The contribution of environmental toxicity in the development of various neurological disorders

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NUTRINED

Professional Disclosures

- Board director ILADEF
  ILADS medical association
- Scientific Consultancy for various Clinics and Laboratories
- Medical Director Nutrined/
  Researched Nutritionals

During our talks we respect the rule that statements need to be based on scientific references & scientific research

In order to make this clinical training as efficient as possible, the organizers have asked me to mention and name products and doses during the lectures I hope this does not disturb you

we have been confronted with an accelerating rate of chronic illnesses like cancer, heart disease, chronic fatigue syndrome, chemical sensitivity, autism spectrum disorders, ADD/AD(H)D, autoimmune disorders, Parkinson’s disease, and Alzheimer’s disease.

Mental health is not only about Neurotransmitters

Different aspects complete the picture of the disease

Meet the toxins

sources of toxicity

Soaps

Cleaning agents

Plastics

Germicides

Packaging materials

Drugs

Food

Industry

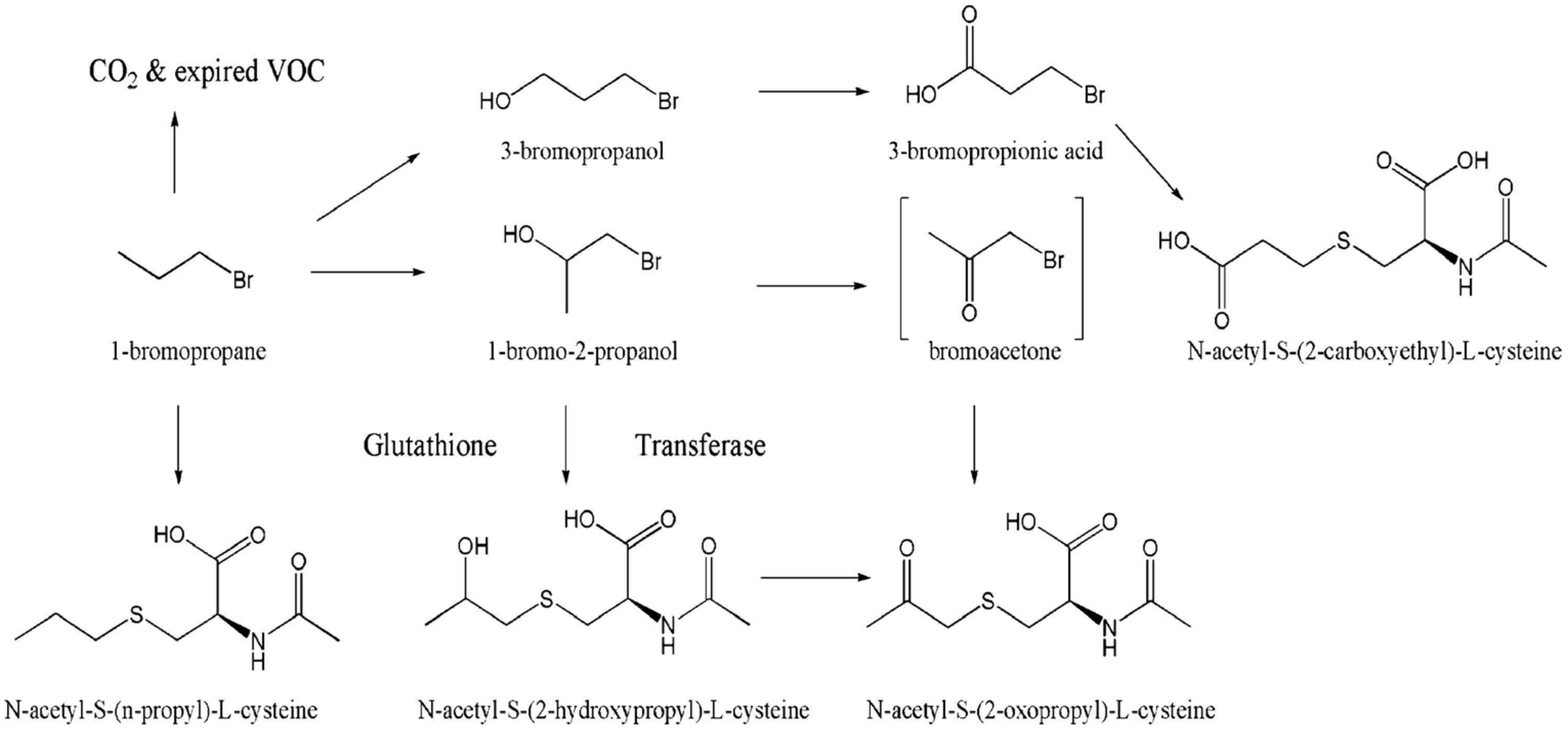
Fungicides

Water

Tests have been developed to measure environmental toxic chemicals

Tests are used in patients with chronic health issues linked to metabolic imbalances and toxicity

Bromopropane



Application and use of 1-bromopropane in Industry

- Introduced to replace methylene chloride and other ozone-depleting chemicals
- Long persistence in water
- Accepted since 2015 as human carcinogen

Industrial uses

- Asphalt
- Synthetic fiber
- Adhesive in laminates & foam products
- Chemical intermediate in synthesis of pesticides and pharmaceutical products
- Cleaning solvent for dry cleaning
- Vapor and immersion degreaser in metals and plastics

Symptoms of 1-bromopropane toxicity

- Cerebellum degeneration
  (cerebellum controls motor nerves)
- Mitochondrial damage
- Peripheral myelin sheath deterioration
- Muscle weakness
- Neurobehavioral de icits
- Cancer
- Numbness
- Tingling
- Weakness
- Paresthesia

Exposure /Distribution

Virtually everyone has detectable levels of 1-bromopropane

N-Acetyl-*S*-(*n*-Propyl)-L-Cysteine in Urine from Workers Exposed to 1-Bromopropane in Foam Cushion Spray Adhesives

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1-Bromopropane (1-BP) has been marketed as an alternative for ozone depleting and other solvents; it is used in aerosol products, adhesives, metal, precision, and electronics cleaning solvents. Mechanisms of toxicity of 1-BP are not fully understood, but it may be a neurological and reproductive toxicant. Sparse exposure information prompted this study using 1-BP air sampling and urinary metabolites. Mercapturic acid conjugates are excreted in urine from 1-BP metabolism involving debromination. Research objectives were to evaluate the utility of urinary *N*-acetyl-*S*-(*n*-propyl)-L-cysteine (AcPrCys) for assessing exposure to 1-BP and compare it to urinary bromide [$Br^{(-)}$] previously reported for these workers. Forty-eight-hour urine specimens were obtained from 30 workers at two factories where 1-BP spray adhesives were used to construct polyurethane foam seat cushions. Urine specimens were also obtained from 21 unexposed control subjects. All the workers' urine was collected into composite samples representing three time intervals: at work, after work but before bedtime, and upon awakening. Time-weighted average (TWA) geometric mean breathing zone concentrations were 92.4 and 10.5 p.p.m. for spraying and non-spraying jobs, respectively. Urinary AcPrCys showed the same trend as TWA exposures to 1-BP: higher levels were observed for sprayers. Associations of AcPrCys concentrations, adjusted for creatinine, with 1-BP TWA exposure were statistically significant for both sprayers ($P < 0.05$) and non-sprayers ($P < 0.01$). Spearman correlation coefficients for AcPrCys and $Br^{(-)}$ analyses determined from the same urine specimens were highly correlated ($P < 0.0001$). This study confirms that urinary AcPrCys is an important 1-BP metabolite and an effective biomarker for highly exposed foam cushion workers.

Keywords: bromide; 1-bromopropane; CAS No. 106-94-5; foam cushion; *N*-acetyl-*S*-(*n*-propyl)-L-cysteine; spray adhesive; urine

Studies show its relationship to development of neurological disorders

Mohideen, Sahabudeen Sheik, et al. "Exposure to 1-bromopropane causes degeneration of noradrenergic axons in the rat brain." Toxicology 285.1-2 (2011): 67-71.

Wang, Te-Hao, et al. "Neurotoxicity associated with exposure to 1-bromopropane in golf-club cleansing workers." Clinical toxicology 53.8 (2015): 823-826.

