondrion,
Volume 16,
2014,
Pages 7-17,
ISSN 1567-7249,
https://doi.org/10.1016/j.mito.2013.08.006.

How to fix a Leaky Gut

Principles:

We need to fully digest foods. Undigested foods make up most of the antigens that enter our bodies. *(Digestive Enzymes)*

We need to re-create the mucus layer in the gut. The mucus layer is where the microbiome lives, what they eat, and where they do their work. The mucus layer traps antigens, toxins, xenobiotics and forms the initial layer of protection. *(FOS, GOS, XOS, HOS)*

We need to repair the cells and the tight junctions. This area is our second layer of defense preventing the entry of the above mentioned into our bodies. *(Butyrate, Zn Carnosine, SBI)*

We need to re-populate the GI tract with an adequate diversity of biota. *(Probiotics)*

Source: "Leaky Gut, Leaky Cells, Leaky Brain" Used with permission of the authors

Miraculous (Almost) Leaky Gut Mucosal Butter

- **Leaky Gut Mucosal Butter** is a simple self-blended product that is showing rapid improvement in cellular repair. It is safe, easy to source, and easy to make.
- Who should use this:
  - Those who want to resolve their cell wall integrity issues that have led to chronic inflammatory symptoms like:
    - Autoimmune diseases
    - ASD
    - Multiple and Extensive Food Intolerances
    - ME/CFS
    - Fibromyalgia
    - Almost any inflammatory condition

Source: "Leaky Gut, Leaky Cells, Leaky Brain" Used with permission of the authors

Leaky Gut Mucosal Butter Ingredients

- Organic Extra Virgin Olive Oil ½ cup
- Organic Salted Butter ¼ cup (if dairy sensitive use ¼ cup coconut, almond, or hempseed oil instead)
- Unpasteurized Natural Honey: 2 Tablespoons
- Probiotics 5 capsules
- Zinc L Carnosine 4 capsules (Seeking Health, Pure Encapsulations)
- Sialex (Ecological Formulas): 4 capsules
- SunButyrate TG (Pure Encapsulations): 1 oz.
- OPTIONAL: L Glutamine powder: 4 scoops.
- *FOR MANY OF MY PATIENTS, INCREASED GLUTAMINE = INCREASED GLUTAMATE AND NEURAL EXCITATION. USE WITH CAUTION IF YOU SUFFER FROM ANXIETY, OCD, OR ANY OF THE OTHER EXCITATORY DISORDERS. IT'S OK TO OMIT THIS IF YOU ARE UNSURE.*

- INSTRUCTIONS:
- Open the capsules and pour out the powder into the blender. Add the oil, butter, and honey.
- Blend on high for approximately two minutes or until the substance is smooth. Then refrigerate. By morning will be able to use the "butter".
- NOTE: You can take the butter "straight" or put on any food that you desire (toast, etc.)

Add Serum Derived Bovine Immunoglobulin Isolate* (6 caps) when there is low SIgA

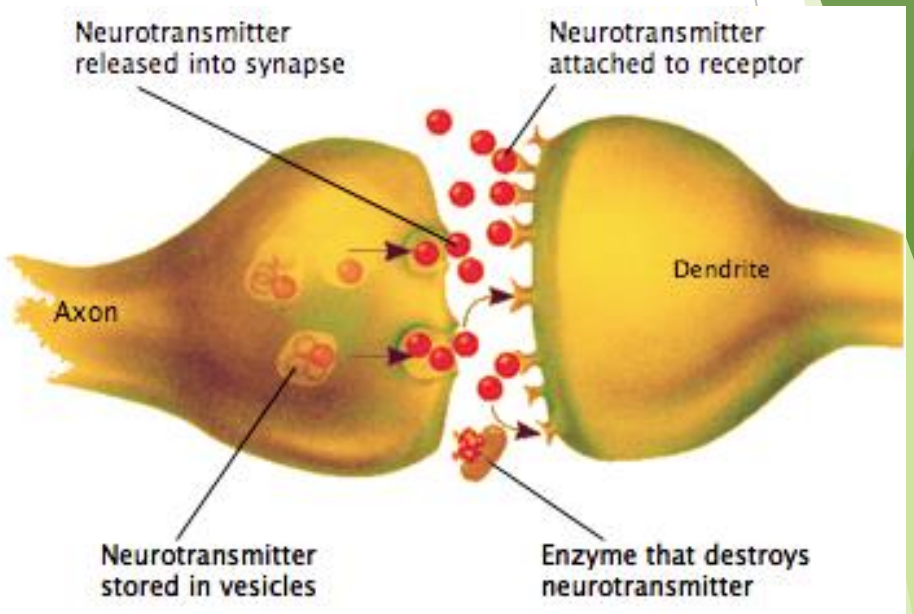
*Hammad Liaquat, Munish Ashat, Abigail Stocker, Lindsay McElmurray, Karen Beatty, Thomas L. Abell, Gerald Dryden, Clinical Efficacy of Serum-Derived Bovine Immunoglobulin in Patients With Refractory Inflammatory Bowel Disease, The American Journal of the Medical Sciences, Volume 356, Issue 6, 2018, https://doi.org/10.1016/j.amjms.2018.08.019.

Source: "Leaky Gut, Leaky Cells, Leaky Brain" Used with permission of the authors

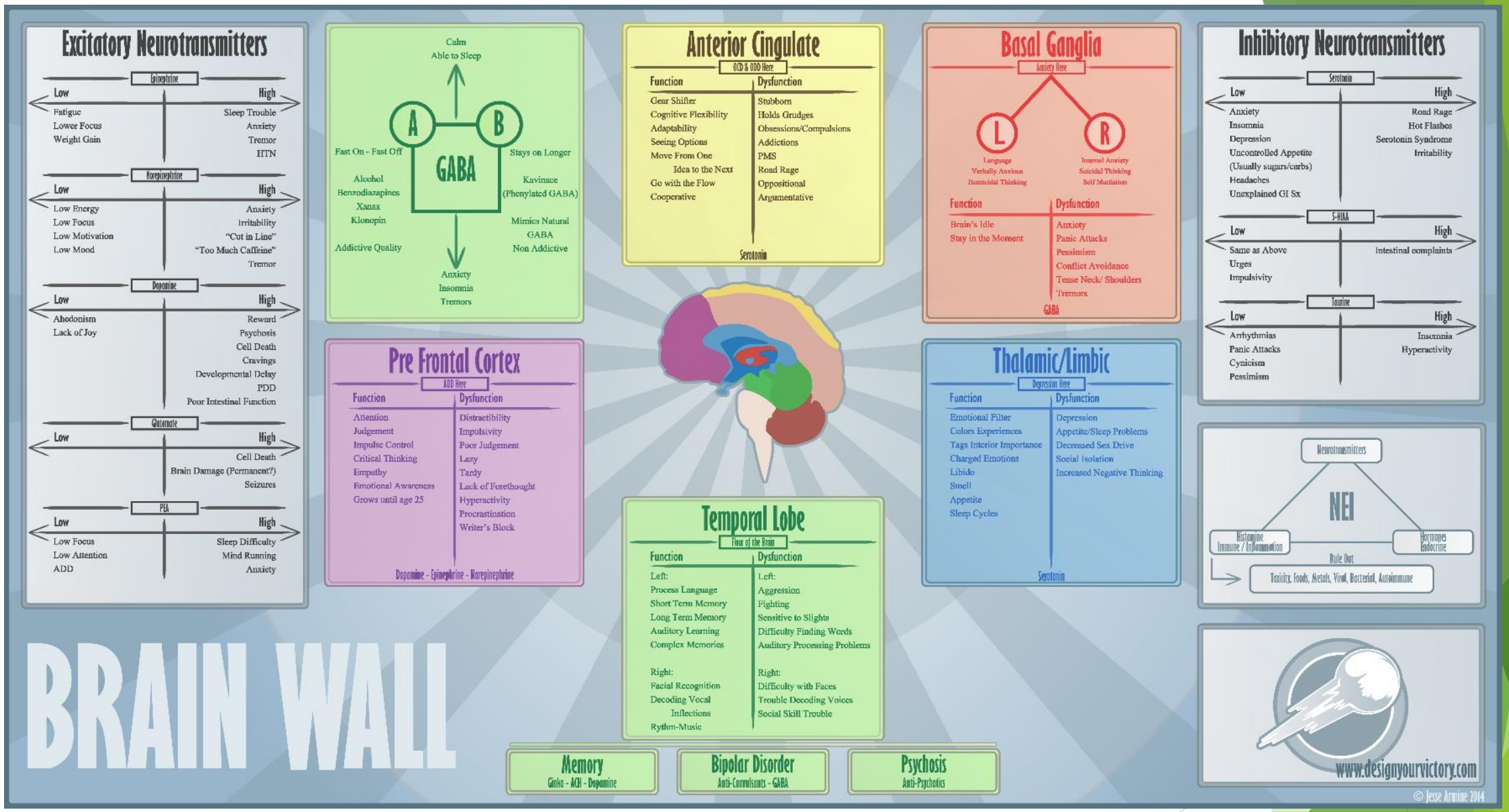
Neurotransmitters

- *Neurotransmitters*, also known as chemical messengers, are endogenous chemicals that enable neurotransmission.

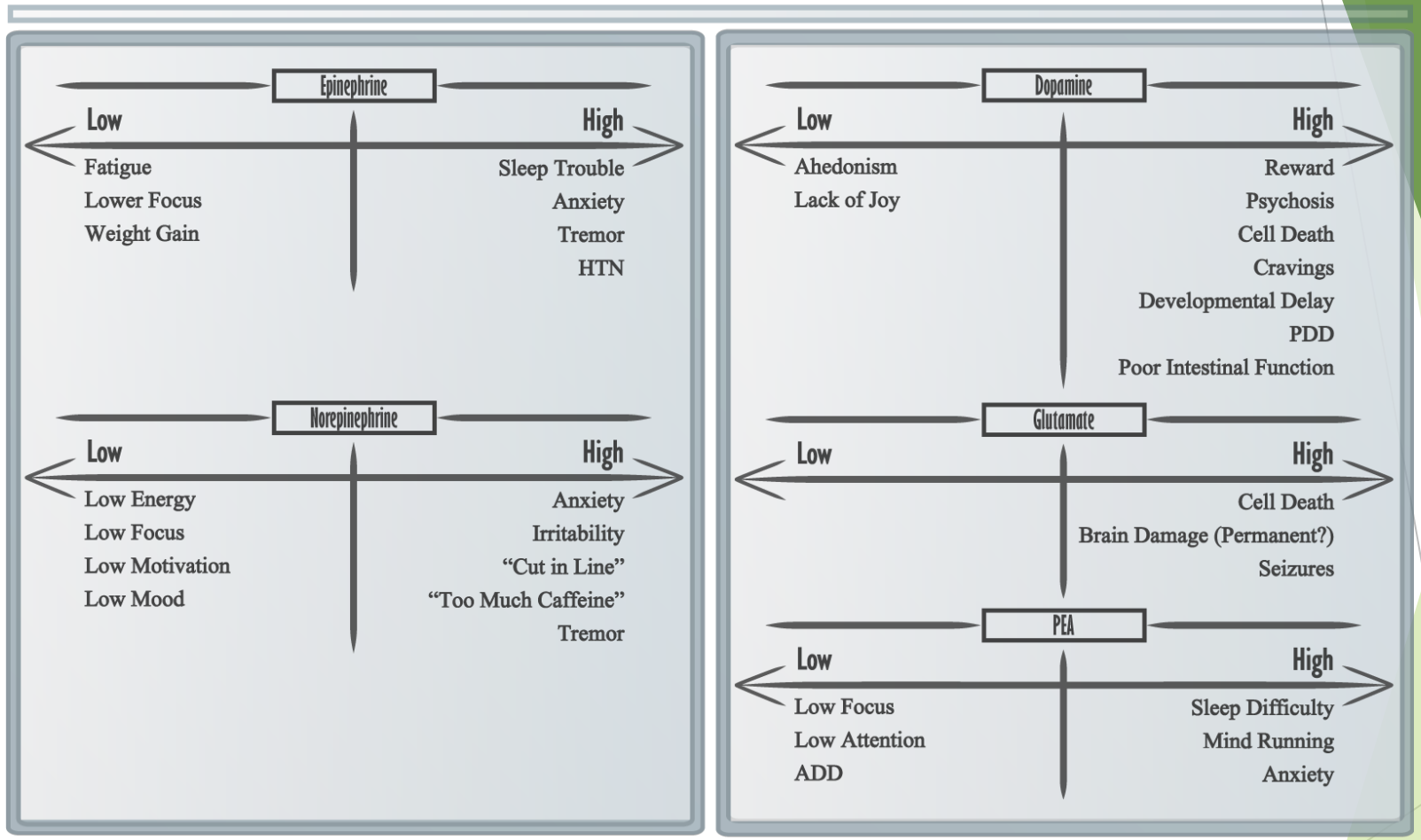
- They transmit signals across a chemical synapse, such as a neuromuscular junction, from one neuron (nerve cell) to another "target" neuron, muscle cell, or gland cell.



