

Powering Up!

Synergistic Activity of Anti-oxidants, Natural Chelators and Detoxifiers against Mitochondrial Dysfunction

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Gordon Research Institute

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Lead Exposure on the Rise Despite Decline in Poisoning Cases

By Mark Fischetti – Feb 17, 2013

Leaded gasoline and lead paint are gone, but other sources are keeping the danger high. Lead is still present in drinking water in many communities, where it can leach from lead pipes in homes, apartment buildings and municipal water system, or from brass fittings or solder used in plumbing.

Another 25,000 to 30,000 tons of lead enters the U.S. environment each year from hunting and shooting-range ammunition, fishing-line weights, discarded batteries and electronic waste, said Mark Pokras at Tufts University.

Coal-burning power plants in developed nations also generate some lead in emissions and more so in ash, and the steep rise in coal power in **China has boosted levels worldwide because regulations are more lax.**

Larger lead particles fall to the ground within about 200 meters of the source (including tailpipes), but the smaller particles, about 0.5 micron in size, can remain airborne for a week before they settle out. According to Flegal, **lead particles from China have been found in rainfall in Santa Cruz, Calif.**



a coal-fired power plant in Dadong, Shanxi province

Fluoride Increases Heavy Metal Accumulation in Your Body

<http://www.youtube.com/watch?v=dKrcmOTmhxo>

YouTube



Studies confirm that hydrofluorosilicic acid increases lead accumulation in bone, teeth, and other calcium-rich tissues.

The free fluoride ion actually acts as a *transport* of heavy metals, allowing them to enter into areas of your body they normally would not be able to go, such as into your brain.

Fluoride is... the most aggressive seeker of another electron. It's the most electromagnetically negatively charged element in the entire world.

"There is a current and growing body of peer reviewed scientific publications showing that fluoridated water causes gene damage leading to birth defects and cancer and that humans are genetically different in their sensitivity to levels of fluoride in their drinking water. "...



Brighton Baby by Dr. Roy Dittman



**A Revolutionary Organic Approach
to Having an Extraordinary Child
The Complete Guide to Preconception and Conception**

The first comprehensive method for preventing birth defects and autism, and supporting natural fertility.

The Brighton Method

- ✓ Addresses methylation pathway & mitochondrial deficiencies
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- ✓ Stresses the importance of eliminating heavy metals & environment toxins before conception

Dr. Dittman provides older couples with a roadmap for reducing their biological age so that they can safely conceive an extraordinary child! His groundbreaking theories on health and disease are sure to turn heads, stir controversy, and bring more awareness to the impact of our environment on gene expression and therefore the health of future generations."

- William Andrews, Ph.D., founder of Sierra Sciences, & discoverer of telomerase

#1 NEW YORK TIMES BESTSELLER

"I hope Dr. Hyman's new book will inspire you as he has inspired me."

—PRESIDENT BILL CLINTON



THE
**BLOOD
SUGAR
SOLUTION**

The UltraHealthy Program for Losing Weight,
Preventing Disease, and Feeling Great Now!



Mark
Hyman, MD

Author of the bestsellers *UltraMetabolism*
and *The UltraMind Solution*

Obesity is the #1 cause of preventable death in America. Gaining just 11 extra pounds doubles your risk for type 2 diabetes, while gaining over 17 pounds triples it.

Diabetics have a four-fold increased risk for dementia. The link is so strong that some experts today call Alzheimer's "type 3 diabetes."



"Will Inspire You As He Has Inspired Me."

"In the last decade, the rise of obesity and diabetes has emerged as a crisis that threatens our families, the global economy, and the success of our next generation. I've made drastic changes to my own diet and exercise routine since my heart troubles surfaced in 2004 and I hope Dr. Hyman's new book will inspire you as he has inspired me."

—President Bill Clinton

Diabetes is the leading cause of high blood pressure. Some 75% of diabetics have it or will develop it.

Diabetes is also the leading cause of kidney failure, liver failure from fatty liver, and blindness among people aged 20 to 74, is a major cause of depression, leads to nervous system damage in 60% to 70% of diabetics.

The Nutrigenomics Connection – Jeffrey Bland, Ph.D., FACN, FACB

Clinical Case History

Type 2 Diabetes or Xenobiotic Stress?