- Daily occupational exposure to 1-BP for 3-10 months.
- The major presenting symptoms were tingling pain, soreness in lower extremities, and paresthesia.
- N-acetyl-S-(n-propyl)-L-cysteine (AcPrCys), a 1-BP metabolite, was identified by LC/MS/MS in the urine (0.171-1.74 mg/g-Cr) of these workers 5-26 days following 1-BP exposure.
- 95th percentile for Great Plains is .035 mg/g-Cr

ALS Amyotrophic Lateral Sclerosis

90% of all cases without family history

= life style and environment play a very important role

Triggers & mediators

Smoking, especially among post-menopausal women.

High level of physical fitness (not strength) or athleticism, and lower body mass index than average.

Increased risk among professional football and soccer players

Repeated head injuries

Occupations in which exposure to chemicals, pesticides, metals, and EMF is more likely.

Pesticides: organochlorine compounds, pyrethroids, herbicides, and fungicides; Lead, aluminum, arsenic, cadmium

Pre-existing autoimmune diseases.

Diets with higher intake of carbs, glutamate, and certain fats and with lower intake of fruits, vegetables, vitamin E, carotenoids and omega-3 PUFAs.

History of repeated antibiotic use.

Fungal contaminated grass and well-water, proximity to water contaminated with cyanobacteria (BMAA).

Treatment options

- Remove from exposure
- Sauna
- Glutathione, liposomal – lots of Glutathione in ALS!
  Trifortify 1 teaspoon per day
- Mitochondrial Lipid Replacement therapy
  ATP 360 1 x 3 capsules during breakfast
- Mitochondrial optimization with NAD+ precursors and PQQ
  Cognifuel 3 x 1 per day
- Switch to organic food (avoid GMO or nonorganic)

Take treatment and measure after a couple of months to see the results

Nerve conduction story with electromyography (NCV/EMG)

Blood or urine studies for various causes of neuropathy including serum/urine protein electrophoresis ,
sed rate (sedimentation) , thyroid disorders , heavy metals , B12 , Lyme, autoimmune markers (antiganglioside GM1 antibodies)

Spinal fluid examination

MRI brain & spinal cord , myelography

Muscle & nerve biopsy

Roundup, Glyphosate

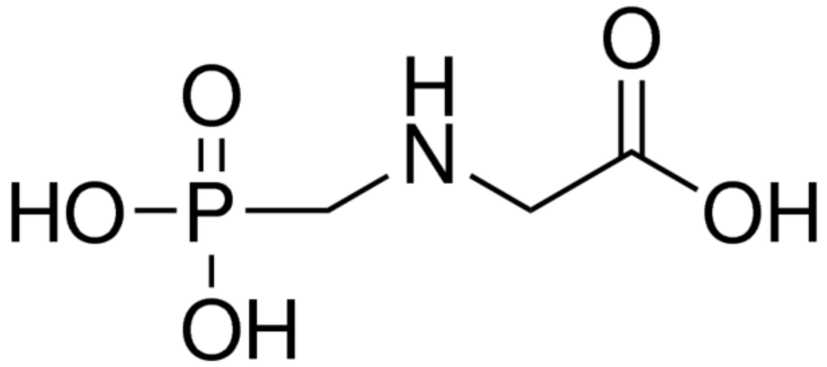
Glyphosate is the world’s most popular herbicide in agriculture , forestry and in home use.

Glyphosate is the main ingredient in Roundup ®

Glyphosate is Phosphonomethylglycine

- Organophosphate
- Contains Glycine

Glyphosate was introduced in the 1970's to kill weeds by disrupting the shikimate pathway



Shikimate pathway

Phosphoenolpyruvate (PEP) + Erythrose 4-phosphate (E4P)

↓ DAHP synthase

3-Deoxy-D-arabina-heptulosonate 7-phosphate (DAHP)

↓

3-Dehydroquinate

↓

3-Dehydroshikimate

↓

Shikimate

↓

Shikimate 3-phosphate (PEP)

Glyphosate ⊘ ESPS synthase

5-enolpyruvylshikimate 3-phopshapte (EPSP)

↓

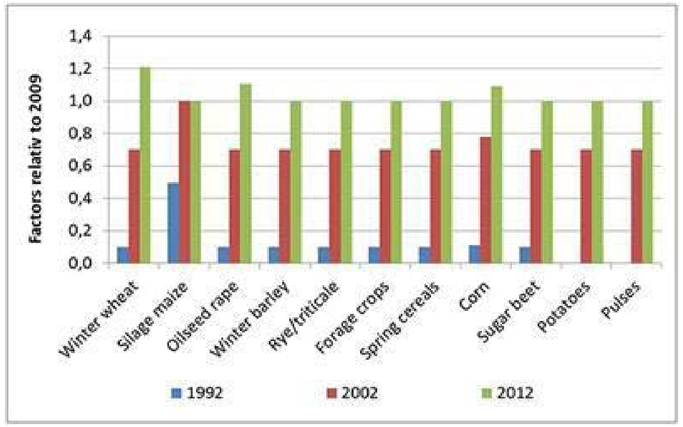
Chorismate

Tryptophane **Phenylaline** **Tyrosine**

(Phytoalezin, lignin, indoleacetatic acid (IAA), etc)

→ **Introduction of genetically modified glyphosate-resistant crops that can still grow in the presence of the herbicide.**

More than 90% of currently used corn, soy, tobacco and sugar beets are GMO



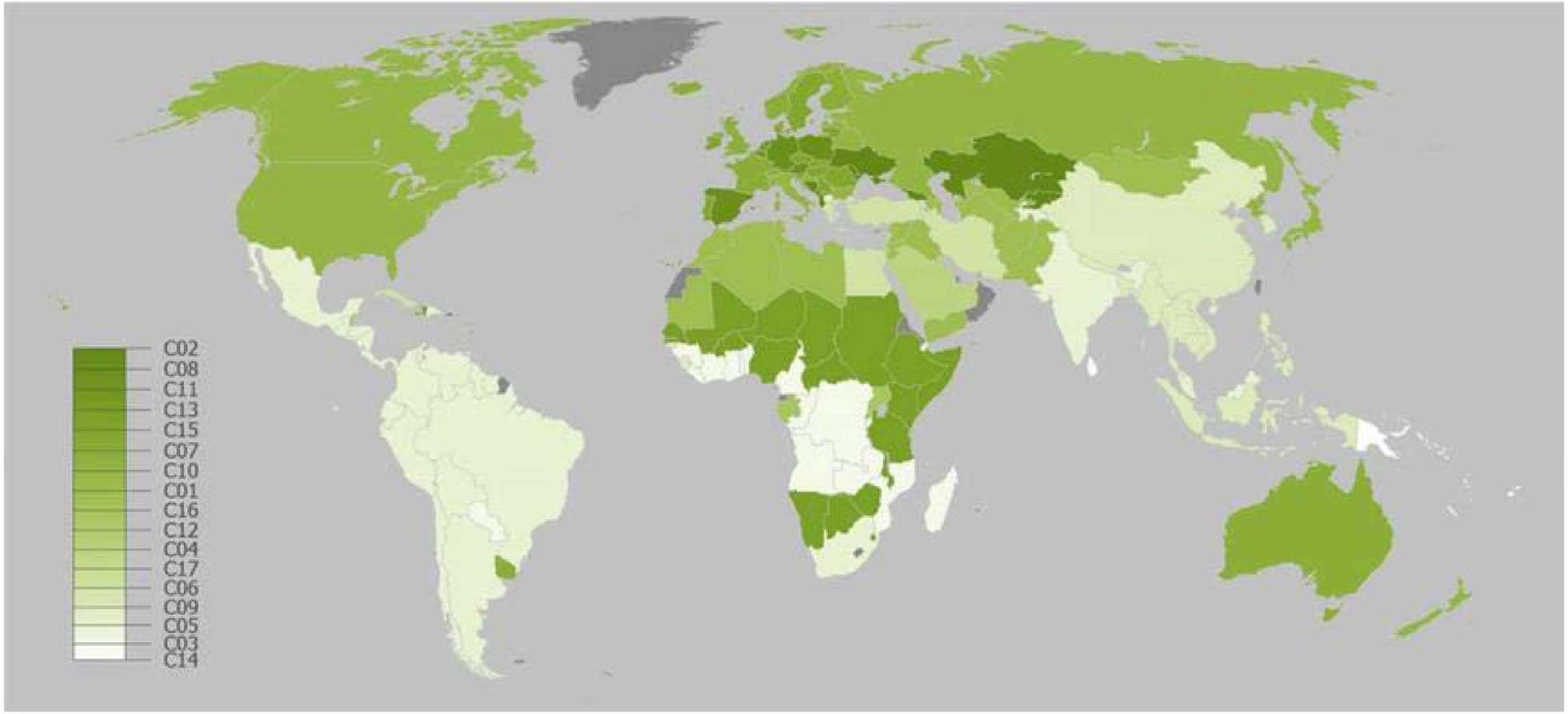
Glyphosate rate of increase

- **1974:** Introduction
- **1996:** Large increase with release of glyph. resistant crops
- **1987:** 2.7–3.6 million kgs sprayed per annum
- **2007:** 81 – 83.5 million kgs per annum
- **2014:** 108 million kgs per annum

Myers et al. Concerns over use of glyphosate -based herbicides and risks associated with exposures: A consensus statement. Environmental Health. 2016.