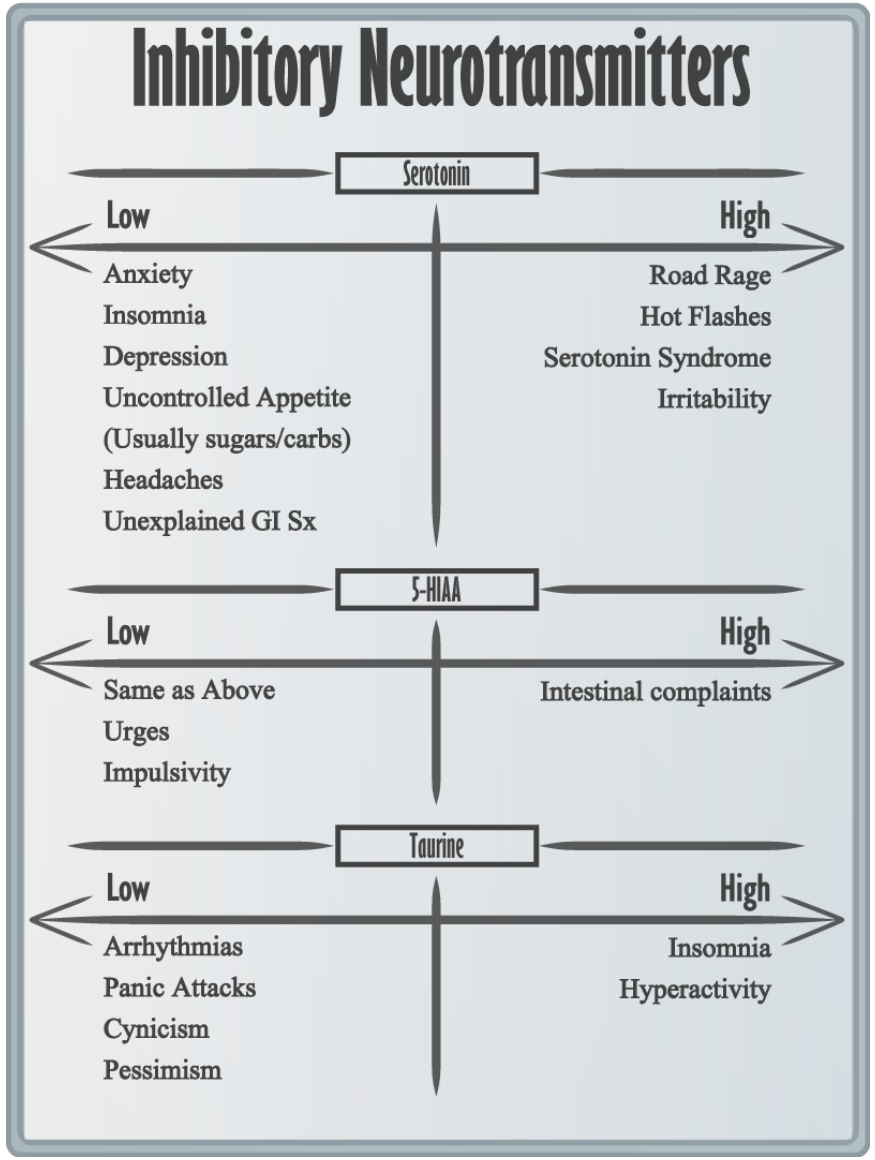
Excitatory vs. Inhibitory



Excitatory Neurotransmitters



Think of these as the substances that keep you awake and give you energy



Think of these as the substances that "calm" the nervous system

Case Studies

Case Study…..Alyssa

8 Year Old Female with visual distortions. Mom initially contacted presenter with the possible need for Irlen Glasses due to visual distortions.

Also c/o "bad gut". Pain upon eating gluten, soy or almost anything else.

After questioning, Hallucinations (Auditory, Olfactory & Visual) were identified.

Advised mom to obtain a standard work up for 2 basic reasons:

- *Sometimes there are conditions that are easily corrected or are better treated by a different specialist. And…*
- *Olfactory hallucinations are secondary to a brain tumor, unless proven otherwise*

Standard Medical Work Up

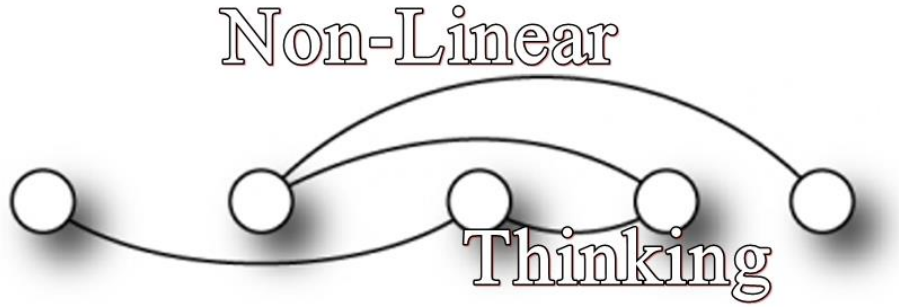
Standard work-up

- *Brain CT*
- *MRI*
- *labs for thyroid, CBC, Complete Medical Profile, etc.*
- *Mom was instructed to return to me if the tests were negative for pathology or signs of obvious illness.*
- *In other words, if she was to be placed on anti-psychotics, let me help.*

Results:

- *CT of the Brain-negative for pathology.*
- *MRI of the brain-negative for pathology*
- *Entire laboratory analysis within reference ranges(A.K.A.-Normal)*
- *The only treatment options offered were progressive use of psychotropic agents leading to atypical antipsychotic medications.*
- *Outlook: GUARDED No expectation of a normal life.*

What Now? There are So Many Possibilities… We Need Direction



Epigenetics Can Help Point The Way

Notice I said, *Help Point the Way*

Most effective use of genetic information

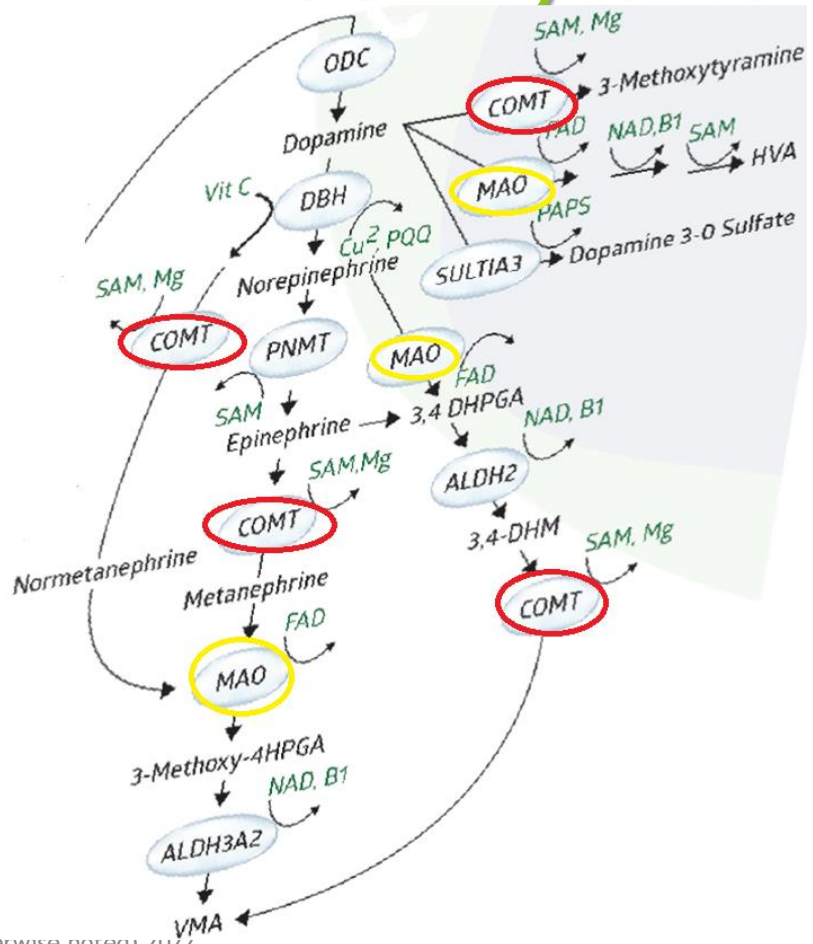
- To raise your index of suspicion of pathophysiology in certain areas of your patient's physiology
- If you know the pathways and there are a significant level of polymorphisms, then…
- That pathway(s) ***may*** not function well under oxidative stress

Say Ye…"But I have to learn all those genes and snps….there are a MILLION of them!"

- Yea, yea so you say…but maybe we can focus our analysis (so we don't end up in paralysis, or worse)?

EXCITATION CAN CAUSE THESE SYMPTOMS, WHICH SNPS ARE IMPORTANT TO CONSIDER?

COMT, MAO



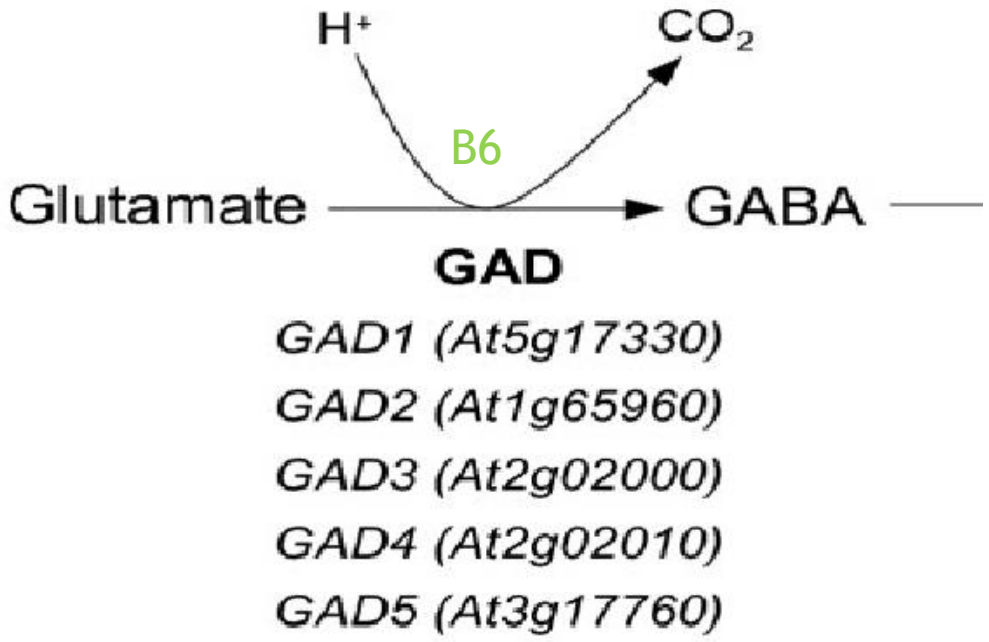
COMT	rs6269	G	AA	-/-
COMT -61 P199P	rs769224	A	AG	+/-
COMT H62H	rs4633	T	TT	+/+
MAO A R297R	rs6323	T	GT	+/-

SNPS slow down the metabolism (drainage) of catecholamines and eventually, they will "overflow"

Papaleo, Francesco et al. "Genetic Dissection of the Role of Catechol-O-Methyltransferase in Cognition and Stress Reactivity in Mice." The Journal of neuroscience : the official journal of the Society for Neuroscience 28.35 (2008): 8709-8723. PMC. Web. 30 July 2015.

Simpson, Eleanor H. et al. "Genetic Variation in COMT Activity Impacts Learning and Dopamine Release Capacity in the Striatum." Learning & Memory 21.4 (2014): 205–214. PMC. Web. 30 July 2015.

INCREASED GLUTAMATE CAN CAUSE EXCITATION
What SNPs can cause that?
GAD



GAD1	rs2058725	C	CC	+/+
GAD1	rs3791851	C	TT	-/-
GAD1	rs3791850	A	AA	+/+
GAD1	rs12185692	A	CC	-/-
GAD1	rs3791878	T	GG	-/-
GAD1	rs10432420	A	AA	+/+
GAD1	rs3828275	T	CC	-/-

Association between glutamic acid decarboxylase genes and anxiety disorders, major depression, and neuroticism.
Mol Psychiatry. 2006 Aug;11(8):752-62. Epub 2006 May 23.
Hettema JM1, An SS, Neale MC, Bukszar J, van den Oord EJ, Kendler KS, Chen X.

Association between glutamic acid decarboxylase genes and anxiety disorders, major depression, and neuroticism.

Mol Psychiatry. 2006 Aug;11(8):752-62. Epub 2006 May 23.

Hettema JM[1], An SS, Neale MC, Bukszar J, van den Oord EJ, Kendler KS, Chen X.

Abstract

Abnormalities in the gamma-aminobutyric acid (GABA) neurotransmitter system have been noted in subjects with mood and anxiety disorders. Glutamic acid decarboxylase (GAD) enzymes synthesize GABA from glutamate, and, thus, are reasonable candidate susceptibility genes for these conditions. In this study, we examined the GAD1 and GAD2 genes for their association with genetic risk across a range of internalizing disorders. We used multivariate structural equation modeling to identify common genetic risk factors for major depression, generalized anxiety disorder, panic disorder, agoraphobia, social phobia and neuroticism (N) in a sample of 9270 adult subjects from the population-based Virginia Adult Twin Study of Psychiatric and Substance Use Disorders. One mem
selected as a case or control based
from the analysis. The resulting sa
stage association study in which ca
which were tested for replication i
tested in the GAD1 region demonst
analysis in all 1128 subjects indicated that they formed a common high-risk haplotype that was significantly over-represented in cases (P=0.003) with effect size OR=1.23. Out of 14 GAD2 markers screened in stage 1, only one met the threshold criteria for follow-up in stage 2. This marker, plus three others that formed significant haplotype combinations in stage 1, did not replicate their association with the phenotype in stage 2. Subject to confirmation in an independent sample, our study suggests that variations in the GAD1 gene may contribute to individual differences in N and impact susceptibility across a range of anxiety disorders and major depression.

Abnormalities in the gamma-aminobutyric acid (**GABA**) neurotransmitter system have been noted in subjects with mood and anxiety disorders.

