Annual Update 2018

Gill and I have delivered four outstanding topics in this past teaching year.

1. **Inflammation**
2. **Why you are who you are**
3. **Autoimmune diseases**
4. **Epigenetics v Genetic determinism**

How are you?

1. Energy
Imagine there is a battery within you – a store of energy – powering your body. On a Scale of 1-100 how full is your battery?

Reboot your Health by Sara Davenport Pub by HayHouse

2. Life Scan
We rarely if ever, take the time to stop, look at where we are going and decide if that is the direction we really want to travel in for the rest of our lives.

On a Scale of 1-100
How does your life feel overall now?

Reboot your Health by Sara Davenport Pub by HayHouse

Life Scan
How much do you like your job?

How much do you like your home?

How are your relationships? (parents, partner, children, work colleagues etc)

Reboot your Health by Sara Davenport Pub by HayHouse

Life Scan
Do you have enough time for yourself?

How many hours a week do you spend with friends having fun?

How much time do you spend helping others?

Reboot your Health by Sara Davenport Pub by HayHouse

3. Happiness Scan

On a Scale of 1-100 where 100 is everything is fine and 1 is it couldn't get any worse how happy are you right here and now?

Reboot your Health by Sara Davenport Pub by HayHouse

4. Body Scan (Physical Health)

List any physical symptoms that are worrying you?

List any diagnosed issues along with any medication?

Reboot your Health by Sara Davenport Pub by HayHouse

4. Body Scan (Physical Health)

On average, how many times a week do you currently exercise?

On average how many hours do you sleep each night?
And how many times do you wake up at night?

Reboot your Health by Sara Davenport Pub by HayHouse

4. Body Scan (Physical Health)

On a Scale oof 1-100 how well do you currently feel physically?

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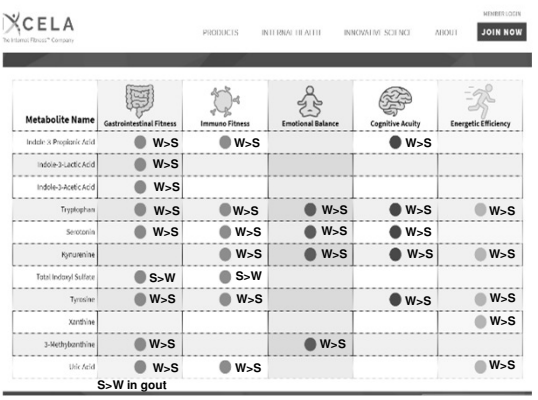
Company looks for metabolites associated with gut health via pinprick blood test

By Hank Schultz
20 Jul 2018 Last updated on 2

Among the metabolites the company looks for in the blood tests are those that would be familiar to any reader, including serotonin, tryptophan and uric acid. Others that are less well known include indole-3-priopionic acid, indole-3 acetic acid and indole-3 lactic acid.

https://ixcela.com

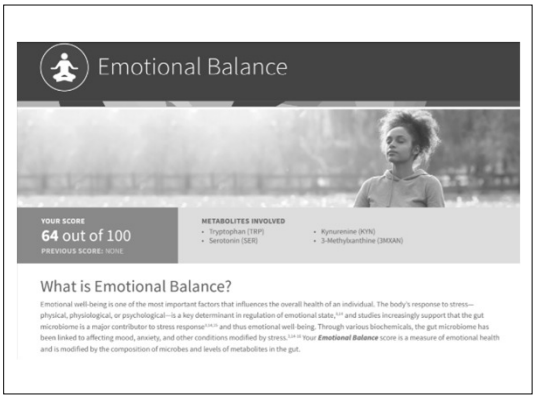
Internal Fitness™ Results

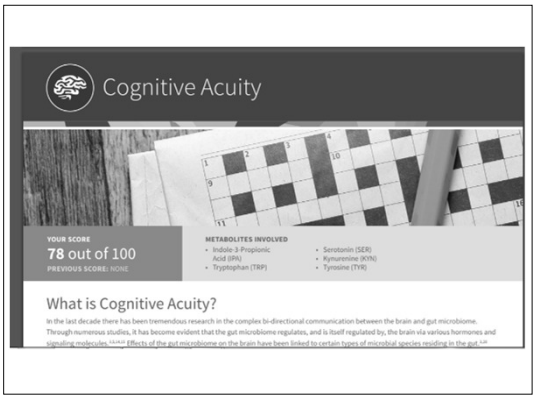


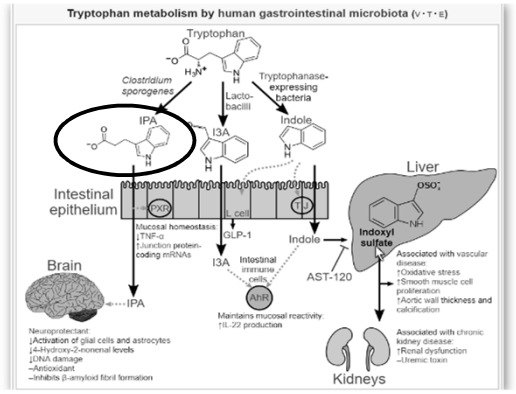
Metabolite Name	Gastrointestinal Fitness	Immuno Fitness	Emotional Balance	Cognitive Acuity	Energetic Efficiency
Indole-3-Propionic Acid	W>S	W>S		W>S	
Indole-3-Lactic Acid	W>S				
Indole-3-Acetic Acid	W>S				
Tryptophan	W>S	W>S	W>S	W>S	W>S
Serotonin	W>S	W>S	W>S	W>S	
Kynurenine		W>S	W>S	W>S	W>S
Total Indoxyl Sulfate	S>W	S>W			
Tyrosine	W>S	W>S		W>S	W>S
Xanthine					W>S
3-Methylxanthine	W>S		W>S		
Uric Acid	W>S	W>S			W>S

S>W in gout


Immuno Fitness
YOUR SCORE
58 out of 100
PREVIOUS SCORE: NONE
METABOLITES INVOLVED
• Indole-3-Propionic Acid (IPA)
• Tryptophan (TRP)
• Serotonin (SER)
• Kynurenine (KYN)
• Total Indoxyl Sulfate (IDS)
• Tyrosine (TYR)
• Uric Acid (UA)


Emotional Balance
YOUR SCORE
64 out of 100
PREVIOUS SCORE: NONE
METABOLITES INVOLVED
• Tryptophan (TRP)
• Serotonin (SER)
• Kynurenine (KYN)
• 3-Methylxanthine (3MXAN)
What is Emotional Balance?
Emotional well-being is one of the most important factors that influences the overall health of an individual. The body's response to stress—physical, physiological, or psychological—is a key determinant in regulation of emotional state,[1,2] and studies increasingly support that the gut microbiome is a major contributor to stress response[3,4,5] and thus emotional well-being. Through various biochemicals, the gut microbiome has been linked to affecting mood, anxiety, and other conditions modified by stress.[1,2,6] Your Emotional Balance score is a measure of emotional health and is modified by the composition of microbes and levels of metabolites in the gut.


Cognitive Acuity
YOUR SCORE
78 out of 100
PREVIOUS SCORE: NONE
METABOLITES INVOLVED
• Indole-3-Propionic Acid (IPA)
• Tryptophan (TRP)
• Serotonin (SER)
• Kynurenine (KYN)
• Tyrosine (TYR)
What is Cognitive Acuity?
In the last decade there has been tremendous research in the complex bi-directional communication between the brain and gut microbiome. Through numerous studies, it has become evident that the gut microbiome regulates, and is itself regulated by, the brain via various hormones and signaling molecules.[1,2,6,7,8] Effects of the gut microbiome on the brain have been linked to certain types of microbial species residing in the gut.[1,9]



Indole-3-Propionic Acid (IPA) W>S• has been associated with brain, kidney, and heart health.*

• IPA is produced in the human gut exclusively by one particular species of gut bacteria (Clostridium sporogenes) from tryptophan.27 Thus, IPA is a critical marker for a healthy gut microbiome.

• IPA is considered one of the strongest antioxidants identified.* IPA has been shown to play an important role in brain health.*28

• IPA plays a crucial role in maintaining a healthy gut by strengthening the tight junctions between cells lining the gut.*28 This is important for maintaining intestinal structural integrity, and decreasing intestinal permeability.

• IPA can be found in some sprouted seeds, such as mung beans and chickpeas.

Indole-3-Lactic Acid (ILA) W>S is linked with the formation of downstream metabolites such as indole-3-propionic acid (IPA).

- **ILA is a tryptophan metabolite and precursor to indole-3-propionic acid (IPA).29**
- **The tryptophan pathway is heavily involved in the creation of neurotransmitters and antioxidants that are important to healthy brain and gut function.**
- **ILA is found in fermented veggies such as kimchi, sauerkraut, pickles and kefir.**

Indole-3-Acetic Acid (IAA) W>S is a precursor to other metabolites in the tryptophan branch, specifically indole-3-propionic acid (IPA). The tryptophan pathway is heavily involved in the creation of neurotransmitters (such as serotonin) and antioxidants that are important for healthy brain and intestinal function.*

- **Proper levels of IAA maintain healthy levels of the beneficial Lactobacillus species of gut bacteria, which converts sugars such as glucose and fructose to lactic acid.30**
- **IAA can be produced from indole-3 pyrurate, which is a precursor to indole-3-propionic acid. • IAA is an auxin (growth hormone) produced in plants.**
- **IAA has been shown to possess antioxidant activity.*31**

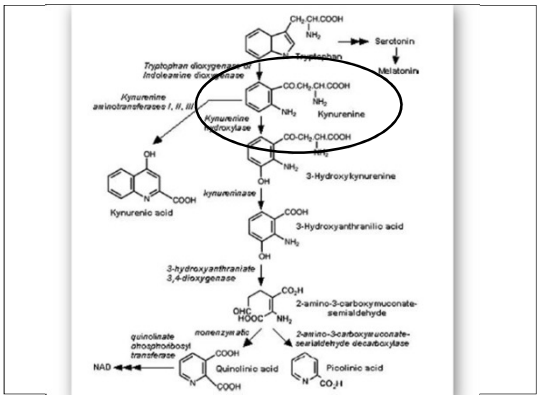
Tryptophan (TRP) W>S levels are linked to the ability to fall asleep and to muscle health. Tryptophan has been linked to mood and is important for emotional well-being.*

- **Tryptophan is obtained mainly through one's diet. Certain gut bacteria are also capable of making tryptophan.**
- **Tryptophan is an amino acid. Amino acids are building blocks for proteins that are essential for maintaining a healthy body.***

• Tryptophan is the precursor to many important metabolites: kynurenine, serotonin, and indole-3-propionic acid.
• Tryptophan can cross the blood-brain barrier, making it available to produce important neurotransmitters like serotonin32 which are essential for normal brain processes that affect mood, behavior, memory, and learning.*33
• Tryptophan is found in foods such as cruciferous vegetables, bananas, eggs and meat.

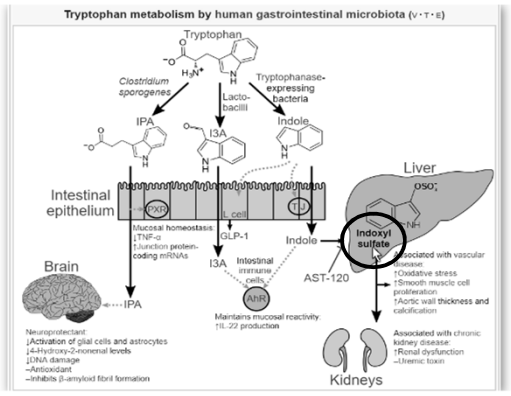
Serotonin W>S is linked to the ability to fall asleep, muscle health, brain health and gut health.34
• Serotonin is a tryptophan metabolite. Serotonin synthesis is facilitated by the adequate presence of vitamins B1, B3, B6, and folic acid. The tryptophan pathway is heavily involved in the creation of neurotransmitters (such as serotonin) and antioxidants that are important to healthy brain and gut function.*

• Serotonin is one of the most important signalling molecules within the gut, where it plays a pivotal role in initiating secretions (mucosal) and motor reflexes (the movement of the intestine),35 and is crucial for normal functionality of the central nervous system.*



Kynurenine (KYN) W>S is linked with levels of downstream metabolites (kynurenic acid) and vitamin B3. Kynurenine has been linked with energy levels and gut health. Kynurenine production is mediated by vitamin B6, selenium and sulfur amino acids.

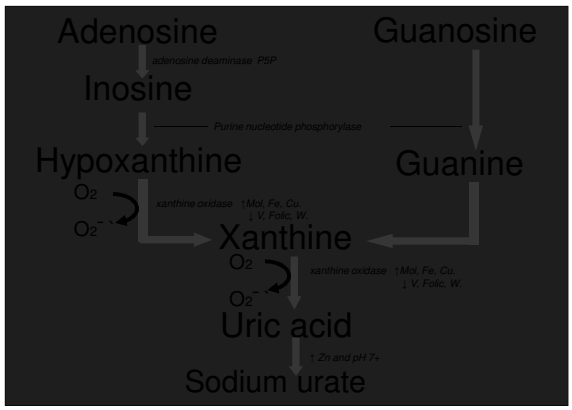
- **Kynurenine is used in the production of niacin (vitamin B3). Niacin is considered to be one of the essential human nutrients where it helps maintain integrity of DNA.***
- **Kynurenine is a metabolite of tryptophan. Its primary function is to dilate blood vessels.* It is also a regulator of the immune system.*36-37**
- **Kynurenine is utilized by the endocrine system to produce certain hormones.***
- **Kynurenic acid, a metabolite of kynurenine, is a neuroprotective agent in the brain.*38**
- **Kynurenine in the eye filters UV radiation***
- **Kynurenine can be found in meat, cheese, cruciferous vegetables, bananas, plums, and kiwi.**



Indoxyl Sulfate (IDS) S>W is linked to oxidative stress in numerous cell types including: vascular smooth muscle cells, endothelial cells, and bone cells.39
• IDS is a metabolite of tryptophan and is absorbed into the blood from the liver. IDS has been associated with kidney and heart health.39

Tyrosine (TYR) W>S is linked to gut and brain health. 5,40,41 • Tyrosine is a nonessential amino acid, which means that an individual can synthesize it from another amino acid, phenylalanine.
• Tyrosine functions as a building block for several important neurotransmitters such as dopamine, adrenalin, and noradrenalin. Neurotransmitters regulate mood, behaviour, and general feelings of well-being.*
• Tyrosine is essential for the thyroid gland to produce hormones T3 and T4 (which regulate growth, metabolism, body temperature, and heart rate).*41,42

• Tyrosine is also an important amino acid for the pituitary gland. The pituitary gland, like the thyroid gland, controls metabolism and growth; additionally, it regulates sexual maturation, reproduction, blood pressure, and many other vital physical processes.*41,43
• Tyrosine is also necessary for cell division.*44,45
• Tyrosine is present in almost every protein in the body.41
• Tyrosine can be found in soy, meat, cheese, nuts and seeds



Xanthine (XAN) W>S plays a role in inducing digestive enzymes. Xanthine levels are linked to heart rate and heart health.46

- **Xanthine is a metabolite of the purine pathway and functions in the digestive tract to induce hydrochloric acid production and promote secretion of pepsin from cells lining the stomach. Both of these processes help to break down consumed food.*47**
- **Xanthine is a mild stimulant and is found in coffee, cola, and green tea.***

3-Methylxanthine (3MXAN) W>S Metabolites of the purine pathway are significant because they affect both the gut and the brain. In the gut it increases hydrochloric acid and pepsin secretion, which aid in digestion.* Purines are key components of cellular energy systems (e.g., ATP and NAD), cellular signalling, and along with pyrimidines are involved in RNA and DNA production.*47

- **3MXAN levels are linked to intake of caffeine.**
- **3MXAN is a purine metabolism-breakdown product in caffeine and theophylline.49**

Uric Acid (UA) W>S (S>W in gout) is a final product of purine metabolism. Metabolites of the purine pathway are important because they affect both the gut and the brain. In the gut, uric acid increases hydrochloric acid and pepsin secretion aiding in digestion.* Purines are key components of cellular energy systems (e.g., ATP and NAD), cellular signalling, and along with pyrimidines are involved in RNA and DNA production.*48

- **Uric acid levels are correlated with hydration and purine levels in the diet. Approximately 1/3 of purines are derived from food. The majority of uric acid is dissolved in the blood, filtered through the kidneys, and expelled in the urine.**
- **Fructose tolerance is linked to uric acid levels.**
- **Uric acid may be a marker of oxidative stress.50**
- **Uric Acid is found in cherries, blueberries and apple cider vinegar**

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60. Silber, B.Y.; Schmitt, J.A. Effects of tryptophan loading on human cognition, mood, and sleep. Neurosci. Biobehav. Rev. 2010, 34, 387–407. 61. Markus, et al. Evening intake of alpha-lactalbumin increases plasma tryptophan availability and improves morning alertness and brain measures of attention. Am. J. Clin. Nutr. 2005, 81, 1026–1033. 62. Alcock, J., Maley, C. C. and Aktipis, C. A. (2014), Is eating behavior manipulated by the gastrointestinal microbiota? Evolutionary pressures and potential mechanisms. BioEssays, 36: 940–949. doi:10.1002/ bies.201400071. 63. Norris V, Molina F, Gewirtz A. Hypothesis: Bacteria Control Host Appetites. Journal of Bacteriology. 2013 February 195 (3): 411–416. 64. Househam AM, Peterson CT, Mills PJ, Chopra D. The Effects of Stress and Meditation on the Immune System, Human Microbiota, and Epigenetics. Adv Mind Body Med. 2017 Fall;31(4):10-25. 65. Bonaz B1,2, Sinniger V1,2, Pellissier S. Vagal tone: effects on sensitivity, motility, and inflammation. Neurogastroenterol Motil. 2016 Apr;28(4):455- 62. doi: 10.1111/nmo.12817. 66. Benedict et al. Gut microbiota and glucometabolic alterations in response to recurrent partial sleep deprivation in normal-weight young individuals. Mol Metab. 2016 Dec; 5(12): 1175–1186

Phenotype
v
Genotype

When examining health issues there are two aspects to consider

1. **Phenotype**
2. **Genotype**

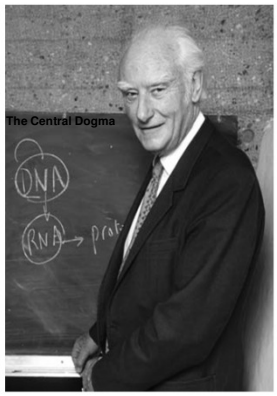
Phenotype (Gene expression) is the appearance of an organism resulting from the interaction of the genotype and the environment. So gene expression really is your ability to maintain homeostasis repair and regenerate.
Genotype is the sum total of the genes transmitted from parents to the offspring. Your constitution.

The function of the nucleus, that contains the genes is to store the blueprints for tissue repair.

Genes encode for protein synthesis.

Enzymes are proteins but not all proteins are enzymes. There are 6953 known enzymes to date.

Francis Crick was the first person to propose the Central Dogma. It is the foundation pillar of molecular genetics.



The character of an organism was thus thought to be pre-programmed in its DNA.
Hence the concept of "Genetic Determinism". (fate is pre-programmed from the moment of conception!)
We would be thus victims of our heredity.

de Melo-Martín, Inmaculada (December 2003). "When Is Biology Destiny? Biological Determinism and Social Responsibility" (PDF). Philosophy of Science. 70 (5): 1184–1194. j:10.1086/377399.

The Human Genome project 1987-2001 (A corporate event!)
Thought that for every protein in the human body you need a gene.
There are over 100,000 proteins in the human body and so it was thought there must be over 100,000 genes (+ regulatory DNA genes 20-40,000).

Biology of Belief by Bruce Lipton

The results showed that humans only have 25,000 genes, little more than fruit flies.

Expectations were that as an organism evolves there would be greater numbers of genes.

Biology of Belief by Bruce Lipton

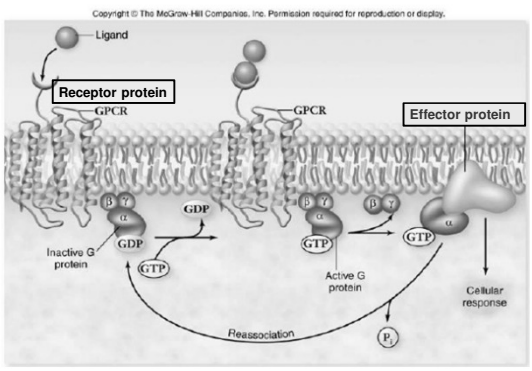
The nucleus was thought to be the brain of the cell.
But over 100 years ago experiments were performed which showed that genes did not control life. De-nucleating cells were shown to continue living quite satisfactorily for many months until either injured, starved or toxified. (environmental change)

Biology of Belief by Bruce Lipton

What maintains cell function are the signals that attach to the receptors on the cell and nuclear membranes.

There are two classes of proteins built into the membrane

1. **Receptor proteins**
2. **Effector proteins**



Signal Receptor Effector

Signal ⇨ Receptor ⇨ Effector

There are thousands of protein receptors built into the cell membranes.

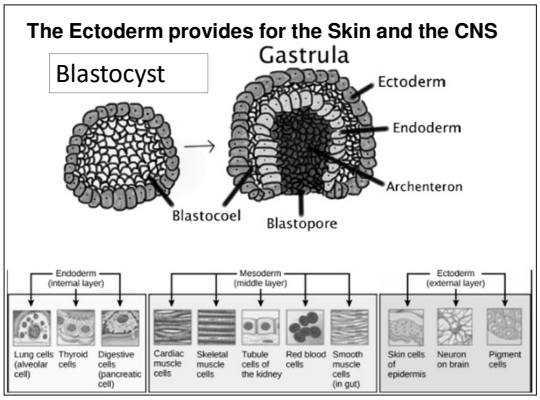
All functions carried out by the human (50 trillion cells) is carried out by each individual cell.

The cell membrane reads the environment because it has receptors.
The human body also has a skin with receptors – big ones such as eyes, ears, nose, taste and small ones such as touch, temperature pain etc. to read the environment and send signals to the brain.

So the skin is really part of our brain.

Embryological connection-
Sperm and Egg
Zygote
Blastocyst ⇨ Gastrula
3 Dermal layers Ectoderm
Mesoderm
Endoderm

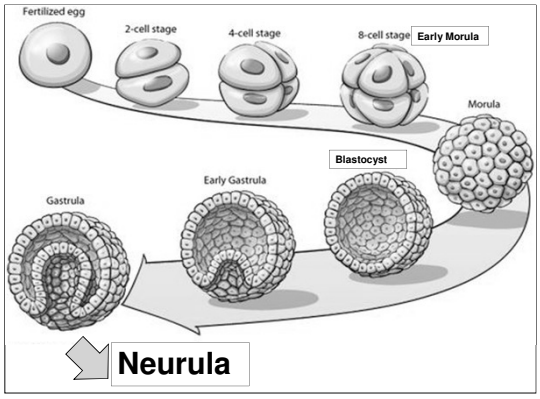
The Ectoderm provides for the Skin and the CNS



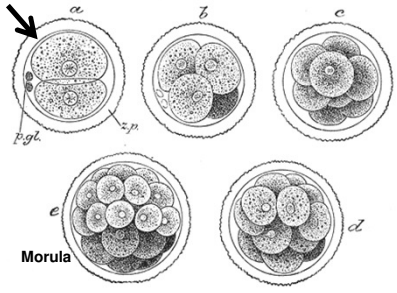
Looking at the early embryology of the cell in more detail

Mitosis is a type of cell division that results in two daughter cells each having the same number and kind of chromosomes as the parent nucleus, typical of ordinary tissue growth.

Meiosis a type of cell division that results in four daughter cells each with half the number of chromosomes of the parent cell, as in the production of gametes.

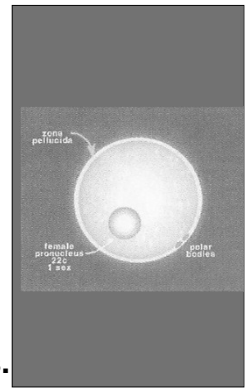


The zona pellucida is a glycoprotein layer surrounding the plasma membrane of mammalian oocytes

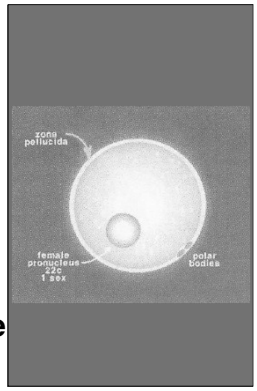


First stages of division of mammalian embryo. Semidiagrammatic. (From a drawing by Allen Thomson.) z.p. Zona striata. p.gl. Polar bodies. a. Two-cell stage. b. Four-cell stage. c. Eight-cell stage. d, e. Morula stage.

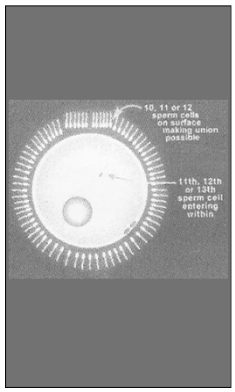
1st Stage
The spherical egg. Note the zona pellucida. Inside the membrane is a fluid and inside this is another perfectly round sphere – the female pronucleus.



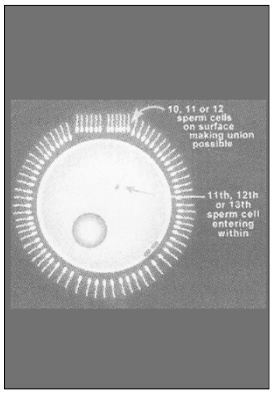
Which contains 22+1 chromosomes – half the chromosomes necessary to create a human body. Inside the zona pellucida are two polar bodies.



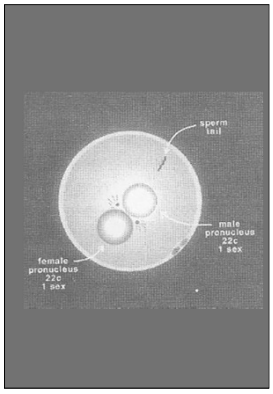
The ovum must be saturated with hundreds of sperm or conception is not possible. Out of those hundreds 10, 11 or 12 must come together in a pattern on the surface.



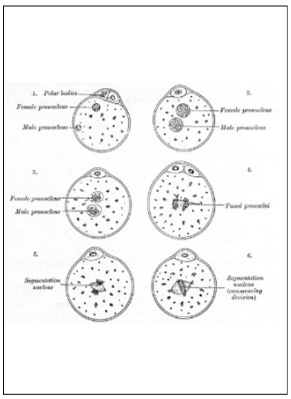
This allows the 11th, 12th or 13th sperm to enter the ovum. One sperm cannot get through without the other 10, 11 or 12.



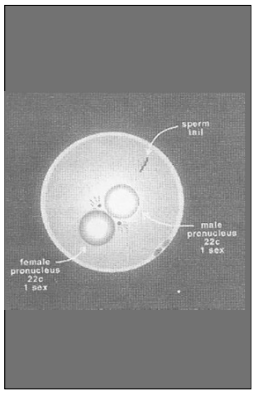
The successful sperm penetrates the zona pellucida and swims towards the female pronucleus.



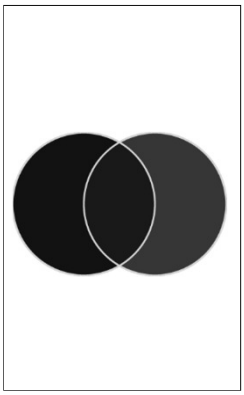
The sperm's tail then breaks off and the tiny sperm head expands and becomes a perfect sphere, which is the male pronucleus.



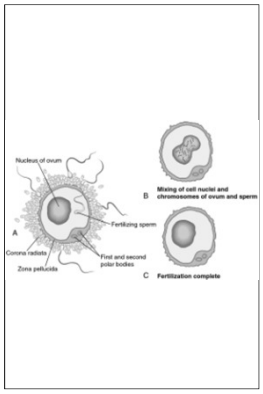
It becomes exactly the same size as the female pronucleus and it contains the other half of the necessary chromosomes to form the genome.



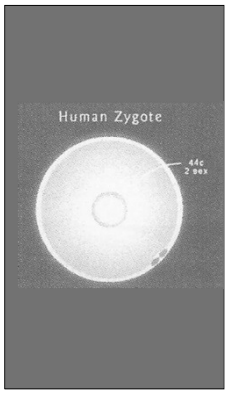
They now pass through each other and form a geometric relationship called the vesica piscis. This cannot occur unless the two pronuclei are the same size.



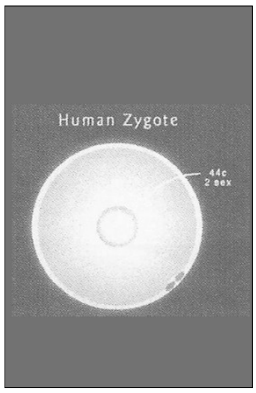
After the two pronuclei make a vesica piscis the male pronucleus continues to permeate the female pronucleus until they are one – the zygote.