Glyphosate use Worldwide

An Assessment of dietary exposure to glyphosate using refined deterministic and probabilistic methods. Food and Chem Tox. 2016.



Toxicity, different mechanisms

Glyphosate can enter the body by absorption through the skin, eating foods treated with glyphosate or by drinking contaminated water

1. **Glyphosate disrupts the shikimate pathway in our microbiome**
    - **Disrupted Dopamine/Norepinephrine Ratio**
    - **Lowered Tryptophane levels and substances produced from Tryptophane**

Beneficial bacteria are very susceptible:
Lactobacillus spp., Bifidobacteria spp., Enterococcus faecalis, Enterococcus faecium , Bacillus badius

Different highly pathogenic bacteria are resistant to Glyphosate:
Salmonella entritidis, Salmonellagallinarum, Salmonella typhimurium, Clostridium perfringens, Clostridium botulinum

Shehata, Awad A., et al. “The effect of glyphosate on potential pathogens and beneficial members of poultry microbiota in vitro.” Current microbiology 66.4 (2013): 350-358.

Passmore, Ian J., et al. “Para-cresol production by Clostridium difficile affects microbial diversity and membrane integrity of Gram-negative bacteria.” PLoS pathogens 14.9 (2018): e1007191.

Lab tests show high levels of Clostridium metabolites HPHPA, 4-Cresol and 4-Hydroxyphenylacetic (HPA)

Clostridia Bacterial markers:

4-hydroxyphenylacetic 4-HPA
(C. difficile , C. stricklandii , C. lituseburense)

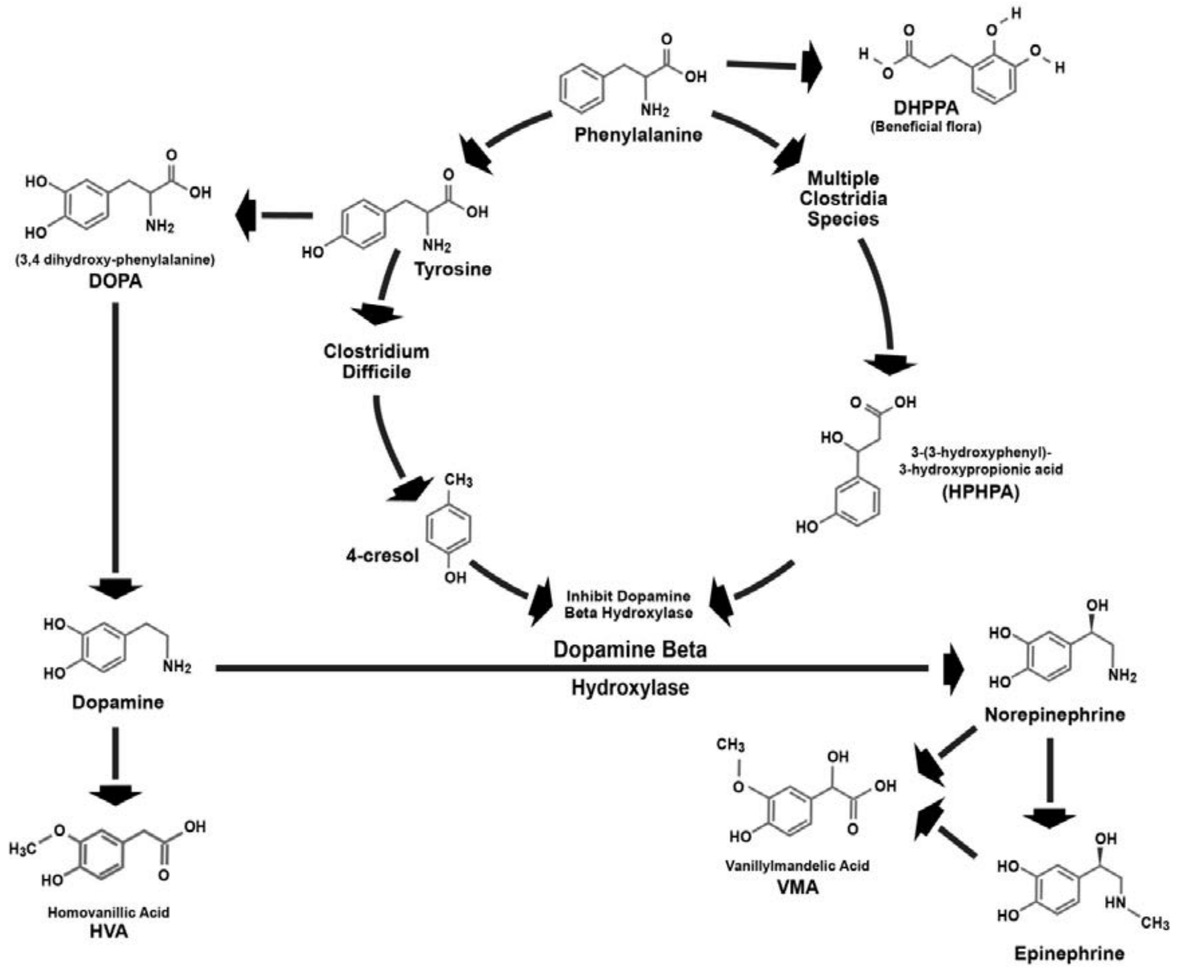
HPHPA
(C. sporogenes , C. caloritolerans , C. botulinum)

4-Cresol (C. difficile)

3- Indoleacetic
(C. stricklandii , C. lituseburense , C. subterminale)

Shehata, Awad A., et al. "The effect of glyphosate on potential pathogens and beneficial members of poultry microbiota in vitro." Current microbiology 66.4 (2013): 350-358.

Toxic Clostridium metabolites inhibit Dopamine beta-hydroxylase
= High levels of Dopamine, disrupted balance Dopamine /Norepinephrine



Labs measure the different Clostridium metabolites but also the ratio between the NT metabolites

- Dopamine metabolite Homovanillic Acid (HVA)
- Norepinephrine, Epinephrine metabolite Vanillylmandelic (VMA)
- HVA/VMA ratio

Labs also measure Glyphosate levels in urine (mcg/g Creatinine)

Hair test shows long term exposure

Lowered Tryptophane levels and substances produced from Tryptophane Impact on important biological compounds

- Alanine (glucogenic)
- Acetoacetyl CoA (ketogenic)
- Formyl group (One-carbon unit)
- Niacin a NAD^+
- Serotonin
- Melatonin
- Hydroxy indole acetic acid (excretory product)