Tests Ordered			
Test Name	Result	Normal Range	Units
VAP Cholesterol Profile			
LDL Cholesterol	69	<100	mg/dL
HDL Cholesterol	39 low	>=40	mg/dL
VLDL Cholesterol	70 high	<30	mg/dL
Cholesterol, Total	169	<200	mg/dL
Triglycerides	661 high	<150	mg/dL
Non HDL Chol. (LDL+VLDL)	139	<160	mg/dL
apoB100-calc	TMP		
Test not performed			
Elevated triglycerides (TG) may affect ApoB100 (TG>499) or other lipid values (TG>1000).			
LDL-R (Real)-C	43	<100	mg/dL
Lp(a) Cholesterol	12.0 high	<10	mg/dL
IDL Cholesterol	14	<20	mg/dL
Remnant Lipo. (IDL+VLDL3)	35 high	<30	mg/dL
Probable Metabolic Syndrome	Yes abnormal	No	
HDL-2 (Most Protective)	8 low	>10	mg/dL
HDL-3 (Less Protective)	22 low	>30	mg/dL
VLDL-3 (Small Remnant)	21 high	<10	mg/dL
LDL1 Pattern A	6.2		mg/dL
LDL2 Pattern A	1.1		mg/dL
LDL3 Pattern B	20.9		mg/dL
LDL4 Pattern B	14.9		mg/dL
LDL Density Pattern	B abnormal	A	

TODAY'S RESULTS			
Test Name	Result	Normal Range	Units
Potassium	3.9	3.5-5.2	mmol/L
Chloride	100	97-108	mmol/L
Calcium	9.9	8.7-10.2	mg/dL
Phosphorus	3.6	2.5-4.5	mg/dL
Protein, Total	7.4	6.0-8.5	g/dL
Albumin	4.8	3.5-5.5	g/dL
Globulin, Total	2.6	2.5-4.5	g/dL
A/G Ratio	1.8	1.1-2.5	
Bilirubin, Total	0.6	0.0-1.2	mg/dL
Alkaline Phosphatase, 5	116	25-150	IU/L
LDH	173	100-250	IU/L
AST (SGOT)	32	0-40	IU/L
ALT (SGPT)	43	0-55	IU/L
GGT	184 high	0-65	IU/L
Iron	76	40-155	ug/dL
Cholesterol, Total	208 high	100-199	mg/dL
Triglycerides	664 very high	0-149	mg/dL
HDL Cholesterol	28 low	>39	mg/dL
According to ATP-III Guidelines, HDL-C >59 mg/dL is considered a negative risk factor for CHD.			
VLDL Cholesterol Calc	VLDLCH	5-40	mg/dL
The calculation for the VLDL cholesterol is not valid when triglyceride level is >400 mg/dL.			
LDL Cholesterol Calc	TRJGHC	0-99	mg/dL
Triglyceride result indicated is too high for an accurate LDL cholesterol estimation.			
T. Chol/HDL Ratio	7.4 high	0.0-5.0	ratio units
Estimated CHD Risk	1.5 high	0.0-1.0	times avg.
T. Chol/HDL Ratio			
Men Women			
1/2 Avg. Risk 2.4 3.3			
Avg. Risk 5.0 4.4			
2X Avg. Risk 9.6 7.1			
3X Avg. Risk 23.4 11.0			
The CHD Risk is based on the T. Chol/HDL ratio. Other factors affect CHD Risk such as hypertension, smoking, diabetes, severe obesity, and family history of premature CHD.			
Vitamin D, 25-Hydroxy	16.0 low	32.0-100.0	ng/mL
Recent studies consider the lower limit of 32.0 ng/mL to be a			

Putative serological biomarkers for toxicity

- Gamma-glutamyltransferase (GGT)
 - >40 units/L
- Uric acid
 - >8mg/dl
- Homocysteine
 - >11 micromol/L
- hsC-reactive protein
 - >0.7 mg/L
- Magnesium
 - <2meq/dL
- Antinuclear Antibody titre
 - >1:125
- Apo B/Apo A1
 - >0.6
- Hemoglobin A1c
 - >5.5%
- 25-Hydroxyvitamin D3
 - <30 ng/ml
- Body Mass Index
 - >27
- Body Composition
 - >30% body fat
- Urinary microalbumin
 - >30 mg in 24 hr

Xenobiotics and their relationship to chronic illness

SPECIAL REPORT: INTEGRATIVE MEDICINE IN THE MARKETPLACE

Pioneering Research: David R. Jacobs, PhD, Explains the Relationship Between Xenobiotics and Type 2 Diabetes

Jeffrey Bland, M.D., MCH

Diabetes: Dr. Bland currently serves as chief science officer for Heligen, a company that sells supplements, and is president of its biotechnology unit. www.heligen.com

Editor's Note: The following is an adaptation of an August 2010 interview by Dr. Bland for Functional Medicine magazine, an online journal now in its 20th year of publication. *Integrative Medicine: A Clinician's Journal* is pleased to publish this exclusive guest presentation.