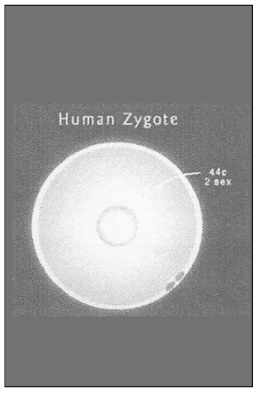
The human zygote will not change size during the first nine cell divisions. Its fixed, as is the size of the outer membrane The human zygote is 200x bigger than the average human cell.



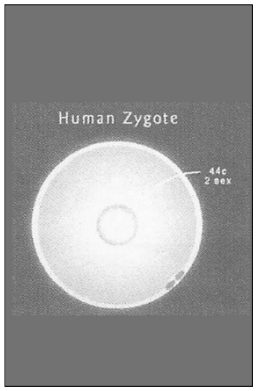
When it divides into two, each of those two cells are half the original size and when they divide into four each cell is a quarter of the original size.



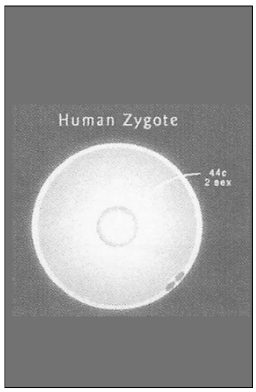
The cells keep dividing like this until they have divided 9 x and number 511.
At this point the average cell size of the human body is reached.



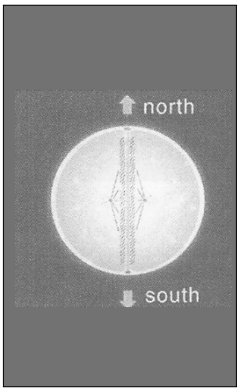
1
2
4
8
16
32
64
128
256
511



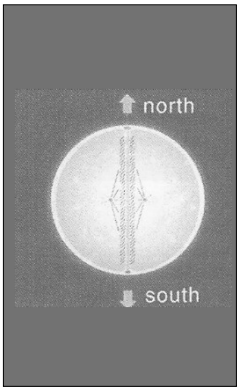
Mitosis continues and the dividing cells expand beyond the boundaries of the original zona pellucida.



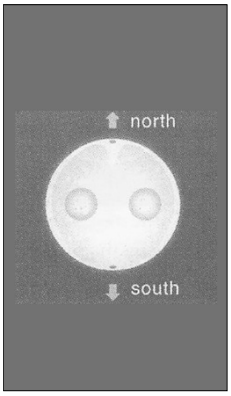
2nd Stage
The zygote splits. The polar bodies now begin to migrate through the zona pellucida. One becoming the north pole and one the south pole.



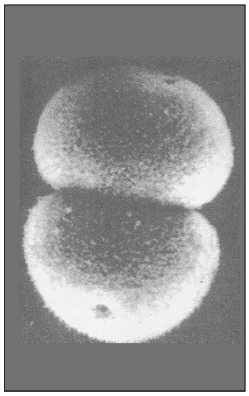
A tube now forms running through the centre of the zygote. The chromosomes then break in half and half line up on the left side of the tube and half on the right side.



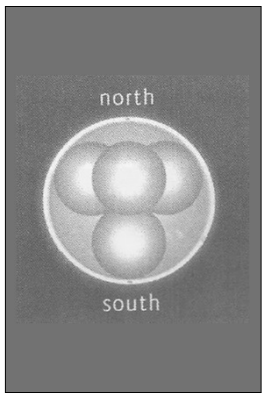
After the chromosomes have lined up along the two sides of the tube, they form into 2 cells, one on each side of the tube and each cell contains 44 +2 chromosomes



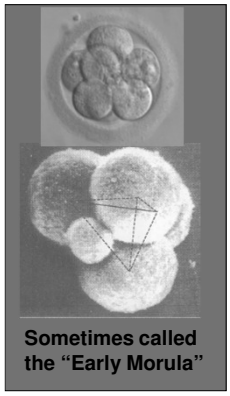
The first two cells. (The zona pellucida has been removed for the photograph.)



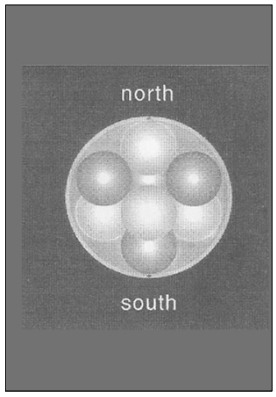
3rd Stage.
2 cells now divide to 4 cells forming a tetrahedron, the apex either pointing to the north pole for a boy or to the south pole for a girl.



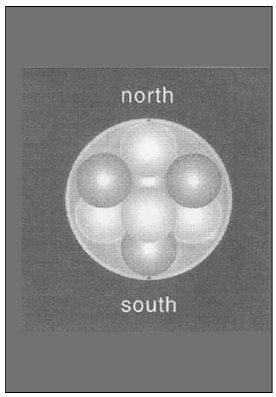
4th Stage
Next the cells divide into 8 forming one tetrahedron facing up and one facing down a star tetrahedron (cube). Known as the "Egg of Life".

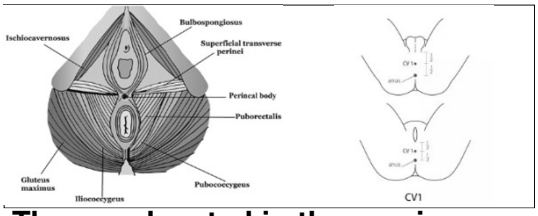

Sometimes called the "Early Morula"

These 8 cells appear to be identical with each cell if separated from the others can form a human being.



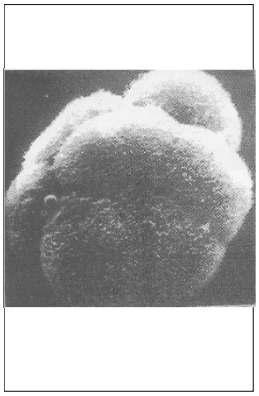
These 8 cells are immortal relative to the physical body and contain the original DNA. (Stem cells)





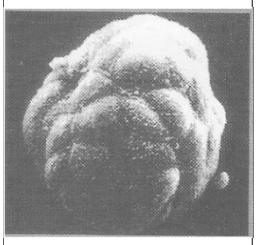
They are located in the precise geometric centre of the body which is 1 cun above the perineal body In Chinese medicine CV 1 – ”Meeting Place of Yin”, “Ren-1”.

The foetus continues to grow radially in 360 degrees from the original 8 cells.

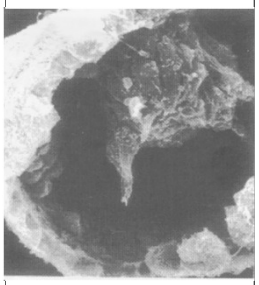


5th Stage
Next the 8 cells divide into 16 cells (morula) where upon it forms another star tetrahedron (cube).This is the last time it will be symmetrical.

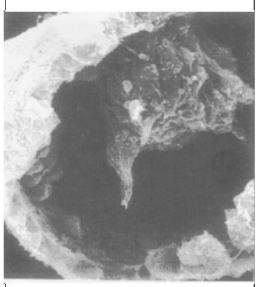
Morula



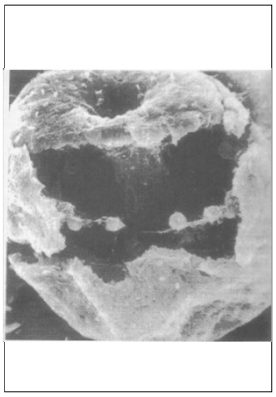
6th Stage
16 cells become 32 cells and create a Blob spherical shape (blastocyst) which stretches and the inside starts turning out becoming a hollow ball.

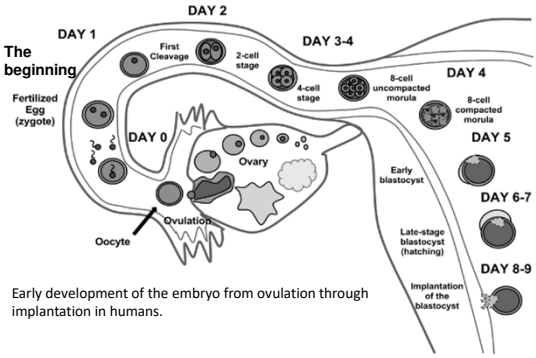


Once at this stage it becomes a perfect hollow sphere. Then the north and south poles start dropping through the space inside like an apple cored through the middle.

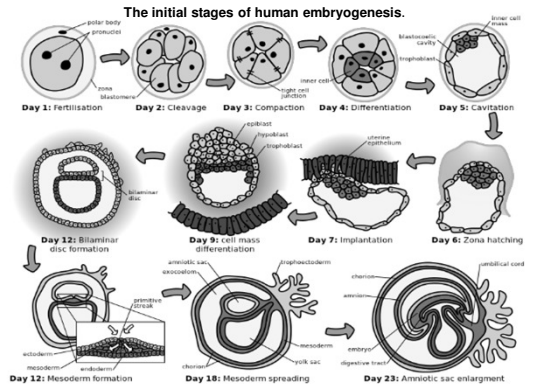


The hollow sphere then becomes a spherical torus at 511 cells.



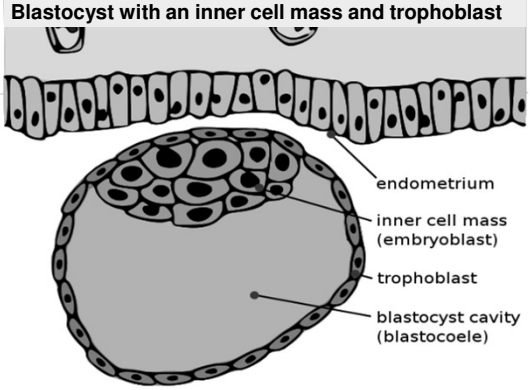


Early development of the embryo from ovulation through implantation in humans.



7th Stage. Day 6. Cells differentiate into an outer layer of cells (collectively called the trophoblast) and an inner cell mass. With further compaction the individual outer blastomeres, the trophoblasts, become indistinguishable. They are still enclosed within the zona pellucida.

Blastocyst with an inner cell mass and trophoblast

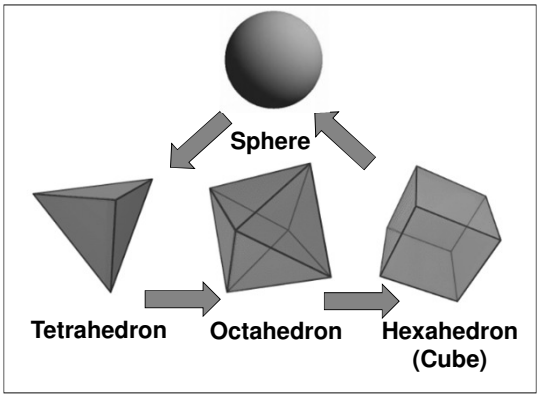


This compaction serves to make the structure watertight, containing the fluid that the cells will later secrete.
The inner mass of cells differentiate to become embryoblasts and polarise at one end.

They close together and form gap junctions, which facilitate cellular communication. This polarisation leaves a cavity, the blastocoel, creating a structure that is termed the blastocyst. The trophoblasts secrete fluid into the blastocoel.

The resulting increase in size of the blastocyst causes it to hatch through the zona pellucida, which then disintegrates. The inner cell mass will give rise to the embryo proper, while the fetal part of the placenta will form from the outer trophoblast layer.

Forgács, G.; Newman, Stuart A. (2005). "Cleavage and blastula formation". Biological physics of the developing embryo. Cambridge University Press. p. 27.



PHENOTYPE CHALLENGE

Scale of Health
"On a scale of 1-100 your Scale of Health (ability to repair, regenerate and maintain health and wellness) calibrates at ……."

GENOTYPE CHALLENGE

"On a scale of 1-100 the ratio of your Non-Zygotic DNA to your Zygotic DNA calibrates at ……."

Non zygote DNA to Zygote DNA

1. **TL perineal body. Should be negative.**
2. **Cross TL any skin or entry point.**
3. **Strong muscle now goes weak.**
4. **Assess for remedy and dose. Usually need to take for 2 months.**

Super Sea Buckthorn seed capsules

Sourced from the Himalayan mountains in northern India. Wild crafted and CO2 extracted. This oil is extracted from the seeds of the Sea buckthorn fruits and not the flesh making it a richer and more concentrated product.

Epigenetics
simply ingenious

Maintains normal structure and function of the skin and mucous membranes in the eyes, nose, mouth and female reproductive tract

Contains powerful phytonutrients

Reduces symptoms of Adrenal Fatigue

Aids in Preventing Infections

Boosts the Immune System

Provides Cardio-protective qualities

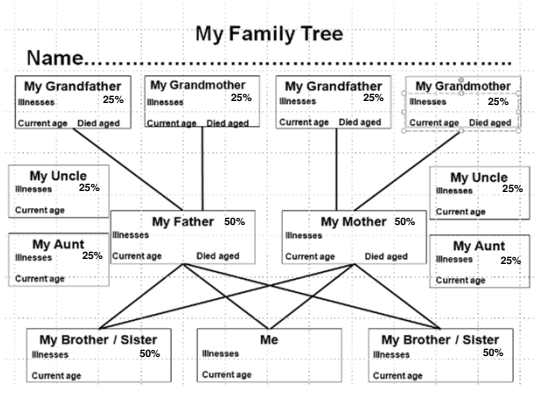
Fights Diabetes

Super Sea Buckthorn seed capsules

2. Scale of Ingestion
On a scale of 1-100 the percentage of essential nutrients that you ingest i.e. eat and drink, to attain optimal health and wellness is ……..?

3. Scale of Digestion
On a scale of 1-100 the percentage that you digest i.e. reduce long chain molecules down to short chain molecules to readily absorb, these essential nutrients is ……?

4. Scale of Absorption
On a scale of 1-100 the percentage that you absorb these short molecules i.e. getting them from the intestine into the blood is……?



Daily Mail 1/9/2018

Stunning anti-ageing breakthrough could see humans live to 150 and regenerate organs by 2020 'for the price of a coffee a day'

Charlie Cox For Daily Mail Australia 16 hrs ago

An extraordinary new anti-ageing technique could see humans live to 150 years old and allow them to regrow their organs by 2020.
Harvard Professor David Sinclair and researchers from the University of New South Wales developed the new process, which involves reprogramming cells.
Dr Sinclair said the technique could allow people to regenerate organs, and even allow paralysis sufferers to move again, with human trials due within two years.
The same researchers also found they could increase the lifespan of mice by ten per cent by giving them a vitamin B derivative pill.
They also said the pill led to a reduction in age-related hair loss, according to The Herald Sun.

The science behind the new technique involves the molecule nicotinamide adenine dinucleotide (NAD), which plays a role in generating energy in the human body.

The Sun | RT | TV & SHOWBIZ | NEWS | FABULOUS | MONEY | MOTORS | TRAVEL | TE

TURN BACK TIME Wrinkles and baldness could be REVERSED 'by switching off ageing gene'

By switching off a mutation that damages cells, scientists were able to regrow hair and reduce wrinkles in ageing mice

By Andrea Downey, Digital Health Reporter
23rd July 2018, 10:00 am | Updated: 23rd July 2018, 4:34 pm

3 COMMENTS

THE need for expensive anti-ageing creams could soon be a thing of the past after scientists discovered a way to reverse wrinkles by "switching off the ageing gene".

The breakthrough could also put an end to baldness after tests showed hair grew back when the gene was targeted.

3

Experts believe the breakthrough could one day reverse the signs of ageing, like wrinkles and grey hair, in people

Ageing and baldness occur when the body's cells start to slow down.

When they switched off this mutation the mice grew thick fur and their skin became smoother - the same as a healthy mouse of the same age.

In humans the decline of the mitochondria in the cell is also linked to age-related diseases like heart disease, diabetes, cancer and neurological diseases.

Scientists used the antibiotic doxycycline, often used to treat bacterial infections including acne and pneumonia, to induce ageing in the cells of the mice.

After four weeks they showed grey, thinning hair, ageing and lethargy.

Cognitive Health: Feeding the Mind

Thyroid medications recalled due to risk of impurities

By Sandee LaMotte, CNN

Updated 1927 GMT (0327 HKT) August 15, 2018

Certain batches of hypothyroid medications are being recalled by Westminster Pharmaceuticals after one of its Chinese suppliers failed a US Food and Drug Administration inspection.

Are the health benefits of turmeric too good to be true?

By Maritza Moulite, CNN
Updated 0752 GMT (1552 HKT) August 7, 2018

Alzheimer's disease. Diabetes. Arthritis. Unwanted hair growth. Baldness. Infertility. Erectile dysfunction. Hangovers, Glaucoma. Cancer. If you have an ailment, there's a good chance that someone, somewhere, is studying whether turmeric can treat it.

There are more than 15,000 manuscripts published about curcumin, the active ingredient in turmeric, and about 50 manuscripts added to this collection each week, according to the National Institutes of Health.

First Biomarker Evidence Autism Is Linked to DDT

Megan Brooks
DISCLOSURES
August 16, 2018

DDE (p,p'-dichlorodiphenyl dichloroethylene), a breakdown product of DDT.

Elevated levels of a dichlorodiphenyltrichloroethane (DDT) metabolite in pregnant women provide the first biomarker evidence that the banned insecticide is implicated in autism in children, new research shows.

"This study provides the first evidence, using a marker of an insecticide in the blood, that a pregnant mother's exposure to this organic pollutant is related to an increased risk of autism in her offspring. Previous studies were based, for example, on proximity to sites that were contaminated with these pollutants," lead investigator Alan S. Brown, MD, MPH, professor of epidemiology at Columbia University's Mailman School of Public Health and of psychiatry at Columbia University Medical Center in New York City, told *Medscape Medical News*.

"The study," he said, "offers potential implications for understanding a pathway regarding how autism might develop from a prenatal exposure and could have policy implications for public health regarding testing for, and minimizing exposure to, environmental pollutants."

The study was published online August 16 in the *American Journal of Psychiatry*.

Autism Trigger?

In the Beginning

Placenta Facts
Provides nutrients and oxygen to a growing fetus
Removes waste from the fetus
Reaches maturation between 3 -4 months gestation
Only transient organ in the body

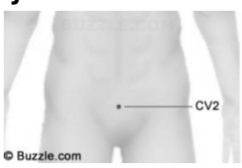
Did you know...
Women living at higher altitudes make more efficient placentas?
A woman transfers her immunity to the fetus via the placenta (causing the baby to be born with double the blood antibody concentration).
Placentas weight between 1-2 lbs at birth.

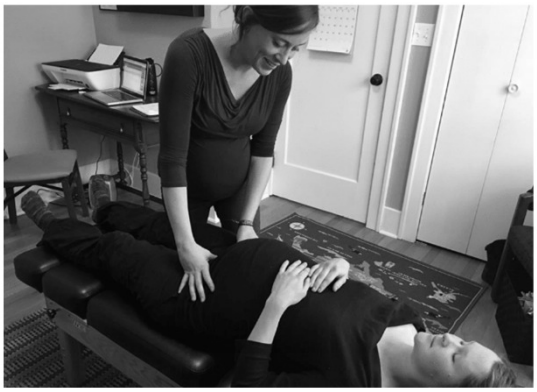
Clinical Importance
A matured placenta will "take over" hormone production form the Corpus Luteum.
This often correlates with a decrease of morning sickness symptoms.
Remember P-5-P in all cases of "morning sickness"

Temporary Placenta Reflex Point
What is it? An organ-reflex point that can be found utilizing manual muscle testing between 11-14 weeks gestation
No longer tests once a woman has given birth
How did we find it? My own pregnancy and prenatal / pediatric practice

Location of Placenta Point
Conception Vessel (CV) 2-QuGu, "Curved Bone"
On top of the notch in the centre of the superior border of the pubic symphysis

Mnemonic: "Three Small Buttons"





How to Find the Point

Diagnostic Tool:
1. Similar to organ alarm points

2. An active placenta point causes a change in manual muscle testing

How to Use the Point
How to Use the Point
Therapeutic Tool:
1. Via Cross TL (therapy localization)- structural, other organ points, neurovascular and neurolymphatic, emotions, etc
2. For supplement testing. (Best access to what an unborn baby needs nutritionally.)

Supplements to Check
Similar supplements used to support liver.
Cardiovascular support.
Immune support.
IMPORTANT: remember by the time this point muscle tests, the placenta is fully formed; therefore supplement support should be focused on increasing function.

YOU can save a life (or two)!
"Preeclampsia is a pregnancy complication characterized by high blood pressure and signs of damage to another organ system. It usually begins after 20 weeks of pregnancy in women whose blood pressure had been normal."-
Mayo Clinic.

Preeclampsia has increased by 25% in the last 2 years
Leading cause of maternal and infant illness and death
New research shows a connection between preeclampsia and PLACENTA health.
Think Magnesium, Magnesium and Magnesium.

Hi Chris, *16/8/2018*

Thank you very much for your email. I would be overjoyed if you used my findings in your September seminar. I greatly appreciate the information you share and would love to watch the seminar this fall. Please let me know when it's available.

Thanks for reaching out!

Madison

11/8/2018

THE Sun

nitrous oxide'

Lichtheim's disease is believed to start when nitrous oxide starves the body of vitamin B12 - damaging the part of the body that protects nerve fibres in the spinal cord that control movement and sensation.

Olivia is now receiving vitamin B12 injections and is hoping she will recover completely.

She has managed to take 12 steps with the help of physiotherapists but will need to spend a long time in hospital for rehabilitation.

11 August 2018

DRUG NIGHTMARE
Mum paralysed after weekend hippy crack binges while son, 3, was with dad

OLIVIA Golding, 24, has to learn how to walk and use her hands again after contracting a disease from lack of vitamin B12 that damaged her spine. The mum-of-one is can't even tie son Parker's shoes up or play with him is and is unable to even go to the toilet by herself.

DEADLY WEED KILLER **Groundsman, 46, awarded £226million after court rules weedkiller Roundup caused his terminal cancer**

A jury in San Francisco found the company failed to adequately warn of the risks of using Roundup

By Lauren Fruen
11th August 2018, 1:30 am | Updated: 11th August 2018, 1:30 am

THE Sun

A GROUNDSMAN has been awarded £226million after a court ruled weedkiller Roundup contributed to his terminal cancer.

A San Francisco jury found the company failed to adequately warn of the risks of using Roundup.

Fish oil supplements for a healthy heart 'nonsense'

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NEWS

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Health

Taking omega-3 fish oil supplements is often touted as a simple way to protect your heart - but experts say the evidence that it does any good is flimsy at best.

Cochrane researchers looked at trials in over 100,000 people and found little proof that it prevented heart disease.

They say the chance of getting any meaningful benefit from taking omega-3 is one in 1,000.

Experts say Cochrane review that finds little support for CVD benefits of omega-3s fails to properly weigh 'totality of evidence'

By Hank Schultz

18-Jul-2018 - Last updated on 19-Jul-2018 at 03:53 GMT

A new review from Cochrane has come to the conclusion that there is not enough evidence to support the effects of omega-3s on forestalling heart disease, stroke or death.

Published yesterday, the review, titled *"Omega-3 fatty acids for the primary and secondary prevention of cardiovascular disease,"* combines the results of 79 randomized trials involving 112,059 subjects. These studies assessed effects of consuming more omega-3s or using omega-3s supplements on the incidence of diseases of the heart and circulation.

Of the 79 trials, 25 studies were assessed as highly trustworthy because the authors judged them to be well designed and conducted. These trials were, as the authors said, *"At low risk of selection bias, performance bias and detection bias, plus low risk of performance bias in supplemental trials."*

Conclusion is far too broad

"We need to understand the what the studies included in these meta-analyses were testing. Typically, the people in these studies were older, already had some chronic disease, and were taking several other medications. What's more, low doses of omega-3s were typically given, and the studies ran for only 2-3 years on average. We agree that omega-3s may not significantly reduce risk for heart disease in this scenario, but the conclusion that 'omega-3s don't improve heart health' is for too broad," said William Harris, PhD, a noted omega-3s researcher at the Sanford School of Medicine at the University of South Dakota.

Source: *Cochrane Database of Systematic Reviews*
DOI: 10.1002/14651858.CD003177.pub3.
"Omega-3 fatty acids for the primary and secondary prevention of cardiovascular disease"

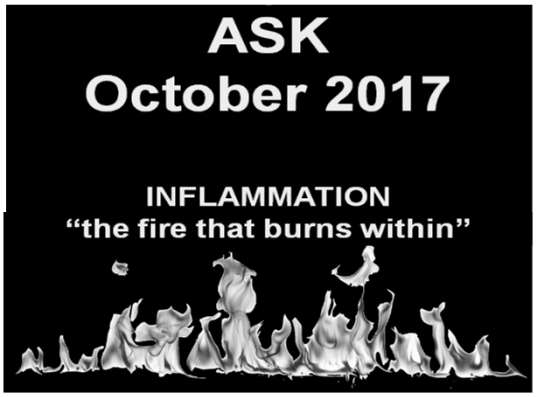
Authors: Abdelhamid AS, Brown TJ, Brainard JS, et al.

Consider a vitamin D supplement alongside breastfeeding, UK government report suggests

By Will Chu

Breastfed infants up to 12 months should receive a daily vitamin D supplement according to a report by the UK Scientific Advisory Committee on Nutrition (SACN) that details feeding in the first year of life.

The publication recommends a 'safe intake' of vitamin D (8.5-10 micrograms per day (µg/d)) for all breastfed infants from birth after figures found 0% of infants were at risk of vitamin D deficiency.



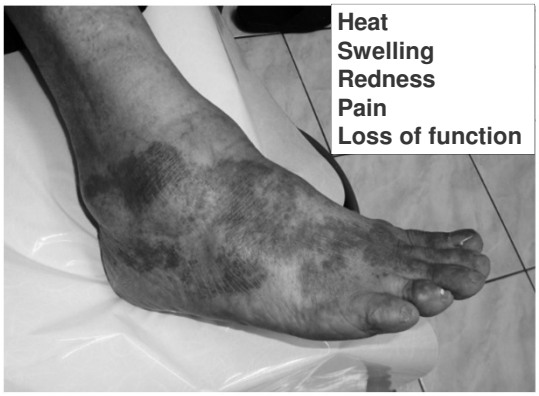
Inflammation

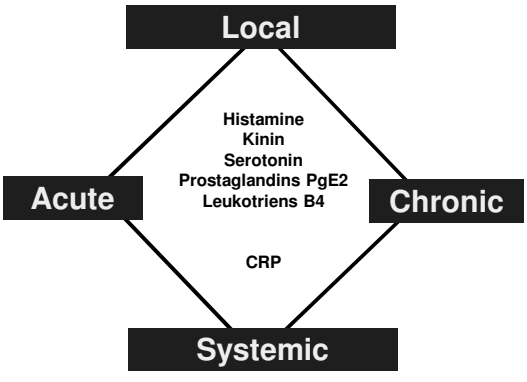
Definition – Acute, Chronic
Causes
- **Mechanical**
- **Chemical**
  - **Allergy**
  - **Infection Local, Systemic, GUT**
  - **Toxicity**
  - **Nutritional deficiencies**
  - **Essential fatty acid deficiency –**
    - **Prostaglandins**
    - **Leukotriens**
  - **Minerals – Ca, Cu, Fe, Mg, Mn, Se, S, Si, Zn**
  - **Vitamins – A, B1, B2, B3, B6, B12, C**
  - **Hypoxia leading to ROS and Antioxidants**
- **Hormones – Hypoadrenia - Low Cortisol,**
- **Autoimmune diseases**

Emotional

Inflammation-Diagnostic markers
C. Reactive Protein
NF Kappa B

Histamine	**Kinin**
Serotonin	**PgE2**
Leuk B4	
	APOE4
	Homocysteine
	Uric acid





Inflammation is part of the complex biological response of body tissues to harmful stimuli, such as pathogens, damaged cells, or irritants, and is a protective response involving immune cells, blood vessels, and molecular mediators.

The function of inflammation is to eliminate the initial cause of cell injury, clear out necrotic cells and tissues damaged from the original insult and the inflammatory process, and to initiate tissue repair and regeneration.

The classical signs of inflammation are heat, pain, redness, swelling, and loss of function. Inflammation is a generic response, and therefore it is considered as a mechanism of innate immunity, as compared to adaptive immunity, which is specific for each pathogen.

In contrast, chronic inflammation may lead to a host of diseases, such as hay fever, periodontitis, atherosclerosis, rheumatoid arthritis.

Inflammation is therefore normally closely regulated by the body.

Inflammation can be classified as either *acute* or *chronic*. *Acute inflammation* is the initial response of the body to harmful stimuli and is achieved by the increased movement of plasma and leukocytes (especially granulocytes) from the blood into the injured tissues.

A series of biochemical events propagates and matures the inflammatory response, involving the local vascular system, the immune system, and various cells within the injured tissue.

Prolonged inflammation, known as *chronic inflammation*, leads to a progressive shift in the type of cells present at the site of inflammation, such as mononuclear cells, and is characterized by simultaneous destruction and poor healing of the tissue from the inflammatory process.

It is useful to differentiate inflammation and infection as there are many pathological situations where inflammation is not driven by microbial invasion – for example - trauma, allergy, hypoxia, toxicity and nutritional deficiency of e.g. essential fatty acids.