ROS, Aldehydes (Yeast)

SOD2	rs2758331	A	AC	+/-	
SOD2	rs2855262	T	CT	+/-	
SOD2 A16V	rs4880	G	AG	+/-	
PON1 Q192R	rs662	C	CT	+/-	

SOD suspect mitochondrial involvement. Involved in MCS

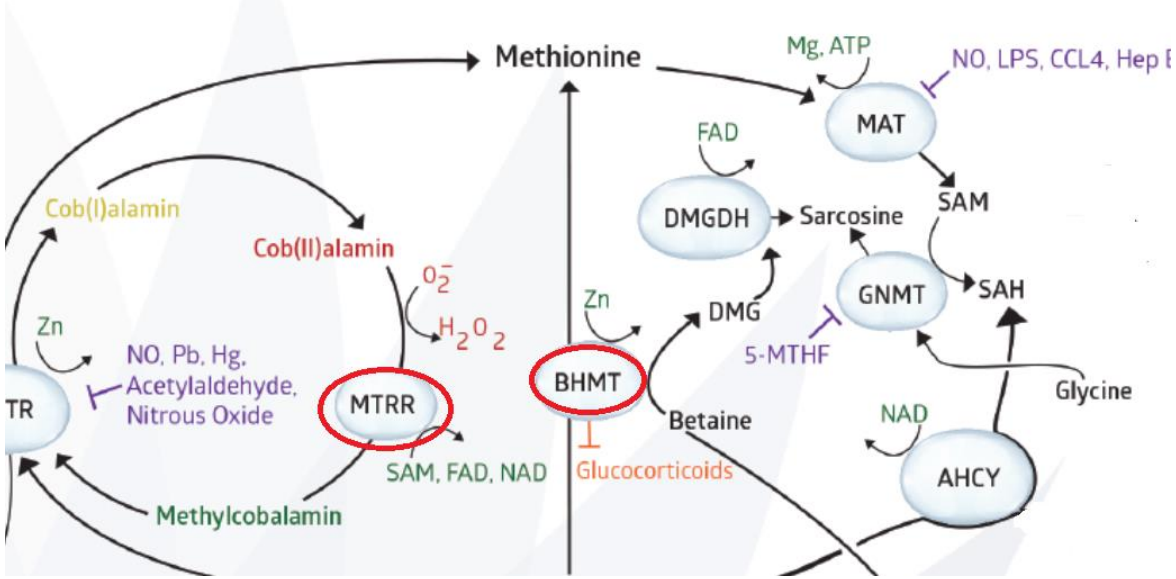
PON1 Organophosphates (Patient lives in a farming community)

Suspect difficulty in metabolizing aldehydes.
Also involved in MCS

NAT2 A803G (K268R)	rs1208	G	AG	+/-
NAT2 C190T (R64W)	rs1805158	T	CC	-/-
NAT2 G590A (R197Q)	rs1799930	A	AG	+/-
NAT2 G857A (G286E)	rs1799931	A	GG	-/-
NAT2 T341C (I114T)	rs1801280	C	CT	+/-

Cui, Xiaoyi et al. "Evaluation of Genetic Polymorphisms in Patients with Multiple Chemical Sensitivity." Ed. Aditya Bhushan Pant. PLoS ONE 8.8 (2013): e73708. PMC. Web. 30 July 2015.

BHMT



MTRR R415T	-/-
MTRR-11 A664A	+/+
MTRR	-/-
MTRR	+/+

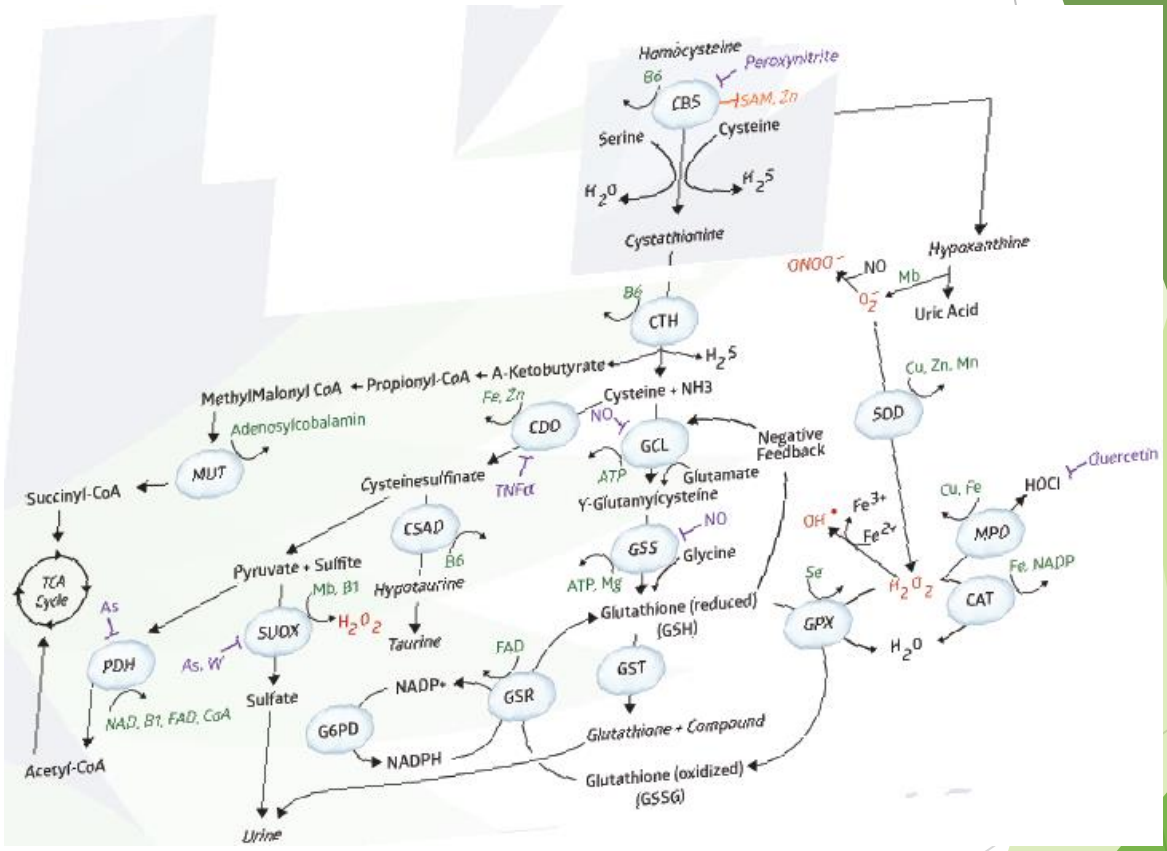
BHMT-02	+/+
BHMT-04	+/+
BHMT-08	+/+
BHMT R239Q	-/-

Pearl: Patients like this will internalize stress and/or have chronic dysthymia. People with this pattern who have PTSD will respond better to EMDR than psychotherapy (talk therapy)

Obeid, Rima. "The Metabolic Burden of Methyl Donor Deficiency with Focus on the Betaine Homocysteine Methyltransferase Pathway." *Nutrients* 5.9 (2013): 3481–3495. *PMC*. Web. 30 July 2015.

TRANSSULFURATION

CBS A13637G	+/-
CBS A360A	+/-
CBS C19150T	-/-
CBS C699T	-/-
CBS N212N	-/-



After questioning and review of labs, the transsulfuration pathway did not seem to express in this patient. When it does express you may see brain fog, high ammonia on lab tests and/or high taurine on NT testing.

FUT2 & IGA

FUT2	rs492602	G	AG	+/-
FUT2	rs601338	A	AG	+/-
FUT2	rs602662	A	AG	+/-

FUT2 has possible contribution to imbalances in the gut microbiome and B12

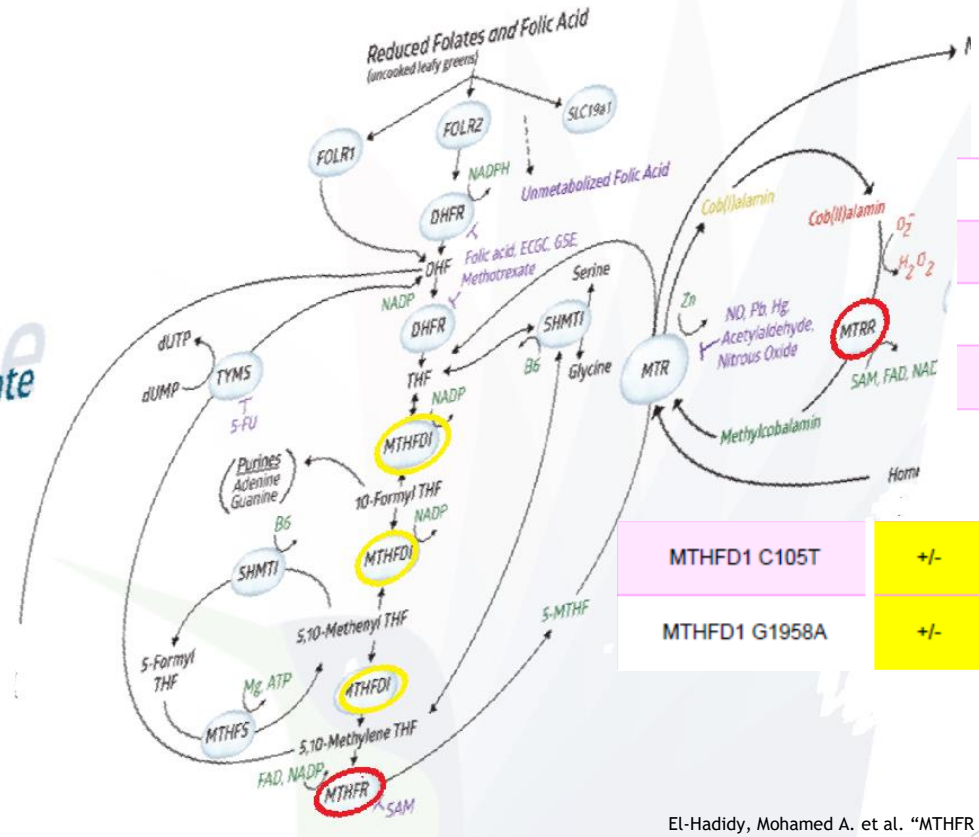
Tendency toward food allergies especially with leaky gut syndrome

IgA Snps

TRAF1	rs3761847	G	AG	+/-
IRF5	rs4728142	A	AG	+/-
IGF1R	rs2229765	A	GG	-/-
IFIH1 (HLA)	rs1990760	C	CT	+/-
HLA	rs9271366	G	AG	+/-
CFH	rs6677604	A	GG	-/-
HLA-DQA2	rs9275224	A	AG	+/-
MTC03P1	rs9275596	C	CT	+/-
PSMB8 / TAP1 / TAP2	rs9357155	A	GG	-/-
HLA-DPB2 / COL11A2P	rs1883414	A	GG	-/-

METHYLATION

MTHFR 03 P39P	+/-
MTHFR A1298C	+/-
MTHFR A1572G	+/-
MTHFR C677T	+/-
MTHFR G1793A (R594Q)	+/-
MTHFR	+/-
MTHFR	-/-
MTHFR	+/-
MTHFR	+/-
MTHFR	+/-
MTHFR	+/-
MTHFR	+/-
MTHFR	-/-
MTHFR	-/-



MTRR R415T	-/-
MTRR-11 A664A	+/+
MTRR	-/-
MTRR	+/+

MTHFD1 C105T	+/-
MTHFD1 G1958A	+/-

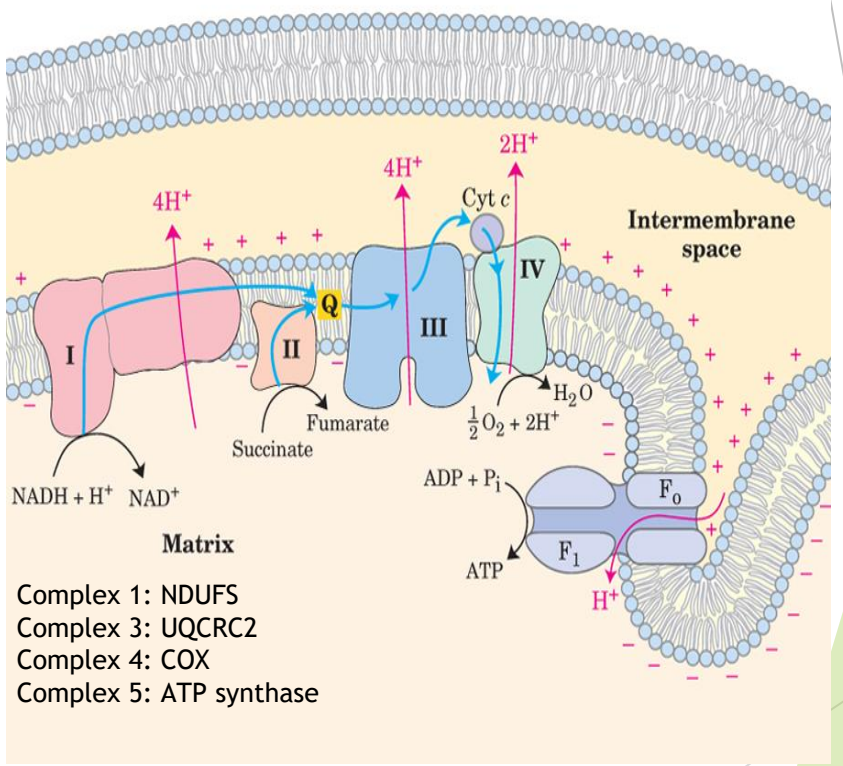
MTHFD1 gastrointestinal health http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3047240/
MTHFR ulcerative colitis http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1774509/

El-Hadidy, Mohamed A. et al. "MTHFR Gene Polymorphism and Age of Onset of Schizophrenia and Bipolar Disorder." BioMed Research International 2014 (2014): 318483. PMC. Web. 30 July 2015.

Neurosci Biobehav Rev. 2013 Sep;37(8):1597-610. doi: 10.1016/j.neubiorev.2013.06.006. Epub 2013 Jun 18. The role of COMT gene variants in depression: Bridging neuropsychological, behavioral and clinical phenotypes. Antypa N1, Drago A, Serretti A.