David R. Jacobs, PhD, from 1984 to 2008, was chief of epidemiology. His research shows that when applied, they don't really lower the numbers. But if you can get the evidence behind the numbers—that which creates the numbers—is of course, extremely important. I have never thought out my career so clearly as I understand the numbers!

Working in epidemiology means for a person looking at associations, and for his there are tremendous amounts of work in a whole range of areas. Let me give you a thumbnail of some of the major ones.

First, however familiar with it is, the data regarding the work has been done on whole grains and fiber—grains, fiber and the relationship to chronic disease—some epidemiological studies, some work that I've seen we'd reach again in the interview. It's also looked at inflammatory processes and oxidation and how these relate to chronic disease. In addition, Dr. Jacobs has done

Jeff Bland. This interview is with a person who, not only has been following very carefully and closely. Every time I see a publication comes out, I can hardly wait to read it because I think the work is exciting and it's new paradigms (or perhaps just David R. Jacobs, PhD).

Dr. Jacobs is a distinguished professor of Public Health, Director of Epidemiology and Community Health, at the University of Minnesota School of Public Health. He has what you might consider a truly interesting background, although, not one that you'd immediately connect to an investigator of type 2 diabetes. He is a cardiovascular disease doctor, has made significant findings and has worked with a lot of epidemiological studies in London, England.

investigative work in periodontal disease and its relationship to the etiology of cardiovascular disease.

More to the point, Dr. Jacobs has been going to be speaking to quite a bit in this interview is related to Dr. Jacobs' pioneering work in type 2 diabetes and its relationship to oxidative and proinflammatory processes published in 1997. Dr. Jacobs will be covering the story as how these translate into biological functions.

Dr. Jacobs has done an outstanding degree in a conference on oxidative stress in relation to the epidemiology and the association between POPs and type 2 diabetes?

David Jacobs: Historically, population science, it is certainly was a branch of applied mathematics. An interesting little story is that when I was doing mathematical statistics, which is really heavy-duty work, the mathematical statistics people would say, "Well, the mathematics, they're just applied, they don't really know the answers." And it turns out that the software behind the numbers—that which creates the numbers—is, of course, extremely important, and I have shown throughout my career so clearly understood the software. Actually, the work was in terms of the software, then to the mathematical principles. That's the short answer.

Dr. Jacobs: I think a hallmark of your work is the collaboration part, but with this time at the Medical University of South Carolina, looking at the computerized systems, actually going back and looking at data from NHANES, the National Health and Nutrition Examination Survey, it and I. Maybe you could take us through that whole story because the way you've done that is through research, but I think I'd like to know where it comes from.

Dr. Jacobs: The story with David Lee is really a fair story because David worked 3 papers with me before I met her. She is just an incredible, rigorous, and bright scientist. I came to know her through colleagues. You know, we English speakers eat our literature, but better in the sense, I can often refer to my English language skills to help people who have written in a foreign language or have a native language other than English. In fact, David and I had a fight off because I can only read the English, but I made a few comments on the first paper that we worked on. Ultimately, the entire 30 minutes conference then had been several times and I've worked with me for months or years at a time. We've had a relationship in which we talk to each other by email probably at least once a week over the past 8 years or so. I think we have become something like 20 papers together.

The way that the science came about is that she was interested in a variety of things such as cancer and that one did, she

- POPs – Persistent organic pollutants
- Exotoxins from the environment
- Endotoxins from bacterial action in the gut

Bland J, *Integrative Medicine*, Oct/Nov 2010

Chronic exposure and mitochondrial dysfunction and insulin resistance

Chronic Exposure to the Herbicide, Atrazine, Causes Mitochondrial Dysfunction and Insulin Resistance