Physical causes:
Burns
Frostbite
Physical injury, blunt or penetrating
Foreign bodies, including splinters, dirt and debris
Trauma
Ionizing radiation **Sp**

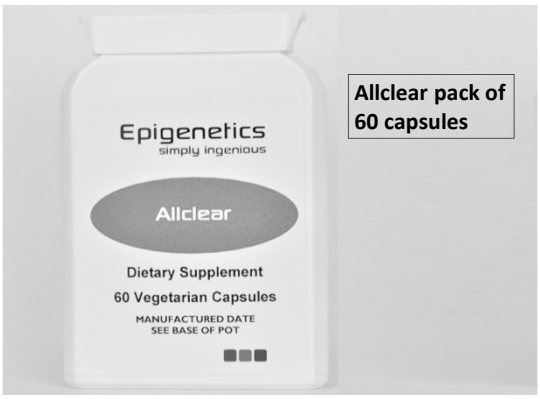
Biochemical causes:
Infection by pathogens
Immune reactions (allergy) due to hypersensitivity
Chemical irritants
Toxins
Alcohol
Hypoxia
Nutritional deficiencies
Sp, Liv, Kid, Lung, Si, LI

A Supplement That May Block The Toxic Effects of Alcohol

George D. Lundberg, MD
DISCLOSURES | September 26, 2017

Metabolizing Alcohol

My friends in the nutritional supplement community tell me that you can enhance the metabolism of blood alcohol to acetate, carbon dioxide, and water and minimize the acetaldehyde molecular logjam by taking oral supplements. L-cysteine, vitamin C, and vitamin B_1 are purported to help. At supplement doses, they are cheap and harmless at worst. At best: Goodbye, acetaldehyde toxicity; hello, restful sleep. About 200 mg of L-cysteine per ounce of alcohol consumed is sufficient to block a major portion of the toxic effect of acetaldehyde. But because alcohol is absorbed and metabolized rapidly, it may be necessary to take L-cysteine before and concurrently with consumption to maintain protection. Also, an excess of vitamin C (perhaps 600 mg) can help keep the L-cysteine in its reduced state and "on the job" against acetaldehyde. Experts recommend these doses (with or without extra B_1): one round before drinking, one with each additional drink, and one when finished.



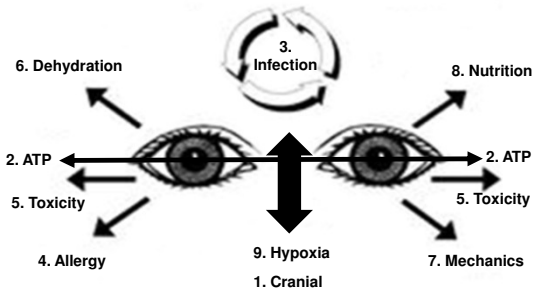
Allclear pack of 60 capsules

Psychological causes:
Stress – Anxiety or Depression
There is evidence for a link between inflammation and depression. Inflammatory processes can be triggered by negative cognitions or their consequences, such as stress, violence, or deprivation.
NB: Sp, LI, Liv, Bl meridians

Calming Stress and Anxiety Levels

Thus, negative cognitions can cause inflammation that can, in turn, lead to depression.
It has been shown in clinical trials that anti-inflammatory medicines taken in addition to antidepressants not only significantly improves symptoms but also increases the proportion of subjects positively responding to treatment.

Eyes into Distortion (EID)



The 5 R Program

1. Remove – Allergens, Toxins, Infections
2. Replace – Nutrients, Digestive enzymes
3. Re-inoculate - Probiotics
4. Repair – High or Low
5. Regeneration – High or Low

Functional Medicine Update 2010. Jeffery Bland

Acute inflammation is the healing process.

It serves to destroy, dilute and wall off the injurious agent but leads to healing by repair and remodelling of damaged tissue.

Chemicals that drive the inflammatory process
Histamine
(Brady)Kinin
Serotonin
Prostaglandins PgE2
Leukotriens B4
IFN-γ
IL-1, IL-6, IL -8, TNF-α
Nitric oxide

Chemicals that sensitize the nociceptors
Histamine
(Brady)Kinin
Serotonin
Prostaglandins PgE2
Leukotriens B4
Lactic acid
Potassium

Chronic inflammation is widely observed in obesity.
Elevated markers of inflammation, including:
IL-6 (Interleukin-6)
IL-8 (Interleukin-8)
IL-18 (Interleukin-18)
TNF-α (Tumor necrosis factor-alpha)
CRP (C-reactive protein)
Insulin
Blood glucose
Leptin

A predominant factor in this correlation is due to the autoimmune response triggered by adiposity, whereby immune cells may mistake fatty deposits for intruders. The body attacks fat similar to bacteria and fungi.

When expanded fat cells leak or break open, macrophages mobilize to clean up and embed into the adipose tissue.
Then macrophages release inflammatory chemicals, including TNF-α and IL-6.

TNF's primary role is to regulate the immune cells and induce inflammation. White blood cells then assist by releasing more cytokines.

Loss of white adipose tissue reduces levels of inflammation markers.

Challenge for Inflammation

1. **Strong muscle goes weak when challenged with C. Reactive Protein 6x or NFKapaB.**

2. **A weak associated muscle strengthens when challenged with C. Reactive Protein 6x or NFKapaB.**

Challenge for Inflammation

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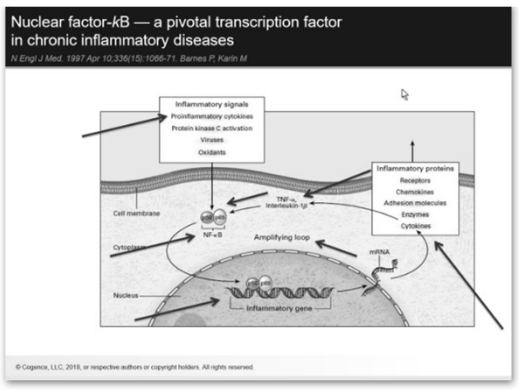


Treatment from a TL

1. Challenge the patient with a positive Therapy Localisation from strength to weakness.

2. Cross challenge the weakness against Histamine 6x, Kinin 6x, Serotonin 6x, Prostaglandins PgE2 6x and Leukotriens B4 6x.

3. Follow the Chemical Mediators of Inflammation chart and identify all negating nutrients, which will aid in the metabolism of the inflammatory mediating chemicals.

Treatment - systemic

1. **Challenge the patient against Histamine 6x, Kinin 6x, Serotonin 6x, Prostaglandins PgE2 6x and Leukotriens B4 6x.**
2. **Cross challenge any weakness against the Chemical Mediators of Inflammation chart and identify all negating nutrients, which will aid in the metabolism of the inflammatory mediating chemicals.**

CHEMICAL of INFLAMMATION	NUTRITIONAL SUPPORT
Histamine	Zn, Mg, Vitamin E, Bioflavonoids such as Hesperadin, Turmeric (Curcumin). Vitamin C SAM, B2, Cu
Serotonin (5HT)	B2, Cu, SAM, Mg, Zn, Vitamin C, Vitamin E, EPA, other Antioxidants, Turmeric, Ginger and Bromelain. Glutathione, Acetyl CoA, Sulphur
(Brady) Kinin	Zn, Bromelain, Hesperadin,
Prostaglandins PgE2	GLA, EPA, Zn, Mg, B6, Folic Acid, B3, Vitamin C and Vitamin A.
Leukotrien B4 (Think allergy isothiocyanates or parasites)	GLA, EPA, Vit amin E, Se, Glutathione, Ginger, Turmeric (Curcumin), Silymarin (Milk thistle).

Top Anti-Inflammatory Spices Dr Mercola

Cloves
Cinnamon*
Jamaican allspice
All spice
Caraway seeds
Cardoman
Coriander
Cummin
Paprika
Chilli*

Turmeric
Ginger*
Garlic
Cayenne
Black pepper
Saffron
Fenugreek
Nutmeg

Top Anti-Inflammatory Herbs - Dr Mercola

Oregano
Marjoram
Sage
Thyme
Coriander
Fennel

Yarrow

Rosemary*
Basil
Bay leaf
Dill
Lemon grass
Mint

What is the cause?

1. **Structural**
2. **Biochemical**
   1. **Deficiency**
   2. **Toxicity**
   3. **Infection**
   4. **Allergy**
   5. **Hypoxia**
3. **Emotional.**

What is the cause?

1. **Structural – Does TL negate in certain positions? Does pain switch on and off by changing positions**

What is the cause?

2. **Biochemical Deficiency**
   Challenge against nutritional composites. Identify exact nutrient and challenge for does and timing.

What is the cause?
2. Biochemical Toxicity
Challenge against eye positions.
Challenge against
CHEMICAL nosode
TOXIC METAL nosode
RADIATION nosode

Find culinary Herb / Spice

What is the cause?
2. Biochemical Infection
Challenge against eye positions
Challenge against
BACTERIA nosode
ACUTE VIRUS nosode
POST VITUS nosode
FUNGUS nosode
Different PARASITE nosodes

What is the cause?
2. Biochemical Allergy
Challenge against eye position
Challenge against
Something eaten
Something drunk
Something inhaled
Something transdermal
Something Hair, Teeth, Nails etc

What is the cause?
2. Biochemical Hypoxia
Challenge against eye positions
Challenge against Oxygen
Challenge Heme synthesis pathways

What is the cause?
3. Emotional
Conscious v Unconscious

Why You Are
Who You Are

But that's your body.

Your body is a direct reflection of your subconscious mind.
Candice Pert – Molecules of Emotion

What you hold in mind you become
David Hawkins Power v Force

Hypertonicity

Preliminary Test
Strong Indicator Muscle

Before proceeding check indicator muscle for hypertonicity by testing with the corresponding meridian acetate on.
If the muscle weakens then it is hypertonic and do not use as an indicator.
e.g. Quadriceps and Small Intestine acetate.

Muscles and their meridian relationship.

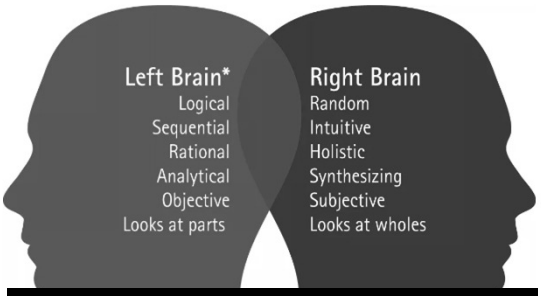
Meridian	Muscles
Bladder	Tibialis ant, Tibialis post, Peroneus long/ brevis, Peroneus tertius
Kidney	Psoas, Iliacus, Upper trap
Gall bladder	Popliteus
Liver	PMS, Rhomoids
Large Intestine	TFL, Hamstrings, QL
Lung	Deltoid, Serratus ant, Coracobrachialis
CV	Supraspinatus, Diaphragm
GV	Teres major
Triple warmer	Teres minor, Infraspinatus
Circulation / sex	Glut max, Glut med/min, Piriformis, Adductors, Sartorius, Gracilis
Stomach	PMC, Neck flexors, Biceps, Brachialis, Pronator teres, Pronator quadratus
Spleen	Lat dorsi, Mid trap, Lower trap, Triceps
Small intestine	Quads, Abdominals
Heart	Subscapularis

A hypertonic muscle is one that fails to become inhibited when it should e.g.

1. **Running the meridian end to beginning point**
2. **Approximating the muscle spindle cells**
3. **Tapping the muscle / Meridian's sedation point**
4. **North / South pole of a magnet**

Dr Sheldon Deal -Shortcuts

Left and Right Brain Dominance



Firstly challenge for Left Brain – Right Brain dominance

*Source: Funderstanding.com, Inc., New Jersey

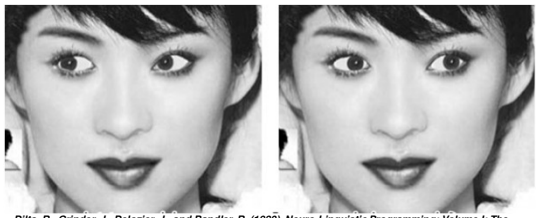
Right and Left side of the Brain a tentative dichotomy

LEFT BRAIN	RIGHT BRAIN
Right body	Left body
Logical	Non-logical
Mathematical	Tonal
Rational	Non-sensible
Reasonable	Unpredictable
Practical	Non-practical
Linea	Spatial
Masculine	Feminine
Intellectual	Intuitive
Argumentative	Experience
Negative	Positive
Time, History	Eternity, Timelessness
CONTENT	Under some circumstances maybe be clairvoyant, clair-audient,
	CONTEXT

Applied Kinesiology Volume 1 by David Walther

1. **Left brain eyes left**
   Right brain eyes right

Side that weakens is the less dominant brain.



Dilts, R., Grinder, J., Delozier, J., and Bandler, R. (1980). Neuro-Linguistic Programming: Volume I: The Study of the Structure of Subjective Experience. Cupertino, CA: Meta Publications. p. 2. ISBN 978-0-916990-07-7

The dominant hemisphere should be the location of the conscious mind.

The less dominant hemisphere should be the location of the unconscious mind.

Percentage left and right brain usage

On a Scale of 0-100 the percentage that you use your LEFT BRAIN IS ……..?

On a Scale of 0-100 the percentage that you use your RIGHT BRAIN is ……...?

Brain activity challenge
"On a Scale of 1-100 with 100 being full firing threshold, the % firing of your left / right Hemisphere calibrates at ……."

Psychological Reversal

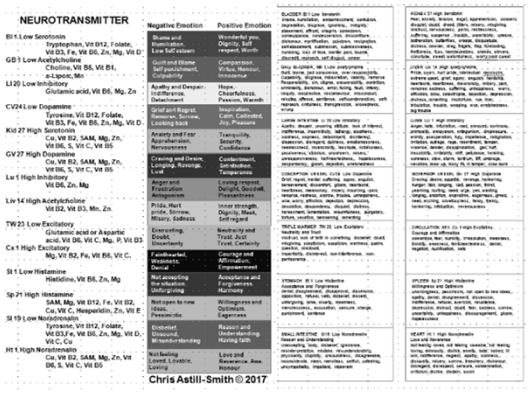
Normally psychological reversal will be in the less dominant (unconscious) brain.

1. I truly <u>want</u> to totally resolve my ……

2. I truly believe that <u>you</u> can totally resolve my ……

3. I truly believe it <u>is</u> possible to totally resolve my……

Weakening to statements 1, 2 or 3 indicates an unconscious block into resolving a person's health condition.

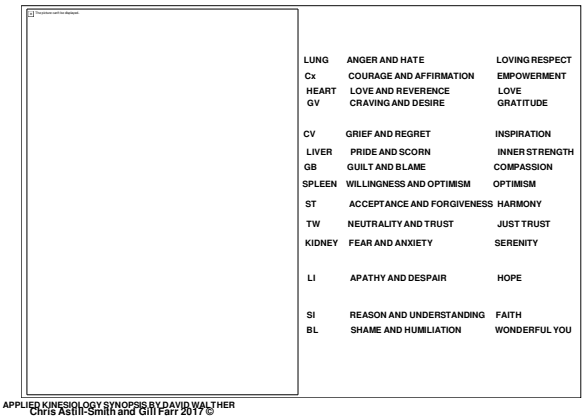


Therapy options for Unconscious emotions

1. **Treat associated point of Unconscious (hyper)**
2. **ESR**
3. **IRT**
4. **Aromatherapy / Perfumes**
5. **EFT**
6. **Therapy Localisation technique (similar to NET)**

Other therapy options for Unconscious emotions

Biophoton energetics - Light therapy
Affirmations
Love
Exercise
Deep massage
Meditation
Being with others
Walk in the woods



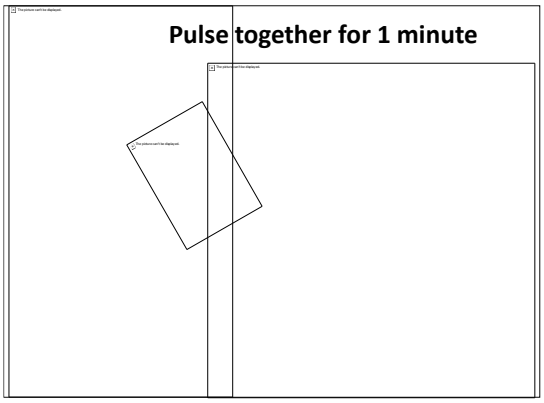
LUNG	ANGER AND HATE	LOVING RESPECT
Cx	COURAGE AND AFFIRMATION	EMPOWERMENT
HEART	LOVE AND REVERENCE	LOVE
GV	CRAVING AND DESIRE	GRATITUDE
CV	GRIEF AND REGRET	INSPIRATION
LIVER	PRIDE AND SCORN	INNER STRENGTH
GB	GUILT AND BLAME	COMPASSION
SPLEEN	WILLINGNESS AND OPTIMISM	OPTIMISM
ST	ACCEPTANCE AND FORGIVENESS	HARMONY
TW	NEUTRALITY AND TRUST	JUST TRUST
KIDNEY	FEAR AND ANXIETY	SERENITY
LI	APATHY AND DESPAIR	HOPE
SI	REASON AND UNDERSTANDING	FAITH
BL	SHAME AND HUMILIATION	WONDERFUL YOU

APPLIED KINESIOLOGY SYNOPSIS BY DAVID WALTHER
Chris Astill-Smith and Gill Farr 2017 ©

Therapy Localisation Technique With all positive nutrients on identify spinal level by therapy localisation.
Perform spiral field force prior to pulsing together. Practitioner puts one finger on spinal level and the other on the symphysis menti. Pulse together for about one minute.

If you cannot get a positive TL from the spinal level you are probably using a hyper muscle (e.g. a deltoid lung related muscle).

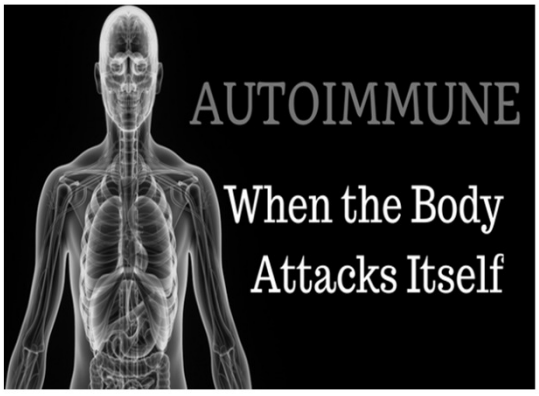
Must only be done at the end of a therapeutic session as all diagnostic markers will be negated.



The Epigenetic Management of Autoimmune Disorders

So far…..

- **Th1/Th2 Status**
- **IgE, IgG, IgM to foods**
- **Vitamin A deficiency**
- **Vitamin D deficiency**



Autoimmune diseases tend to have one of three characteristic pathological effects which characterize them as:

1. **Damage to or destruction of tissues**
2. **Altered organ growth**
3. **Altered organ function**

Autoimmune disorders: MedlinePlus Medical Encyclopedia". *www.nlm.nih.gov*. Archived from the original on 2016-01-12. Retrieved 2016-01-21.

Autoimmunity is the presence of self-reactive immune response (e.g., auto-antibodies, self-reactive T-cells), with or without damage or pathology resulting from it.
Certain organs – thyroiditis

Harrison's Principles of Internal Medicine: Volumes 1 and 2, 18th Edition (18 ed.). McGraw-Hill Professional. 2011-08-11. ISBN 9780071748896. Archived from the original on 2016-05-29

Or involve a particular tissue in different places, eg. Goodpasture's disease affects the basement membranes in lung & kidney.

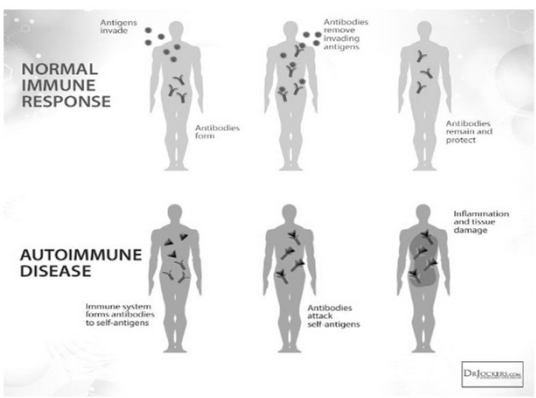
Harrison's Principles of Internal Medicine: Volumes 1 and 2, 18th Edition (18 ed.). McGraw-Hill Professional. 2011-08-11. ISBN 9780071748896. Archived from the original on 2016-05-29

Normally the adaptive immune system produces T cells & B cells that are capable of being reactive with self-antigens. BUT these are usually killed prior to becoming active – placed into a state of anergy or removed by regulatory cells

***Harrison's Principles of Internal Medicine: Volumes 1 and 2, 18th Edition** (18 ed.). McGraw-Hill Professional. 2011-08-11. ISBN 9780071748896. Archived from the original on 2016-05-29*

- **When these mechanisms fail leads to a reservoir of self-reactive cells that become active.**
- **Prevention of self reactive cells takes place in thymus as the T cell is developing into a mature immune cell.**

***Harrison's Principles of Internal Medicine: Volumes 1 and 2, 18th Edition** (18 ed.). McGraw-Hill Professional. 2011-08-11. ISBN 9780071748896. Archived from the original on 2016-05-29*



In both autoimmune and inflammatory diseases, the condition arises through aberrant reactions of the human adaptive AND innate immune systems. In autoimmunity, the patient's immune system is activated against the body's own proteins.

In chronic inflammatory diseases, neutrophils and other leukocytes are constitutively recruited by cytokines and chemokines, leading to tissue damage.

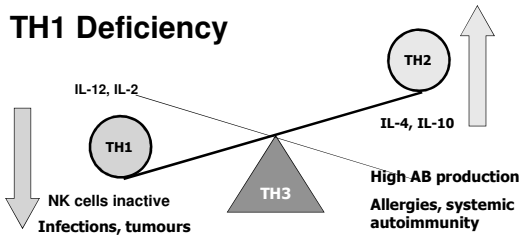
Mukundan L, Odegaard JI, Morel CR, Heredia JE, Mwangi JW, Ricardo-Gonzalez RR, Goh YP, Eagle AR, Dunn SE, et al. (Nov 2009). "PPAR-delta senses and orchestrates clearance of apoptotic cells to promote tolerance". *Nat Med.*

The Immune System

TH2 weakens – TH1 strengthens

TH2 Excess

TH1 Deficiency



All chronic diseases have the following in common. Autoimmune diseases are typical examples
1. Oxidative stress

2. Inflammation

3. Immune system

Molecular Mimicry describes a situation in which a foreign antigen can initiate an immune response in which a T or B cell component cross-recognises self.
The cross reactive immune response is responsible for the autoimmune disease state.

Wucherpfennig KW, Strominger JL (1995). "Molecular mimicry in T cell-mediated autoimmunity: viral peptides activate human T cell clones specific for myelin basic protein". *Cell.* 80 (5): 695–705. doi:10.1016/0092-8674(95)90348-8. PMID 7534214

Molecular Mimicry
Similarity between molecules found on some disease- causing microorganisms and on specific body cells or tissues.
Stimulates the immune system to set up a self reactive response where it attacks healthy body cells or tissues.

Wucherpfennig KW, Strominger JL (1995). "Molecular mimicry in T cell-mediated autoimmunity: viral peptides activate human T cell clones specific for myelin basic protein". *Cell.* 80 (5): 695–705. doi:10.1016/0092-8674(95)90348-8. PMID 7534214

Molecular Mimicry
The immune system acts in this way because the 2 molecules – the disease causing organism and the body's cells or tissues share a sequence in the protein molecule or structural similarities. e.g. in Type 1 Diabetes with pancreas beta cells.

Wucherpfennig KW, Strominger JL (1995). "Molecular mimicry in T cell-mediated autoimmunity: viral peptides activate human T cell clones specific for myelin basic protein". *Cell.* 80 (5): 695–705. doi:10.1016/0092-8674(95)90348-8. PMID 7534214

<u>Secrets of your cells</u>
The basic job of our immune system is to recognise "self" & "other", while collaborating with the brain, gut, thoughts, beliefs and hormones.

Sondra Barrett PhD "Secrets of Your Cells – Discovering Your Body's Inner Intelligence". 2013 ISBN 978-1-60407-819-0

- **In AI the recognition of "self" is compromised – our own cells are no longer identified as "ours" – become the enemy**
- **In addition to mistaken identity, this response fails to be suppressed**

Sondra Barrett PhD "Secrets of Your Cells – Discovering Your Body's Inner Intelligence". 2013 ISBN 978-1-60407-819-0

Emotional Reflection

"When have I lost the ability to discriminate between people, places or behaviours that are well matched to me and those that are not?"

Sondra Barrett PhD "Secrets of Your Cells – Discovering Your Body's Inner Intelligence". 2013 ISBN 978-1-60407-819-0

Emotional Crisis of Self Identity

Emotional Reflection

- **Emotionally lost self identity**
- **Can't differentiate between yourself & others**
- **Have become like others**
- **Influenced by others, taken on the behaviour of others**
- **Not true to yourself**

Sondra Barrett PhD "Secrets of Your Cells – Discovering Your Body's Inner Intelligence". 2013 ISBN 978-1-60407-819-0

Meridian VEP Perfume

- **Essential oils for the specific meridian as a perfume**
- **Blended to complement the 6 essential oils. Maintains the full efficacy in terms of treating the emotional state**
- **Roll on 50 ml miron bottle**

Autoimmune diseases
Addison's disease
Celiac
Crohn's
Endometriosis
Inflammatory bowel disorder
Multiple sclerosis
Myasthenia gravis
Polymyalgia rheumatica
Polymyositis
Psoriasis
Rheumatoid arthritis
Scleroderma
Sjogren's syndrome
System Lupus Erythematosus
Temporal arteritis
Thyroiditis / Hashimoto's / Graves
Type 1 Diabetes
Vasculitis
Vitiligo

<u>Common elements – A/I Disease</u>

- **Hereditary – genetics**
- **Environmental factors**
- **Viral infection**
- **Psychological stress**
- **Mutations in HLA genes**
- **Molecular mimicry – viral proteins, engulfed molecules**

Common elements – A/I Disease

- **Damaged self structures targeted for apoptosis mistakenly exposed to immune system**
- **Hormonal factors**
- **Vitamin D deficiency**
- **Vitamin A deficiency**

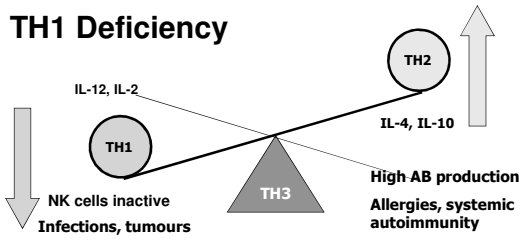
Challenge with
TH1 and TH2 markers

TH1 Weakens – TH2 strengthens
or
TH2 weakens – TH1 strengthens

The Immune System
TH2 weakens – TH1 strengthens

TH2 Excess

TH1 Deficiency



The Immune Connection

When there is lowered immune system function we need to increase immune system activity.

When there is an increased system function we need to decrease immune system activity as in autoimmune disorders.

It is generally recognized that there are two parts of the human immune system

1. The innate immune system

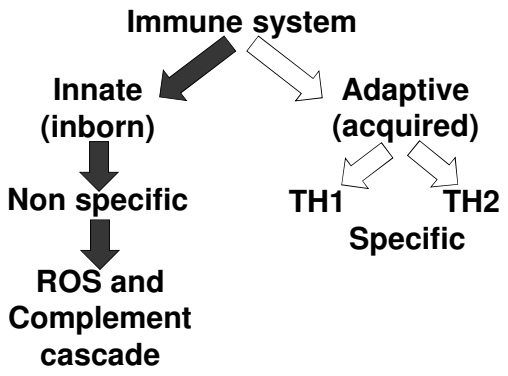
2. The adaptive immune system

The question is:
what part(s) of the immune system should we increase or decrease?

Innate immune system?

Adaptive immune system?
(TH1 or TH2)

The solution in the majority of patients is to optimize innate immune function rather than focus only on adaptive immune response.



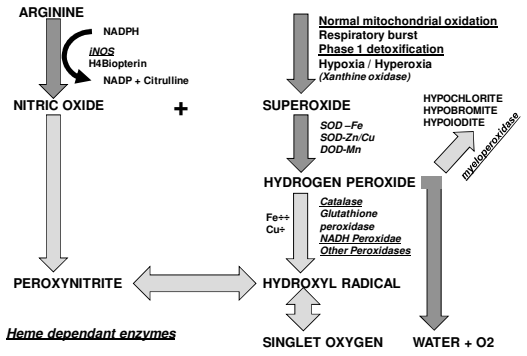
In the innate immune system the body's initial response is to eliminate microbes & infections immediately or within hours.

Innate immune system
Non-specific defence against pathogens.
Activates complement system.
No long-lasting or protective immunity for the host.