MITOCHONDRIAL COMPLEX 1-THE MOST IMPORTANT

NDUFS7	rs2332496	A	AG	+/-
NDUFS7	rs7254913	G	AA	-/-
NDUFS7	rs1142530	T	TT	+/+
NDUFS7	rs7258846	T	TT	+/+
NDUFS7	rs11666067	A	AA	+/+
NDUFS7	rs2074895	A	AA	+/+
NDUFS7	rs809359	G	AA	-/-
NDUFS8	rs4147776	C	AA	-/-
NDUFS8	rs1122731	A	AG	+/-
NDUFS8	rs999571	A	AG	+/-
NDUFS8	rs2075626	C	CT	+/-
NDUFS8	rs3115546	G	TT	-/-
NDUFS8	rs1104739	C	AC	+/-
NDUFS8	rs1051806	T	CT	+/-



NADH-ubiquinone oxidoreductase (NDUFS) - GSSG will block the entry of the electron donors into the electron transport chain

What is Expressing? Pointers to the Diagnoses

Complaint/ Symptoms	Snps	Index of Suspicion high for these root causes	Downstream effects	Questions to ask	Testing
Hallucinations (excitation)	COMT, MAO, MTHFD1, GAD, MTHFR, MTRR, MTR	Immune issues, microbial involvement	Neurotransmitter Imbalance	Voices “chattering” or screaming (intrusive thoughts)	NT test, Tests for: Lyme, Co-infections, Viruses, parasite, Candida, etc.
“Bad Gut”	IgE, IgA, IgG DAO, HNMT, HDC. HRH, FUT2	Leaky Gut Syndrome	Immune Upregulation, Immune dysregulation, Dysautonomia, Histamine Intolerance	Relationship of symptoms to to food intake, color/frequency of BM,	Food Allergy Tests, Organic Acid Test, Cross Reactivity Testing
Bad Gut	NAT/ALDH (aldehyde metabolism)	Yeast (acetyl-aldehydes)	Neural upregulation, adrenal fatigue,	How does patient react to ETOH intake? Coated tongue?	Stool, Antibody Testing, B5 level
Mitochondrial Dysfunction	NDUFS, COX, UQCRC2, ATP	GSSG, Oxidative stress	Fatigue, lack of healing ability	Ask about fatigue, lack of ability to heal,	ATP, ADP conversation, GSSG, reduced GSH, anti oxidant testing (SOD), Thyroid panel
Methylation	MTHFD1, MTHFR, MTRR, MTR	All of the Above	General lack of ability to heal	(too broad, many symptoms)	Organic Acid Testing, cellular micronutrient analysis

Alyssa's SNPs Indicated Probable Issues in the Following Areas…

Areas/pathways

- Neurotransmitters
- Leaky Gut Syndrome
- Aldehyde Metabolism
- Methylation
- Mitochondrial function

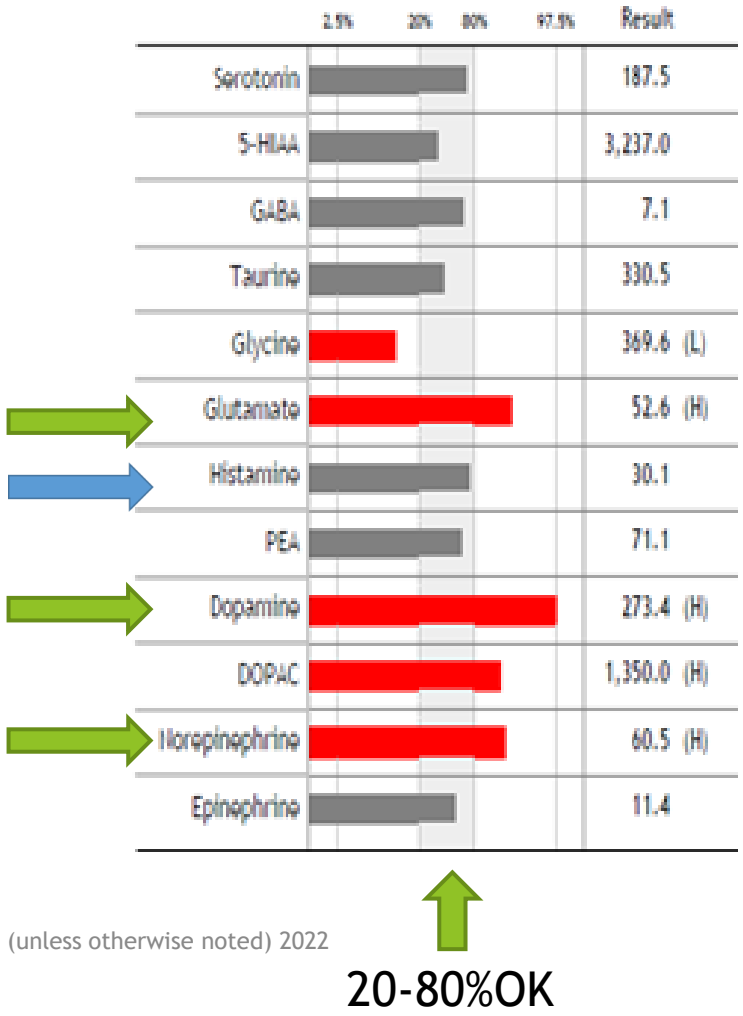
How do we use this information?

- **Correlate, correlate, correlate!** Or, if all the dogs are barking up a tree, don't yell at the dogs…look up the tree!
- Use the estimated function of the enzymes (snps) and compare them to:
  - Symptoms
  - Personal/family Hx
  - Clinical observations
- Use the estimated function of the enzymes (snps) to:
  - Raise index of suspicion of root cause(s)
  - Help identify downstream effects
  - Determine which tests will solidify diagnoses
  - Ultimately, assist you in creating an individualized, successful treatment plan

DIAGNOSIS

- the process of determining by examination the nature and circumstances of a diseased condition.
- the decision reached from such an examination.
- ***AKA: A Search for the ROOT CAUSE(S)***

Alyssa's NTs…Where is she?



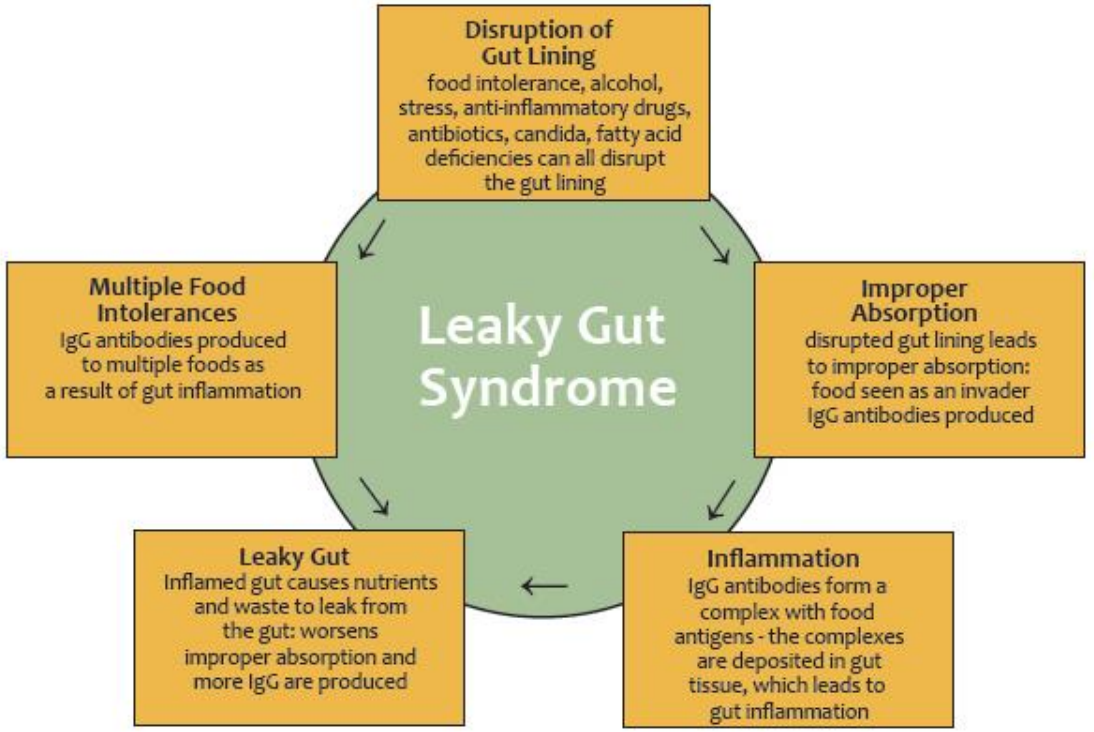
- Inhibitory/Excitatory Balance
  - Visually compare the rough levels of inhibitory NT's (Serotonin, GABA, Taurine, Glycine) with the excitatory NT's (Glutamate, Histamine, PEA, Dopamine, Norepi, Epi)
  - The excitatory NT's "outweigh" the inhibitory NT's
  - ***The "Net Result" is an excited nervous system.***
- Hallucinations
  - Always from over excitation
  - Classically, high dopamine causes hallucinations (*but not always*)
  - Glutamate, Histamine, PEA, Dopamine, Norepi, Epi can all cause "excitotoxicity" or perhaps it's the combination
- Adrenal Fatigue
  - Give indicator of how long her root causes have been present

Who is Upregulating The Nervous System

We Need To Elucidate

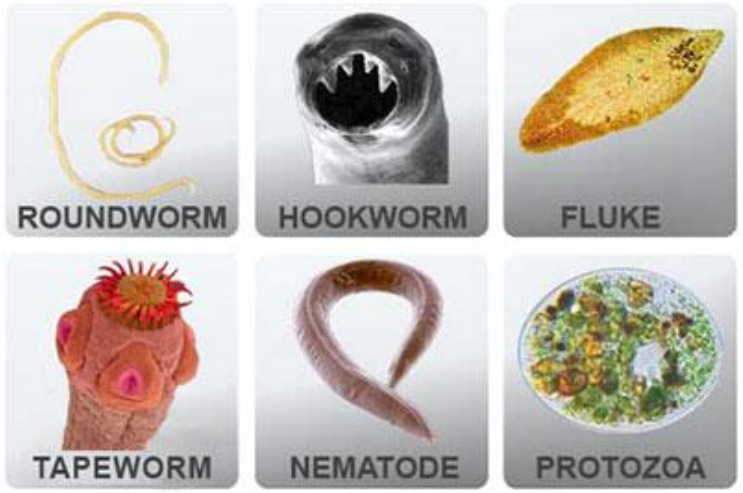
Leaky Gut Syndrome

Hints: “bad gut” on history; IgA/IgG/IgE, SHMT, FUT2 SNPS; Food Allergy Testing

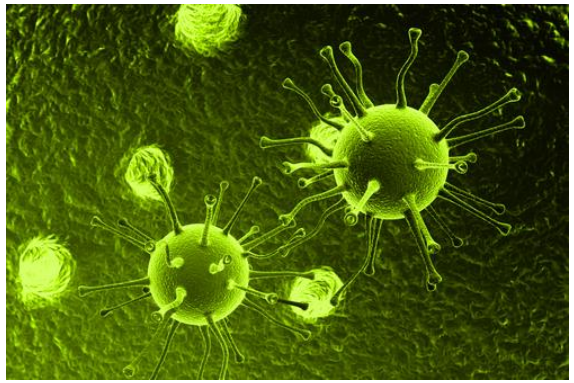


Source: http://allergytreatmentservices.com/digestion.html

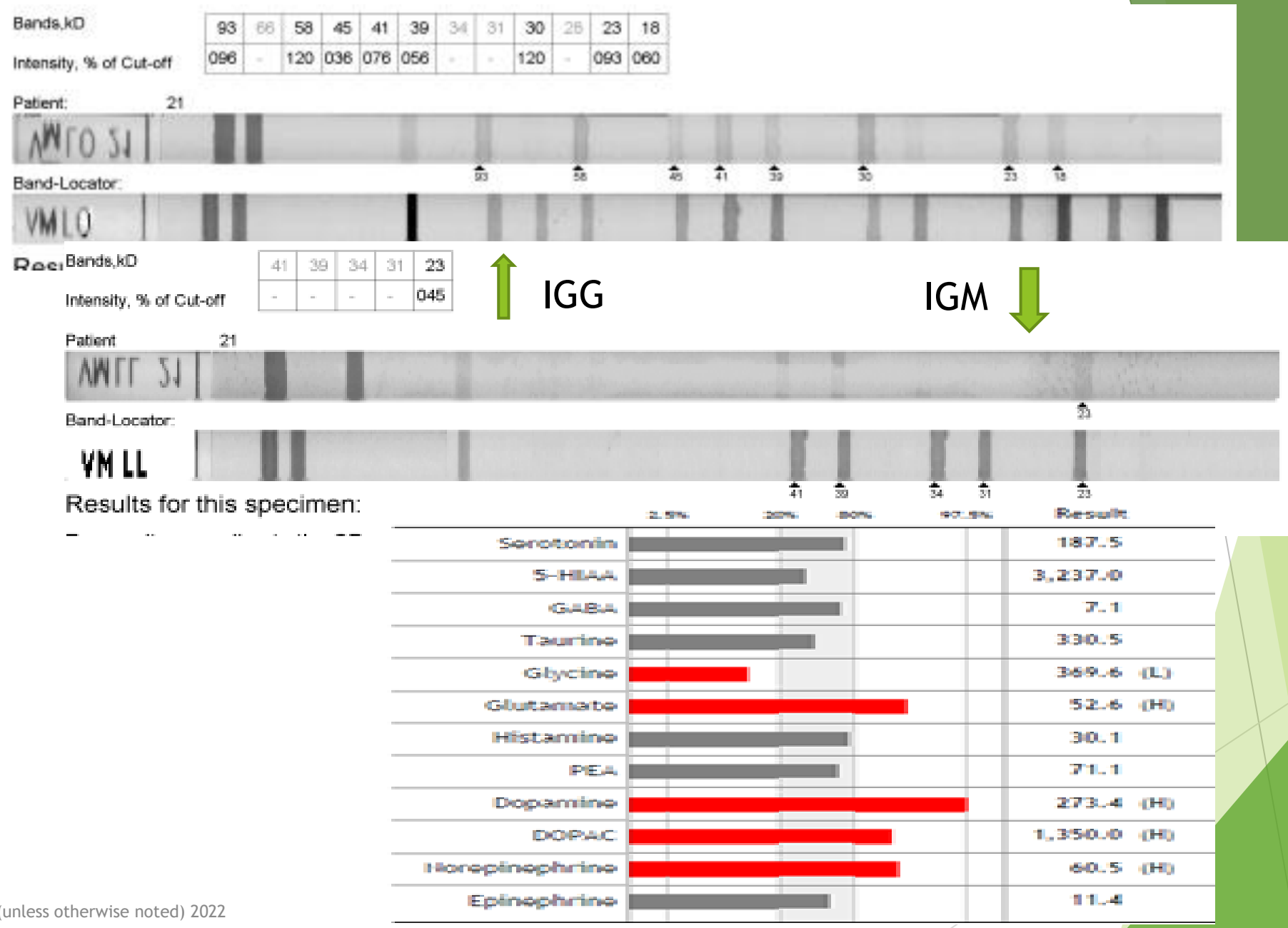
Net Result…INFLAMMATION



Microbial Involvement



*Hint: COMT, MAO, GAD, **WITH** clinical signs of neural excitation….always consider multiple bugs*



Lyme Disease: Adult Symptoms

Close Window

Fast Facts

- Lyme is fastest growing vector-borne disease
- 85% do not recall tick bite
- Less than 70% of people develop a rash
- Treatment should begin without testing if rash is present
- Lab tests may be negative in the first 4-6 weeks

Early symptoms

- Flu-like illness (fever, chills, sweats, muscles aches, fatigue, nausea and joint pain)
- Rash (10% have EM rash)
- Bell's palsy

CHILDREN'S SYMPTOMS

Later Symptoms

- Headache
- Stiff neck
- Light or sound sensitivity
- Cognitive impairment
- Sleep disturbance
- Depression, anxiety, or mood swings
- Arthritis
- Fatigue
- Abdominal pain, nausea, diarrhea
- Chest pain, palpitations
- Shortness of breath
- Tingling, burning or shooting pains

Alyssa's Labs and Dx

Lab

- Alyssa was extensively tested and found to have antibodies to Yeast and HHV6.
- A Western Blot for Lyme was positive in my opinion.
- Numerous food allergies by IgG testing.
  - Concentrations were in Gluten, Dairy and Yeast areas.