2. Glyphosate creates nutritional deficiencies

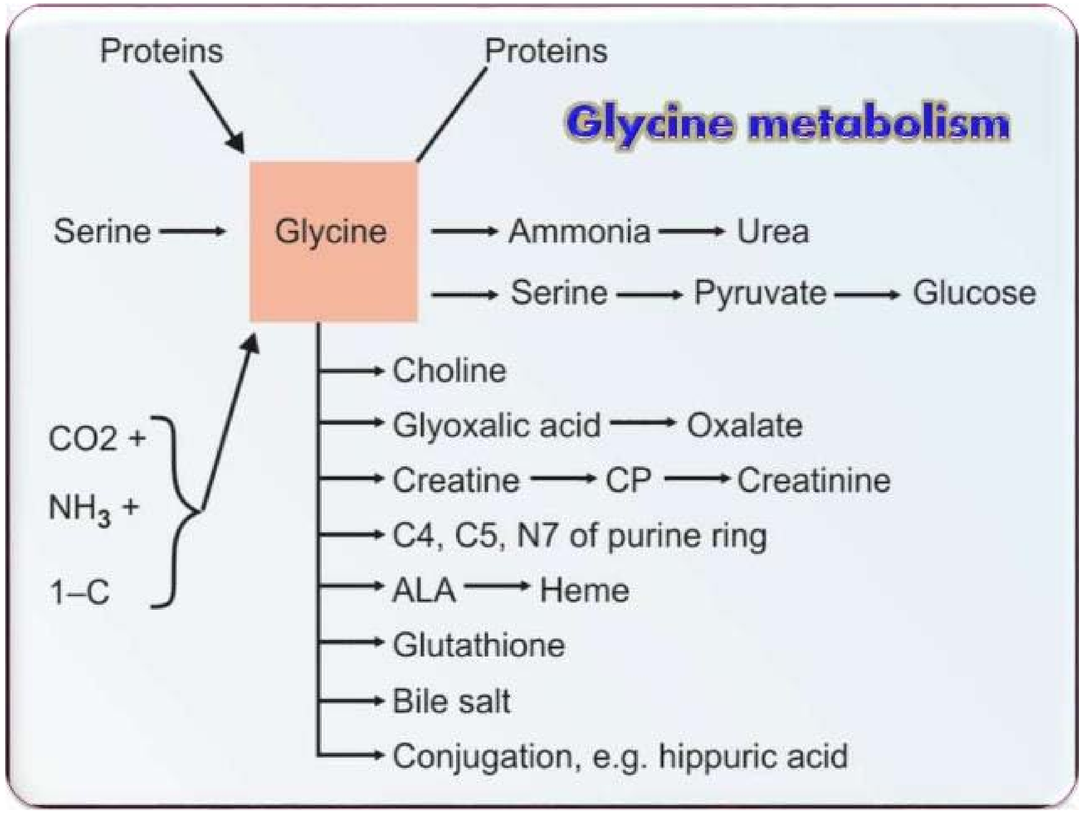
- Glyphosate chelates Calcium, Magnesium, Iron & Manganese in seeds and roots of plants
- Leads to a decrease of nutrients in our food

Impact of Manganese deficiency:

- Mn superoxide dismutase protects mitochondria from oxidative damage
- Manganese deficiency can then lead to mitochondrial dysfunction
- Increase in oxidativestress

Cakmak, Ismail, et al. “Glyphosate reduced seed and leaf concentrations of calcium, manganese, magnesium, and iron in non-glyphosate resistant soybean.” European Journal of Agronomy 31.3 (2009): 114-119.

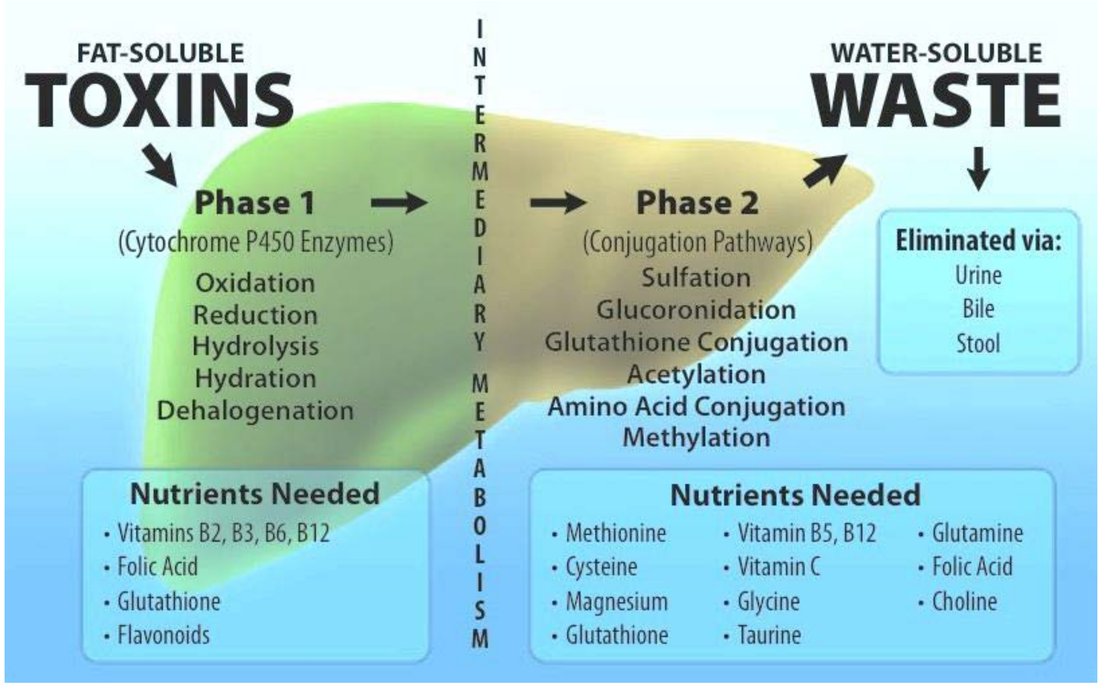
3. Glycine in Glyphosate substitutes our metabolic Glycine stores



4. Glyphosate disrupts Cytochrome P450 enzymes

Cytochrome P450 functions:

- Assistance to the synthesis of Vit D3
- Hormone synthesis: conversion of cholesterol into pregnenolone
- Synthesis of bile and bile acids
- Detoxification



Manifestations of toxic effects

Overview on pathologies where the organic test on Clostridium metabolites makes sense

Schizophrenia

Psychosis

Depression

Chronic Fatigue

Tourette

Autism

Parkinson’s Disease

Tremors

Multiple Sclerosis

ADD/ADHD

Obsessive Compulsive Dis-order

Seizures

Irritable Bowl

Crohn’s Disease

Ulcerative Colitis

Anorexia nervosa

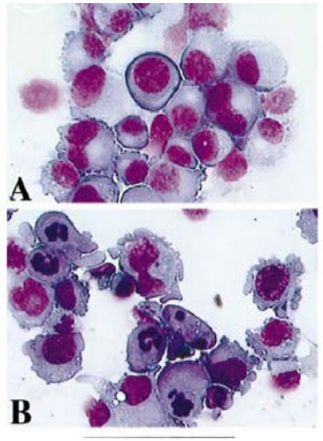
Clostridium overgrowth inhibits Dopamine Beta Hydroxylase
HVA/VMA represents the ratio between Dopamine & Norepinephrine

Dopamine neurotransmission may not be the major neurotransmitter casualty in Parkinson's Disease

Growing evidence supports:

- Dopamine Toxicity caused by initial excess of Dopamine
- Norepinephrine deficiency
- Replacing Dopamine or using Tyrosine would neglect underlying mechanisms that we see in many patients with a diagnosis of Parkinsonism

Espay, Alberto J., Peter A. LeWitt, and Horacio Kaufmann. "Norepinephrine deficiency in Parkinson's disease: the case for noradrenergic enhancement." Movement Disorders 29.14 (2014): 1710-1719.