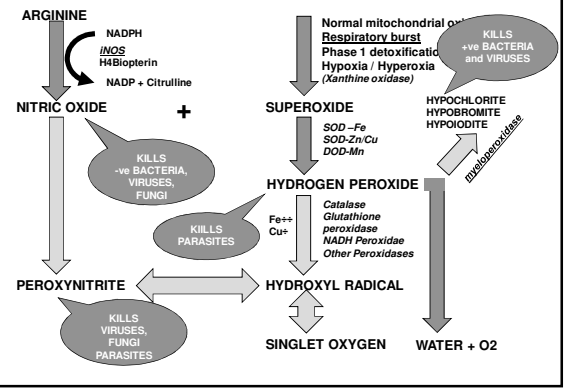
The adaptive immune system does this.

Innate immune system
Complement cascade
Triggers inflammation *
Identifies & removes foreign substances
Attracts phagocytes
Activates adaptive immune system

Reactive Oxygen Species



Reactive Oxygen Species



Innate Immune Challenge

1. Superoxide = Superoxide + NADPH
2. H2O2 = H2O2
3. Hypochlorite = Hypochlorite
4. Hydroxyl Radical = Superoxide + NADPH + H2O2
5. Nitric oxide = Nitric oxide
6. Peroxynitrite = Superoxide + NADPH + ` Nitric oxide

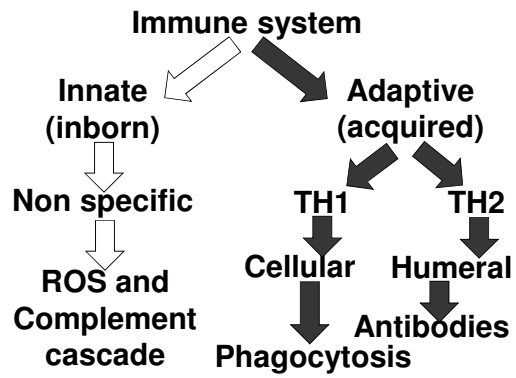
Screening remedies for innate immune response
1. Ginger to boost the respiratory burst to produce Superoxide.
2. Zinc / Copper for SOD to convert Superoxide to H_2O_2.
3. Silver to block catalase / stimulate myeloperoxidase.
4. Maybe Iodine / Bromine / Chlorine

Screening remedies for innate immune response
5. Arginine to stimulate Nitric oxide
6. Maybe Vitamin C and Zinc as iNOS cofactors.
7. Selenium to inhibit viral replication – IMMUNE WHY 600 CAPSULES

Screening remedies for innate immune response

Vitamin D	**Glucosamine**
Astragalus	**Echinacea**
Golden seal	**Garlic**
Cayenne	**Ginger**
Olive leaf	**Lemon balm**
Black walnut	**Bilberry**

The Adaptive Immune System



It takes 5-7 days after encountering a new antigen for the adaptive immune system to reach full activity…
…why a “cold” lasts about a week.

Adaptive immune system -
T-cells & B-cells

T Lymphocytes mature in thymus
T Helper cells
T Regulatory (T suppressors)

B Lymphocytes mature in bone marrow. Make antibodies
Spleen

Helper T- Cells are a type of T-Lymphocyte white blood cell. Helper T-Cells stimulate B-Lymphocytes and other types of T-Lymphocytes to activate an immune response to Antigens. Helper T-Cells stimulate the conversion of B-Lymphocytes to Plasma Cells.

Plasma Cells are responsible for the production and transport of Antibodies (Immunoglobulins) in response to Antigens.

Helper T-Cells stimulate the growth of NK Lymphocytes.

Helper T-Cells counterbalance the function of Suppressor T-Cells

Ideally, TH1 Helper T-Cells should be in equal balance with TH2 Helper T-Cells.

When either subset of Helper T-Cells dominate, illness results.

A shift to a dominance in one pathway over another has been linked with tissue specific autoimmunity and hyper-inflammatory conditions.

An excess of one pathway is at the expense of the other pathway.

Stimulate TH1 cells

Zinc	Melatonin	**NTs**
Omega 3	Chlorella	Acetyl CoA
L. Acidophilus	Lemon balm	Choline
L. Casei		Thiamine tri
L. Rhamnosus		Manganese
L. Paracasei	Echinacea	NAC
L. Salivarius	Reishi	Glutathione
B. Longum	mushroom	Dairy
L. Brevis	Smart Vitamin C	Thyroxin
S. Boulardei	Olive leaf tinc.	BCAAs
	Almonds	
Astragalus		Vitamin D

TH2 IMMUNE REACTIONS

Antibody-Mediated Immunity
Help B-cells produce antibodies (e.g. IgE, IgG)
Non-living: foods, pollens (some parasites)
Extracellular Immunity (includes traditional allergic reactions)

TH2 Helper T-Cells are primarily responsible for the Humoral Immunity arm of the Immune System which involves the differentiation of B-Lymphocytes which leads to Antibodies responding to and limiting the damage induced by extracellular detrimental micro-organisms.

Inhibit TH2 cells

1000's	Others	NTs
Turmeric	Olive leaf tincture	Vitamin B2
Star anise	Astragalus	Vitamin B3
Ginger		Manganese
Cinnamon		Zinc
L. Reuteri	Glutathione	Magnesium
L. Plantarum	Bilberry	
L Salivarius	Black cumin oil	SAMe
L. Lactic	Bromelain	UVA light
NAC	Omega 3	Vit D
Glutathione		
Rice	Milk thistle	

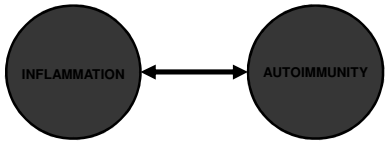
TH1 and TH2 modulating compounds:
Probiotics
Vitamin A
Vitamin E

T-regulatory supporting compounds:
Vitamin D
EPA and DHA

New Insights

- **Inflammation caused by persistent infection triggers autoimmunity**
- **Interplay between innate and adaptive immune systems**
- **Th17 cells**
- **Th17 Vs Treg cells**

RELATIONSHIP BETWEEN INFLAMMATION AND AUTOIMMUNITY



- **Inflammation drives autoimmunity & autoimmunity drives inflammation**
- **NFKappa B and STAT3 both drive neutrophils into tissue**
- **Neutrophils drive the inflammatory tissue destruction**

Samuel F. Yanuck "Immunology Home Runs for Non-Immunologists" Cogence Immunology.

- **NFKappaB and STAT3 are co-activators**
- **Reducing over active STAT3 promotes T regulatory cells encouraging tolerance**

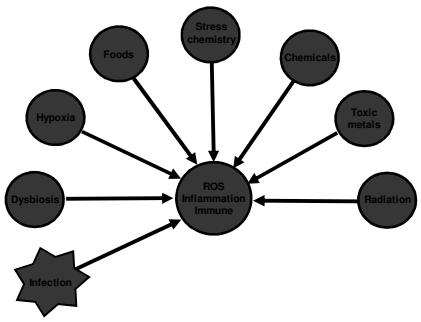
Samuel F. Yanuck "Immunology Home Runs for Non-Immunologists" Cogence Immunology.

- **TH17 extracellular bacteria**
  Fungi
  Autoimmunity
- **TH1 intracellular pathogens**
  NOT Autoimmunity
- **TH2 Extracellular parasites**
  Allergy
  Asthma
- **Treg regulation of immune responses, tolerance**

Sam Yanuck

- **Stat3 is a transcription factor which is encoded by STAT3 gene**

Samuel F. Yanuck "Immunology Home Runs for Non-Immunologists" Cogence Immunology.



Dysbiosis Testing

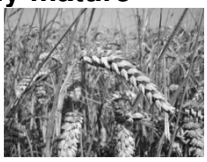
- **Check individual digestive enzymes**
- **Parasites and fungal overgrowth**
- **Re-balance gut flora**
- **5 R Program – Remove, Replace, Re-inoculate, repair, Regenerate**

A positive challenge to the immunoglobulin markers:

IgA - parasites
IgE – short term half life – 2-3 days - allergen
IgG – longer response half life – 18-21 days – allergen
IgM – similar to IgG
(Strength to weakening)

Common Allergens

Gluten –	**Wheat, Rye, Barley, Oats**
Cow's milk-	**Casein**
	Lactose
Cheese	**Especially mature**
	Cooked
Egg-	**White**
	Yolk
Fish	



Common Recognised Allergens

Tree nuts - Brazil, Hazelnuts, Almonds, Walnuts

Ground nuts - Peanuts

Shell fish

Soya products

Citrus fruits

Chocolate

Tea

Coffee

Common Recognised Allergens

Maize (Corn)

Lupin

Yeast

Rice - arsenic

Mustard

Celery and Celeriac

Onion / Garlic

Common Allergens

Tyramine foods

Chocolate, Old avocado, Old banana, Old cheese, Fermented foods

Solanene foods

Potatoes, Tomatoes, Aubergines, Peppers, Chilli

Common food and drink chemicals

Alpha Solanene	Oxalates
Betaine	Salicylates
Caffeine	Sulfites
Cysteine	Thiobromine
Glutamate	Tomato toxin
Histamine	Tyramine
Isothiocyanate	Uric acid
Malondialdehyde	

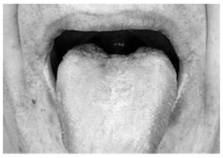
Infections Bacteria
Zinc
Vitamin C, Vitamin D, Vitamin A
Arginine Olive leaf
Ginger Echinacea
Golden seal Colloidal silver
Immune WHY600
Mannose, Other Saccharides
Black walnut tincture

Infections Virus
Ionic Iron, Calcium, Zinc
Vitamin C, Vitamin A, Vitamin D
Echinacea Astragalus
Olive leaf Garlic
Colloidal silver
Black walnut tincture
Immune WHY 600
Glucosamine
NAC for Post virus

Infections Parasites
Protease DR – half hour after meal
Iodine
Artemesia Annua
Black walnut tincture and caps
Wormwood
Wormwood combination
AP Formula
Saccharides
Probiotics

Infections Fungi
Amylase DR – half hour after meal

Zinc SA
Oregano
Probiotics
Coconut oil



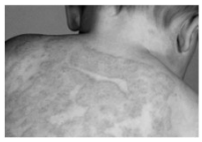
Pau D'arco tincture or caps
AF Cream locally
Always check for EFAs

Infections GUT -Lipopolysaccharides
Digestive enzymes

Prebiotics - Inulin
Probiotics
Fibre – Psyllium
Chlorella
Water

Check for Folates, Zinc, Glutamine.

Toxins – Toxic metals
Black walnut
Coriander herb **Coriander spice**
Lemon balm **Lipoic acid**
Yarrow **Glutathione**
Vitamin C for nickel
Potassium ascorbate
NAC
CBS
Allclear



High success rates

Seventy-six percent of chronic fatigue patients in a clinical trial experienced health improvement after removing dental restorations containing allergenic metals, as identified by the MELISA test (2). An additional study of patients with autoimmune diseases showed that 71% of those with positive responses in MELISA improved after having their fillings removed (3). In a further study, patients with fibromyalgia were tested for allergy to metals with MELISA. By reducing their exposure to metals identified as problematic, significant health benefits were seen. 50% of patients no longer fulfilled the criteria for fibromyalgia diagnosis; the remaining 50% all reported an improvement in their symptoms (4).

Metal allergy testing. Exposure to metals in dental fillings and implants, joint prostheses, pacemakers, environmental pollutants and jewellery can lead to health problems in susceptible individuals. **http://www.melisa.org**

Toxins – Chemicals
Black walnut
Coriander spice **NAC**
Lemon balm **Rosemary**
Yarrow **Other spices**
Chlorella **Allclear**
CBS
Zinc **Potassium ascorb**
Nutrient Phase 1&2
Taurine SA **Ornithine SA**

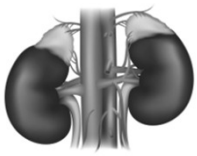
Toxins – Radiation
Chlorella
Coriander spice
Smart Vitamin C (Rutin)
Turmeric
Allclear
CBS
Ornithine SA
Taurine SA
Yarrow

Oxygen Deficiency - Hypoxia
Iron
Adenosylcobalamin
Magnesium SA
Zinc SA
Pyridoxal-5-phosphate
Riboflavin-5-phosphate / FADH2
Folinic / CH2H4Folate, 5MTHF

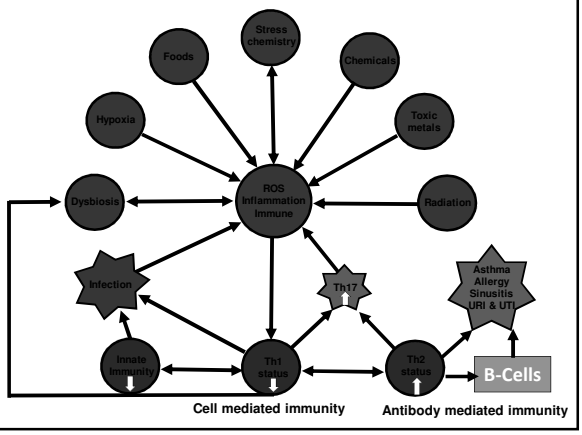
Cortisol Deficiency

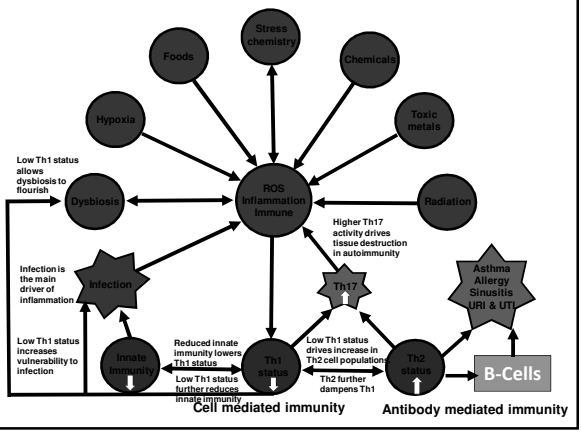
Magnesium SA
Zinc SA, Molybdenum
Pyridoxal-5-phosphate
Riboflavin-5-phosphate / FADH2
Vitamin C

Smart Adrenal
Adrenal Support



Consequences of Inflammation on the Immune System





Chronic Infection

- Infection is the main driver of inflammation
- Reduced innate immunity lowers TH1 status
- Low TH1 further reduces innate immunity
- Low TH1 drives TH2 cell proliferation

Samuel F. Yanuck "Immunology Home Runs for Non-Immunologists" Cogence Immunology.

Chronic Infection

- A combination of low innate immunity, low TH1 and high TH2 leads to increased TH17

Samuel F. Yanuck "Immunology Home Runs for Non-Immunologists" Cogence Immunology.

Chronic illness

- Elements of chronic illness, inflammation, dysbiosis, stress biochemistry
- Leads to key immune system changes – innate immunity down, Th1 down, TH2 up
- Consequences of these changes are TH17 up,

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Chronic illness

- **TH2 up leading to asthma, allergy, sinusitis, URI**
- **Low TH1 increases vulnerability to infection and allows dysbiosis to flourish**

Samuel F. Yanuck "Immunology Home Runs for Non-Immunologists" Cogence Immunology

Hollow space pathogens

- **It is essential to address hollow space pathogens like dysbiosis, sinusitis, chronic UTIs**
- **Hollow space chronic pathogen burden leads to persistent TH17 response & autoimmune destruction**

Samuel F. Yanuck "Immunology Home Runs for Non-Immunologists" Cogence Immunology

Hollow space pathogens

- **Around 70% of the immune system is localised in the gastrointestinal tract with the mucosa having around 200 times the surface area of the skin**

A brief history of TH17, the first major revision in the TH1/TH2 hypothesis of T-cell mediated tissue damage. Nat. Med. 2007 Feb, 13(2): 139-45, Steinman, L

Importance of TH17

High TH17 activity drives tissue destruction in Autoimmune Disease

Function of TH17 cells

- **Subset of proinflammatory T helper cells defined by their production of IL-17**
- **Related to T regulatory cells & the signals that cause TH17 to differentiate inhibit Treg differentiation**

Hartigan-O'Connor DJ, Hirao LA, McCune JM, Dandekar S (May 2011). "Th17 cells and regulatory T cells in elite control over HIV and SIV". *Current Opinion in HIV and AIDS*. **6** (3): 221–7.

Function of TH17 cells

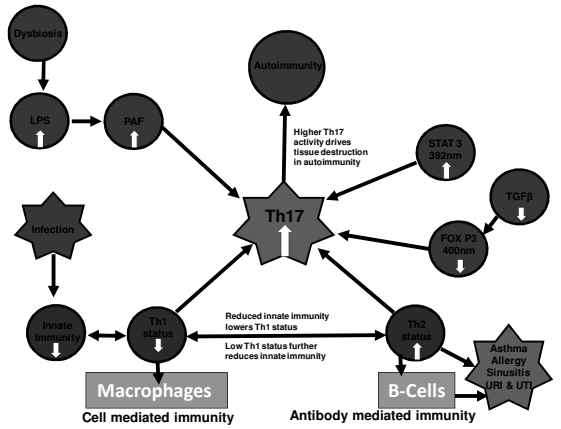
- **Play a role in the adaptive immune system protecting the body against pathogens**
- **Maintain the mucosal barriers**
- **Implicated in Auto-immune and inflammatory disorders**

Hartigan-O'Connor DJ, Hirao LA, McCune JM, Dandekar S (May 2011). "Th17 cells and regulatory T cells in elite control over HIV and SIV". *Current Opinion in HIV and AIDS*. **6** (3): 221–7.

New Research on TH17

"A major role for the cytokine IL-17 has now been described in various models of immune-mediated tissue injury, including organ-specific autoimmunity in the brain, synovium, intestines, allergic disorders of the lung and skin"

A brief history of TH17, the first major revision in the TH1/TH2 hypothesis of T-cell mediated tissue damage. Nat. Med. 2007 Feb, 13(2): 139-45, Steinman, L



Over-expression of STAT3

- **Transcription factor which is encoded by STAT3 gene. On chromosome 17Q, W/L 392**
- **Turn genes on & off to make sure they are expressed in the right cell at the right time in the right amount**

Akira S, Nishio Y, Inoue M, Wang XJ, Wei S, Matsusaka T, Yoshida K, Sudo T, Naruto M, Kishimoto T (April 1994). "Molecular cloning of APRF, a novel IFN-stimulated gene factor 3 p91-related transcription factor involved in the gp130-mediated signaling pathway". *Cell*. **77** (1): 63–71. doi:10.1016/0092-8674(94)90235-6. PMID7512451.

Over-expression of STAT3

- **STAT3 is essential for the differentiation of the TH17 helper T cells**
- **Gain-of-function mutations in the gene have been reported to cause multi organ early onset auto-immune diseases**

Yang XO, Panopoulos AD, Nurieva R, Chang SH, Wang D, Watowich SS, Dong C (March 2007). "STAT3 regulates cytokine-mediated generation of inflammatory helper T cells". *The Journal of Biological Chemistry*. **282** (13): 9358–63. doi:10.1074/jbc.C600321200. PMID 17277312.

Over-expression of STAT3

- **STAT3 activated by Il-5, IL-6, EGF, Interferons**
- **TEST – weak to STAT3 (weak to 392 wavelength)**
- **Gene mutation is usually a requirement for a co-enzyme**

Lim CP, Cao X (November 2006). "Structure, function, and regulation of STAT proteins". *Molecular bioSystems*. **2** (11): 536–50. doi:10.1039/B606246F PMID17216035..

T-regulatory cells (Tregs)

- **Tregs formerly known as T suppressor cells, are a subpopulation of T cells that modulate the Immune system**
- **Maintain tolerance to self antigens and prevent autoimmune disease**

Bettelli E, Carrier Y, Gao W, Korn T, Strom TB, Oukka M, Weiner HL, Kuchroo VK (May 2006). "Reciprocal developmental pathways for the generation of pathogenic effector TH17 and regulatory T cells". *Nature*. **441** (7090): 235–8. doi:10.1038/nature04753. PMID 16648838.

T-regulatory cells (Tregs)

- **Immunosuppressive – suppress or downregulate induction & proliferation of effector T cells**
- **Involved in shutting down immune responses after invading organisms have been eliminated**

Shevach EM (2000). "Regulatory T cells in autoimmmunity*". *Annual Review of Immunology*. **18**: 423–49. doi:10.1146/annurev.immunol.18.1.423. PMID10837065.

T-regulatory cells (Tregs)

- **Suppress immune responses of other cells, important "self-check" built into the immune system to prevent excessive reactions**

Shevach EM (2000). "Regulatory T cells in autoimmmunity*". *Annual Review of Immunology*. **18**: 423–49. doi10.1146/annurev.immunol.18.1.423. PMID 10837065.

T-reg Vs Th17

- **Th17 are pro-inflammatory & are produced under similar environments to Tregs**
- **TH17 are produced under the influence of Transforming Growth Factor Beta (TGF-b), IL-6**

Zhou L, Chong MM, Littman DR (May 2009). "Plasticity of CD4+ T cell lineage differentiation". *Immunity*. **30** (5): 646–55. doi:10.1016/j.immuni.2009.05.001. PMID 19464987.

T-reg Vs Th17

- **Tregs are produced under the influence of solely TGF-b**
- **So the difference between a pro-inflammatory cell & a pro-regulatory scenario is the presence of a single interleukin**

Zhou L, Chong MM, Littman DR (May 2009). "Plasticity of CD4+ T cell lineage differentiation". *Immunity*. **30** (5): 646–55. doi10.1016/j.immuni.2009.05.001. PMID 19464987.

FOXP3 gene expression

- **Major transcription factor controlling Treg cells**
- **Defects in FOXP3 function causes autoimmunity or immunodeficiency**
- **Identified as a master regulator for Treg lineage**

Hori S, Nomura T, Sakaguchi S (February 2003). "Control of regulatory T cell development by the transcription factor Foxp3". *Science*. **299** (5609): 1057–61. doi:10.1126/science.1079490 PMID 12522256.

FOXP3 gene expression

- **Can act as a transcriptional activator or suppressor depending on specific factors acting on it**
- **FOXP3 gene converts naïve T cells to Treg cells**

Hori S, Nomura T, Sakaguchi S (February 2003). "Control of regulatory T cell development by the transcription factor Foxp3". *Science*. **299** (5609): 1057–61. doi:10.1126/science.1079490. PMID 12522256.

FOXP3 gene expression

- **So this suggests that FOXP3 is capable of regulating the expression of suppression mediating molecules**

Hori S, Nomura T, Sakaguchi S (February 2003). "Control of regulatory T cell development by the transcription factor Foxp3". *Science*. **299** (5609): 1057–61. doi:10.1126/science.1079490. PMID 12522256.

FOXP3 gene - TEST

- **Low level of FOXP3 allows TH17 proliferation to take over and not enough Treg**
- **FOXP3 on chromosome 23 – 400nm**
- **If FOXP3 low – ie strengthen to FOXP3 (weak to 400nm) – find co-enzyme**

Hori S, Nomura T, Sakaguchi S (February 2003). "Control of regulatory T cell development by the transcription factor Foxp3". *Science*. **299** (5609): 1057–61. doi:10.1126/science.1079490. PMID 12522256.

High Platelet Activating Factor

- **High PAFs induces TH17 cell differentiation**
- **PAF is a lipid mediator causing platelet aggregation, inflammation & allergic response**
- **Produced by a variety of cells, especially those**

Zimmerman GA, McIntyre TM, Prescott SM, Stafforini DM (May 2002). "The platelet-activating factor signaling system and its regulators in syndromes of inflammation and thrombosis". *Critical Care Medicine*. **30** (5 Suppl): S294–301. doi:10.1097/00003246-200205001-00020. PMID 12004251.

High Platelet Activating Factor

- Involved in host defence, platelets, endothelial cells, neutrophils, monocytes & macrophages
- Continually produced by these cells but in low quantities

Zimmerman GA, McIntyre TM, Prescott SM, Stafforini DM (May 2002). "The platelet-activating factor signaling system and its regulators in syndromes of inflammation and thrombosis". *Critical Care Medicine*. **30** (5 Suppl): S294–301. doi:10.1097/00003246-200205001-00020 PMID 12004251.

High Platelet Activating Factor

- It causes platelets to aggregate & blood vessels to dilate
- Causes an inflammatory response in allergic reactions
- It is produced in larger quantities by inflammatory cells

Zimmerman GA, McIntyre TM, Prescott SM, Stafforini DM (May 2002). "The platelet-activating factor signaling system and its regulators in syndromes of inflammation and thrombosis". *Critical Care Medicine*. **30** (5 Suppl): S294–301. doi:10.1097/00003246-200205001-00020. PMID 12004251.

High Platelet Activating Factor

- Toxins such as fragments of destroyed bacteria induce the synthesis of PAFs
- PAF synthesis is activated by inflammatory agents
- TEST - if weak to PAF look for cause of inflammation

Zimmerman GA, McIntyre TM, Prescott SM, Stafforini DM (May 2002). "The platelet-activating factor signaling system and its regulators in syndromes of inflammation and thrombosis". *Critical Care Medicine*. **30** (5 Suppl): S294–301. doi:10.1097/00003246-200205001-00020. PMID 12004251.

Transforming Growth Factor B

- TGFb is a protein that controls the rate of transcription of genetic material from DNA to messenger RNA
- Controls cell division, cell growth & cell death, expressed in right amount

Eisenstein, Eli M.; Williams, Calvin B. (2009-05-01). "The Treg/Th17 Cell Balance: A New Paradigm for Autoimmunity". *Pediatric Research*. **65** (5 Part 2): 26R–31R. doi:10.1203/PDR.0b013e31819e76c7

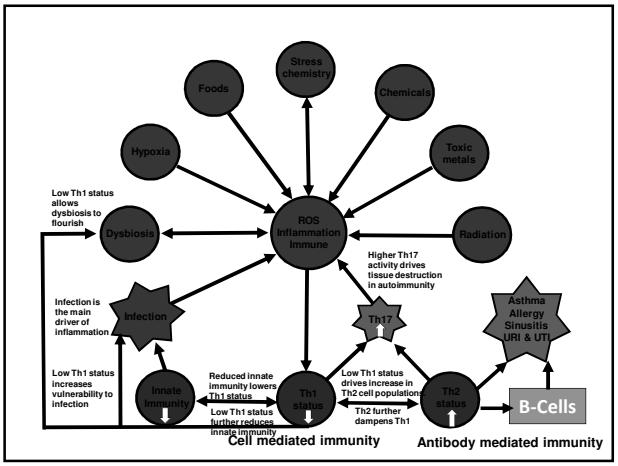
Transforming Growth Factor B

- TGFb induces TH17 cell differentiation in a concentration dependant manner
- Low levels favour TH17
- Higher levels favour Treg cells
- TEST – strengthen to TGFb

Eisenstein, Eli M.; Williams, Calvin B. (2009-05-01). "The Treg/Th17 Cell Balance: A New Paradigm for Autoimmunity". *Pediatric Research*. **65** (5 Part 2): 26R–31R. doi:10.1203/PDR.0b013e31819e76c7

Th17 Resolution

- Identify the virus and treat, causing Th1 to increase, Th2 to decrease and Th17 to decrease
- Quercitin
- Acetyl carnitine/Alpha Lipoic Acid/NADH

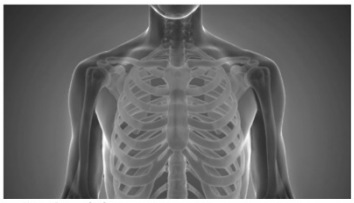


Nutritional Remedies

Essential Fatty Acid Deficiency
Borage seed oil GLA
Evening primrose oil GLA
Omega 3 EPA+DHA
DHA
Omega 3,6 and 9
Flax seed oil Hempseed oil
Wheat germ oil
Black cumin seed oil
Smart Thinking oil, Rapeseed oil

Microbiome manipulation: Could fibre-rich muesli help fight arthritis and other autoimmune conditions?

By Nathan Gray



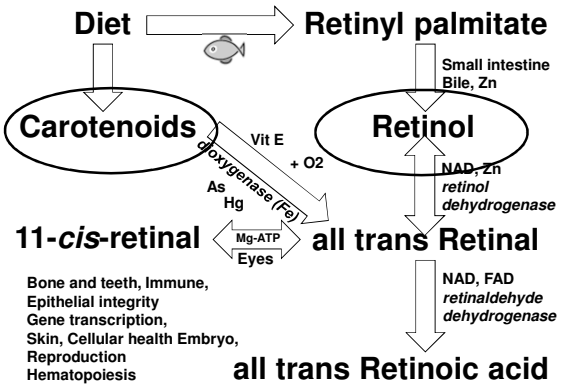
Source: *Nature Communications*
Volume 9, Article number: 55, doi: 10.1038/s41467-017-02490-4
"Short-chain fatty acids regulate systemic bone mass and protect from pathological bone loss"
Authors: Sébastien Lucas, *et al*

A diet rich in fibre could aid chronic inflammatory joint diseases, leading to stronger bones through the increased production of short-chain fatty acids in the microbiome, say researchers.

Mineral Deficiency
Calcium SA
Magnesium SA
Selenium phosphate
Zinc SA

Vitamin Deficiency
Vitamin A
Vitamin D

Vitamin A



Vitamin A, in the retinoic acid form, plays an important role in gene transcription. Once retinol has been taken up by a cell, it can be oxidized to retinal (retinaldehyde) by retinol dehydrogenases and then retinaldehyde can be oxidized to retinoic acid by retinaldehyde dehydrogenases which is tightly regulated, due to its activity as a ligand for nuclear receptors.