Working Diagnoses

- Lyme Disease (neural) leading to neural upregulation
- Yeast overgrowth (gut) releasing acetaldehydes (neurological irritant)
- Leaky Gut Syndrome (food allergies, immune upregulation)
- Viral Syndrome (neural dysregulation)

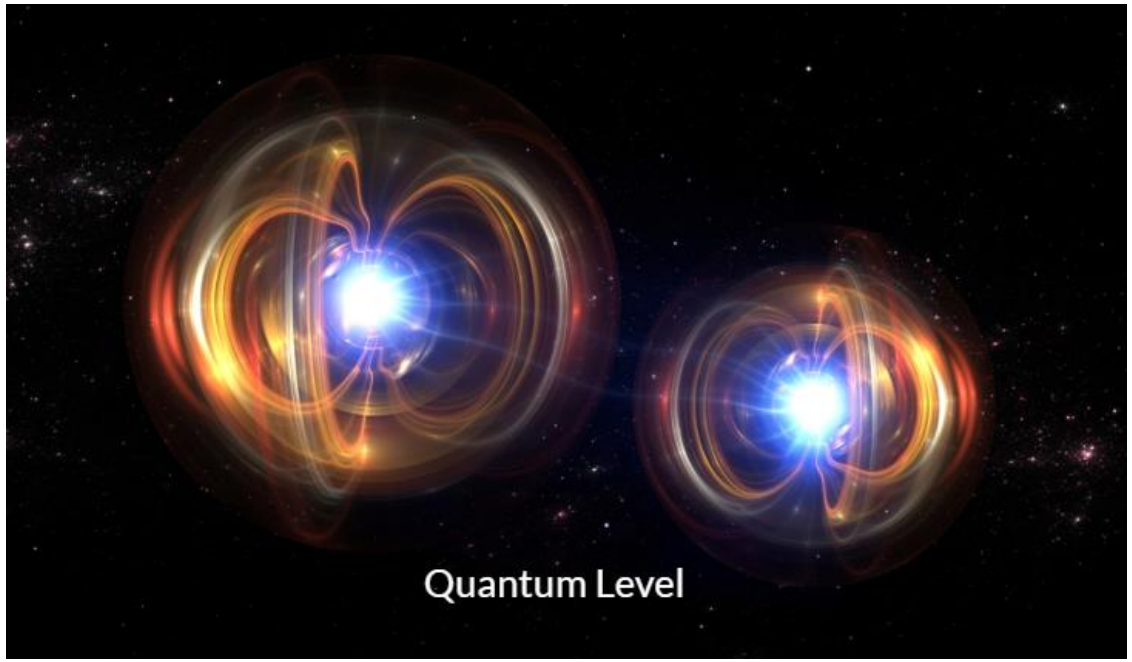
CHECKPOINT:
Root Cause vs. Downstream Effect…
Ask Yourself…

- Leaky Gut Syndrome can and does lead to immune upregulation/dysregulation. This is evidenced by the numerous food allergies and the patient's GI symptoms.
  - ***Can this cause the increase in catecholamines and hallucinations***?
- Lyme and HHV6 attack the neural cells.
  - ***Can this cause the increase in catecholamines and hallucinations***?
- Yeast overgrowth causes increased levels of acetylaldehyde. Combined with the NAT2 snps.
  - ***Can this cause neural inflammation resulting in hallucinations***?
- Answer: ***Yes to all of the above***.

What To Do?
When to Do it?
Keep It "Foundational"

"Reduce Stress,
Heal the Cells,
Heal the Gut,
Kill the Bugs!!"

You May Understand Physiology Down to the Quantum Level But You Can Only Intervene at the Global Level



Turn This

Into This

TREAT ROOT CAUSES AND DOWNSTREAM EFFECTS

TREATMENT (LESSEN THE TRAFFIC)

Treatment
Step 1: Cellular & GI Repair

- **Principles:**
- We need to fully digest foods. Undigested foods make up the majority of the antigens that enter our bodies.
- We need to re-create the mucus layer in the gut. The mucus layer is where the microbiome live, what they eat, and where they do their work. The mucus layer traps antigens, toxins, xenobiotics and forms the initial layer of protection.
- We need to repair the cells and the tight junctions. This area is our second layer of defense preventing the entry of the above mentioned into our bodies.
- We need to re-populate the GI tract with an adequate diversity of biota.

- Demulcent herbs to recreate the mucus layer*
- Phospholipids to support cellular repair
- Digestive enzymes to assure full breakdown of foods and prevent creation of antigens.
- DAO enzyme to help break down histamine
- Probiotics (soil based with S. Boulardii)
- Absorbable Vitamins and Minerals

Treatment
Step 2: Kill the Bugs

The Quintessential Devils in this Matter

- Child was co treated by myself and an integrative pediatrician
- GI Repair program was conducted for a period of 3 months
- Thereafter, we went after the bugs. There was some disagreement as to the form of treatment (whether to insert a PICC line and use rotating antibiotics or use other available non-pharmaceutical options)
- The parents were given full information, pros, cons, etc. by the pediatrician and myself
- The parents chose the latter.

Treatment
Step 3: Retest

- Three months after biocidal treatment was initiated, testing was done again at the same lab.
- All results were negative
- All symptoms were gone

The Sleuthing Was Worth It!

Alyssa is now in College

She's an Honor Student, Star Athlete, and a beautiful young woman.

18 years old

8 y/o

Reality:

Hallucinations were a expression of genetic predisposition caused by neural excitation and immune upregulation secondary to infections and leaky gut syndrome. All "kept going" by chronic CDR.

12y/o

16 y/o

Prospect:

A life on antipsychotic meds

Result:

A life saved

Chelsi

Story of Hope

Started with Febrile Seizures at 10 months old

- **1994**
- **4 seizures in 3 years**. Normal birth. First seizure at 10 months old during high fever. Maybe 4 more seizures throughout the next 3 years, but only during high fever.

- **1997**
- **A Few absence**. In August, started with freezing type seizures where she would bend her arms up, turn her head and eyes to the right and gently, rhythmically quiver for 3 to 10 seconds with head and eyes to the right. Only happens when she's playing, and if she playing hard enough to get breathless, they would last longer (up to a minute) and she would collapse after.
  - Started on **Zarontin** – didn't do much (started absence seizures)
  - **Depakote** added – seizure free for 2 months, weaned off **Zarontin**. As soon as she was on a lower dose, myoclonic jerks started

- **1998**
- **2 febrile/lots of myoclonic**. MRI at Childrens 5/98 diagnosed myoclonic with other generalized activity.
  - **Depakote** level 138, weaned to introduce **Lamictal**
  - Started **Lamictal** 25mg, ½ tab bid
  - 2-3 weeks later, 2 tonic clonic seizures 15 minutes apart (July)
    - Became severely ataxic and ended up in Children's for 4 days.
      - Thrombocytopenia - Platelet count in the 60's, got a rash, **Depakote** decreased, **Lamictal** discontinued
- **Video EEG** 5/28 & 5/29 Generalized slowing and myoclonic seizures. Tendency for generalized atypical SW discharges to the rt hemisphere.

- **1999**
- **No Seizures.**
  - **Depakote** 250mg AM, 125mg PM, **Zarontin** 250mg – Had been seizure free for several months.
  - Was under care of Marcio Sotero, started seeing Dr. Graf locally through Childrens 10/99
  - Seizure free for over 1 year. Drugs decreased because of sleepiness/cognitive difficulties.

- **2006**
- **9 tonic clonic seizures**
- Seizures 12/26, 10/9, 9/22, 8/1, 8/10, 7/20, 4/9, 3/14, 2/28, (nothing 10 months prior)
  - **First seizure EVER not related to HEAT**…and continued to have them for no reason.
  - Seizures more convulsive
- 6/20 Increased **Zonegran** to 175 in the evening, **Keppra** 750 BID.
  - March is when the frequency really picked up and seizures were unpredictable and harder.
  - Started mensus for the first time October 6, 2006
  - **Zonegran** 125 in eve and **Keppra** 1000 bid. Drugs switched in hopes of less absence, but result was more grand mal.
- MRI at Childrens 8/25 - normal

Number and type of seizures increased through the years

- **2010**
- **47 tonic clonic seizures**
- **Zonegran** 300 mg /day (tried to stop…it didn't go well-seizures increased and came at odd times)
- **Keppra** 1750 bid
- **Clobezam** down to 7.5 mg/day

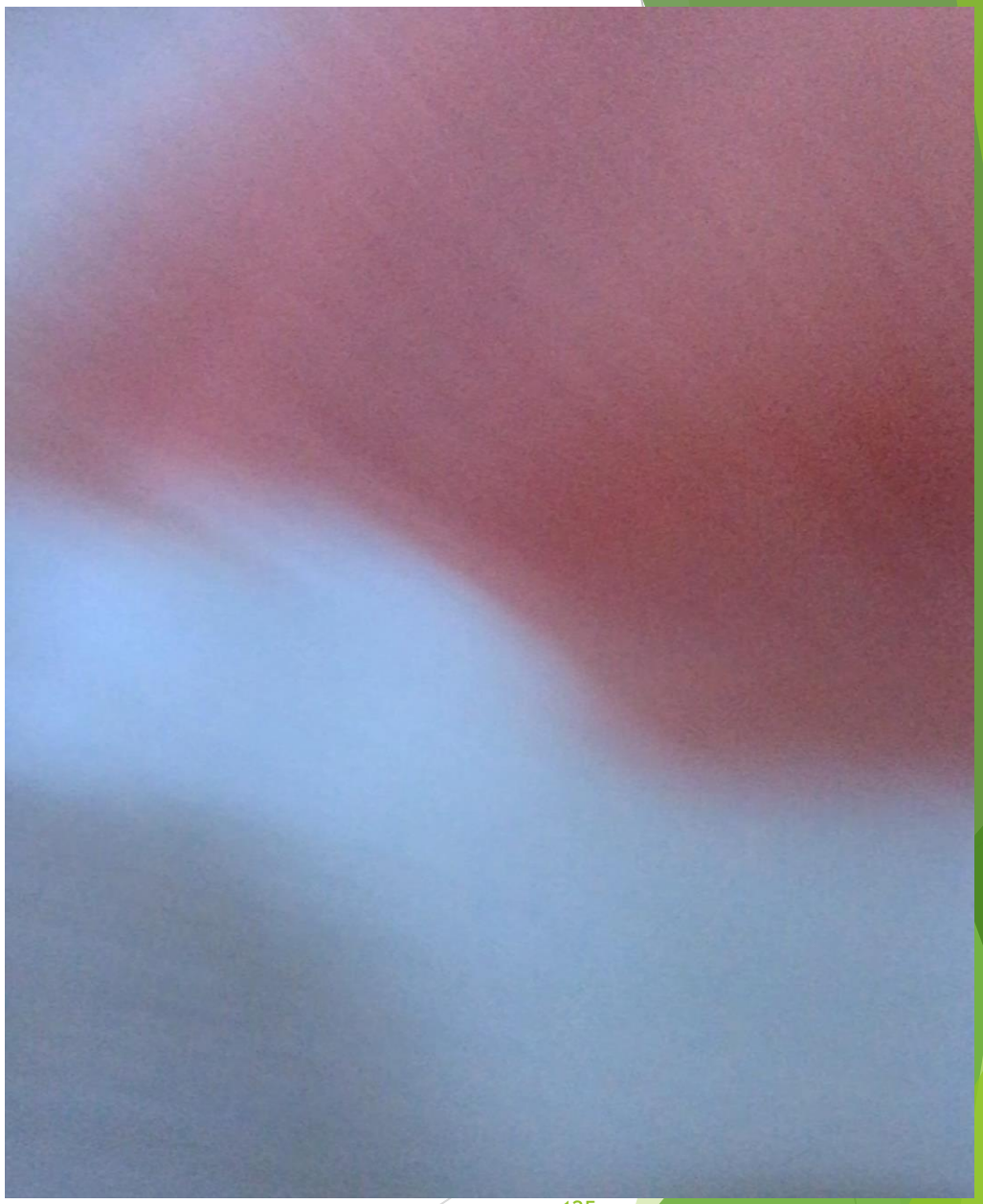
- **2011**
- **74 tonic clonic seizures**
- **Video EEG** done at Harborview Epilepsy Center. Confirmed generalized seizures.
- **NutrEval** 10/11 – NOTE still low on alanine, lysine, glycine, senine (see 2005 Swedish tests)
- **Hair** sent to Doctor's Data for Toxic testing: High in Uranium, Copper, Cobalt, Lead
- **Blood** tests showed Chloride High, Alkaline Phosphatase low
- **DNA** tested for C677T and A1298C mutations (negative)
- **FOOD** allergy tested 10/11 – High antibodies for Cheese, Milk, Whey, beef, lamb, pork
- **Zonegran** 200 mg bid
- **Keppra** 1000 bid
- **Clobezam** 12.50.
- **Banzel** ? mg – Started falling forward. Many daytime seizures and injuries and stitches. Weaned off between February & July

- **2012**
- **101 tonic clonic seizures (probably 10% just tonic)**
- **NutrEval** 10/12 – NOTE still low on alanine, lysine, glycine, senine (see 2005 Swedish tests)
- Jan to June, 90% of seizures between 2pm&6pm. Many injuries and stitches.
- Medical Marijuanna tried 6/26/12 to 12/12. Switched seizures to her sleep (perhaps because she was getting sugar in the brownies?), but frequency increased. Seizures would start at 9:38pm and sometimes had 2 or 3 per night.
- **Zonegran** 200 mg bid
- **Keppra** 1000 bid
- **Clobezam** 10 mg bid
- **Vimpat (Lacosamide)** 125mg /day (I believe this is why they switched to daytime)

- **2013**
- **146 tonic clonic seizures**

- **I BELIEVE INCREASES FOR THE LAST 3 YEARS WERE FROM BANZEL, VIMPAT & RUFINIMIDE.** Depakote added back in because Dr. Miller saw this history and thought it was worth going back. I disagree.