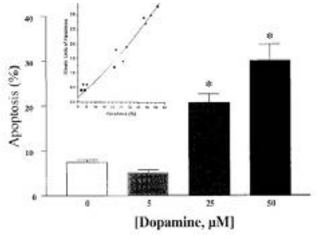


FIG. 4. Quantitative assessment of apoptosis. Inset: Relationship between KU of apoptosis and percentage of apoptotic cells. In brief, cells were exposed to increasing doses of dopamine and studied in both the MiCK assay and Giemsa-stained cytospin preparations at the appropriate time when T_m was detected by MiCK assay. Data are mean ± SE (bars) percentages of apoptotic cells calculated from the results of the MiCK assay (n = 6 for each data point). *$p < 0.05$ for control versus dopamine at 25 or 50 μM.

that these compounds autoxidize in culture medium more rapidly than other catechol thioethers and thereby generate more oxidative stress. Therefore, the half-lives of 5

High levels of Dopamine are neurotoxic

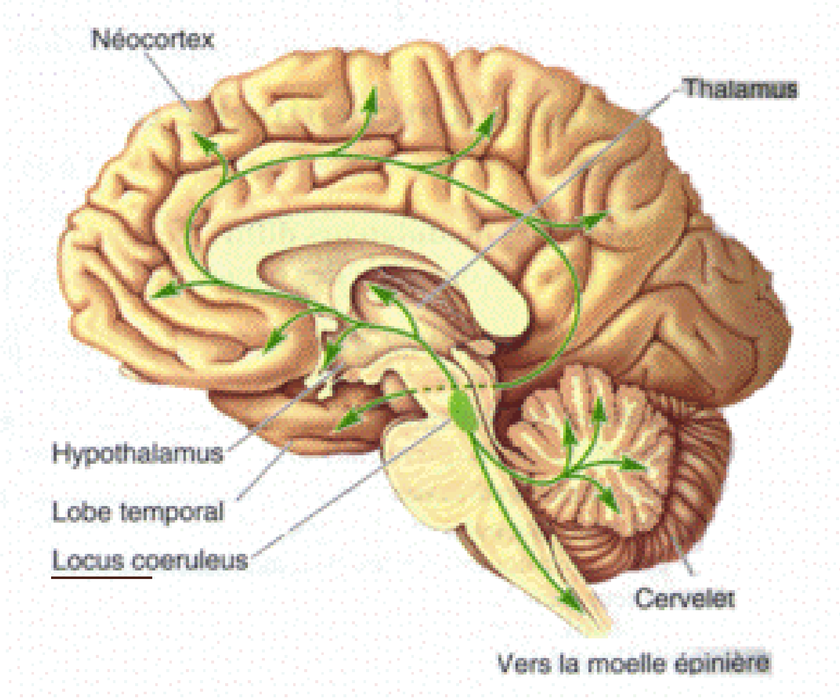
More than 90% of Dopamine is stored in synaptic vesicles
10% of Dopamine is in cytosol and is extremely toxic :

Dopamine is broken down to HVA, extremely toxic Dopamine metabolites and oxidative species which deplete Glutathione stores in brain!

Extra Tyrosine or Dopamine precursors will increase symptoms, at least in that part of the population with underlying dysbiosis and Clostridium overgrowth

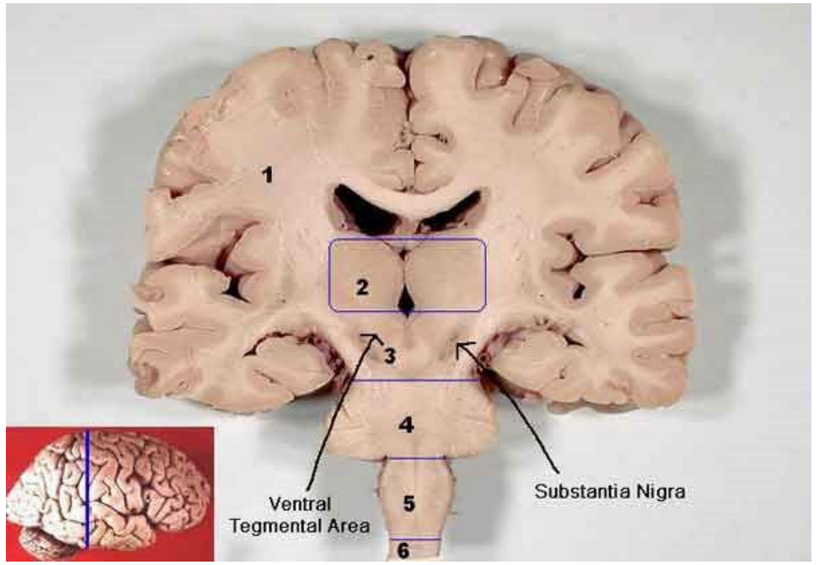
Chen, Linan, et al. “Unregulated cytosolic dopamine causes neurodegeneration associated with oxidative stress in mice.” Journal of Neuroscience 28.2 (2008): 425-433.

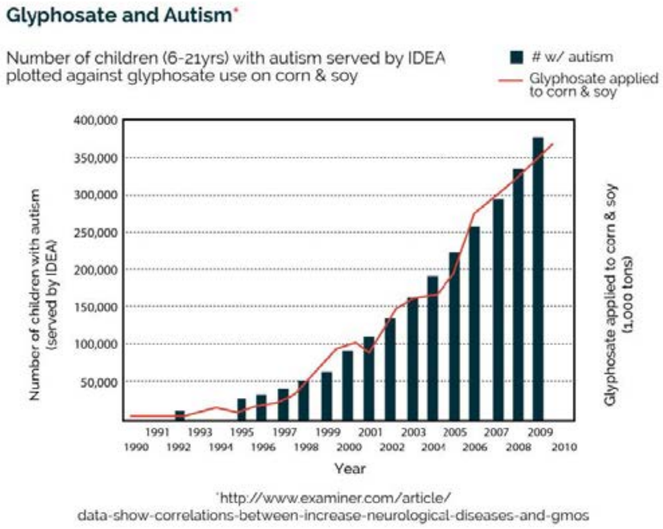
Munoz, Patricia, et al. “Dopamine oxidation and autophagy.” Parkinson’s disease 2012 (2012).



Locus coeruleus-major source of norepinephrine

Areas of brain producing dopamine





*http://www.examiner.com/article/data-show-correlations-between-increase-neurological-diseases-and-gmos

Autism

Rates of increase in Glyphosate correlate with increases in autism

Biological mechanisms behind the correlation:

- Disruption of gut microbiome
- Manganese deficits impair mitochondrial activity
- Glutathione deficiency
- Impaired methylation

Samsel, Anthony, and Stephanie Seneff. “Glyphosate’s suppression of cytochrome P450 enzymes and amino acid biosynthesis by the gut microbiome: pathways to modern diseases.” Entropy 15.4 (2013): 1416-1463.

Samsel, Anthony, and Stephanie Seneff. “Glyphosate, pathways to modern diseases III: Manganese, neurological diseases, and associated pathologies.” Surgical neurology international 6 (2015).

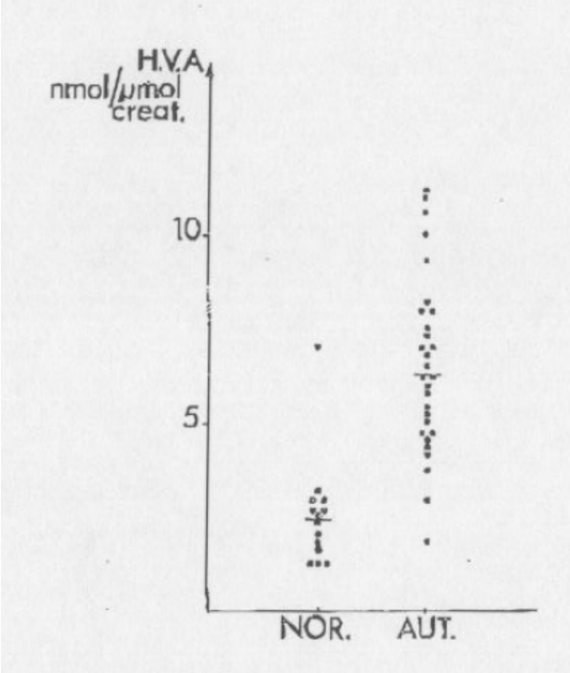
Beecham, James E., and Stephanie Seneff. “Is there a link between autism and glyphosate-formulated herbicides.” J Autism 3.1 (2016): 1.

Studies show the correlation between Autism and Clostridium overgrowth, actually increased urinary excretion of HPHPA

Shaw, William. "Increased urinary excretion of a 3-(3-hydroxyphenyl)-3-hydroxypropionic acid (HPHPA), an abnormal phenylalanine metabolite of Clostridia spp. in the gastrointestinal tract, in urine samples from patients with autism and schizophrenia." Nutritional neuroscience 13.3 (2010): 135-143.

Keşli, Recep, et al. "Investigation of the relation between anaerobic bacteria genus clostridium and late-onset autism etiology in children." Journal of Immunoassay and Immunochemistry 35.1 (2014): 101-109.