Nat Rev Immunol. Author manuscript; available in PMC 2010 Jul 20.
Published in final edited form as:
Nat Rev Immunol. 2008 Sep; 8(9): 685–698.
doi: 10.1038/nri2378
PMCID: PMC2906676
NIHMSID: NIHMS185109

Vitamin effects on the immune system: vitamins A and D take centre stage

J. Rodrigo Mora,* Makoto Iwata,† and Ulrich H. von Andrian§

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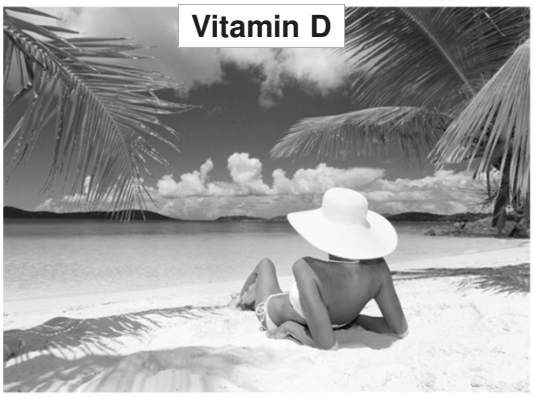
The publisher's final edited version of this article is available at Nat Rev Immunol
See other articles in PMC that cite the published article.

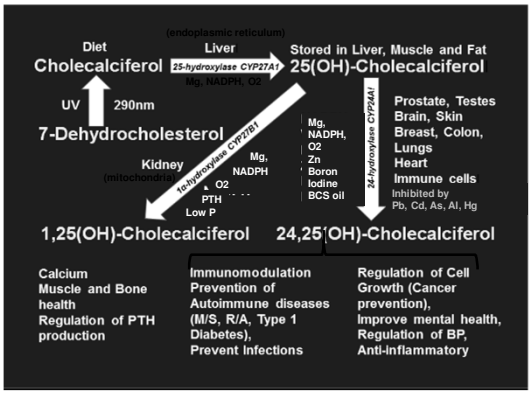
Abstract

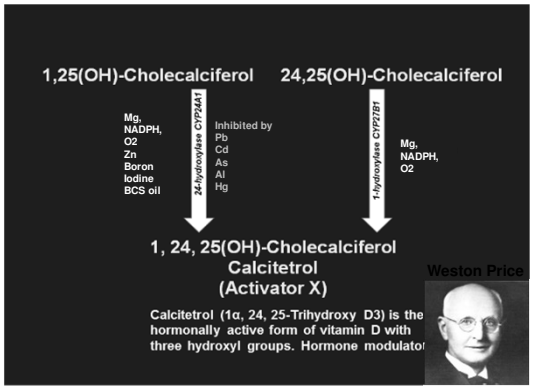
Go to:

Vitamins are essential constituents of our diet that have long been known to influence the immune system. Vitamins A and D have received particular attention in recent years as these vitamins have been shown to have an unexpected and crucial effect on the immune response. We present and discuss our current understanding of the essential roles of vitamins in modulating a broad range of immune processes, such as lymphocyte activation and proliferation, T-helper-cell differentiation, tissue-specific lymphocyte homing, the production of specific antibody isotypes and regulation of the immune response. Finally, we discuss the clinical potential of vitamin A and D metabolites for modulating tissue-specific immune responses and for preventing and/or treating inflammation and autoimmunity.

Vitamin D







The VDR may be involved in cell proliferation and differentiation. Vitamin D affects the immune system, and VDRs are expressed in several white blood cells, including monocytes and activated T and B cells.

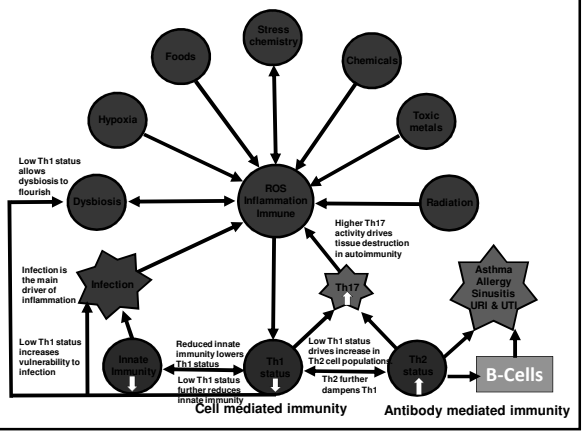
Watkins RR, Lemonovich TL, Salata RA (May 2015). "An update on the association of vitamin D deficiency with common infectious diseases". *Canadian Journal of Physiology and Pharmacology*.

In vitro, vitamin D increases expression of the tyrosine hydroxylase gene in adrenal medullary cells, and affects the synthesis of neurotrophic factors, nitric oxide synthase, and glutathione.

Puchacz E, Stumpf WE, Stachowiak EK, Stachowiak MK (February 1996). "Vitamin D increases expression of the tyrosine hydroxylase gene in adrenal medullary cells". Brain Research. Molecular Brain Research.

TH1 and TH2 modulating compounds:
Probiotics
Vitamin A
Vitamin E

T-regulatory supporting compounds:
Vitamin D
EPA and DHA



<u>Testing for Autoimmunity</u>
- **Th1/Th2 Status**
- **Th17 Status**
- **Genetic involvement – STAT3 & FOXP3/TGFb**
- **IgE, IgG, IgM**
- **Inflammation – PAF, NFKappaB**

NEW Immune Test Kit

- **Cytokines**
- **Secondary cell signals**
- **Immunoglobulins**
- **Growth Factors**
- **Immune markers**
- **Common allergens**
- **Nucleotide bases**
- **Reactive Oxygen Species**
- **Viruses**

Autoimmune diseases and Applied Kinesiology

Specific muscle to organ association have identified the Infraspinatus muscle as being specific to the Thymus gland and generally indicative of immune function. Other authors *(Portelli, Marcellino)* have cited the mid deltoid as also diagnostic of thymus gland problems.

In my experience (Pierotti) in almost all cases tested (over 100) neither the infraspinatus nor the mid deltoid have ever shown to be inhibited in "the clear" as we would expect with obvious immune dysfunction.

However,
A challenge to the area of the thymus gland by a firm but gentle striking of the mid body of the sternum with a lateral edge of a closed fist over 4-5 repetitions elicited and unusual and consistently reproducible response on patients with T- cell dysfunction.

Bilateral inhibition of the Infraspinatus

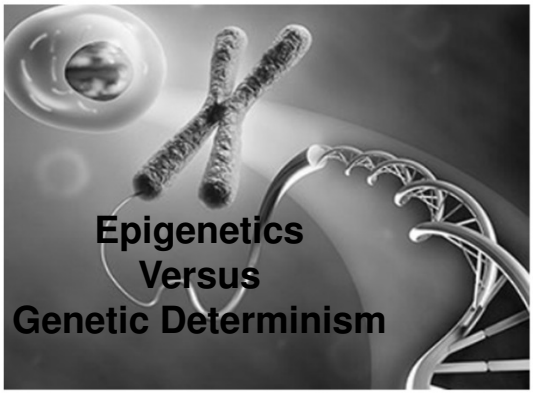
OR

Bilateral inhibition of the Mid Deltoid

Cross checking with specific cytokine biomarkers found the following pattern;
Bilateral Infraspinatus inhibition correlated with;
TH2 excess

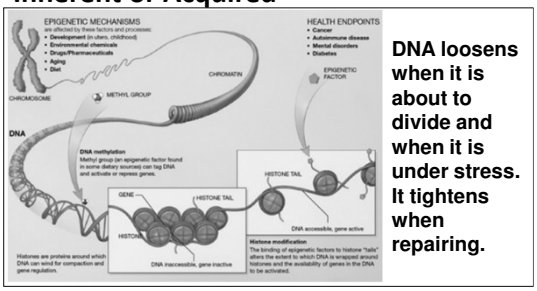
Bilateral Mid deltoid inhibition correlated with;
TH1 excess

The resultant inhibition once initiated persists for quite some time and allows the benefit of challenging for specific nutrients, botanicals or other therapeutic aids necessary for successful treatment of the dysfunction.



Keeping the gene caps on or off

Histones - (De)Methylation and (De)Acetylation
Inherent or Acquired

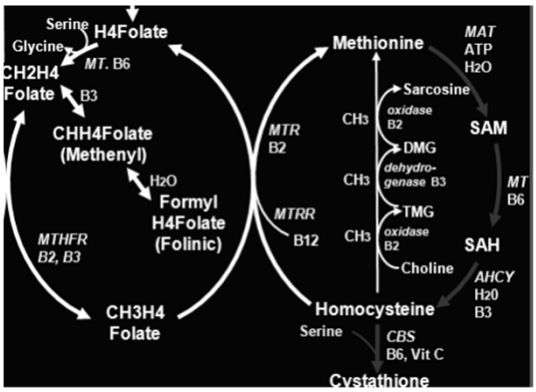


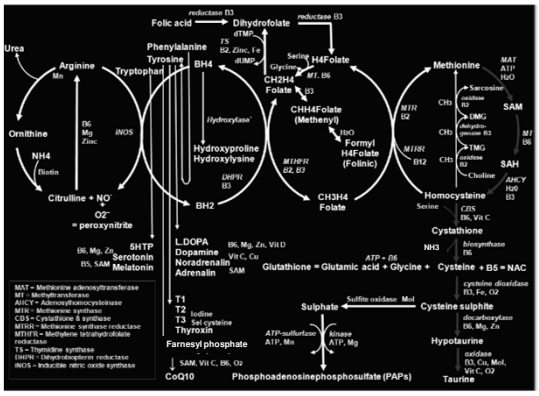
DNA loosens when it is about to divide and when it is under stress. It tightens when repairing.

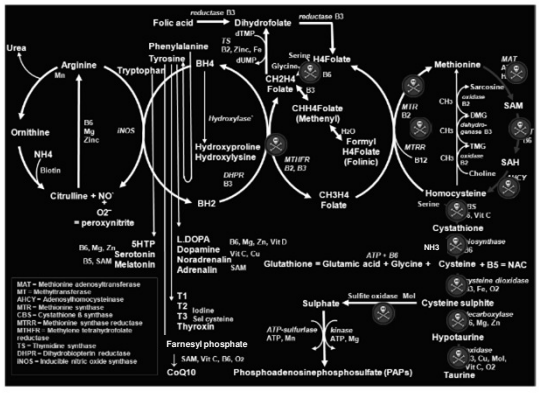
Such modifications include
1. Methylation
2. Acetylation
This affects their function of gene regulation.

In general, genes that are active have less bound histone, while inactive genes are highly associated with histones during interphase.
All histones have a highly positively charged N-terminus with many lysine and arginine residues.

1. Methylation
The addition of one, two or three methyl groups to lysine or one or two methyl groups to arginine has little effect on the chemistry of the histone; methylation leaves the charge of the arginine or lysine intact and adds a minimal number of atoms so steric interactions are mostly unaffected.







Main methylators are
S. Adenosylmethionine (SAM)
Methylcobalamin
5MTHF
Betaine (Cofactors Zn)

Also check for
H4Biopterin
Folinic acid
CH2 H4Folate

BRENDA (The Comprehensive Enzyme Information System)

Functional Test for Methylation Defects

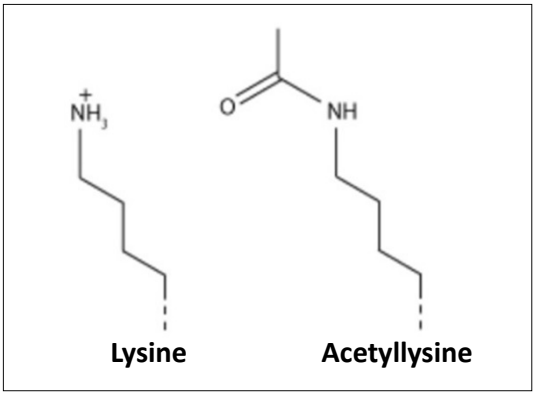
Caffeine challenge test
Sellotape challenge test

Demethylation
Cytochrome p450 enzymes
Alpha-ketoglutarate-dependent non-heme enzymes are active for demethylation of DNA.
Flavin adenine dinucleotide (FAD)-dependent amine oxidase
Vitamin C
Iron
Hydroxycobalamin

BRENDA (The Comprehensive Enzyme Information System)

2. Acetylation
Addition of an acetyl group to lysine neutralises its positive charge. This reduces electrostatic attraction between the histone and the negatively charged DNA backbone, loosening the chromatin structure.

Highly acetylated histones form more accessible chromatin and tend to be associated with active transcription. Lysine acetylation appears to be less precise in meaning than methylation, in that histone acetyltransferases tend to act on more than one lysine.



DNA is wrapped around histones, and, by transferring an acetyl group to the histones, genes can be turned on and off. In general, histone acetylation <u>increases</u> gene expression.

Histone deacetylases are a class of enzymes that remove acetyl group from an N-acetyl lysine amino acid on a histone, allowing the histones to wrap the DNA more tightly.
CoA. Resveratol, Butyric acid
ATP
Co-enzyme NAD+
Cofactors Zn and Na
Inhibited by Curcumin, peroxynitrite, aspirin
BRENDA (The Comprehensive Enzyme Information System)

Examples A *BRCA* mutation is a mutation in either of the *BRCA1* and *BRCA2* genes, which are tumour suppressor genes. Hundreds of different types of mutations in these genes have been identified, some of which have been determined to be harmful, while others have no proven impact.

Harmful mutations in these genes may produce a hereditary breast-ovarian cancer syndrome in affected persons. Only 5-10% of breast cancer cases in women are attributed to *BRCA1* and *BRCA2* mutations (with *BRCA1* mutations being slightly more common than *BRCA2* mutations).

Women with harmful mutations in either *BRCA1* or *BRCA2* have a risk of breast cancer that is about five times the normal risk, and a risk of ovarian cancer that is about ten to thirty times normal. The risk of breast and ovarian cancer is higher for women with a high-risk *BRCA1* mutation than with a *BRCA2* mutation.

High-risk mutations, which disable an important error-free DNA repair process (homology directed repair), significantly increase the person's risk of developing breast cancer, ovarian cancer and certain other cancers.

Why *BRCA1* and *BRCA2* mutations lead preferentially to cancers of the breast and ovary is not known, but lack of *BRCA1* function seems to lead to non-functional X-chromosome inactivation.

Mutations can be inherited from either parent and may be passed on to both sons and daughters. Each child of a genetic carrier, regardless of sex, has a 50% chance of inheriting the mutated gene from the parent who carries the mutation.

As a result, half of the people with *BRCA* gene mutations are male, who would then pass the mutation on to 50% of their offspring, male or female.

The risk of *BRCA*-related breast cancers for men with the mutation is higher than for other men, but still low.
However, *BRCA* mutations can increase the risk of other cancers, such as colon cancer, pancreatic cancer, and prostate cancer.

72 previously unknown genes mutations have been recently found that lead to the development of breast cancer. BRCA1 mutation contains 125,950 base pairs. A mutation is a misspelling such that the gene cannot code the proper protein.

According to the National Cancer Institute 55% - 65% of women who inherit the BRCA1 mutation and around 45% of women who inherit the BRCA2 mutation will develop breast cancer by the age of 70. However only 1% of women have these mutations which is only a small fraction of all inherited breast cancer.

Only about 10% of breast cancers are hereditary.
Most of the newly identified variants are in regions of the genome that regulate nearby genes.
BRCA1 Chromosome 17q 392nm
BRCA2 Chromosome 13q 386nm

Holly Yan (2013-05-14). "What's the gene that led to Angelina Jolie's double mastectomy?. Health. CNN.

Elephants rarely get cancer. Here's why this matters to humans

By Michael Nedelman, CNN

Updated 0931 GMT (1731 HKT) August 15, 2018

You'd think elephants would be getting cancer left and right: They are giants of the animal kingdom and have trillions more cells than humans -- cells that, in theory, could turn into cancer over their decades-long lifespans. But you'd be wrong. It's not that they never get cancer, but less than 5% of elephants die from it, versus up to 25% of humans.

It's not just large animals, either. There are smaller cancer-resistant critters, too, including naked mole rats, microbats and grey squirrels says pediatric oncologist Dr. Joshua Schiffman, professor of pediatrics at University of Utah and an investigator at Huntsman Cancer Institute.

Schiffman's own research includes other genes that could give elephants their exceptional ability to quash cancer before it starts. Schiffman referred to one in particular, a tumor suppressor gene called p53, as the "genetic police" for its role in stopping DNA damage from turning into cancer.

Elephants have dozens of copies of the gene. Humans normally have just two copies of p53 -- a less robust form than in elephants. And when that gene is mutated or inactivated, as with many of Schiffman's patients, cancer is allowed to grow unchecked.
In elephants, p53 also revs up the zombie gene.

Tumour protein p53, also known as p53, is any isoform of a protein encoded by homologous genes in various organisms, such as *TP53* (humans). This homolog is crucial in multicellular organisms, where it prevents cancer formation, thus, functions as a tumour suppressor.* As such, p53 has been described as "the guardian of the genome" because of its role in conserving stability by preventing genome mutation. Hence *TP53* is classified as a tumour suppressor gene.
Located on Chromosome 17p 391nm

*Surget S, Khoury MP, Bourdon JC (December 2013). "Uncovering the role of p53 splice variants in human malignancy: a clinical perspective". *OncoTargets and Therapy*. 7: 57–68.

HER2 (from human epidermal growth factor receptor 2) is a member of the human epidermal growth factor receptor family. Over-expression of this oncogene has been shown to play an important role in the development and progression of certain aggressive types of breast cancer.

In recent years the protein has become an important biomarker and target of therapy for approximately 30% of breast cancer patients.

HER2 is so named because it has a similar structure to human epidermal growth factor receptor, or HER1. It is so named because it was derived from a rodent glioblastoma cell line, a type of neural tumour. Chromosome 17q 392nm

Mitri Z, Constantine T, O'Regan R (2012). "The HER2 Receptor in Breast Cancer: Pathophysiology, Clinical Use, and New Advanc in Therapy". Chemotherapy Research and Practice. 2012: 743193. PMC 3539433. PMID 23320171.

An oncogene is a gene that has the potential to cause cancer. In tumour cells, theyareoften mutated and/or expressed at high levels. Activated oncogenes can cause mutant cells designated for apoptosis to survive and proliferate instead.

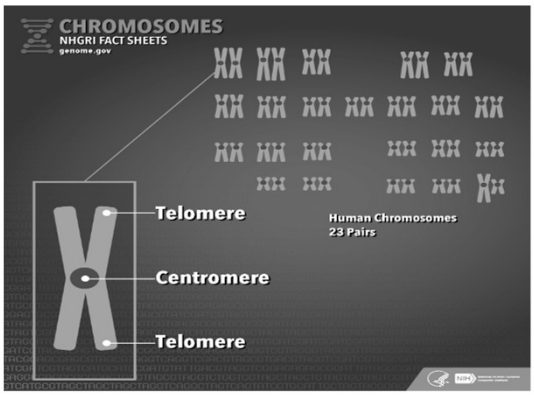
Wilbur, Beth, editor. The World of the Cell, Becker, W.M., et al., 7th ed. San Francisco, CA; 2009.

T. J., Nam, K. W., Shin, H. S., Lee, S. ng, S., & Soh, K. (2002). Biophoton emission from finger nails and fingerprints of ving human subjects. Acupunct Electro es, 27(2), 85-94.

As long as they live, cells and whole organisms give off a pulsating glow with a mean intensity of several up to a few ten thousand photons per second per square cm.

Chromosomes

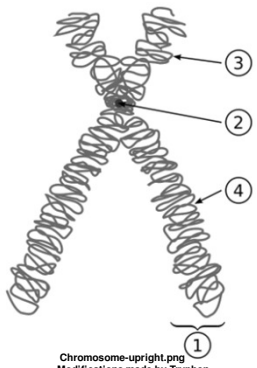
Chromosomes
(*chroma* means colour,
***soma* means body) is**
a DNA molecule with part or all of the genetic material (genome) of an organism.
Humans contain 23 pairs of chromosomes in each cell nucleus



DNA condensation of the duplicated chromosomes during celldivision (mitosis - division or meiosis - multipication) results either in a four-arm structure if the centromere is located in the middle of the chromosome or a two-arm structure if the centromere is located near one of the ends.

Schleyden, M. J. (1847). Microscopical researches into the accordance in the structure and growth of animals and plants.

Diagram of a replicated and condensed metaphase eukaryotic chromosome. (1) Chromatid – one of the two identical parts of the chromosome after S phase. (2) Centromere – the point where the two chromatids touch. (3) Short (p) arm. (4) Long (q) arm.



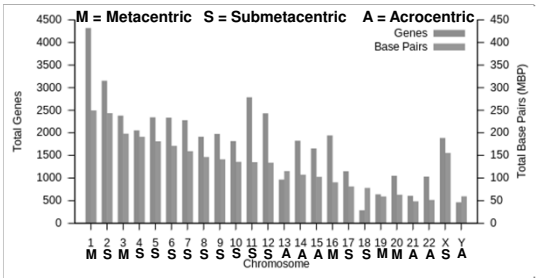
Chromosome-upright.png
Modifications made by Tryphon.

Metacentric
These are X-shaped chromosomes, with the centromere in the middle so that the two arms of the chromosomes are almost equal.

Submetacentric
If arms' lengths are unequal, the chromosome is said to be submetacentric. Their shape is j shape during anaphase

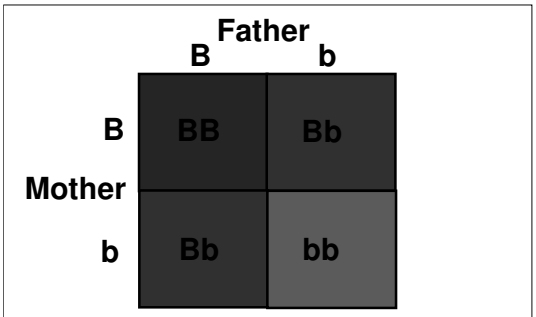
Acrocentric
If the p (short) arm is so short that it is hard to observe, but still present, then the chromosome is acrocentric

Pluta, A.; A.M. Mackay; A.M. Ainsztein; I.G. Goldberg; W.C. Earnshaw (1995). "The centromere: Hub of chromosomal activities". *Science*. 270(5242): 1591–1594. doi:10.1126/science.270.5242.1591. PMID 7502067



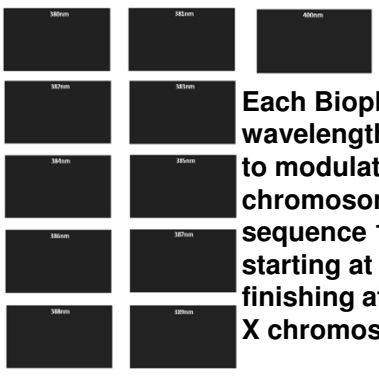
Estimated number of genes and base pairs (in mega base pairs) on each human chromosome

Genetic dominance



B = Brown eyes **b = Blue eyes**

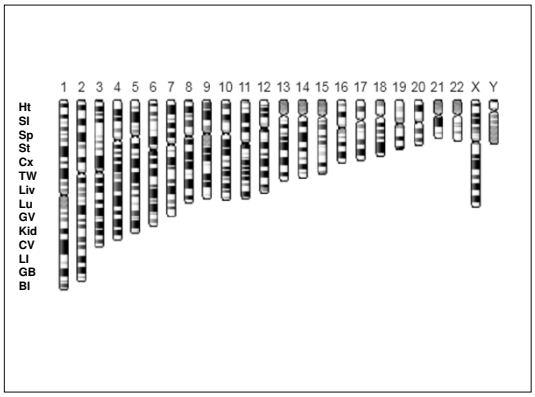
Relationship of the Chromosomes to the Violet / Ultraviolet wavelengths



Each Biophoton wavelength appears to modulate a specific chromosome in sequence 1-23 starting at 370nm and finishing at 400nm - X chromosome.

Identifying the Diagnostic Biophoton Wavelength (DBW)

Strong muscle weakens to one of the 31 Diagnostic Biophoton Wavelengths.
This indicates the chromosome that is emitting non-coherent light due to one or more polymorphisms.



CHROMOSOME 1 M p-arm	370nm 2000 genes
Uroporphyrinogen decarboxylase	Uroporphrinogen > Coproporphrinogen
↑HCG,	↑ Human Chorionic gonadotrophine
Lactate dehydrogenase	Lactic acid > Pyruvate
3bHydroxy steroid dehydrogenase	Pregnenalone > Progesterone DHEA > Androstenedione Androstenediol > Testosterone
Salivary amylase	Starch
Glutathione peroxidase	H2O2 > H2O
Methylene tetrahydrofolate red	CH2H4Folate > MTHFolate
Enolase 1	2-Phosphoglycerate > Phosphenolpyruvate
Succinate dehydrogenase,	Succinate > Fumarate
Fumerase,	Fumarate to Malate
Glutathione-s-transferase,	Peroxidised lipids and Xenobiotics
Lysyl hydroxylase	Lysine > Hydroxylysine
Prolyl 3-hydroxylase	Proline > Hydroxyproline
Glutamyl cysteine ligase	L-glutamate + L-cysteine + ATP > gamma-glutamyl cysteine + ADP + P
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)

CHROMOSOME 1 M q-arm	**371nm 2000 genes**
Protoporphyrinogen oxidase	**Protophoryrinogen > Protoporpyrin**
Low methionine/high methylB12 Histone methyltransferase	**Metylcobalamin > Methionine**
Pyruvate kinase	**Phosphenolpyruvate > Pyruvate**
Prolyl 4-hydroxylase	**Proline > Hydroxyproline**
Delta-4-desaturase	**EPA > DPA/DHA**
aarF domain containing kinase3	**> Co-enzyme Q10 (induced by p53)**
Aldehyde dehydrogenase	**Aldehydes > Carboxylic acids (Short chain fatty acids)**
Methionine synthase	**Homocysteine > Methionine**
Adiponectin receptor 1	

CHROMOSOME 2M p-arm	**372nm 1300 genes**
Thyroid peroxidase	**Tyrosine > T1 and T2**
Urophorphinogen decarboxylase	**Uroporphyrinogen > Coproporphrinogen**
Lactase	**Cows milk, Lactulose**
B12	**Hydroxy / Adenosyl/Methylcobalamin**
Lysyl oxidase,	**Homocysteine > Collagen 1, 2, 3, 4**
CYP450 1B1,	**Estradiol > 4-Hydroxyestradiol Estrone > 4-Hydroxyestrone**
Succinyl CoA synthetase	**Succinyl CoA > Succinate**
Malate dehydrogenase	**Malate > Oxaloacetate**
Sepiapterin reductase	**> H4 Biopterin**

CHROMOSOME 2 M q-arm	**373nm 1300 genes**
Histamine methyltransferase	**Histamine > Methylhistamine**
CYP27A1 25-OHVit D3	**Cholecholesterol > 25(OH) Vit D3**
Lactase	**Cows milk, Lactulose**
Methylmalonic aciduria and homocystinuria (low adenosyl and methylcobalamin),	**Malonic acid > Succinyl CoA**
Isocitrate dehydrogenase	**Isocitrate > a-Ketoglutarate**
Aldehyde oxidase	**Aldehydes > Carboxylic acids (Short chain saturated fatty acids)**

CHROMOSOME 3 M p-arm	374nm	1000 genes
Aminolevulinate, delta-,synthase	Glycine + SuccinylCoA > ALA,	
Glutathione peroxidase	H2O2 > H2O	
Pyruvate dehydrogenase	Pyruvate > AcetylCoA	
Succinyl CoA synthase	Succinyl CoA > Succinate	
von Hippel–Lindau (tumor suppressor gene)		

CHROMOSOME 3 M q-arm	375nm	1000 genes
Coproporphyrinogen oxidase	Coproporphrinogen > Protoporphrinogen	
Sucrase-isomaltase	Sucrose > Glucose	
Lysyl hydroxylase	Lysine > Hydroxylysine	
Prolyl 4-hydroxylase	Proline > Hydroxyproline	
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)	

CHROMOSOME 4 S	376nm	1000 genes
Methylmalonic aciduria (B12 deficiency)	Methylmalonic acid > SuccinylCoA	
SOD (Zn/Cu)	Superoxide + NADPH > H2O2	
Alcohol dehydrogenase	Ethanol > Acetaldehyde	
Delta-5-desaturase	DGLA > Arachidonic acid	
Para-hydroxybenzoate—polyprenyltransferase	> Co-Q10	
Estrogen sulfur transferase	Methoxyestrogen > Sulfur conjugates	

CHROMOSOME 5 S	377nm 900 genes
5-MTHFolate transferase	5-MTHFolate > Methylcobalamin
Sulfatase	Chondroiton sulfate
Dihydrofolate reductase	Dihydro folic acid > Tetrahydro Folic acid
Glutathione peroxidase	H2O2 > H2O
Succinate dehydrogenase	Succinate > Fumarate
Lysyl oxidase	Collagen
Prolyl 4-hydroxylase	Proline > Hydroxyproline
HMG CoA reductase	HMG CoA > Mevalonic acid
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)
Taurine dehydrogenase	Hypotaurine > Taurine
Betaine-homocysteine methyltransferase	Betaine + Homocysteine > Methionine and Dimethylglycine
Adenomatous polyposis gene (Tumour suppressor against Colorectal cancer)	