What she fought. Tonic Clonic seizures



One year report for Chelsi Ownby

Date created: March 17, 2020
Start Month: April 2019
End Month: March 2020
Weight: 106 lbs. (as of June 12, 2015)
Birth date: March 11, 1994
Current Medications: Depakote 1000.00 mg Daily
Keppra 1250.00 mg Daily
Zonegran 50.00 mg Daily

April, 2019	
Week 1	4
Week 2	5
Week 3	3
Week 4	5
Total:	17

May, 2019	
Week 1	5
Week 2	4
Week 3	4
Week 4	3
Total:	16

June, 2019	
Week 1	
Week 2	
Week 3	
Week 4	
Total:	

July, 2019	
Week 1	3
Week 2	3
Week 3	2
Week 4	4
Total:	12

August, 2019	
Week 1	5
Week 2	4
Week 3	4
Week 4	5
Total:	18

September, 2019	
Week 1	
Week 2	
Week 3	
Week 4	
Total:	

October, 2019	
Week 1	4
Week 2	4
Week 3	3
Week 4	9
Total:	20

November, 2019	
Week 1	6
Week 2	6
Week 3	3
Week 4	7
Total:	22

December, 2019	
Week 1	
Week 2	
Week 3	
Week 4	
Total:	

January, 2020	
Week 1	3
Week 2	4
Week 3	7
Week 4	9
Total:	23

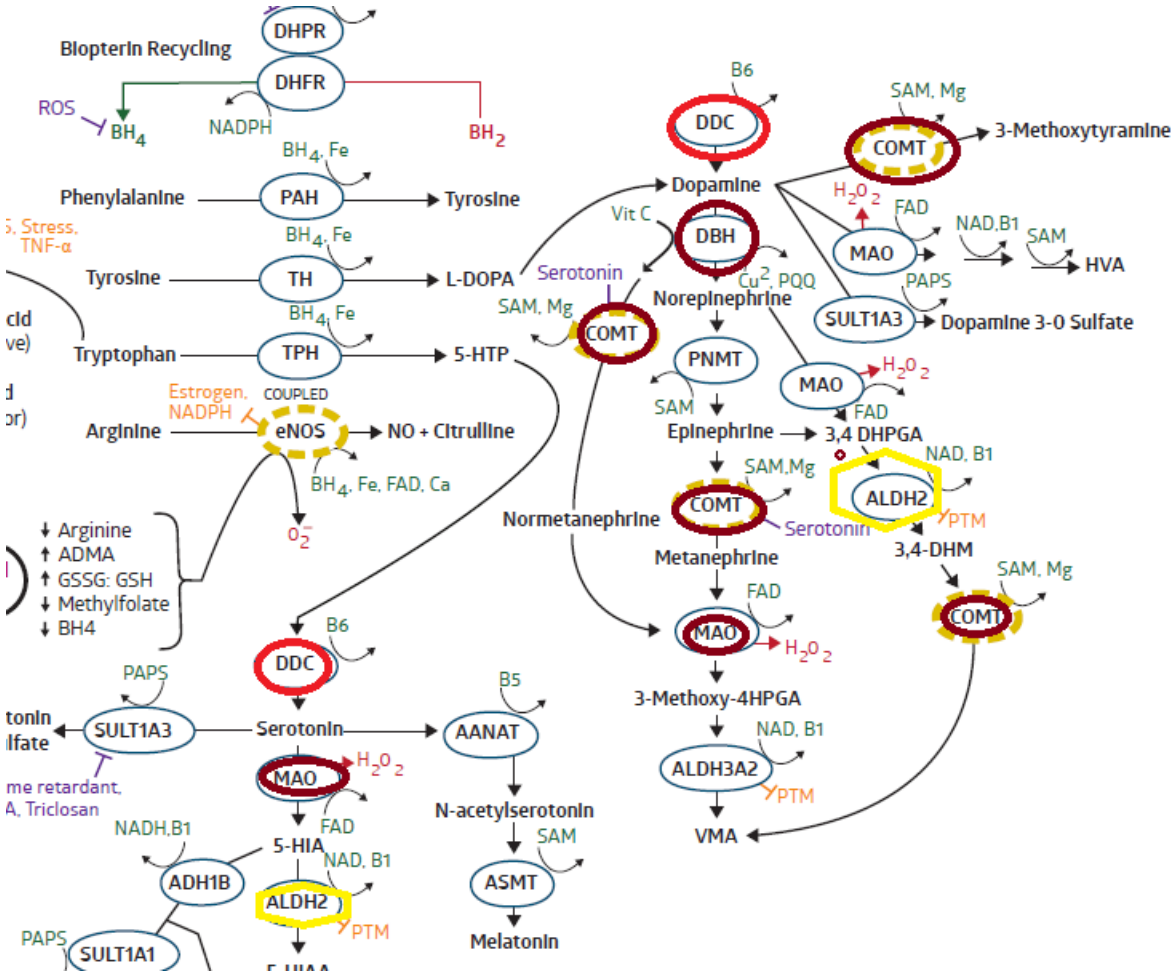
February, 2020	
Week 1	15
Week 2	4
Week 3	4
Week 4	5
Total:	28

March, 2020	
Week 1	
Week 2	
Week 3	
Week 4	

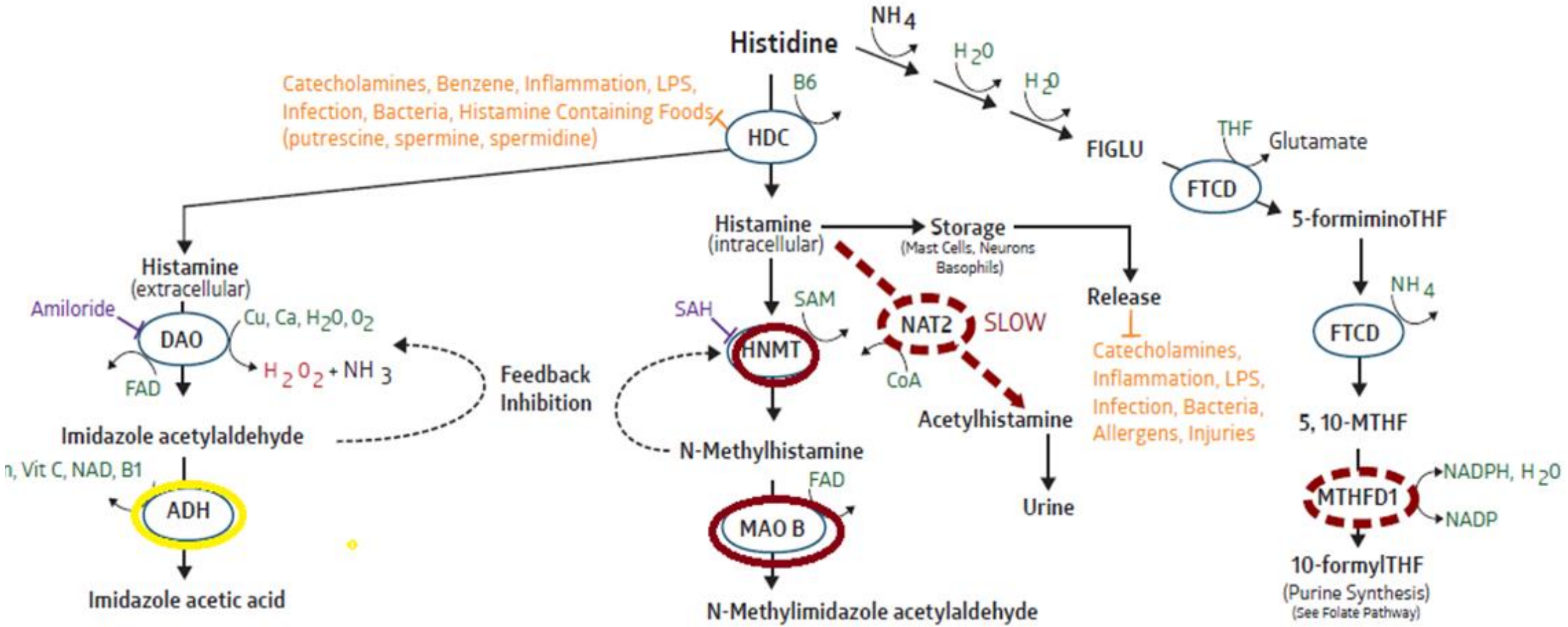
25

Number of monthly seizures steadily increased from 4/2019 through 3/2020

Genetic Predisposition toward Excitation

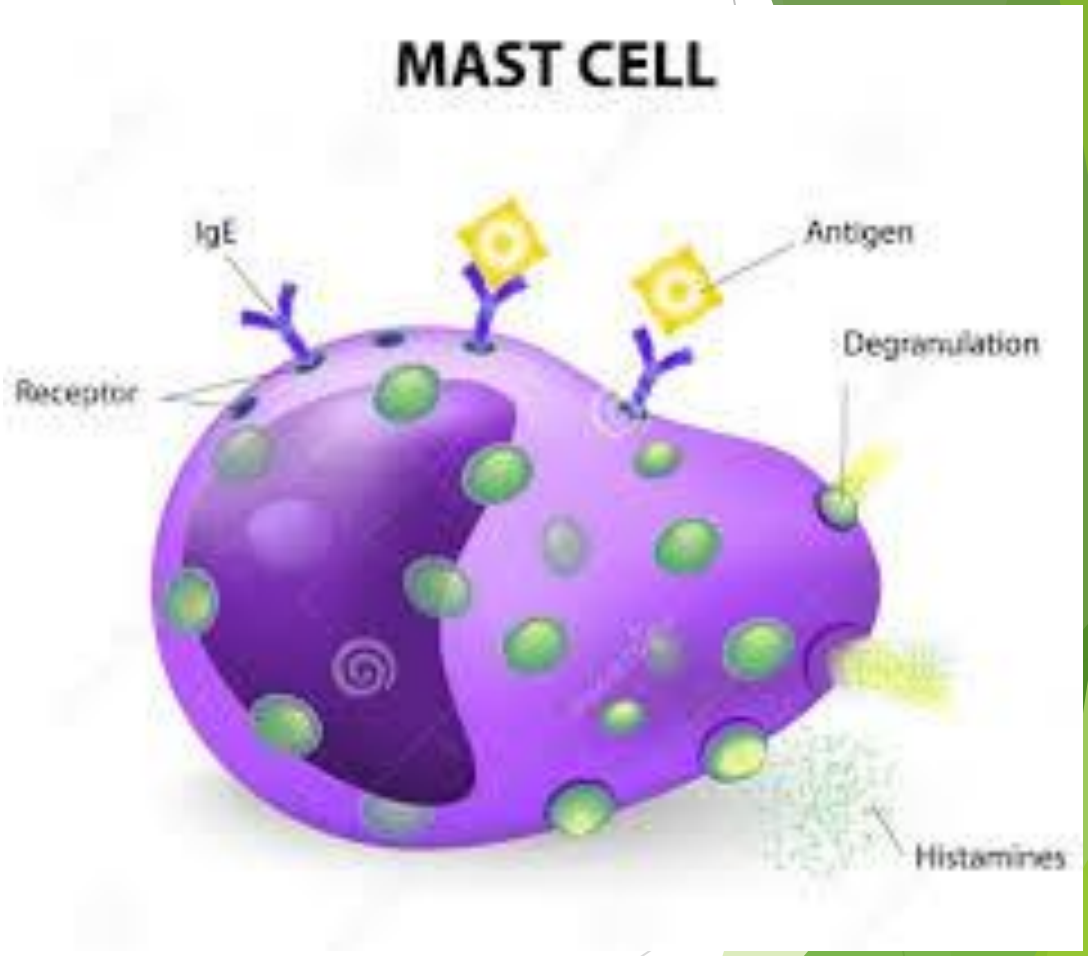


Predisposition to High Histamine



Histamine: The Major Offender

- Histamine is most commonly known for it's role in allergic reactions
- Also involved in neurotransmission and can affect your emotions and behavior as well.
- Histamine helps control the sleep-wake cycle and promotes the release of epinephrine and norepinephrine.
- High histamine levels have been linked to obsessive compulsive tendencies, depression, and headaches.
- Low histamine levels can contribute to paranoia, low libido, fatigue, and medication sensitivities.