Gabriele, Stefano, et al. "Urinary p-cresol is elevated in young French children with autism spectrum disorder: a replication study." Biomarkers 19.6 (2014): 463-470.



High Dopamine levels in Autism

Majority of children with ASD have high levels of DA

Origin in Clostridium overgrowth OR

Some of them have a genetic deficiency on DA hydroxylase

Properties of Clostridia Bacteria:

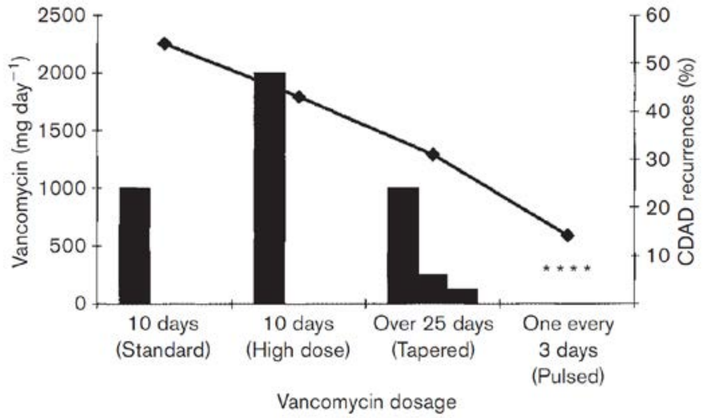
- Strict anaerobic
- Some species cause tetanus, diarrhea and botulism
- Spore formation, spores are resistant to antibiotics

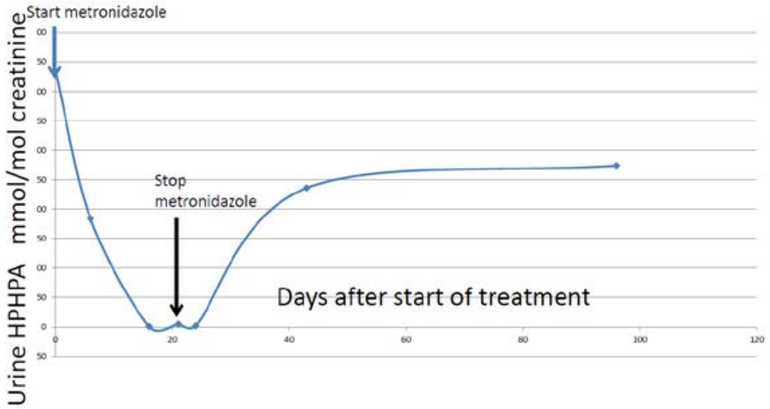
Clostridium overgrowth:

- Endoscopy

Pseudomembranous colitis

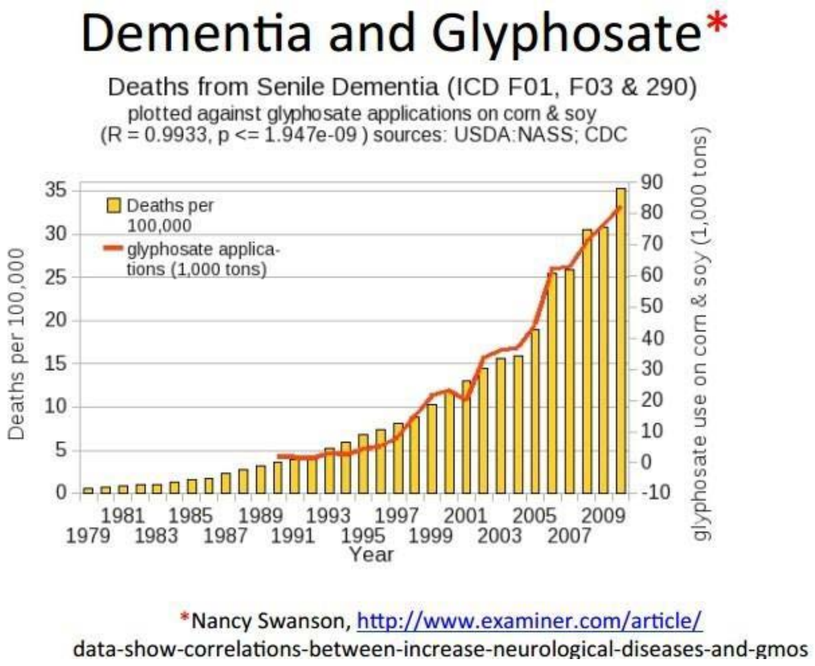
inflammation (swelling, irritation) of the large intestine. In many cases, it occurs after taking antibiotics or in Clostridium diff. overgrowth





Treatments for Clostridia bacteria

- Vancomycin 5-10mg/kg/day
  divided in 3 doses during 10 days
- Metronidazole 30mg/kg/day
  divided in 3 doses during 10 days
- Oral Liposomal Glutathione
- Spore Probiotics
- Watch out with protein rich food:
  Phenylalanine and Tyrosine may worsen symptoms



Dementia

Rates of increase in Glyphosate correlate with increases in dementia

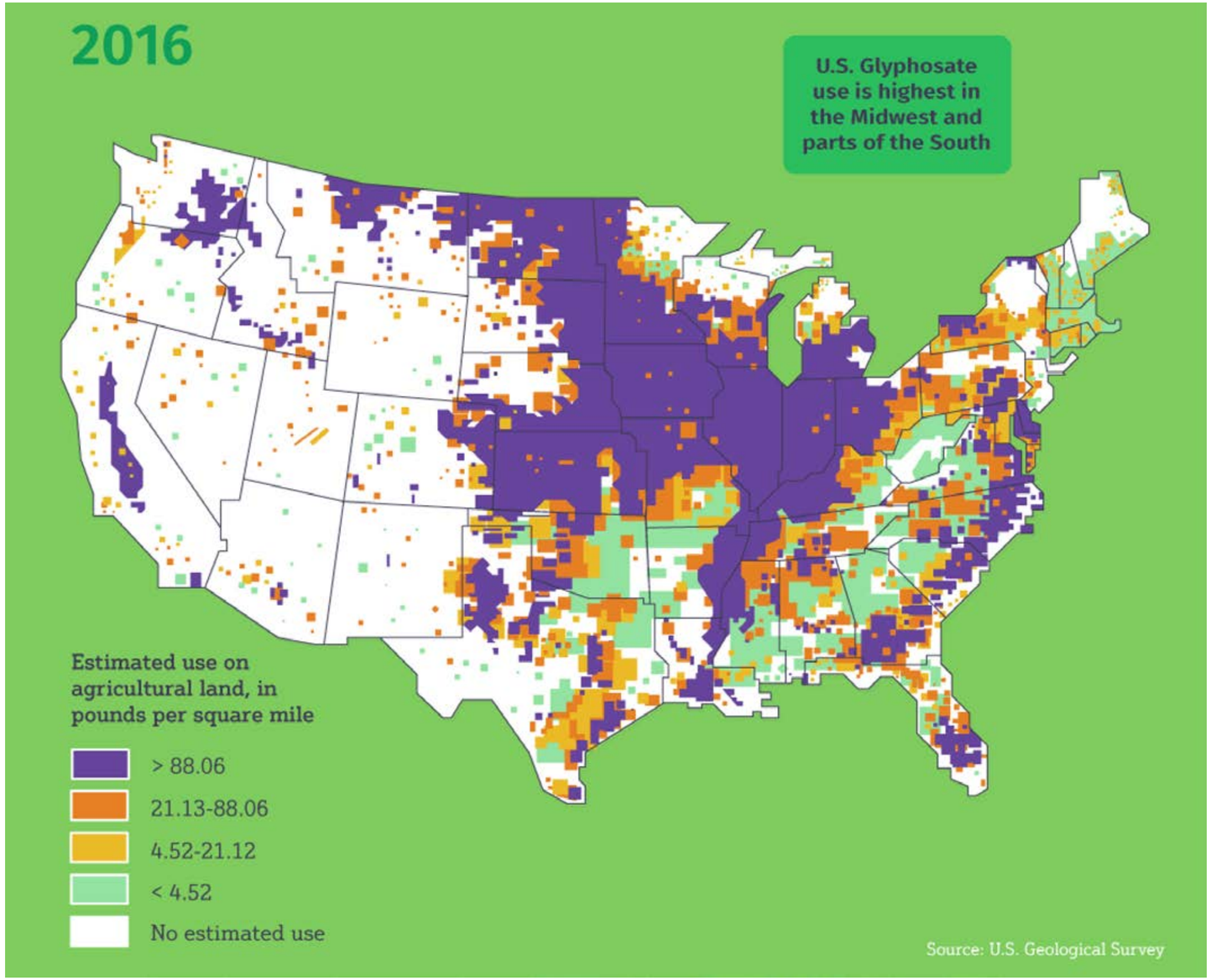
Life long exposure of glyphosate in rats