CHROMOSOME 6 S p-arm	378nm 500 genes
Glycine methyltransferase	SAM + Glycine > SAH
Glutathione peroxidase	H2O2 > H2O
Methylmalonyl mutase	Malonatic acid > Succinyl CoA
DNA polymerase	
Glutathione-s-transferase	Peroxidised lipids
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)

CHROMOSOME 6 S q-arm	379nm 500 genes
Pyruvate dehydrogenase	Pyruvate Acetyl CoA
Liver Arginase	Arginine > Ornithine
Nitric oxide synthase	Arginine > Nitric oxide
SOD(Mn)	Superoxide + NADPH > H2O2
Decaprenyl-diphosphate Synthase	> Co-Q10
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)

CHROMOSOME 7 S	380nm 900 genes
Hemochromatosis	High iron (High Heme?)
Sucrase	Sucrose > Glucose
DOPA decarboxylase	DOPA > Dopamine
5HTP decarboxylase	5HTP > Serotonin
B glucuronidase	Bilirubin
Acetylcholinesterase	Acetylcholine > Acetate + Choline
Histone methyltransferase	
Nitric oxide synthase endothelial	Arginine > Nitric oxide
CYP450 3A4	Warfarin
Trypsinogen	Trypsin(ogen) strengthens
Thiamine pyrophosphokinase	Thiamine > Thiamine pyrophosphate
Arginosuccinase	Arginine succinate > Arginine
Phosphoglycerate mutase	3-Phosphoglycerate > 2-Phosphoglycerate
a-Ketoglutarate dehydrogenase	a-Ketoglutarate > Succinyl CoA
Lysyl hydroxylase	Lysine > Hydroxylysine
Suppressor of tumorigenicity protein 7	

CHROMOSOME 8 S	381nm 700 genes
Pyruvate dehydrogenase	Acetyl CoA > Pyruvate
Acetyltransferase	Choline > Acvetycholine Serotonin > Acetyl serotonin
Sulfatase	Cysteine sulphinate
Lipoprotein lipase	Triglycerides > Free fatty acids
Pyridoxine kinase	Pyridoxine > Pyridoxine -5-phosphate
Cholesterol-7-alpha hydroxylase	Cholesterol > 7-a-Hydroxycholesterol
Hypoaldosterone	Corticosterone > Aldosterone

CHROMOSOME 9 S	382nm 800 genes
Aminolevulinate delta-, dehydratase	ALA > Porphrobilinogen (PBG)
Deiodinase II	T4 > T3 (reverse T3?)
17β-Hydroxysteroid dehyd	Androstenedione > Testosterone
Dopamine beta-hydroxylase	Dopamine > Noradrenalin
Arginosuccinate synthetase	Citrulline > Argino succinate
Aconitase 1	Citrate > Isocitrate
Cyclooxygenase	DGLA, AA, EPA > PgE1,2,3
Glycine-taurine N-acyltransferase	Cholyl CoA / Chenodeoxycholyl CoA > Taurocholic / Glycocholic acids
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)
Germ Cell Nuclear Factor	

CHROMOSOME 10 S	383nm 700 genes
Uroporphyrinogen III synthase	HMB > Uroporphrinogen
Lipase	Triglycerides > Free fatty acid
Methionine adenosyltransferase	Methionine > SAM
Choline acetyltransferase	Choline > Acetylcholine
CYP450 2E1	Ethanol
CYP450 2C9	Warfarin
CYP450 2C19	Phenolbarbitol
Hexakinase	Glucose > Glucose-6-phosphate
Lipoxygenase	Arachidoonic acid > Leukotrien B4
Decaprenyl-diphosphate Synthase	> Co-enzyme Q10
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)
First apoptosis signal receptor (tumour suppressor gene)	

CHROMOSOME 11 S	384nm 1300 genes
Tyrosine hydroxylase 1	Tyrosine > L.DOPA
Tryptophan hydroxylase 1	Tryptophan > 5HTP
PBG deaminase	PBG > Hydroxymethylbilane
Pepsinogen 3A, 4A, 5A,	Protein
Catalase	H2O2 > H2O
25 Hydroxylase Vit D	Cholecalciferol > 25(OH) cholecalciferol
Pyruvate dehydrogenase	Pyruvate > Acetyl CoA
Succinate dehydrogenase	Succinate > Fumarate
Glutathione-s-transferase	Peroxidised lipds and Xenobiotics
Delta-6-desaturase	DGLA > Arachidonic acid
Beta carotene oxygenase	Beta carotene > Retinal
Aldehyde dehydrogenase	Aldehydes > Carboxylic acids (Short chain fatty acids)
Suppression of tumorigenicity 5	
Suppressor of tumorigenicity 14	

CHROMOSOME 12 S	385nm 1100 genes
Methylmalonic aciduria	Methylmalonic acid > Succinyl CoA
Collagen type 2	Collagen type 2
Phenylalanine hydroxylase	Phenylalanine > Tyrosine
11 cis Retinol dehydrogenase	Retinol > Retinal
Tryptophan hydroxylase	Tryptophan > %HTP
Sulfatase	Cysteine sulphinate
CYP27B1 Vit D	25(OH) Vit D > 1, 25(OH) Vit D
Diamine oxidase	Histamine > Imidazole acetic acid
Histone methyltransferase	
Nitric oxide synthase neuronal	Arginine > Nitric oxide
Sulfite oxidase	Sulfite > Sulfate
Aldehyde dehydrogenase	Aldehyde > Imidazole acetic acid
Glyceraldehyde 3-phos dehyd	Glyceraldehyde 3-phos dehyd > 1,3Bisphosphoglycerate
Enolase 2	2-Phosphoglycerate > Phosphenolpyruvate
Citrate synthase	Oxaloacetate > Citrate
Taurine dehydrogenase	Hypotaurine > Taurine
Adiponectin receptor 2	

CHROMOSOME 13 A	**386nm 300 genes**
BRCA2: breast cancer 2	
Cytochrome C	**Complex 111 > Complex IV**
1.24.25OH Vit D	**Bone density**
Succinyl CoA synthetase	**Succinyl CoA > Succinate**

CHROMOSOME 14 A	**387nm 800 genes**
Thyroid stimulating hormone receptor	
MAOxidase	**Dopamine > Dihydromandelenic acid** **Noradrenalin > Dihydromandelenic acid** **Serotonin > Dihydroxyindole acetate**
Thyroxine deiodinase II and III	**T 4 > T3**
Retinol dehydrogenase	**Retinol > Retinal**
Glutathione peroxidase	**H2O2 > H2O**
Coenzyme Q6,monooxygenase	**> Co-enzyme Q10**
Alpha ketoglutarate dehyd	**a-Ketoglutarate > Succinyl CoA**
Delta-4-desaturase	**DPA > DHA**
Aldehyde dehydrogenase	**Aldehydes > Carboxylic acids (Short chain fatty acids)**
Arginase II	**Arginine > Ornithine**

CHROMOSOME 15 A	**388nm 600 genes**
Chondroitin sulfate synthase 1	**Chondroiton sulfate >**
Retinaldehyde dehydrogenase	**Retinal > Retinoic acid**
Histidine decarboxylase	**Histidine > Histamine**
CYP450 1A1	**2-Estrogen > 2Hydroxyestrogens**
Hepatic lipase	**Tricycerides > Free fatty acids**
Mitochondrial DNA polymerase	
Isocitrate dehydrogenase 2	**Isocitrate > a-Ketoglutarate**
Lysyl oxidase	**Homocysteine > Collagen 1, 2, 3, 4**

CHROMOSOME 16 p-arm	**389nm 800 genes**
Pyruvate dehydrogenase	**Pyruvate > Acetyl CoA**
Aldolase	**Fructose 1,6 phosphate > Glyceraldehyde 3 phosphate**
β-Carotene 15-dioxygenase	**β-carotene > Retinal**
Yippee-like 3 (tumour suppressor)	

CHROMOSOME 16 M q-arm	**390nm 800 genes**
Delta 4 desaturase	**DPA > DHA**
24.25OHVitD	**25(OH) Vit D > 24, 25 (OH) Vit D**
Protophorinogen oxidase	**Protoporphrinogen > Protoporphyrin**
Sulfatase	**Cysteine sulphinate**
β-carotene oxidase	**β-carotene > Retinal**

CHROMOSOME 17 p-arm	**391nm 600 genes**
Sex hormone binding globulin	**Sex Hormone Binding Globulin (high in cases of hot flushes)**
Enolase 3	**2-Phosphoglycerate > Phosphenolpyruvate**
Lipoxygenase	**Arachidonic acid > Leukotrien B4**
Aldehyde dehydrogenase	**Aldehydes > Carboxylic acids (Short chain fatty acids)**
P53 Tumour suppressor gene	

CHROMOSOME 17 S q-arm	**392nm 600 genes**
Collagen, type I	**Collagen type I**
Pyruvate dehydrogenase	**Pyruvate > Acetyl CoA**
1.24.25OHVitD	**>1,24,25(OH) Vit D**
Myeloperoxidase	**H2O2 > Hypochlorite**
Sulfatase	**Cysteine sulphinate**
Serotonin-n-acetyltransferase	**Serotonin > Acetylserotonin**
Nitric oxide synthase 2	**Arginine > Nitric oxide**
Pyridoxine-5-phosphate oxidase	**Pyridoxine-5-phos > Pyridoxal-5-phosphate**
Prolyl 4-hydroxylase	**Proline > Hydroxyproline**
STAT3	
HERS2	

CHROMOSOME 18 S	**393nm 200 genes**
Ferrochelatase (protoporphyria)	**Protporphyrin > Heme B**
↓DHEA	
Aldehyde and Xanthine oxidase	**Xanthine > Uric acid**
Endothelial lipase	**Triglycerides > free fatty acids**

CHROMOSOME 19 M p-arm	**394nm 1800 genes**
Cartilage oligomeric matrix protein	
Histone methyltransferase	
Glutathione peroxidase	**H2O2 > H2O**

CHROMOSOME 19	**M**	**q-arm**
Hemochromatosis		
CYP450 2A6		
Hormone sensitive lipase		
Phosphoglucose isomerase		
Aldehyde dehydrogenase		

395nm 1800 genes
APOE4
Iron >
Nicotine
Triglycerides > Free fatty acids
Glucose-6-phosphate > Fructose-6-phosphate
Aldehydes > Carboxylic acids (Short chain fatty acids)

CHROMOSOME 20	**M**	**p-arm**
S-adenosylhomocysteine hydro		

396nm 500 genes
S-adenosylhomocysteine > Homocysteine

CHROMOSOME 20	**M**	**q-arm**
Adenosine deaminase		
Sulfatase.		
CYP24A1 Vit D		
Glutathione synthase		
Gammaglutamyl transeferase		

397nm 500 genes
Adenosine > Inosine
Cysteine sulphinate
25(OH) Vit D > 24,25(OH)Vit D
Gamma glutamyl-cysteine > Glutathione

CHROMOSOME 21 A	**398nm 200 genes**
Down's syndrome	
Cystathionine-beta-synthase	**Homocysteine > Cystathionine**
Trypsin	**Polypeptides > Free amino acids**
SOD(Zn/Cu)	**Superoxide + NADPH > H2O2**

CHROMOSOME 22 A	**399nm 500 genes**
Catechol-*O*-methyltransferase	**Dihydromandelenic acid > Vanillylmandelenic acid**
	Hydroxyindole acetate > Methoxyindole acetate
Sulfatase	**Sulfatides, DHEA sulfate**
CYP450 2D6	**Phenolbarbitol**
Arylsulfatase A	**Sulfatides > Sulfate and Cerebroside**
Aconitase 2	**Citrate > isocitrate**
Gamma glutamyl transferase	**Xenobiotics >**

CHROMOSOME 23 X S	**400nm 800 genes**
NF-kappa-B-repressing factor	
ALA synthase	**Succinyl CoA + Glycine > ALA**
Acetylserotonin-O-methyltransferase	**Acetylserontonin > Melatonin -**
MAO A and B	**Dopamine / Noradrenalin > Dihydroxymandelic acid**
	Serotonin > Hydroxyindole acetate
Sulfatase	**Heparin sulfate**
Ornithine transcarbamylase	**Ornithine > Citrulline**
Pyruvate dehydrogenase	**Pyruvate > Acetyl CoA**
DNA polymerase	
Phosphoglycerate kinase	**1,3Bisphosphoglycerate > 3-Phosphglycerate**
FOXp3	

CHROMOSOME 23 Y A 400nm 50 genes

Most changes in gene expression are due to faulty signals caused by toxins.

The most common toxins are naturally occurring chemicals within the foods we eat or drink.

Common food and drink chemicals

Alpha Solanene
Betaine
Caffeine
Cysteine
Glutamate
Histamine
Isothiocyanate
Malondialdehyde
Oxalates
Salicylates
Sulfites
Thiobromine
Tomato toxin (Atropine)
Tyramine
Uric acid

Detoxification Phase 1

Cytochrome p450 Mono-oxygenases (CYP450) The most extensively studied mechanism responsible for the metabolism of xenobiotics is the action of the cytochrome p450 enzymes (CYP450). The CYP450 enzymes constitute a super family of proteins (containing a heme cofactor) that are not only responsible for metabolism of xenobiotics and metabolic waste, but are also involved in the metabolism of nutrients, fatty acids, cholesterol and steroid hormones.

Other Phase I Oxidative Enzymes:

Flavin-Containing Monooxygenases
Alcohol Dehydrogenase
Aldehyde dehydrogenase
Aldehyde Oxidase
Xanthine oxidase
Diamine oxidase
Monoamine oxidase
Molybdenum hydroxylase

The Detoxification System Part II: Hepatic Biotransformation by Mark J. Donohue.
file:///E:/Users/Chris%20Astill-Smith/Downloads/Report%20%2310%20-%20Hepatic%20Biotrans.pdf

Phase II – Conjugation 200 enzymes

Whether endogenous or exogenous, some compounds by-pass Phase I and enter Phase II directly. However, most compounds enter Phase II as Phase I bioactivated intermediates. Phase II is to further biotransform compounds to a less toxic, more hydrophilic compound.

The Detoxification System Part II: Hepatic Biotransformation by Mark J. Donohue.
file:///E:/Users/Chris%20Astill-Smith/Downloads/Report%20%2310%20-%20Hepatic%20Biotrans.pdf

To do this, Phase II incorporates the use of a type of enzyme called a *transferase* enzyme. *Transferase* enzymes are a family of enzymes whose function is to catalyze the transfer of various chemical groups from one compound to another.

In hepatic biotransformation, the *transferase* enzyme transfers and attaches a co-factor to the exposed functional group of the entered Phase I intermediate.

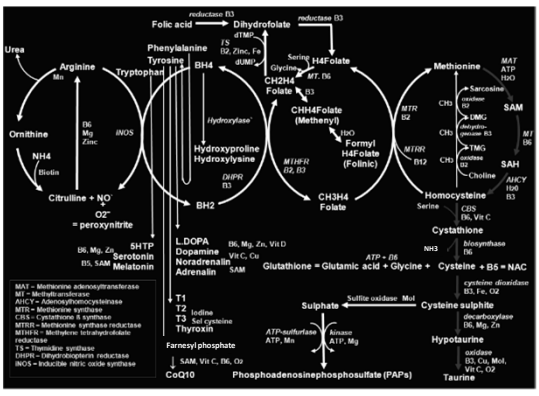
The Detoxification System Part II: Hepatic Biotransformation by Mark J. Donohue.
file:///E:/Users/Chris%20Astill-Smith/Downloads/Report%20%2310%20-%20Hepatic%20Biotrans.pdf

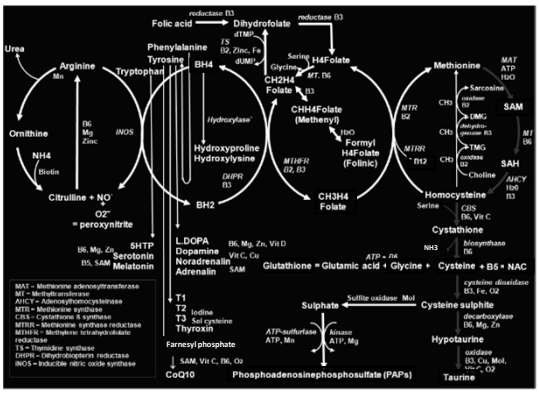
PHASE II	BIOMARKER	NUTRIENTS
XOH + GLUTATHIONE	GLUTATHIONE-S-TRANSFERASE	GLUTATHIONE (NAC, Glutamate, Glycine) B6, Zn
XOH + GLUCURONIDATION	GLUCURONOSYL TRANSFERASE	GLUCURONIC ACID
1. XOH + SULFATION 2. SULFITE OXIDASE	SULFUR TRANSFERASE 2. SULFITE OXIDASE	PAPs, S, MSM Mol, Fe, B2.
XOH + ACETYLATION	N.ACETYL TRANSFERASE	Acetyl CoA (B5, Mg, Acetic acid)
XOH + METHYLATION	METHYL TRANSFERASE	Methionine, MgATP, B12, Folic, Betaine, DMG
XOH + TAURINE CONJUGATION	TAURINE	Taurine, NAD, Vit C, Vit A
XOH + GLYCINE CONJUGATION	GLYCINE	Glycine, B6, B2, Mg, Folic.
XOH + CYSTEINE CONJUGATION	CYSTEINE	Cysteine, NAC, Methionine, B6

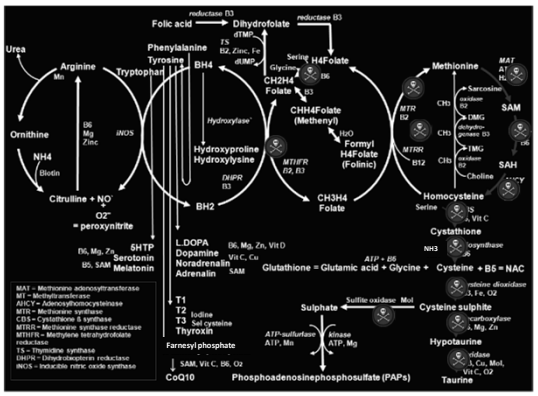
Methylation

Methylation
Amines, phenols, thiols (isothiocyanates), noradrenalin, adrenalin, L.DOPA, dopamine, melatonin, histamine, serotonin, pyridine, sulfites and hypochlorites, heavy metals, caffeine, solanene.

"HNMT histamine N-methyltransferase". NCBI Genetic Testing Registry. Retrieved 18 February 2014.
COMT catechol-O-methyltransferase". NCBI Genetic Testing Registry. Retrieved 18 February 2014.
Ragsdale, S.W. "Catalysis of methyl group transfers involving tetrahydrofolate and B12" *Vitamins and Hormones*, 2008



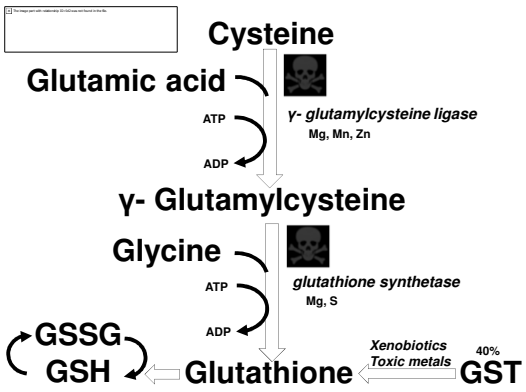


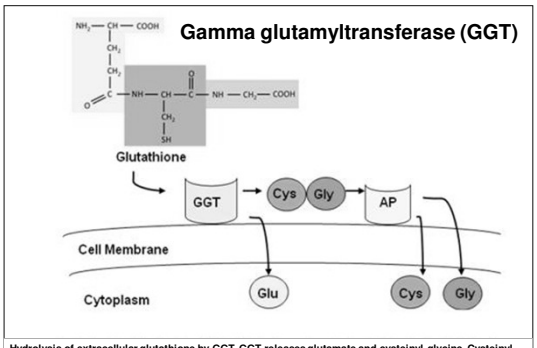


Glutathione

Glutathione
Xenobiotics such as aromatic disulfides, napthalene, anthracene, phenanthacin compounds, aliphatic disulfides and the regeneration of endogenous thiols from disulfides.

Harper's Illustrated Biochemistry 29th Edition Pub Lange. Page 679
Hayes JD, Flanagan JU, Jowsey IR (2005). "Glutathione transferases". *Annu. Rev. Pharmacol. Toxicol.* 45: 51–88. doi:10.1146/annurev.pharmtox.45.120403.095857. PMID 15822171





Hydrolysis of extracellular glutathione by GGT. GGT releases glutamate and cysteinyl-glycine. Cysteinyl-glycine hydrolysed by aminopeptidase (AP) releasing cysteine and glycine. All three amino acids can then be taken up into the cell to synthesise glutathione but process not very efficient. Glutathione cannot be taken up intact in most cells.

Gamma-glutamyltransferase (GGT)
High in
Alcohol abuse, Barbituates, NSAIs, Aspirin, St John's Wort.
Biliary, Liver and Pancreas diseases
CVD and Atherosclerosis
Metabolic syndrome. High body mass index is associated with type 2 diabetes only in persons with high serum GGT.

Lim JS, Lee DH, Park JY, Jin SH, Jacobs DR (June 2007). "A strong interaction between serum gamma-glutamyltransferase and obesity on the risk of prevalent type 2 diabetes: results from the Third National Health and Nutrition Examination Survey". Clinical Chemistry. 53 (6): 1092–8. doi:10.1373/clinchem.2006.079814. PMID 17478563.

Yarrow stimulates the Glutathione pathway.
α-Lipoic acid (oxidised form) is a mild pro-oxidant which stimulates Glutathione synthesis

Sulphation

Sulphation
Neurotransmitters, steroid hormones, certain drugs, many xenobiotic and phenolic compounds such as estrogens, aliphatic alcohols, aryl amines and alicyclic hydroxysteroids, paracetamol (acetaminophen), Bisphenol A, cyanide, oxalates

Harper's Illustrated Biochemistry 29th Edition Pub Lange. Page 679
The Detoxification System Part III: Sulfoxidation and Sulfation by Mark J Donohue
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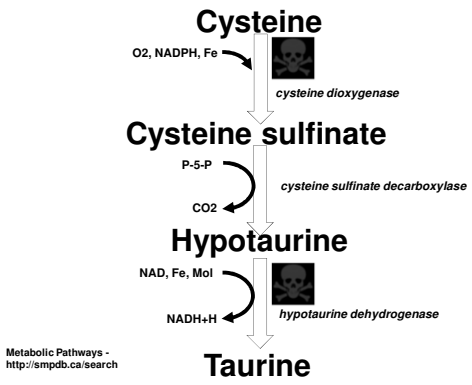
Taurine

Taurine
Bile acids, hypochlorites

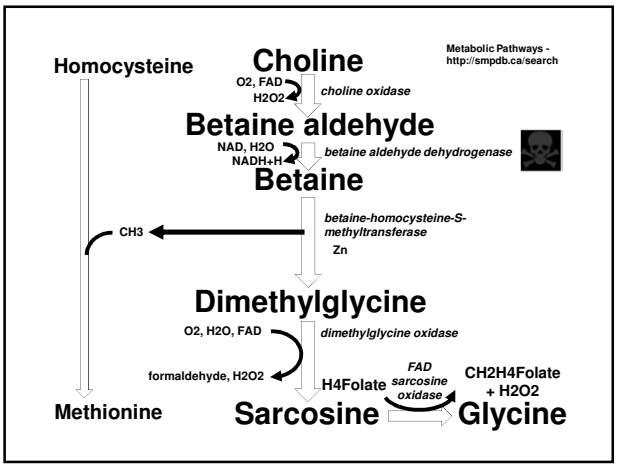
The Detoxification System Part III: Sulfoxidation and Sulfation by Mark J Donohue
file:///E:/Users/Chris%20Astill-Smith/Downloads/Report%20%2311%20-%20Sulfoxidation.pdf



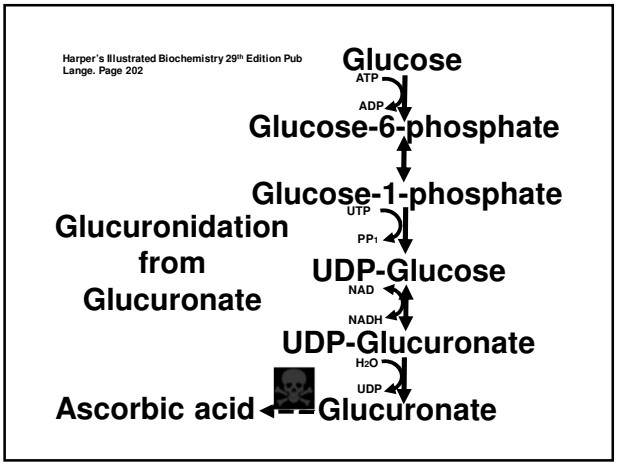
Glycine

Glycine
Bile acids, (7 and 12 hydroxycholesterols), benzoates, toluene, aspirin and other salicylates.

Glycine conjugation: importance in metabolism, the role of glycine N-acyltransferase, and factors that influence inter-individual variation.
Badenhorst CP[1], van der Sluis R, Erasmus E, van Dijk AA.



Glucuronidation



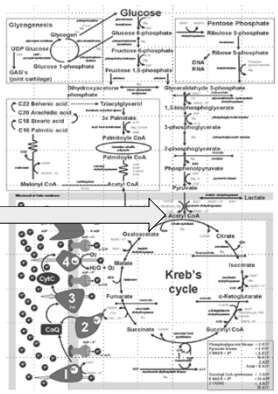
Glucuronidation
Chemical and bacterial toxins such as alcohols, phenols, enols, carboxylic acid, amines, hydroxyamines, carbamides, sulfonamides and thiols, benzoic acid and many steroid hormones, vanillin.

Harper's Illustrated Biochemistry 29th Edition Pub Lange. Page 679

Bock K, Köhle C (2005). "UDP-glucuronosyltransferase 1A6: structural, functional, and regulatory aspects". Methods Enzymol. 400: 57–75. i:10.1016/S0076-6879(05)00004-2. PMID 16399343.

Acetylation

Acetylation from AcetylCoA



Acetylation
Aromatic amines such as histamine, serotonin, PABA, P-amino salicylic acid, analine and procaine amide, sulfur amides, aliphatic amines and complex hydrazines, isoniazid.

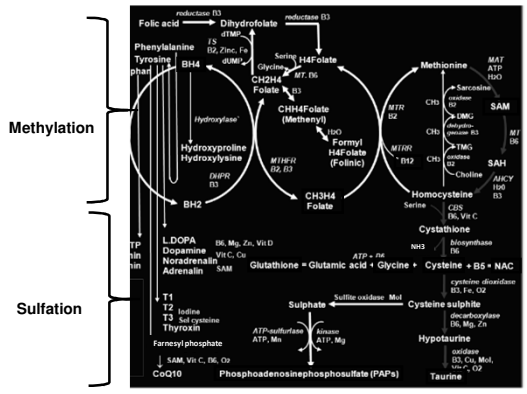
Harper's Illustrated Biochemistry 29th Edition Pub Lange. Page 680

Naturally occurring chemicals in foods and drinks f

Isothiocyanates

<u>Isothiocyanate foods 20%</u>
Brussels sprouts, Broccoli, Cabbage, Cauliflower
Kale, Spinach, Pak choi
Watercress, Garden cress, Mustard, Turnip, Kohlrabi, Horseradish, Radishes, Capers
Globe artichoke, Celery

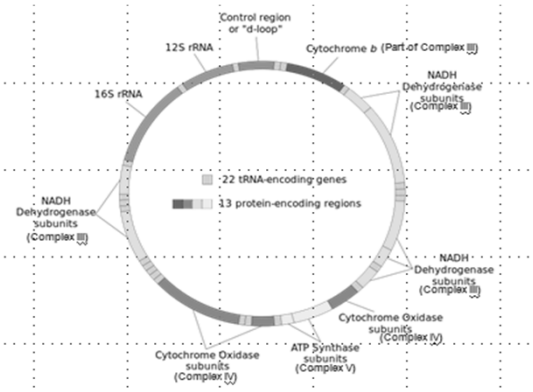
Possibly Egg, Oats, Bulgur wheat in some cases.

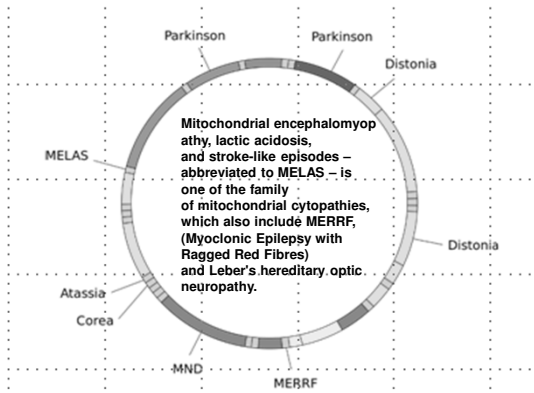


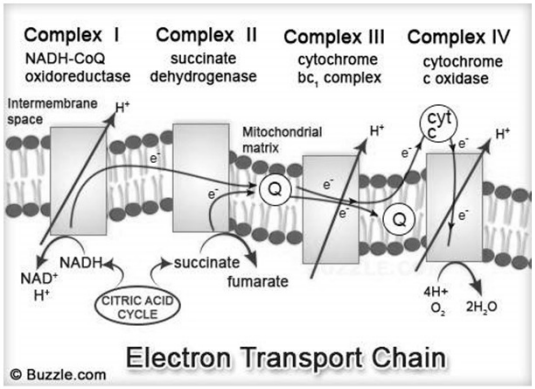
Their mechanism of action is proposed to involve inhibition of cytochrome b in Complex 3 of the mitochondria and inhibition of P450 enzymes, which oxidize a wide range of xenobiotics.