Toxic & Essential Elements; Hair

TOXIC METALS		RESULT µg/g	REFERENCE INTERVAL	PERCENTILE 68th – 95th
Aluminum	(Al)	3.4	< 8.0	
Antimony	(Sb)	< 0.01	< 0.066	
Arsenic	(As)	0.036	< 0.060	
Barium	(Ba)	0.93	< 1.5	
Beryllium	(Be)	< 0.01	< 0.020	
Bismuth	(Bi)	0.17	< 2.0	
Cadmium	(Cd)	0.019	< 0.060	
Lead	(Pb)	0.80	< 0.60	
Mercury	(Hg)	0.11	< 0.40	
Platinum	(Pt)	0.003	< 0.005	
Thallium	(Tl)	< 0.001	< 0.002	
Thorium	(Th)	< 0.001	< 0.002	
Uranium	(U)	1.0	< 0.060	
Nickel	(Ni)	0.38	< 0.30	
Silver	(Ag)	0.13	< 0.18	
Tin	(Sn)	0.32	< 0.30	
Titanium	(Ti)	0.53	< 0.60	
Total Toxic Representation				

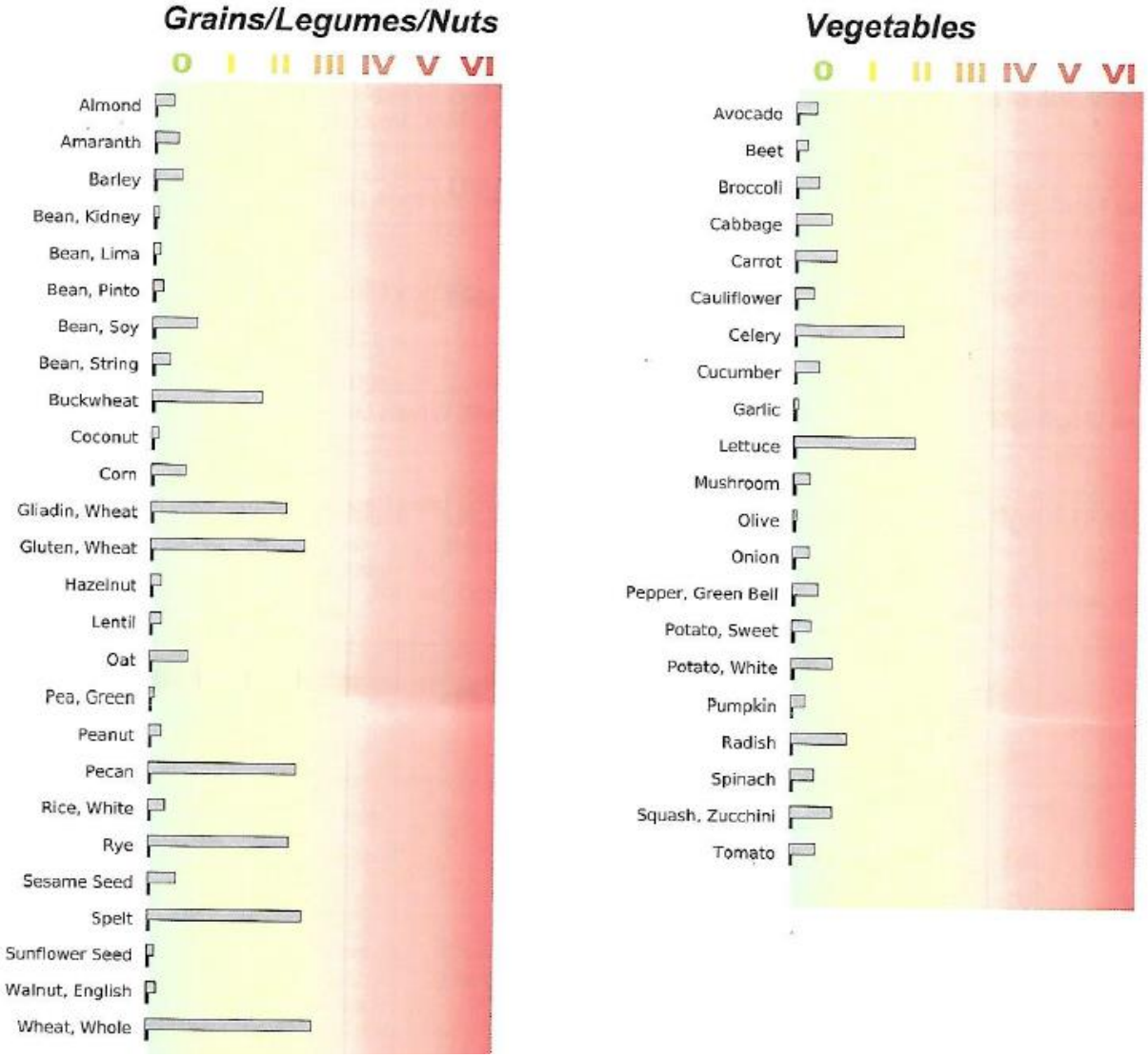
Hair Analysis: 6-week overview of what the body is EXCRETING.

Serum: Recent
RBC: approximately 3 months
WBC: approximately 6 months

ESSENTIAL AND OTHER ELEMENTS		RESULT µg/g	REFERENCE INTERVAL	PERCENTILE 2.5th – 16th – 50th – 84th – 97.5th
Calcium	(Ca)	1050	350- 1000	
Magnesium	(Mg)	240	35- 120	
Sodium	(Na)	390	18- 180	
Potassium	(K)	16	8- 75	
Copper	(Cu)	170	11- 37	
Zinc	(Zn)	190	150- 230	
Manganese	(Mn)	0.47	0.08- 0.60	
Chromium	(Cr)	0.44	0.40- 0.65	
Vanadium	(V)	0.13	0.020- 0.075	
Molybdenum	(Mo)	0.032	0.025- 0.060	
Boron	(B)	0.61	0.20- 1.2	
Iodine	(I)	0.66	0.25- 1.3	
Lithium	(Li)	0.013	0.007- 0.020	
Phosphorus	(P)	165	150- 220	
Selenium	(Se)	0.61	0.70- 1.1	
Strontium	(Sr)	2.4	0.86- 6.2	
Sulfur	(S)	44900	44000- 50000	
Cobalt	(Co)	0.23	0.005- 0.040	
Iron	(Fe)	8.1	7.0- 16	
Germanium	(Ge)	0.035	0.031- 0.040	
Rubidium	(Rb)	0.018	0.006- 0.060	
Zirconium	(Zr)	0.57	0.025- 0.50	

Patient: Chelsi R Ownby
Accession #: 201155514
Sex: F **Age:** 18
Date of Birth: 1994-03-11
Collected: 2011-10-03 **Received:** 2011-10-04 **Completed:** 2011-10-12 CLIA #: 50D0965661 © US BioTek Laboratories

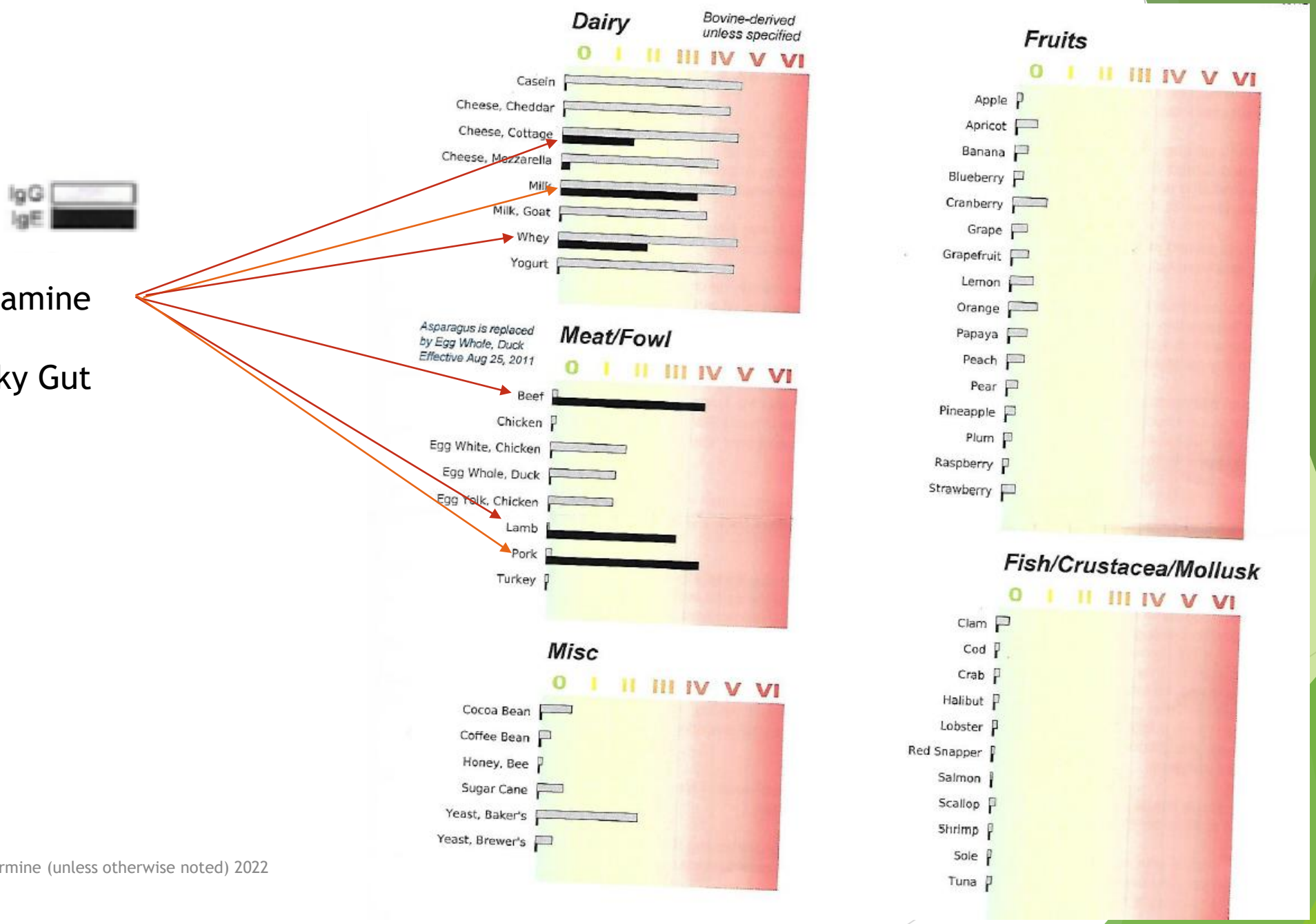
IgG
IgE



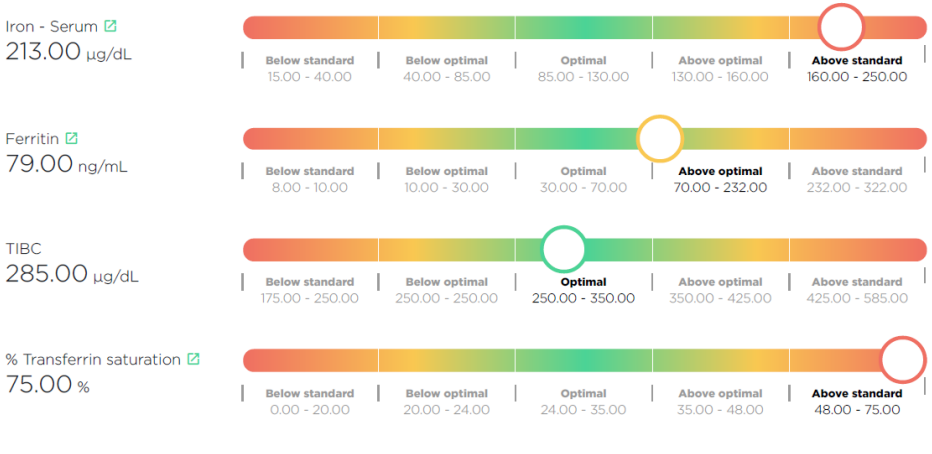
Leaky Gut!

Histamine

Leaky Gut



IRON MARKERS



Review > Nat Rev Microbiol. 2008 Jul;6(7):541-52. doi: 10.1038/nrmicro1930.

Viral infection and iron metabolism

Hal Drakesmith [1], Andrew Prentice

Affiliations + expand

PMID: 18552864 DOI: 10.1038/nrmicro1930

Abstract

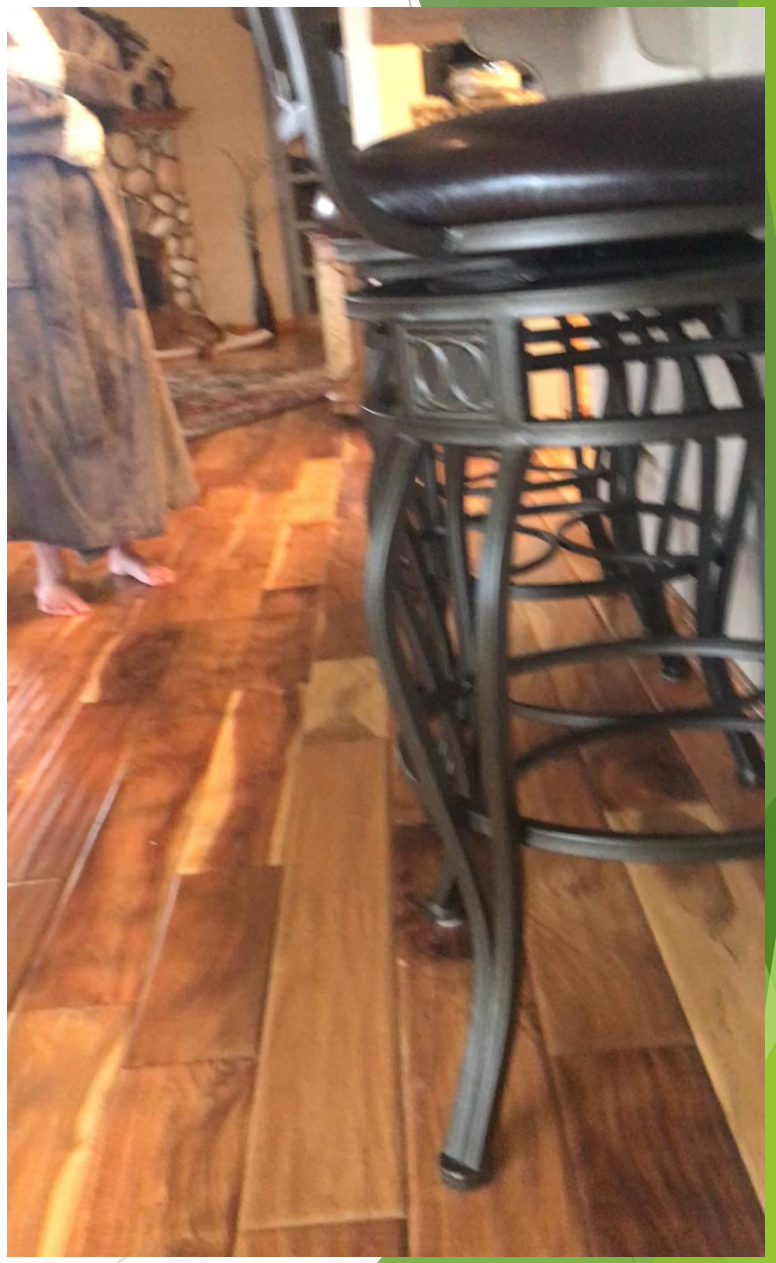
Fundamental cellular operations, including DNA synthesis and the generation of ATP, require iron. Viruses hijack cells in order to replicate, and efficient replication needs an iron-replete host. Some viruses selectively infect iron-acquiring cells by binding to transferrin receptor 1 during cell entry. Other viruses alter the expression of proteins involved in iron homeostasis, such as HFE and hepcidin. In HIV-1 and hepatitis C virus infections, iron [illegible] could be partly caused by the viruses them[illegible] interact might suggest new m[illegible]

iron overload is associated with poor prognosis and could be partly caused by the viruses themselves.