- Liver damage
- Kidney damage
- Greatly increased risk of cancer
- Shortened lifespan

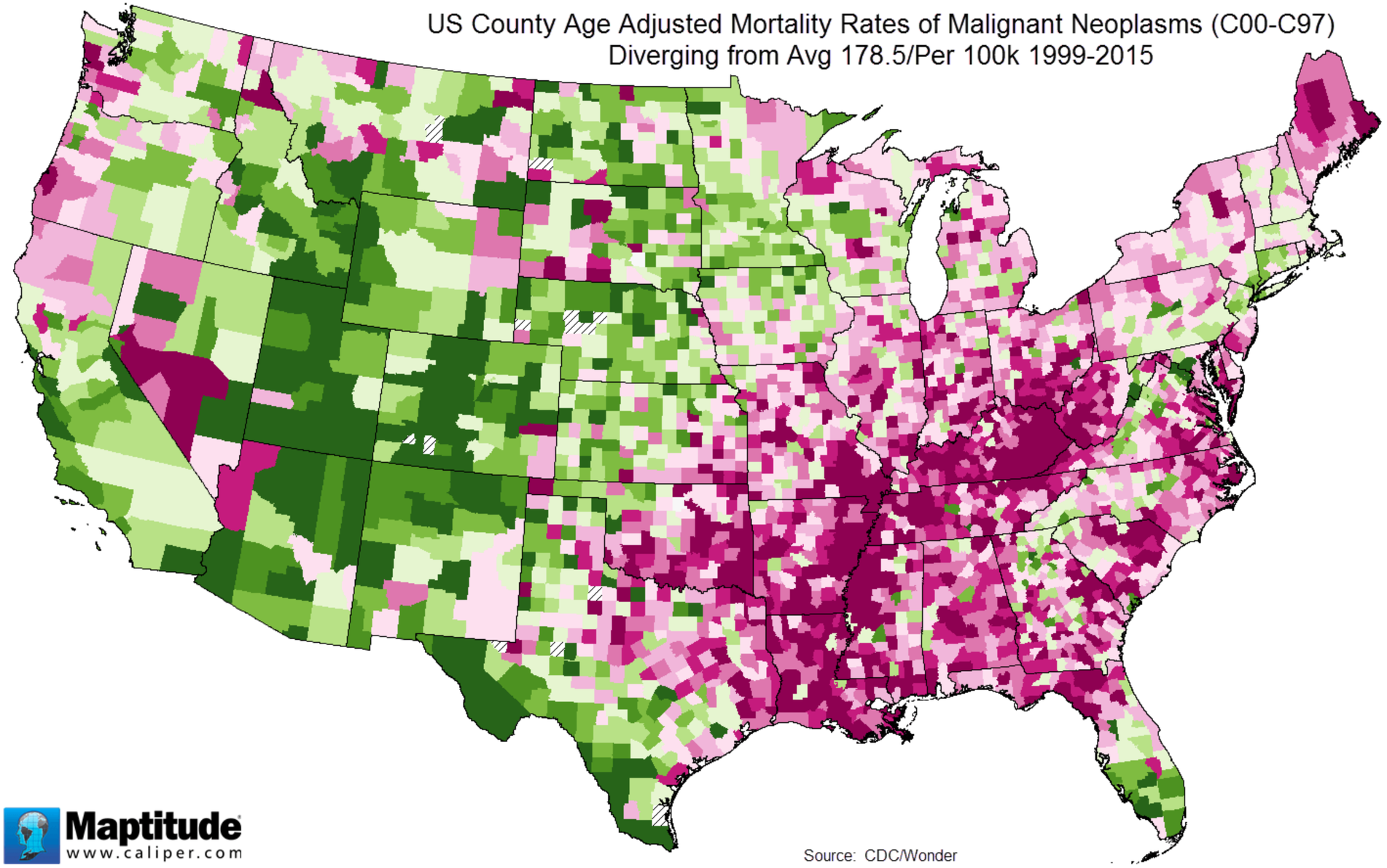
Séralini, G. Long term toxicity of a Roundup herbicide and a Roundup tolerant genetically modified maize. Food Chem. Toxicol. 2012 , 50 , 4221 4231.

Jayasumana, Channa, Sarath Gunatilake, and Priyantha Senanayake. “Glyphosate, hard water and nephrotoxic metals: are they the culprits behind the epidemic of chronic kidney disease of unknown etiology in Sri Lanka?.” International journal of environmental research and public health 11.2 (2014): 2125-2147.

Correlation between Cancer Mortality Rates and the use of Glyphosate in the USA



US County Age Adjusted Mortality Rates of Malignant Neoplasms (C00-C97)
Diverging from Avg 178.5/Per 100k 1999-2015



Source: CDC/Wonder

Maptitude
www.caliper.com

@MetricMaps

	Oreo Double Stuf Golden Sandwich Cookies	Glyphosate - 215.40* ppb
	PepsiCo	
	Stacy's Simply Naked Pita Chips (Frito-Lay)	Glyphosate - 812.53 ppb
	Lay's: Kettle Cooked Original	Glyphosate - 452.71* ppb
	Doritos: Cool Ranch	Glyphosate - 481.27* ppb
	Fritos (Original) (100% Whole Grain)	Glyphosate - 174.71* ppb
	Campbell Soup Company	
	Goldfish crackers original (Pepperidge Farm)	Glyphosate - 18.40 ppb
	Goldfish crackers colors	Glyphosate - 8.02 ppb
	Goldfish crackers Whole Grain	Glyphosate - 24.58 ppb
	Little Debbie	
	Oatmeal Creme Pies	Glyphosate - 264.28* ppb
	Lucy's	
	Oatmeal Cookies Gluten Free	Glyphosate - 452.44* ppb
	Whole Foods	
	365 Organic Golden Round Crackers**	Glyphosate - 119.12* ppb
	Back to Nature	
	Crispy Cheddar Crackers	Glyphosate - 327.22* ppb

IF THE AMOUNT OF THE WEEDKILLER GLYPHOSATE EWG FOUND IN THIS PRODUCT WERE LISTED ON THE NUTRITION FACT PANEL...

NUTRITION FACTS

Calcium	4600 ppm
Phosphorus	3600 ppm
Magnesium	900 ppm
Vitamin C	320 ppm
Iron	160 ppm
Niacin	140 ppm
Zinc	98 ppm
Vitamin B6	15 ppm
Riboflavin	12 ppm
Thiamin	11 ppm
Folic Acid	7.1 ppm
Vitamin A	3.2 ppm
Glyphosate	**0.86 ppm**
Vitamin D	0.07 ppm
Vitamin B12	0.02 ppm

Nutrient concentrations represent a conversion from the Percent Daily Values of vitamins and minerals on the package's Nutrition Facts label. The table is ordered by chemical concentration in the product in parts per million (ppm).

Treatments

- avoid exposure
- Eating non-GMO foods
- watch out!
  various snack foods contain Glyphosate
- drinking reverse osmosis water
- Rain?

Glyphosate is everywhere

Pregnancy?

Study conducted in 2018 showed 93% of pregnant women had GLY levels above the limit of detection

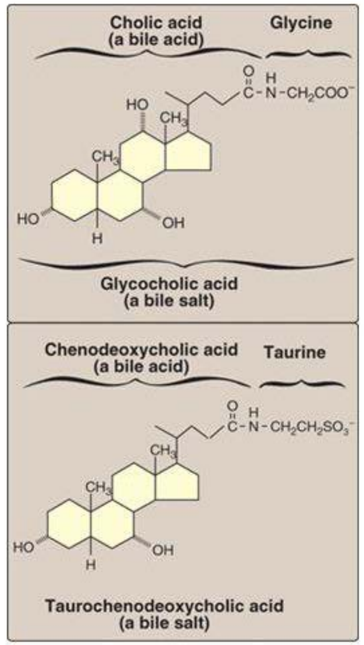
Average measured level : 3.40ng/ml (range 0.5-7.20ng/ml)

Correlation with pre-term delivery

Parvez, Shahid, et al. “Glyphosate exposure in pregnancy and shortened gestational length: a prospective Indiana birth cohort study.” Environmental Health 17.1 (2018): 1-12.