<u>Common diseases -</u> Parkinson's disease, High leukotrien B4.
Detoxification - Methylation
SAM, 5-MTHFolate, Methylcobalamin

Mitochondrial.DNA (mtDNA) is the DNA located in mitochondria. It is inherited solely from the mother.
mtDNA is organized as a circular, covalently closed, double-stranded DNA.
100-10,000 separate copies of mtDNA are usually present per cell.







α-Solanine

<u>α-Solanine foods15%</u>
Potatoes especially if green (also chaconine)
Tomatoes
Green peppers (also <u>capsaicin</u>)
Aubergines (egg plants)
Tobacco
Paprika
Goji berries
Ashwagandha

The following foods contain solanine, but are not a part of the nightshade family, including:
Blueberries / Bilberries
Apples
Cherries
Sugar beets
Okra
Artichokes
Ascorbyl Palmitate (it's potatoes)
Yeast (Most yeast contains potato)

ACETYLCHOLINE

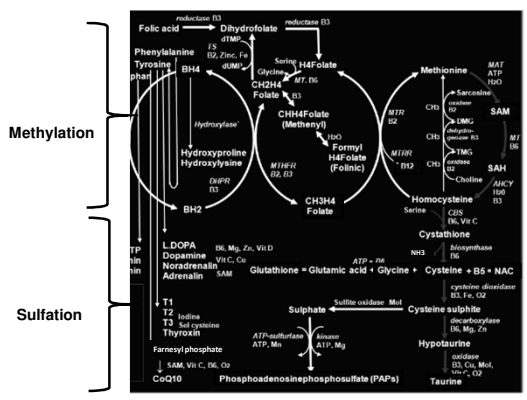
Inhibited by
Chemicals – α-Solanene

H_20
acetylcholinesterase
B2
B3
Mn++
Zn++ Cysteine **Recycled**

Acetate + Choline

Solanum glycoalkaloids inhibit acetylcholinesterase. Intestinal bacteria aids in the detoxification by hydrolyzing the glycoside into solanidine (aglycone), which is less toxic than solanine and also poorly absorbed.

<u>Liver meridian</u>
<u>Detoxified by Methylation</u>
<u>Antidote</u> – Allclear, Thyme / Lemon balm



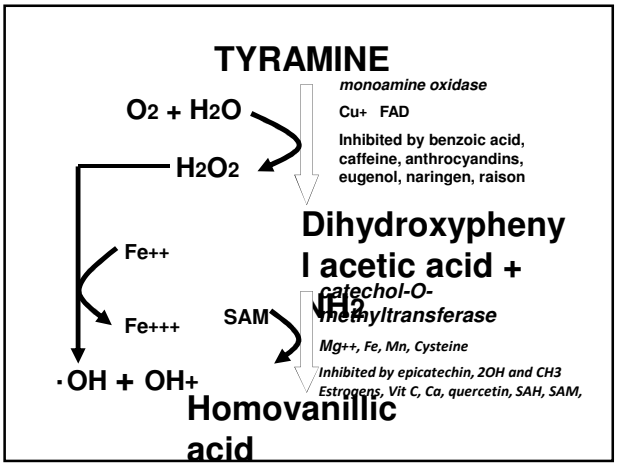
Tyramine

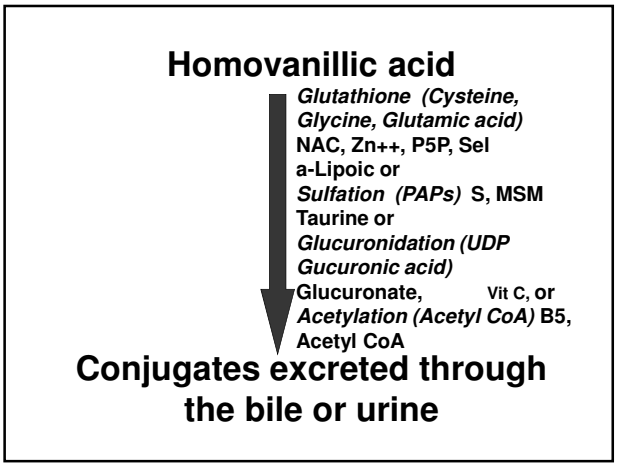
Tyramine foods10%

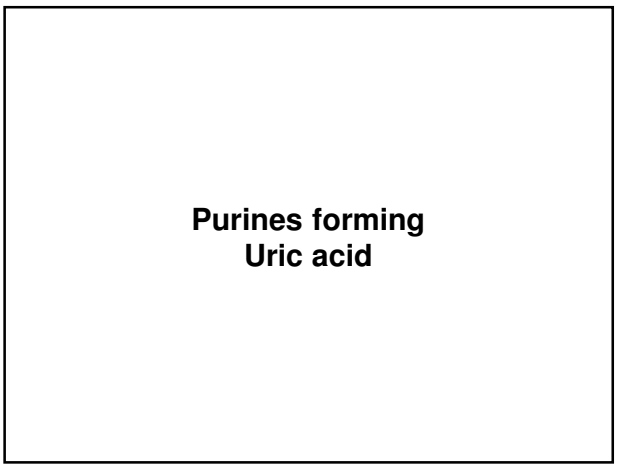
Cheese – aged cheese: blue, brick, brie, cheddar, swiss, roquefort, mozzarella, provolone, emmental, colby, american, parmesan
Fruits – Over ripe bananas and avocados, figs, grapes, oranges, pineapples, raspberries, plums, prunes, raisins, overripe fruit and dried fruit
Meat & Fish – aged, dried, fermented, salted, smoked or pickled – pepperoni, salami, liverwurst, bologna, bacon, frankfurters, ham.
Vegetables – snow peas, fava or broad beans, sauerkraut, pickles, olives, avocados, eggplant, tomatoes
Soy – fermented: miso, soy sauce, teriyaki sauce, tofu, tempeh
Nuts and Seeds – all nuts
Beverages – all alcoholic beverages, all non-alcoholic fermented beverages
Other – yeast, brewers extracts, chocolate, caffeine, coke

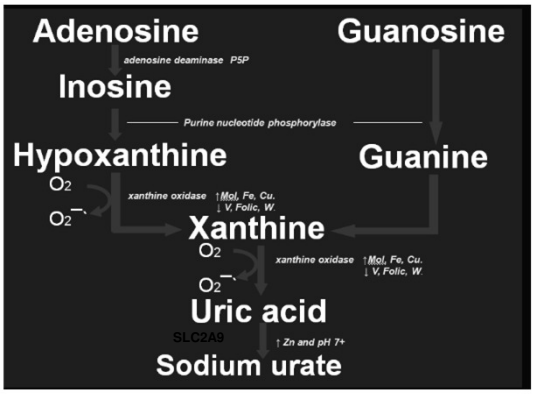
Tyramine foods10%

Detoxified by MAO
Antidote – Rosemary, Yarrow, Vitamin C


TYRAMINE
monoamine oxidase
Cu+ FAD
Inhibited by benzoic acid, caffeine, anthrocyandins, eugenol, naringen, raison
O2 + H2O
H2O2
Dihydroxyphenyl acetic acid + H2
Fe++
Fe+++
SAM
catechol-O-methyltransferase
Mg++, Fe, Mn, Cysteine
Inhibited by epicatechin, 2OH and CH3 Estrogens, Vit C, Ca, quercetin, SAH, SAM,
·OH + OH+
Homovanillic acid

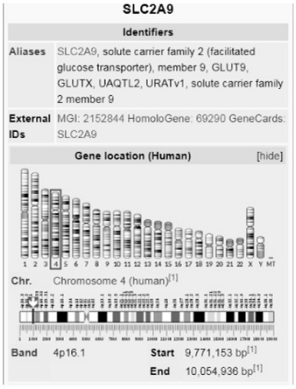

Homovanillic acid
Glutathione (Cysteine, Glycine, Glutamic acid)
NAC, Zn++, P5P, Sel
a-Lipoic or
Sulfation (PAPs) S, MSM
Taurine or
Glucuronidation (UDP Gucuronic acid)
Glucuronate, Vit C, or
Acetylation (Acetyl CoA) B5,
Acetyl CoA
Conjugates excreted through the bile or urine


Purines forming
Uric acid



SLC2A9 has also recently been found to transport uric acid, and genetic variants of the transporter have been linked to increased risk of development of both hyperuricemia, gout and Alzheimer's disease.

Vitart V, Rudan I, Hayward C, et al. (2008). "SLC2A9 is a newly identified urate transporter influencing serum urate concentration, urate excretion and gout". Nature Genetics. 40 (4): 437–42.



Purine high foods > High Uric acid

Red meats which come from cows or sheep and include steak, chops, corned beef and larger pieces of meat usually roasted in the oven. Game. Meat extracts (e.g Oxo, Bovril). Gravy.
Brains, kidneys, liver & heart (offal), sweetbreads (thymus and panceas).
Shellfish such as , mussels, oysters and sea eggs.
Anchovies, herrings, mackerel, sardines.
Peas and beans, carrot.
Alcohol. especially beer and wine.

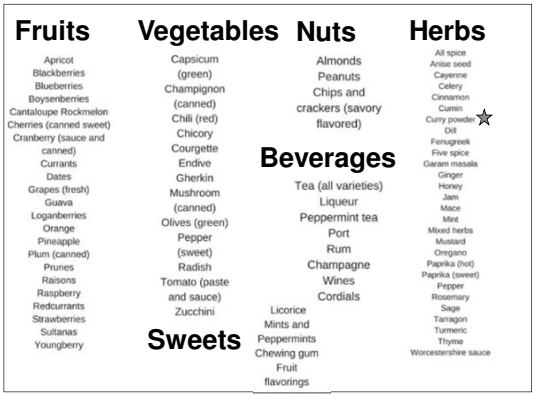
Phenolic foods

Phenols Foods
Phenols are present naturally in certain foods and are also found in food additives or preservatives in processed foods and food packaging. The types of phenols known to cause symptoms are:
Salicylates
Amines (e.g. Histamine)
Glutamates

Salicylates

Salicylate foods

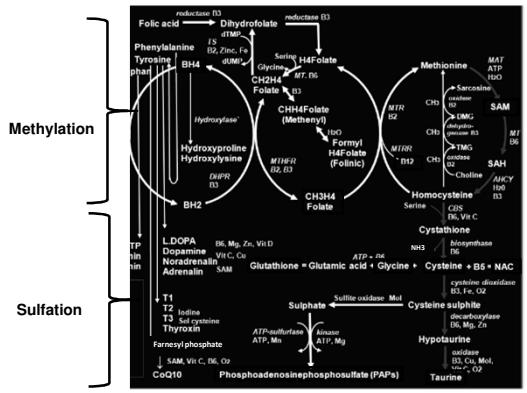
Cold & flu remedies
Medicines used for pain for headache, periods, sinus
Some antacids
Drugs used for inflammatory bowel disease
Many complementary and alternative medicines, especially those used for Pain and joint problems
Teething gels.
Foods containing high levels of salicylate include tea (except fruit and camomile tea), coffee, almonds, dried herbs and spices, cloves, black pepper, paprika, sharp green apples, apricots, bananas, cherries, strawberries, dried fruit, peaches, plums, prunes, tomatoes (fresh, puree and ketchup), cucumber, pickles, fruit juices, grapes, nectarines, oranges, cider, cider vinegar, wine, wine vinegar, peppermints and liquorice. Oil of wintergreen, rosehips, acerola, food colourings and preservers, broccoli. Smoked foods.



Salicylate foods

Common diseases – Epilepsy, eczema, Asthma.
Detoxified by Glutathione, Sulfation

Antidote - NAC, Taurine, CoQ10 Glutathione

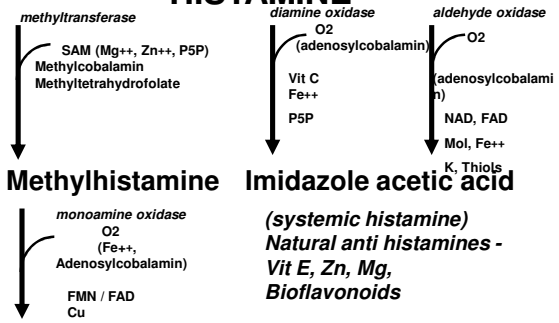


Histamine

Histamine foods

Bananas, Prickly pear, Stinging nettle, Cabbage, Milk thistle, Shepherds purse, Celendine, Melon, Sunflower, Strawberries, Sauerkraut, Salami, Bacon, Bass, Beer, Chicken, Cocoa, Chocolate, Cod, Crab, Haddock, Ham, Lobster, Mackerel, Milk (cow and goat), Mutton, Oyster, Salmon, Scallop, Shrimp, Trout, Tuna, Turkey, Yeast, Yoghurt, Avocados.

HISTAMINE



(systemic histamine)
Natural anti histamines - Vit E, Zn, Mg, Bioflavonoids

Histamine foods

Common diseases – Allergy, Chronic infections

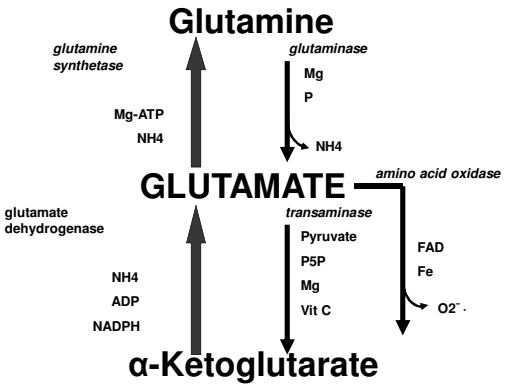
Detoxified by ***Diamine oxidase***
Adenosylcobalamin, Vit C, P-5-P
Aldehyde dehydrogenase
Adenosylcobalamin, FAD, NAD, Mol

Antidote- **Allclear, AH formula, Hesperidin Plus.**

Glutamate

Glutamate Foods

Celery, Foods matured, cured or preserved – eg mature cheeses, Parmesan, cured meats
Fish sauce
Soy sauce and soy protein
Mushrooms
Ripe tomatoes
Broccoli
Peas
Walnuts
Grape juice
Bone broths
Meats cooked for a long time – eg braising, stews
Malted barley in breads and beer
Wheat gluten, Dairy casein



Glutamate Foods

Common diseases – Hyperactivity, Hypertonicity in muscles

Antidote- NAC, Yarrow (for Glutathione)

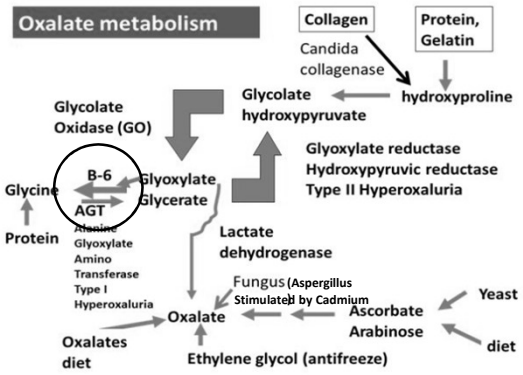
Monosodium glutamate (MSG) 3 pages

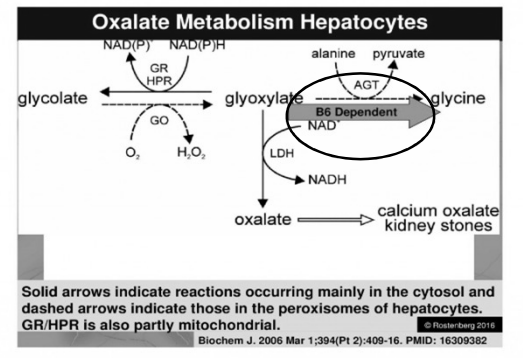
Celery, Autolyzed yeast - which contains free glutamate
Other menu items that contain soy sauce, natural flavours, autolyzed yeast or hydrolyzed protein which can contain up to 20% free glutamic acid - the active part of MSG.
Hamburger Helper Microwave Singles® (targeted towards children)
Doritos®
Campbell's® soups - all of them - based on their commitment to add "umami" (read - MSG)
Pringles® (the flavoured varieties)
Lipton® Noodles and Sauce
Lipton® Instant soup mix
Unilever or Knorr® products - often used in homemade Veggie dips.
Kraft® products nearly all contain some free glutamate
Cup-a-soup® or Cup-o-Noodles®
Planters® salted nuts - most of them
Accent® -this is nearly pure MSG
Braggs® Liquid Aminos -
Tangle extract (seaweed extract) - found in sushi rolls
Fish extract (sauce) - made from decomposed fish protein - used now in Japanese sushi dishes.

Monosodium glutamate cont
Sausages - most supermarkets add MSG to theirs
Processed cheese spread
Marmite®
Supermarket poultry or turkeys that are injected or "self-basting"
Restaurant gravy from food service cans
Boullion - any kind
Instant soup mixes
Many salad dressings
Most salty, powdered dry food mixes - read labels
Flavoured potato crisps
Monopotassium glutamate
Glutamic acid
Gelatin
Hydrolyzed vegetable protein, like canned tuna and even hot dogs)
Hydrolyzed plant protein, like canned tuna and even hot dogs)
Sodium caseinate
Textured protein
Beet juice - it is used as a colouring, but MSG is manufactured from beets and the extract may contain free glutamic acid - Yo Baby - organic baby yogurt has just changed the formula to include beet extract
Yeast extract

Monosodium glutamate cont
Yeast food or nutrient
Soy protein isolate
Soy sauce
Worcestershire sauce
Kombu extract
Dry milk and whey powder
“Natural flavours" - may contain up to 20% MSG
Carageen
Dough conditioners
Malted barley
Malted barley flour - found in many supermarket breads and all-purpose flours
Body builder drink powders containing protein
Parmesan cheese - naturally high in free glutamate
Over-ripe tomatoes - naturally high in free glutamate
Mushrooms - naturally high in free glutamate
Medications in gelcaps - contain free glutamic acid in the gelatin
Cosmetics and shampoos - some now contain glutamic acid
Fresh produce sprayed with Auxigro in the field.
May also be in Apple juice, Cranberry juice, Alcoholic drinks, Dark chocolate or cocoa, Multi vitamins, Hydrogeneated fats
Antidote – Glutathione, NAC

Oxalates


Oxalate metabolism
Collagen
Protein, Gelatin
Candida collagenase
hydroxyproline
Glycolate hydroxypyruvate
Glycolate Oxidase (GO)
Glyoxylate reductase
Hydroxypyruvic reductase
Type II Hyperoxaluria
B-6
Glyoxylate
Glycerate
Glycine
AGT
Protein
Alanine Glyoxylate Amino Transferase Type I Hyperoxaluria
Lactate dehydrogenase
Fungus (Aspergillus Stimulated by Cadmium
Yeast
Oxalate
Ascorbate
Arabinose
diet
Oxalates diet
Ethylene glycol (antifreeze)


Oxalate Metabolism Hepatocytes
NAD(P)
NAD(P)H
GR
HPR
alanine
pyruvate
AGT
glycolate
glyoxylate
glycine
B6 Dependent
GO
NAD
O2
H2O2
LDH
NADH
oxalate
calcium oxalate kidney stones
Solid arrows indicate reactions occurring mainly in the cytosol and dashed arrows indicate those in the peroxisomes of hepatocytes.
GR/HPR is also partly mitochondrial.
© Rosenberg 2016
Biochem J. 2006 Mar 1;394(Pt 2):409-16. PMID: 16309382

Oxalates

Very high -
Avocados, Dates, Grapefruit, Kiwi, Oranges, Raspberries, Canned and dried pineapple, Dried figs, Bamboo shoots, Beets, Fava beans, Okra, Olives, Parsnip, Kidney beans, Rhubarb, Spinach, Tomato sauce, Raw carrots, Soy beans, Brussel sprouts, Potatoes, Brown rice,
Couscous, Tahini, Pasta, Veggie burgers, All nuts, Carrot juice, Hot chocolate, Lemonade, Rice milk, Soy milk, Tea, Clam chowder, Miso soup, Lentil soup. CABBAGE.
High – Tangerines, Figs, Dried prunes, Celery, Collards, Whole wheat, White rice.

Oxalates

Common diseases – Kidney stones (Calcium oxalate), Interstitial cystitis
Detoxified by Sulfotransferase
Antidote – Folinic acid, P-5-P, EFAs. Magnesium*
Probiotics*

Lieske, J. C.; Goldfarb, D. S.; De Simone, C.; Regnier, C. (2005). "Use of a probiotic to decrease enteric hyperoxaluria". *Kidney International.* 68 (3): 1244–9.

Caffeine

Caffeine

Coffee (also avoid decaf – is only 97% caffeine free) and Tea
Soda, energy drinks other beverages
Chocolate (also contains theobromine)
Hot Chocolate, mocha- and coffee-flavoured ice cream and frozen yogurt.
Caffeine-Fortified Foods such as sunflower seeds, nuts, frozen waffles, snack chips, beef jerky -- even marshmallows, jelly beans and gummy bears.
Protein bars and candy bars
Fancy flavoured water
Alcohol flavoured energy drinks
Weight loss pills, Pain relievers
Breath fresheners, Caffeinated mints
Some instant oatmeal
Antidote -Thyme

Caffeine

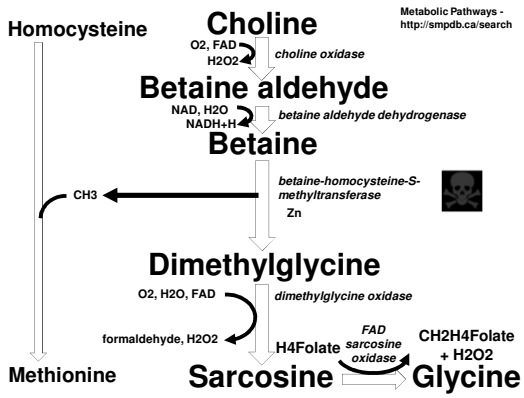
Common diseases – Hypertension
Detoxified by Methylation
Antidote -Thyme

Betaine

Betaine

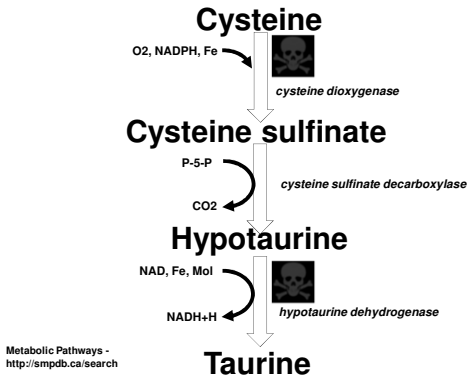
in descending order

Wheat Bran
Quinoa
Beets (root and sugar)
Spinach
Amaranth Grain
Rye Grain
Kamut Wheat Grain
Bulgar Wheat Grain
Sweet Potato
Turkey Breast
Veal
Beef
Onions
Mushrooms
Shrimp
Scallops,
Broccoli
Chicken
Eggs
Pork
Soya
Pork
Oats
Brown rice
Wine
Beer
Green tea.



Cysteine

Cysteine foods
Animal: meat (including pork and poultry), eggs, dairy;
Plant: Red peppers
Garlic, Onions (Onions also produce sulfenic acids), Broccoli, Brussels sprout, Oats, Sweet potato
Wheat germ, Sprouted lentils, Spinach



Cysteine

Common diseases –

Detoxified by Cysteine dioxidase, P-5-P, Folinic acid,
Antidote -

Sulfites

Sulphites

Wine, beer, cocktail mixes, soft drinks, instant tea
Cookies, crackers, dried fruit or vegetables
Dried citrus fruit beverage bases
Horseradish, pickled onions, pickles, olives, wine vinegar
White sugar from sugar beet
Anti-emetics, CVS drugs, antibiotics, tranquilizers, muscle relaxants, analgesics, steroids, bronchial dilators.
Canned clams; fresh, frozen, canned or dried shrimp; frozen lobster; scallops; dried cod.
Fruit fillings, flavoured and unflavoured gelatine, pectin jelling agents.
Cornstarch, modified food starch, spinach pasta, gravies, breadings, batters, noodle/rice mixes.
Jams, jellies, shredded coconut
Canned, bottled or frozen fruit juices (including lemon, lime, grape and apple); dried fruit; canned, bottled or frozen dietetic fruit or fruit juices; maraschino cherries and glazed fruit.
Vegetable juice, canned vegetables (including potatoes), pickled vegetables (including sauerkraut), dried vegetables, instant mashed potatoes, frozen potatoes and potato salad.

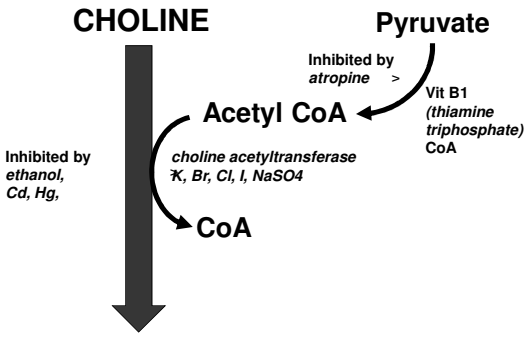
Sulphites

Common diseases –
Detoxified by Sulfite oxidase
Antidote – Fe, Mol, Yarrow, Vit C, NAC, Allclear

Atropine
(Tomato / Potato Toxin)

Atropine is present in
Tomato
Potato
Aubergine
Bell peppers
Chilli
Egg Tobacco
Datura, Herbane
Mandrake root

Atropine counters the "rest and digest" activity of glands regulated by the parasympathetic nervous system.
Atropine is a competitive, reversible antagonist of the muscarinic acetylcholine receptors types M1, M2, M3, M4 and M5 in the parasympathetic nervous system.
Rang, Dale, Ritter and More: Pharmacology, p. 139. Elsevier 2003.



Gall bladder meridian

Common diseases – Detoxified by Methylation
Antidote – SAM, 5MTHF, H4Biopterin, Methylcobalamin

Galantamine – Lemon balm, Rosemary, Fennel, Black walnut

High atropine "hot as a hare, blind as a bat, dry as a bone, red as a beet, and mad as a hatter". These associations reflect the specific changes of warm, dry skin from decreased sweating, blurry vision, decreased sweating / lacrimation, vasodilation, and central nervous system effects on muscarinic receptors, type 4 and 5.

Robert S. Holzman, MD (July 1998). "The Legacy of Atropos". *Anesthesiology*. 89 (1): 241–249.

Curare is a nicotinic acetylcholine antagonist. (Memory and Neuromuscular junctions).

Naturally present in Mushrooms

Rang, Dale, Ritter and More: Pharmacology, p. 139. Elsevier 2003.

Malondialdehyde

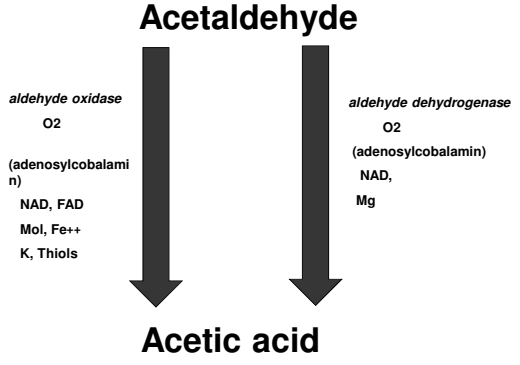
Malondialdehyde from rancid fats. 50%

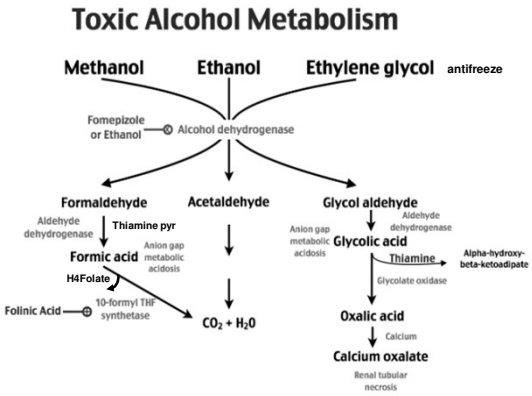
Flax, Olive, Rapeseed, Sunflower Corn, Groundnut, Safflower oils. Most packaged, bottles and processed foods e.g. Mayonnaise, Humus, Sardines, Anchovies etc

Use only Biona Organic Cold pressed olive oil and or Clearspring Organic cold pressed rapeseed oil for cooking.
Use organic butter but only put small amount out at a time. Keep remainder in refrigerator.