Drakesmith H, Prentice A. Viral infection and iron metabolism. Nat Rev Microbiol. 2008 Jul;6(7):541-52. doi: 10.1038/nrmicro1930. PMID: 18552864.

2019

- **2019**
- **201 tonic clonic seizures**
- Wandering around after seizure got much worse. Seizures coming later & later.
- Frankincense & Copaiba essential oils tried in February. Had a situation where extra Frankincense was used and had involuntary "dancing" movements- she couldn't stop and was in distress (have video). Discontinued. Seizures started getting later (1am & 2am) and sometimes having 2 or 4 per night. 1st fall in over 2 years. Awake – standing on wood floor and went backward. Bizarre episode where she saw her belly in the mirror and had her 1st ever total freak out. Seizures started at ANY time of the night/morning 2:30am to 8:30am. Unprecedented! Things spun out of control this year, especially Oct to Dec. We have not been able to regain any normalcy (9:30 to 11pm) in seizures, even though we are back on doses of all 3 drugs same as 2015 . Looking into EMF's and Wifi (#Steelesarmy) and Dr. Jess Armine.



February, 2020	
Week 1	9
Week 2	4
Week 3	4
Week 4	5
Total:	22

March, 2020	
Week 1	6
Week 2	8
Week 3	7
Week 4	4
Total:	25

April, 2020	
Week 1	7
Week 2	3
Week 3	6
Week 4	5
Total:	21

May, 2020	
Week 1	6
Week 2	5
Week 3	6
Week 4	10
Total:	27

June, 2020	
Week 1	6
Week 2	4
Week 3	6
Week 4	10
Total:	26

July, 2020	
Week 1	0
Week 2	1
Week 3	5
Week 4	7
Total:	13

August, 2020	
Week 1	6
Week 2	19
Week 3	5
Week 4	8
Total:	38

September, 2020	
Week 1	4
Week 2	5
Week 3	8
Week 4	8
Total:	25

October, 2020	
Week 1	3
Week 2	4
Week 3	3
Week 4	3
Total:	13

November, 2020	
Week 1	1
Week 2	1
Week 3	1
Week 4	2
Total:	5

December, 2020	
Week 1	1
Week 2	1
Week 3	1
Week 4	2
Total:	5

January, 2021	
Week 1	1
Week 2	1
Week 3	1
Week 4	1
Total:	4

Feb 2020 to Feb 2021

FMP treatment started January 2020

- Foundational treatment consisting of liposomal vitamins and minerals.
- Treatment for leaky gut syndrome.
- Mitochondrial support.
- Cell membrane support

- This patient progressed very slowly. The hundreds (maybe thousands) of seizures did significant damage to her central nervous system. There was no single root cause that we could identify so we concentrated on optimizing her cell function, biochemical pathways, and balancing her neurotransmitters.

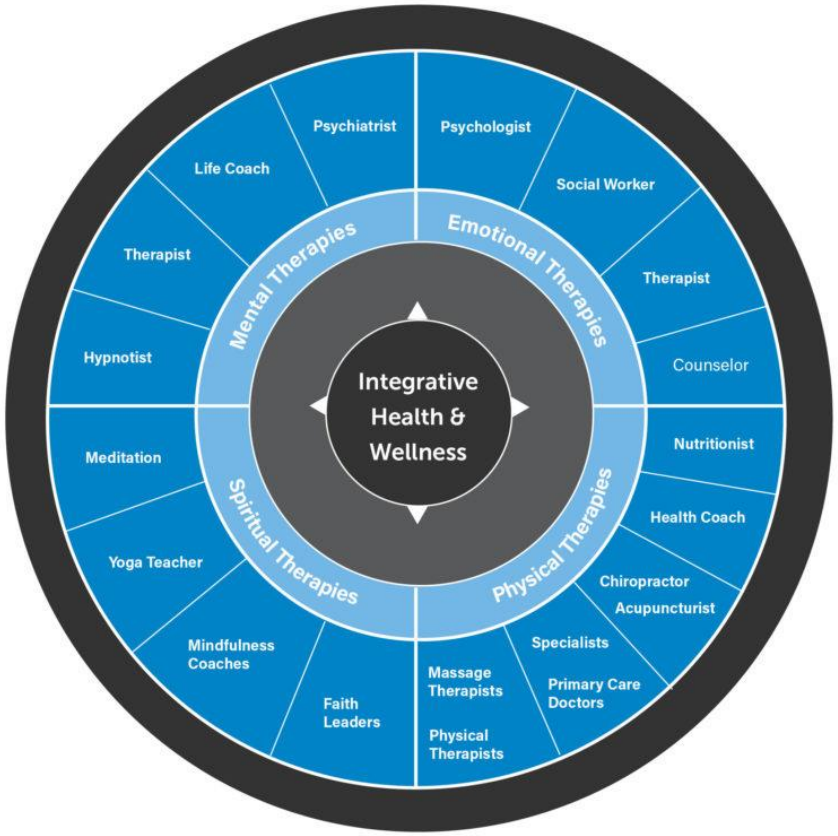
- It worked!

Playing Cards 2021

- Chelsi is 27 years old and continues to progress albeit slowly.
- I want to give a shout out to her parents (and dog). They are the finest, most dedicated people I've had the pleasure of working with in my career.

Late 2021

If we think differently and Work TOGETHER



…we can change lives!!

Tips on Picking out a Practitioner

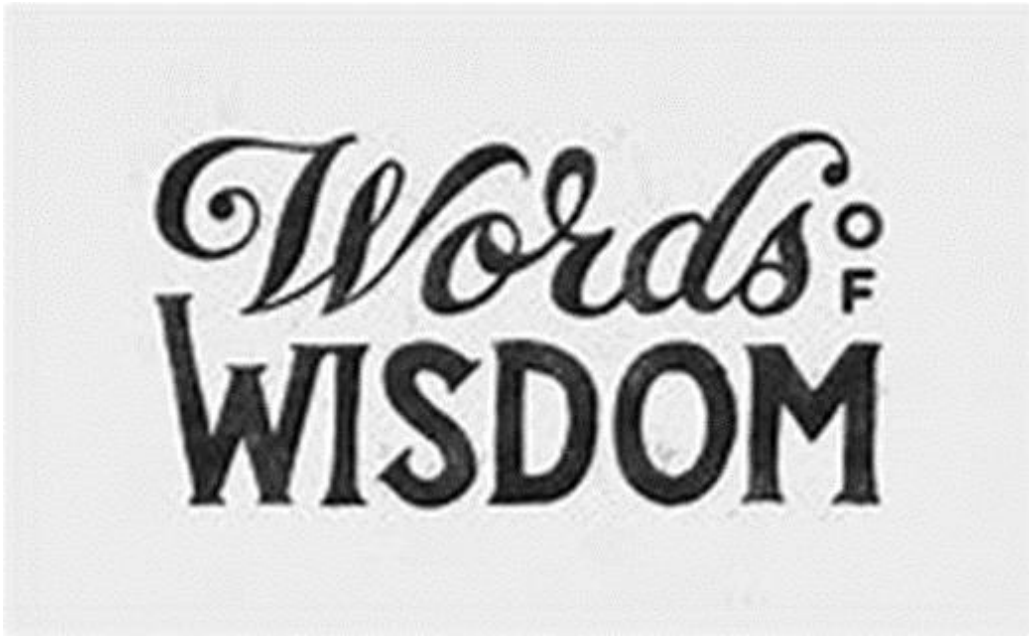
"Listen to your patient, he is telling you the diagnosis"

Sir William Osler, Bt
Founder Father of Johns Hopkins Medical Center*

**Tuteur, Amy (November 19, 2008). "Listen to your patient". The Skeptical OB. Retrieved April 9, 2012.*

REMEMBER, In Real Estate, It's "Location, Location, Location."

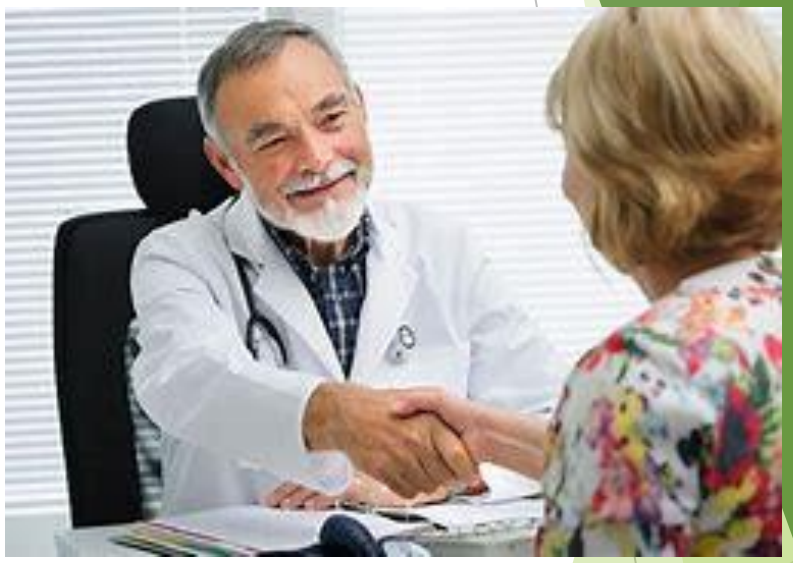
In Health Care it's, "History, History, History!"



Treats the Patient… NOT the Test

You can’t do this alone….TIPS on How to pick a practitioner

- Certifications beyond their original degree / license
- An eclectic knowledge base so you are afforded true holistic care
- They’re focused on finding root causes, the downstream effects, and creating an individualized manner of treating ***YOU!*** Not “your condition”.
- They use lab tests appropriately and know how to ***Interpret*** (not just read) them. But most of all…
- ***They will take time to listen and explain***



Interview the practitioner before committing yourself to their care.

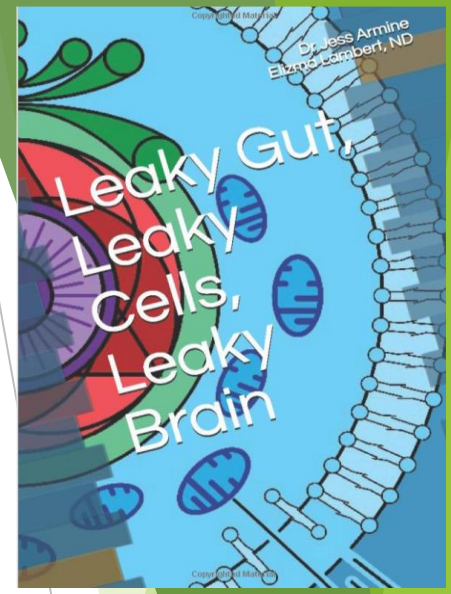
Assure yourself that he/she is as committed to your healing as you are and will take the time and effort to return you to life.

Chronic Illnesses Take a Long Time to Heal.

- The magic pill does not exist.
- Working with a practitioner, embracing the healing process, and participating in your recovery and you WILL HEAL!!!

Resources

- Nutritionist (ldnresearchtrust.org)
- Leaky Gut, Leaky Cells, Leaky Brain: Where to go when all hope is lost!: Armine, Jess, Lambert, Elizma: 9798747272231: Amazon.com: Books
- USA: Rupa Health | A simpler way to order specialty labwork.
- UK/EU: https://functionaldx.com, Welcome to Biolab Medical Unit London UK, Regenerus Labs



Evidenced Based References

Butyrate: **are important as food for cells lining the mammalian colon (colonocytes). Without butyrates for energy, colon cells undergo autophagy (self digestion) and die.**[1]

https://www.ncbi.nlm.nih.gov/pubmed/27346602
https://www.ncbi.nlm.nih.gov/pubmed/25875123

Honey: **Today, honey has been scientifically proven for its antioxidant, regulation of glycemic response, antitumor, antimicrobial, anti-inflammatory, and cardiovascular potentiating agent. It can be used as a wound dressing and healing substance.**

https://www.ncbi.nlm.nih.gov/pubmed/29101693

Zinc Carnosine: ***Involved in the reversal of neurodegenerative diseases, gastrointestinal conditions****, antioxidant, metal chelating, anti-crosslinking, and anti-glycation activities*

https://www.ncbi.nlm.nih.gov/pubmed/29382141
https://www.ncbi.nlm.nih.gov/pubmed/24247360
https://www.ncbi.nlm.nih.gov/pubmed/25846004

Sialic acid **are cytoprotectors, mainly localized on the surface of cell membranes with multiple and outstanding cell biological functions. Provides mucin for the GI tract.**

https://www.ncbi.nlm.nih.gov/pubmed/30509400

- NEI: https://www.neurorelief.com/index.php?p=cms&cid=108&pid=85&type=1
- Brain Basics: http://www.nimh.nih.gov/health/educational-resources/brain-basics/brain-basics.shtml
- The Brain from Top to Bottom: http://thebrain.mcgill.ca/flash/i/i_01/i_01_m/i_01_m_ana/i_01_m_ana.html
- Neurotransmitters, An Introduction: http://mybrainnotes.com/serotonin-dopamine-epinephrine.html
- Epigenetics of depression. Lolak S, Suwannarat P, Lipsky RH. Prog Mol Biol Transl Sci. 2014;128:103-37. doi: 10.1016/B978-0-12-800977-2.00005-X. PMID: 25410543

- Cell Membrane Rap: Cell Membranes Rap – YouTube
- The Cell Song: The Cell Song – YouTube
- Mitochondria Song: Electron Transport Chain (Music Video) – YouTube
- Enzymes Enzymes: Mr. W's Enzyme Song – YouTube
- Sciencemusicvideos.com

Learning doesn't have to be difficult

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Dr Jess treats patients and mentors practitioners worldwide.

Dr Jess offers prospective patients a complimentary 30 min “get acquainted” session.