Nutritional support

- **Spore based probiotics, Corebiotic**
- **Detoxification /Oral Chelation:**
  - **Humic Acid**
    Natural acidic organic polymer derived from humus, decomposed plant matter
    Humic acid absorbes Glyphosate through binding of electric charges
    Humic acid inhibited the antibiotic attack of Glyphosate on our beneficial microbiome
  - **Fulvic Acid**
    In humus like Humic Acid but smaller molecule



- **Taurine**

  Taurine Involved in Production of Bile Salts Needed to Bind, Digest, and Eliminate Fats

Synthesis of bile salts

- Before the bile acids leave the liver, they are conjugated to a molecule of either glycine or taurine (an end product of cysteine metabolism) by an amide bond between the carboxyl group of the bile acid and the amino group of the added compound
- These new structures are called called bile salts and include glycocholic and glycochenodeoxycholic acids, and taurocholic and taurochenodeoxycholic acids

MOLECULAR ENTOMOLOGY

Induction of Detoxification Enzymes by Quercetin in the Silkworm

YUE-E ZHANG, HUI-JING MA, DAN-DAN FENG, XIAO-FEI LAI, ZHAO-MIN CHEN, MING-YUE XU, QUAN-YOU YU, AND ZE ZHANG[1]

The Institute of Agricultural and Life Sciences, Chongqing University, Chongqing 400044, China

- **Quercefit**
  (Quercetin with lecithin-coating, bio-availability x20)
  Improves damaged Cytochrome P450 enzymes

  Quercetin supplementation to Glyphosate – treated rats markedly ameliorated liver markers

Soudani, Nejla, et al. "Glyphosate disrupts redox status and up-regulates metallothionein I and II genes expression in the liver of adult rats. Alleviation by quercetin." General physiology and biophysics 38.2 (2019): 123-134.

4.

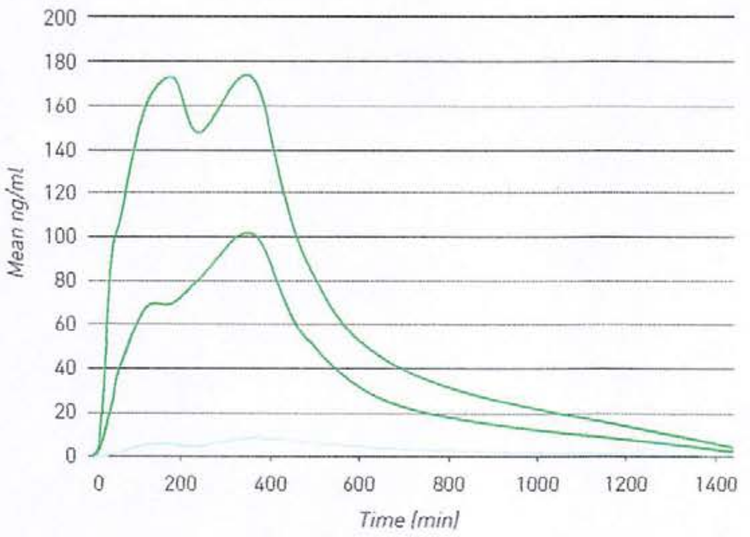
Main applications

> New recent studies suggest positive results in terms of bioavailability, efficacy in sports, discomforts and high tolerability for Quercefit®.

Five human studies have been focused on Quercefit®, standardized in ≥36.0% and ≤42.0% of quercetin.

According to a published human pharmacokinetic study comparing the Indena formulation to unformulated quercetin, **it proved to be up to 20-fold more bioavailable and able to be used at lower dosages, preserving its profile of natural ingredient.**[1]

Twelve healthy volunteers of both sexes, aged 18-50 years, were administered orally with a dose of quercetin (500 mg) and two different doses of Quercefit® (250 and 500 mg). Pharmacokinetic samples were collected at twelve time intervals (0h to 24h) after administration, and quercetin levels in plasma were measured by HPLC/MS/MS.



AUC IMPROVEMENT

Quercefit® 500mg	**20x**
Quercefit® 250mg	**10x**
Quercetin 500mg	**1x**

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10.4236/as.2015.61005

Aluminum and Glyphosate Can Synergistically Induce Pineal Gland Pathology: Connection to Gut Dysbiosis and Neurological Disease

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- **Silica**
  Binds Aluminum and reduced symptoms of Aluminum toxicity

Glyphosate and Aluminum: Partners in crime…

- Clostridium difficile produces p-cresol which promotes aluminum uptake by cells
- Glyphosate promotes calcium uptake by voltage-activated channels
- Aluminum & Glyphosate together increase risk of neurological disease

.

Phospholipid complex

- Nutritional detoxification of Glyphosate
  = Remove toxins and eliminate via intestines

- Oral Liposomal Glutathione supports the detoxification process and neutralizes the oxidative stress and damage caused by toxins
  + GSH needs to be replaced after Destruction by Dopamine

- Replace minerals lost through detoxification

Chelation of Glyphosate

Toxinpul 1-3 caps/day depending on bodyweight – separated from food

Nutritional detoxification of Glyphosate
= Remove toxins and eliminate via intestines

- **45kg bodyweight 1 caps**
- **45-65 kg bodyweight 2 caps**
- **+65 kg bodyweight 3 caps**

Rebalancing minerals during chelation

Replace minerals lost through detoxification

Coreminerals 4 caps 12hrs after Toxinpul

Supporting detoxification

Oral Liposomal Glutathione supports the detoxification process and neutralizes the oxidative stress and damage caused by toxins + GSH needs to be replaced after Destruction by Dopamine

Trifortify watermelon or Orange 1 teaspoon/day

Microbial Balance

Rebuild Microbiome with spore probiotics that compete with harmful resistant bacteria

Corebiotic 1x2 caps/day

Mitochondrial damage caused by exposure to chemical toxins

Lipid replacement therapy repairs damaged mitochondria & rebuilds mitochondrial metabolism

ATP 360 1x3 caps during breakfast

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The list with chemical toxins, regularly measured, is extremely long

- Vinyl Chloride, an intermediate in the synthesis of several commercial chemicals like Polyvinyl Chloride
- Benzene, organic solvent
- Perchlorate, chemical used in the production of rocket fuel, fireworks, explosives
- MTBE, gasoline additives
- Organophosphates, commonly used in pesticide formulations but currently also applied as terroristic weapons
- Xylenes are solvents in paints
- Acrylamide can polymerize to form polyacrylamide, is used in plastics, food packaging, cosmetics, nail polish.
- Styrene
- Pyrethrins.

PHTHALATES: probably the most widespread group of toxic chemicals found in our environment.

These chemicals soften plastics and help scents and chemicals bind together.

Exposure to phthalates has been associated with lower IQ levels and evidence shows its contribution in Autism Spectrum Disorder Pathology

They can be found in shampoos, conditioners, body sprays, hair sprays, perfumes, colognes, soap, nail polish, shower curtains, medical tubing, IV bags, vinyl flooring and wall coverings, food packaging and coatings on time-release pharmaceuticals.

Phthlates and DEHP are not bound to the vinyl, readily leaches into the liquids in IV solution

You can reduce your exposure to phthalates by using unscented lotions and laundry detergents, microwaving food in glass containers rather than plastic, using cleaning supplies without scents

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Intense exposure during destruction of the World Trade Center

Dust contained lots of toxins

Rescue workers were severely exposed, many developed severe neurologic disorders

Alper, Howard E., et al. “Injury, intense dust exposure, and chronic disease among survivors of the World Trade Center terrorist attacks of September 11, 2001.” Injury epidemiology 4.1 (2017): 1-10.

US veterans of the Persian Gulf War developed multiple persistent symptoms called Gulf War illness.

While the etiology is uncertain, several toxic exposures including pesticides and chemical warfare agents have shown associations.