Malondialdehyde from rancid fats. 50%

Common diseases – Neurological disorders, Skin, High PgE2.
Detoxified by Sulfotransferase
Aldehyde dehydrogenase
Aldehyde oxidase
Glutathione
Antidote – Adenosylcobalamin, Glutathione, P-5-P, Folinic acid, Non rancid oils, Vitamin E, Selenium, Yarrow,





Free radical decomposition of lipid hydro-peroxides leads to the formation of excited chemo-luminescent species by the self reaction of secondary lipids peroxy-radicals, producing either singlet oxygen or excited carbonyl groups.

Cadneas and Sies: Low level chemoluminescence in liver microsomeal fractions initiated by tetrabutyl hydroperoxide: Eur J. Biochemistry 124, 349-356

Lipid radical L˚
Lipid peroxyl radical LOO ˚
Lipid hydro-peroxide LOOH

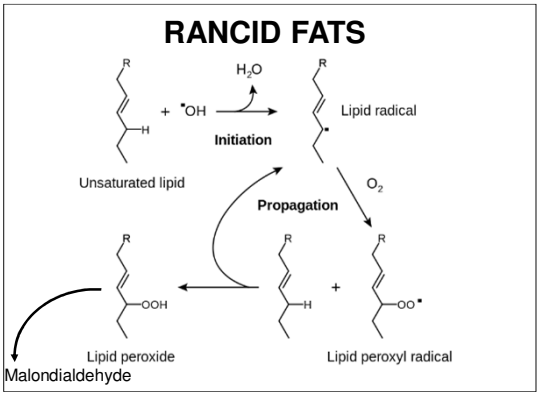
All form Malondialdehyde and 4 Hydroxynonenal.

Certain diagnostic tests are available for the quantification of the end-products of lipid peroxidation, to be specific, malondialdehyde (MDA). The most commonly used test is called a TBARS Assay (thiobarbituric acid reactive substances assay). Thiobarbituric acid reacts with malondialdehyde to yield a fluorescent product.
Lipid peroxidation-DNA damage by malondialdehyde. Marnett LJ. *Mutation research* 1999 Mar 8;424(1-2):83–95.

Rancid Fats

- Primarily occurs with unsaturated fats
- More susceptible to rancidity because of structure with many double bonds
- Fats turn rancid in the presence of free radicals or reactive oxygen species

RANCID FATS



Rancid Fats

- Reactive oxygen species degrade polyunsaturated lipids forming malondialdehyde
- Reactive aldehyde causes toxic stress in cells and forms advanced lipoxidation end products
- Lead to loss of membrane integrity

Rancid Fats

- Malondialdehyde is used as a biomarker to assess the oxidative stress of a person
- It reacts with deoxyadenosine and deoxyguanosine in DNA to form DNA combinations which can be mutagenic

Rancid Fats

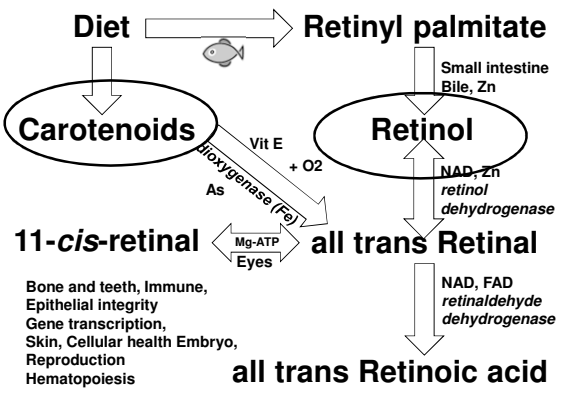
- Measure the oxidative stability of an oil
- Rancimat method measures the progress of the oxidation reaction
- Measures the volatile oxidation products, largely formic acid
- Biomarker Formic acid to test rancid oils

To test if an oil or food is rancid

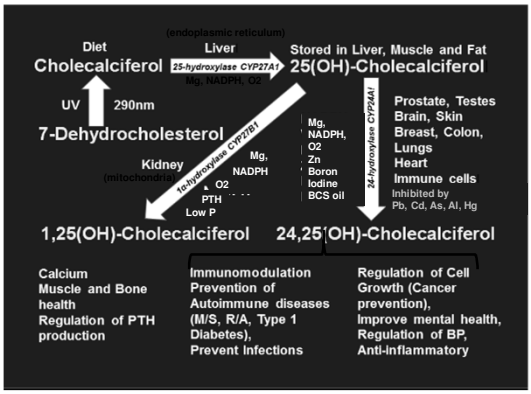
- Test patient with Formic acid to check not weakening in the clear
- Test oil or food vial
- Test oil or food with formic acid test vial on the body
- If SIM weakens, oil or food is rancid and contributing to lipid peroxidation

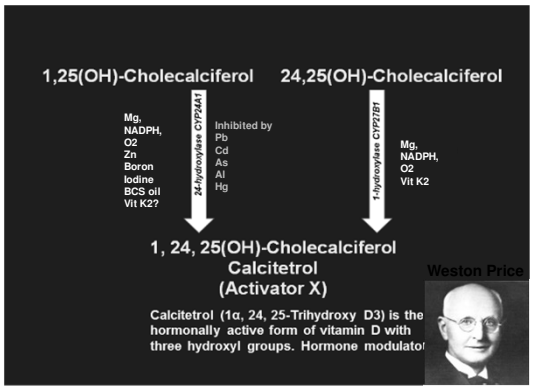
Fat Soluble Vitamins are really Co-enzymes and have to be activated

Vitamin A



Vitamin D
Cholecalciferol



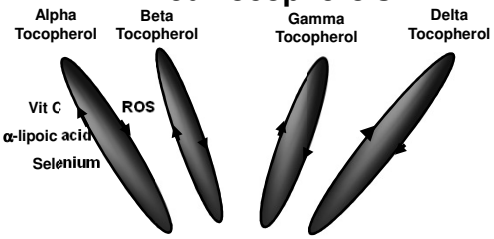


Enzymes that are induced by Vitamin D
Tyrosine hydroxylase
Tryptophan hydroxylase
Cholesterol to pregnenalone
Nitric oxide synthase
Increases Glutathione levels

Vitamin E
(Tocopherols)

Vitamin E

Mixed Tocopherols



TOCOPHEROL RADICAL

Vitamin K 1 and K2
Menaquinone

Menadione (K3)
(water soluble, most potent form but not found naturally)

Menaquinone- 4, 7 (K2)
(fat soluble, from animal tissue and synthesised by intestinal bacteria)

MK4- Synthesized in artery walls, pancreas and testes.

MK7 -By bacterial fermentation in the colon by B. Subtilis.

Phyloquinone (K1)
(fat soluble from plant tissue)

Nuclear receptors

Nuclear Receptors are a class of proteins found within cells that are responsible for sensing steroid and thyroid hormones and certain other molecules. In response, these receptors work with other proteins to regulate the expression of specific genes, thereby controlling the development, homeostasis, and metabolism of the organism.

Nuclear receptors have the ability to directly bind to DNA and regulate the expression of adjacent genes, hence these receptors are classified as transcription factors. The regulation of gene expression by nuclear receptors generally only happens when a ligand — a molecule that affects the receptor's behaviour — is present.

More specifically, ligand binding to a nuclear receptor results in a conformational change in the receptor, which, in turn, activates the receptor, resulting in up- or down-regulation of gene expression.

	Group	Name	Ligand
0.	Dosage Sensitive Sex Reversal	DAX1*	Anti testis
1.	Thyroid receptors	Thyroid hormone receptor TR	Thyroxin
		Retinoic acid receptor RAR	Vitamin A
		Peroxisome Proliferator-Activating Receptor (PPAR)	Fatty acids and 369 Prostaglandins
		Rev-ErbA*	Heme
		RAR related orphan receptor	Cholesterol All trans Retinoic acid
		Liver X Receptor LXR	Oxysterols (Oxidised cholesterol)
		Vitamin D receptor VDR	Vitamin D Xenobiotics Androstane (Androstadione, Androstenadiol)
		NRs with two DNA binding domains	???????
		Farnasoid X Receptor FXR``	Bile salts
		Pregnane X receptor PXR	Xenobiotics
		Androstane receptor (CAR)	Endobiotics and Xenobiotics

	Group	Name	Ligand
2.	Retinoid x receptor	Hepatocyte Nuclear factor HNF4	Fatty acid
		Retinoid X Receptor RXR	Retinoids
		Testicular Receptor TR2*	Androgens / Estrogens
		TLX/ PNR*	Photoreceptor
		COUP*/ EAR	?????
3.	Estrogen receptor	Estrogen Receptor ER α and β	Estrogen
		Estrogen Related Receptor ERR	Energy production
		3-Ketosteroid receptors GC	Cortisol, Borage
		MR	Andosterone,
		PR	Progesterone,
		AR	Testosterone
4.	Nerve growth factor receptor	NGF1B*	??????
5.	Sterogenic receptor	SF1*	Phosphatilylinostitol PC
		Liver Related Homologue 1 LRH1*	Cholesterol, Steroiodgenesis
6.	Germ cell nuclear factor receptor	GCFN*	?????? Propionic acid?
7.	Miscellaneous receptors	DAX* / SHP*	??????

* = Orphan Nuclear Receptor

The germ cell nuclear factor (GCNF), is a protein that in humans is encoded by the *NR6A1* gene. GCNF is a member of the nuclear receptor family of intracellular transcription factors . In adults, GCNH is expressed mainly in the germ cells of gonads and is involved in the regulation of embryogenesis and germ cell differentiation.

Zechel C (Dec 2005). "The germ cell nuclear factor (GCNF)". Molecular Reproduction and Development. 72 (4): 550–6.

Its expression pattern suggests that it may be involved in neurogenesis and germ cell development. The protein can homodimerize and bind DNA, but in vivo targets have not been identified. The gene expresses three alternatively spliced transcript variants.

Zechel C (Dec 2005). "The germ cell nuclear factor (GCNF)". Molecular Reproduction and Development. 72 (4): 550–6.

Germ cell nuclear factor (GCNF) is an orphan nuclear receptor for which a ligand has yet to be identified. During embryonic development, *GCNF* is expressed between the gastrula and neurula stages. Loss of GCNF causes embryonic lethality, disrupts normal somitogenesis, as well as neural tube and axis formation, suggesting that GCNF is a critical factor for normal embryonic development.

The International Journal of Biochemistry & Cell Biology
Volume 33, Issue 12 December 2001, Pages 1141-1146 Germ cell nuclear factor
Author links open overlay panel Arthur C.-KChungAustin JCooney

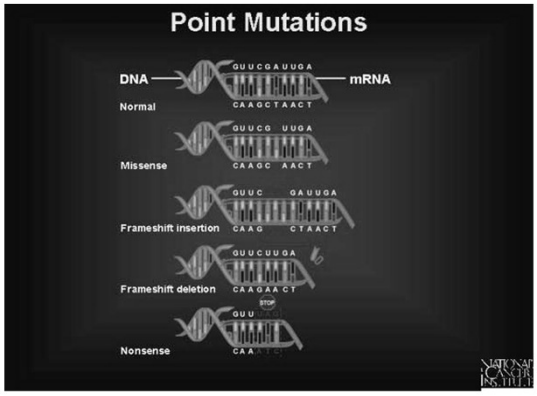
The Germ Cell Nuclear Factor is located on Chromosome 9q 382nm

Genetic mutations

Genetic mutations
P – Point mutation, or any insertion/deletion entirely inside one gene (SNIP or Frameshift mutation)
D – Deletion of a gene or genes
C – Whole chromosome extra, missing, or both.
T – Trinucleotide repeat disorders: gene is extended in length

A frameshift mutation (also called a framing error or a reading frame shift) is a genetic mutation caused by indels (insertions or deletions) of a number of nucleotides in a DNA sequence that is not divisible by three. Due to the triplet nature of gene expression by codons, the insertion or deletion can change the reading frame (the grouping of the codons), resulting in a completely different translation from the original.

The earlier in the sequence the deletion or insertion occurs, the more altered the protein. A frameshift mutation is not the same as a single-nucleotide polymorphism (SNIP) in which a nucleotide is replaced, rather than inserted or deleted.
A frameshift mutation will in general cause the reading of the codons after the mutation to code for different amino acids.



M = Metacentric S = Submetacentric A = Acrocentric

Wavelength	Chromosome		Gene	Enzyme
370	1 P-arm	M	2000	GST, MT, ST, ALDH,
371	1 Q-arm	S	2000	MT, ALDH,
372	2 P-arm	M	1300	NAT, MT, CYP1B1
373	2 Q-arm	M	1300	UGT, ST, AO
374	3 P-arm	M	1000	NAT, MT, ST
375	3 Q-arm	M	1000	ST, ALDH,
376	4	S	1000	GST, UGT, MT, ST,
377	5	S	900	MT, ST, ALDH, CDO, TD
378	6 P-arm	S	1000	GST, MT, ALDH,
379	6 Q-arm	S		UGT, ALDH,
380	7	S	900	GST, MT, ST, CYP3A4, ALDH
381	8	S	700	NAT
382	9	S	800	MT, ALH1A1
383	10	S	700	GST, MT, ST, CYP2C8, CYP2C9, CYP2C19, CYP2E1, ALDH

CYP = Cytochrome p450 GST = Glutathione-s-transferase, MT = Methyltransferase COMT = Catechol-O-methyltransferase ST = Sulfotransferase NAT = N. Acetyltransferase UGT = UDP-Glucuronosyltransferase MAO-A Monoamineoxidase, MAO-B Monoamineoxidase SO = Sulfite oxidase GL = Glycine ligase GT = Glycine transferase ALDH = Aldehyde dehydroenase AO = Aldehyde oxidaseALDR = Aldose reductase CDO = Cysteine dioxygenase TD = Taurine dehydrogenase

384	11	S	1300	GST, NAT, UGT, MT, ST, GT, ALDH,
385	12	S	1100	GST, MT, ST, SO, ALDH, TD
386	13	A	300	MT
387	14	A	800	MAO-A, ALDH,
388	15	A	600	ST, CYP1A1, ALDH,
389	16 P-arm	M	800	ST, GL
390	16 Q-arm	M	800	MT, ST,
391	17 P-arm	S	1200	MT, ALDH,
392	17 Q-Arm	S		NAT, MT, ST
393	18	S	200	MT,
394	19 P-arm	M	1800	MT
395	19 Q-arm	M	1800	MT, ST, CYP2A6, CYP2A7, ALDH,
396	20 P-arm	M	500	MT, NAT, GST
397	20Q-arm	M	500	NAT, MT
398	21	A	200	MT, NAT
399	22	A	500	GST, COMT, ST, CYP2D6
400 Sex X	23	S	800	NAT , MT,, ST, MAO-A, MAO-B
400 Sex Y	23	A	50	

Shared molecular neuropathology across major psychiatric disorders parallels polygenic overlap

Michael J. Gandal[1,2,3,4], Jillian R. Haney[1,2,3], Neelroop N. Parikshak[1,2,3], Virpi Leppa[1,2,3], Gokul Ramaswami[1,2,3], Chris Hartl..

+ See all authors and affiliations

Science 09 Feb 2018:
Vol. 359, Issue 6376, pp. 693-697
DOI: 10.1126/science.aad6469

Genes overlap across psychiatric disease
Many genome-wide studies have examined genes associated with a range of neuropsychiatric disorders. However, the degree to which the genetic underpinnings of these diseases differ or overlap is unknown. Gandal *et al.* performed meta-analyses of transcriptomic studies covering five major psychiatric disorders and compared cases and controls to identify co-expressed gene modules. From this, they found that some psychiatric disorders share global gene expression patterns. This overlap in polygenic traits in neuropsychiatric disorders may allow for better diagnosis and treatment.

The predisposition to neuropsychiatric disease involves a complex, polygenic, and pleiotropic genetic architecture. However, little is known about how genetic variants impart brain dysfunction or pathology. We used transcriptomic profiling as a quantitative readout of molecular brain-based phenotypes across five major psychiatric disorders—autism, schizophrenia, bipolar disorder, depression, and alcoholism—compared with matched controls. We identified patterns of shared and distinct gene-expression perturbations across these conditions. The degree of sharing of transcriptional dysregulation is related to polygenic (single-nucleotide polymorphism–based) overlap across disorders, suggesting a substantial causal genetic component. This comprehensive systems-level view of the neurobiological architecture of major neuropsychiatric illness demonstrates pathways of molecular convergence and specificity.

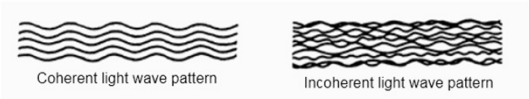
We identified 1099 genes whose differential gene expression is replicated in Autism, 890 genes for schizophrenia, and 112 genes for bipolar disorder.
The transcriptome may reflect the cause or the consequence of a disorder. To refine potential causal links, we compared single-nucleotide polymorphism (SNP)–based genetic correlations between disease pairs with their corresponding transcriptome overlap. SNP coheritability was significantly correlated with transcriptome overlap across the same disease pairs, suggesting that a major component of these gene-expression patterns reflects biological processes coupled to underlying genetic variation.

Cross-Disorder Group of the Psychiatric Genomics Consortium, International Inflammatory Bowel Disease Genetics Consortium (IIBDGC)
, Genetic relationship between five psychiatric disorders estimated from genome-wide SNPs. Nat. Genet. 45, 984–994 (2013).doi:10.1038/ng.2711pmid:23933821

Identifying the Healing Wavelength

The Healing Wavelength

1. Identify Diagnostic Biophoton Wavelength acetate. Strong muscle weakens.
2. Cross check all other 370-400nm wavelengths for negating the weakness.
3. This is the Healing Wavelength used for the light therapy.



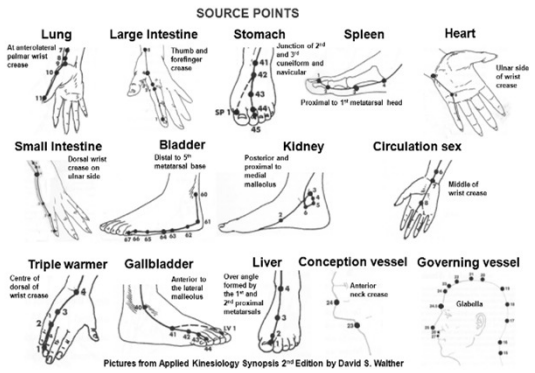
Ideally light used for therapy should be coherent using the individual's healing wavelength acetate to the chomosomal meridian's Source Point(s).

The Chromosomal Meridian

The Chromosomal meridian

1. **Identify Diagnostic Biophoton Wavelength acetate. Strong muscle weakens.**
2. **Cross check each Biophoton meridian acetates for negating the weakness.**
3. **This is the Chromosomal meridian. It's Source points are used in Light Therapy.**

Source Points

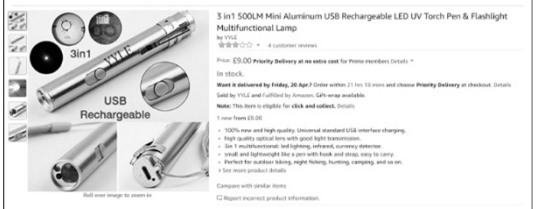


Hakan's points

Lung 7	**LI 4**
Stomach 3	**Spleen 3**
Heart 7	**SI 3**
Bladder 10	**Kidney 27**
Cx 6	**TW 5**
GB 43	**Liver 3**
CV 22	**GV Glabella**

Use the SOURCE points for light therapy with the HEALING wavelength acetate over the point.
Apply laser therapy for 3 minutes.

Easy handheld laser



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- 100% new and high quality. Universal standard USB interface charging.
- high quality optical lens with good light transmission.
- 3in 1 multifunctional: led lighting, infrared, currency detector.
- small and lightweight like a pen with hook and strap, easy to carry.
- Perfect for outdoor biking, night fishing, hunting, camping, and so on.

› See more product details

Compare with similar items

Report incorrect product information.

Roll over image to zoom in

Patient Procedure

Patient Day Sheet

Name						Date		
Symptoms								
Cone colour Right		Left	Gene expression		%	ZINZ		%
Nutritional input		%	Digestion		%	Absorption		%
Energy - Glycolysis			Krebs cycle			Electron transport		
Allergy			Dehydration					
P.Grandfather	P.Grandmother		M.Grandfather			M.Grandmother		
	Father			Mother				
Chemical			%	Enzyme	SNIP			%
	Toxic metal		Radiation					
Infection -	Bacteria		Acute Virus		Post Virus			
	Parasite		Fungus / Fungal toxin					
Structure					Cranial			
Hypoxia	ALA > PBG > HMB > UPG > CPG > PPG > PP > Heme							
Exercise -	Aerobic		Anaerobic					
Hormones	Pineal		Hypothalamus		Pituitary			
Thyroid	Pancreas		Parathyroid		Thymus			
Adrenal medulla			Adrenal cortex					
Ovaries			Testes					
DBW	nm		Healing wavelength				nm	
1. Prescribe								
drops	ml	caps	squirts	x day		time		
2. Prescribe								
drops	ml	caps	squirts	x day		time		
3. Prescribe								
drops	ml	caps	squirts	x day		time		
4. Prescribe								
drops	ml	caps	squirts	x day		time		
6. Herb								
drops	ml	caps	squirts	x day		time		
6. Oil		caps	ml	x day		time		
7. Probiotic				caps last thing at night				
SNIP -			Chromosomal meridian					%
Priority Muscle								
Subconscious Meridian			Superconscious meridian					
Left / Right brain	Conscious Meridian		Unconscious Meridian					

Hypertonicity

Preliminary Test
Strong Indicator Muscle

Before proceeding check indicator muscle for hypertonicity by testing with the corresponding meridian acetate on.
If the muscle weakens then it is hypertonic and do not use as an indicator.
e.g. Quadriceps and Small Intestine acetate.

Muscles and their meridian relationship.

Meridian	Muscles
Bladder	Tibialis ant, Tibialis post, Peroneus long/ brevis, Peroneus tertius
Kidney	Psoas, Iliacus, Upper trap
Gall bladder	Popliteus
Liver	PMS, Rhomoids
Large Intestine	TFL, Hamstrings, QL
Lung	Deltoid, Serratus ant, Coracobrachialis
CV	Supraspinatus, Diaphragm
GV	Teres major
Triple warmer	Teres minor, Infraspinatus
Circulation / sex	Glut max, Glut med/min, Piriformis, Adductors, Sartorius, Gracilis
Stomach	PMC, Neck flexors, Biceps, Brachialis, Pronator teres, Pronator quadratus
Spleen	Lat dorsi, Mid trap, Lower trap, Triceps
Small intestine	Quads, Abdominals
Heart	Subscapularis

Taken from Applied Kinesiology Synopsis 2nd Edition by David Walther DC

A hypertonic muscle is one that fails to become inhibited when it should e.g.

1. **Running the meridian end to beginning point**
2. **Approximating the muscle spindle cells**
3. **Tapping the muscle / Meridian's sedation point**
4. **North / South pole of a magnet**

Dr Sheldon Deal -Shortcuts

1. **Check strong indicator muscle is not Hypertonic using the meridian coloured acetate associated with the meridian of the muscle you are using.**

2. **Tap cross extensor reflexes**

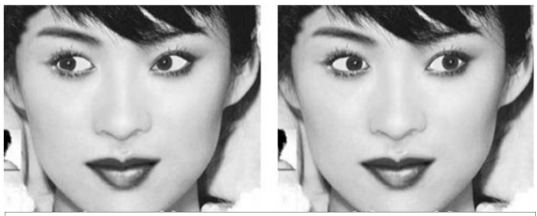
Richard Belli DC

3.Test for Body type – RED, GREEN, BLUE over both eyes.

Then each eye. If different from above treat subconscious with Miron light.

Then over both eyes with deep inspiration and deep expiration for cranial faults.

4. Check which hemisphere patient is coming from i.e. LEFT or RIGHT. And amount each hemisphere is firing.



Dilts, R., Grinder, J., Delozier, J., and Bandler, R. (1980). Neuro-Linguistic Programming: Volume I: The Study of the Structure of Subjective Experience. Cupertino, CA: Meta Publications. p. 2. ISBN 978-0-916990-07-7.

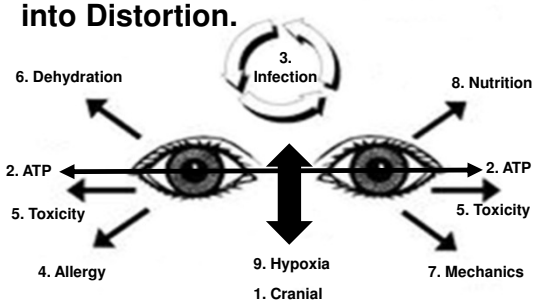
5. Phenotype challenge

Scale of Health
"On a scale of 1-100 your Scale of Health (ability to repair, regenerate and maintain health and wellness) calibrates at ……."

6. Challenge for Phenotype Meridian using B&E points or Biophoton acetates.

Challenge for weak muscle usually on opposite side to the less dominant brain. Use this to test remedies against.

7. Challenge for cause using Eyes into Distortion.



If Nutrition challenge for
Scale of Ingestion
Scale of Digestion
Scale of Absorption

Supplement appropriately.

8. Place on Psorinum 10m.
Challenge for Scale of Genotype
Challenge for Genotype meridian.
Weakness usually negated by a nutrient that the mother was deficient in during pregnancy.

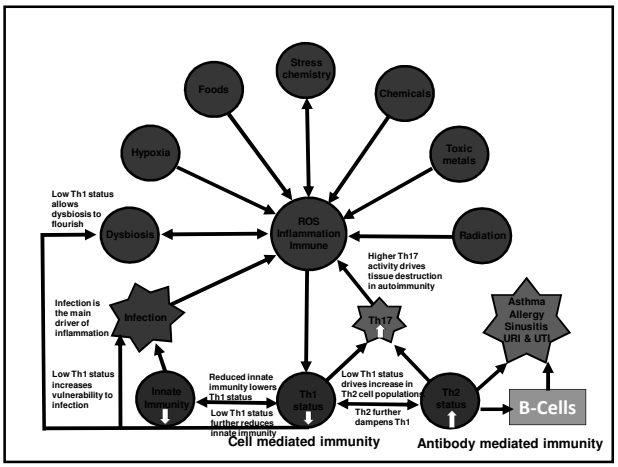
Challenge for weak muscles.
Usually all muscles on this meridian are weak.

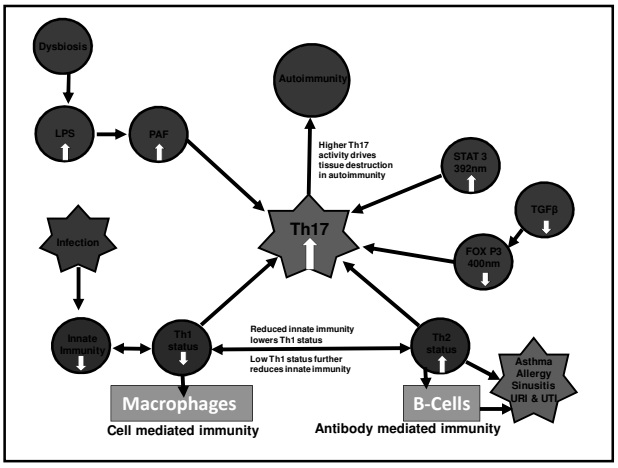
9. When both Phenotype and Genotype clear challenge for Th17 for immune system.
Challenge for meridian that negates this challenge. This meridian will weaken in the clear if the Phenotype and Genotype meridians are balanced.
One muscle on this meridian will be weak.

Interestingly this meridian will cross TL to the Emotional stress reflexes as will the Th17 indicating that there is an emotional component to immune issues.

10. If positive challenge Th1 and Th2 imbalance.
Challenge STAT 3
Challenge FOXP3

10. Challenge for cause of high Th17.
Most commonly a Post Virus.
Treat with appropriate nutrients and / herbs





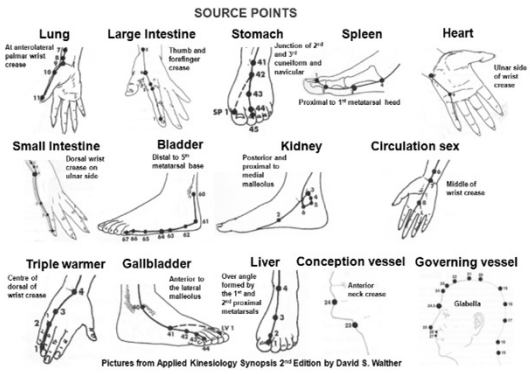
11. Finally cross TL to the Emotional Stress Reflexes.

If positive treat with most appropriate therapy

TL technique
Injury Recall
Perfume - Aromatherapy
Bioenergetic Light Therapy
unconscious meridian SOURCE point
Flower essences

11. Find Healing wavelength – Will be used for light therapy.

Use the SOURCE points for light therapy with the HEALING wavelength acetate over the Unconscious meridian point. Apply laser therapy for 3 minutes.



Therapy Localisation Technique
Identify spinal level by therapy localisation.
Perform spiral field force prior to pulsing together. Practitioner puts one finger on spinal level and the other on the symphysis menti. Pulse together for about one minute.

If you cannot get a positive TL from the spinal level you are probably using a hyper muscle (e.g. a deltoid lung related muscle).

Must only be done at the end of a therapeutic session as all diagnostic markers will be negated.