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Abstract

There is an apparent overlap between areas in the USA where the herbicide, atrazine (ATZ), is heavily used and obesity-prevalence rates of people with a BMI over 30. Given that herbicides act as endocrine disruptors of the hypothalamic-pituitary-thyroid axis, which have a functional profile similar to mitochondria, we investigated whether chronic exposure to low concentrations of ATZ might cause obesity or insulin resistance by disrupting mitochondrial function. Sprague-Dawley rats ($n=48$) were treated for 3 months with low concentrations (20 or 500 $\mu\text{g kg}^{-1} \text{ day}^{-1}$) of ATZ provided in drinking water. One group of animals was fed a regular diet for the entire period, and another group of animals was fed a high-fat diet (60% kcal) for 2 months after 3 months of regular diet. Various parameters of insulin resistance were evaluated. Mitochondrial and hormonal activities of mitochondria were evaluated in tissues of ATZ-exposed animals and in isolated mitochondria. Chronic administration of ATZ increased basal metabolic rate, and increased body weight, intra-abdominal fat and insulin resistance without changing food intake or physical activity level. A high-fat diet further exacerbated insulin resistance and obesity. Mitochondria in skeletal muscle and liver of ATZ-treated rats were smaller with disrupted cristae. ATZ blocked the activities of oxidative phosphorylation complexes I and II, resulting in decreased oxygen consumption. It also suppressed the insulin-mediated phosphorylation of Akt. These results suggest that long-term exposure to the herbicide ATZ might contribute to the development of insulin resistance and obesity, particularly where a high-fat diet is prevalent.

Changbin Kim, Ji-Up Lee, Sun Young Ahn, In Chan Song, Myung Hee Chung, Hak Chul Jung, Kyong Soo Park, Yeongsil Kim Park, Hong Myu Lee, et al. (2009) Chronic Exposure to the Herbicide, Atrazine, Causes Mitochondrial Dysfunction and Insulin Resistance. *PLoS ONE* 4(4): e5433. doi:10.1371/journal.pone.0054333

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Introduction

A clear association between environmental endocrine disruptors and insulin resistance is well established [1–3]. In a rat model, treatment with sublethal doses of endocrine-disruptive chemical bisphenol A (BPA) increased insulin resistance [4]. However, there are no in vivo studies showing the exposure to environmental endocrine-disruptors causes insulin resistance.

Previous rodent publications (PXR) that endocrine disruptors and insulin resistance are associated in the tissue of animals will be passed via the food chain, leading to human exposure. Some PXR have been associated with the prevalence of diabetes in some communities (epidemiologic studies [5]). The common herbicide, atrazine (ATZ), is a triazine-tetrahydro-2-pyrimidin-5(1H)-one, has been extensively used in the USA since the early 1960s. It has been thus recognized as the beginning of the general obesity epidemic [6]. Because it is predominantly present under normal conditions and has low to moderate toxicity, ATZ is routinely found as a contaminant in many water and ground waters [7,8]. Most of ATZ usage data from the Kern Hills region of the Midwest USA has the highest

application. Usage of atrazine (ATZ) has been reported to be increasing (Figure S1A). Interestingly, the Behavioral Risk Factor Surveillance Survey (BRFSS) from 1992 to 2002 by the Center for Disease Control and Prevention revealed a high prevalence of self-reported obesity (BMI ≥ 30 kg/m²) over 30 years in the Kern Hills and surrounding counties (see text S1B) (<http://www.cdc.gov/ncehd/odphp/dnhd/docs/brfss/brfssreport.htm>).

ATZ usage and obesity rates show a strong correlation, suggesting that heavy usage of ATZ may be associated with the risk of obesity. ATZ binds covalently to the phytyltransferase-binding site of phytyltransferase II (a critical mitochondrial enzyme, directly inhibiting electron transport [9]). It also binds to cytochrome oxidase (COX) complex I and II, also known as mitochondrial cytochrome oxidase (COX) complex I and II, and inhibits cellular DNA damage [10–12]. In contrast, the exposure to ATZ reduces oxidative activity in the liver [13] and increases oxidative stress in the liver [14]. In the present study, we found that chronic exposure to low concentra-

- Uncoupling of mitochondrial bioenergetics with the production of free radicals and oxidative stress
- Energy deficit produces insulin dysregulation and resistance
- Glutathione mediated detoxification and antioxidant systems put under stress

PLoS ONE 2009, 4(4): e5433-90.

Power Failure

Does mitochondrial dysfunction lie at the heart of common, complex diseases like cancer and autism?

By Megan Scudellari

Over the last five years, a growing number of papers by researchers around the world have implicated dysfunctional mitochondria in many elusive diseases, including Parkinson's, autism, and aging.

Leading the charge is a respected and renowned member of the National Academy of Sciences, Dr. Douglas Wallace, founder of the field of human mitochondrial genetics.

“Every one of the diseases we can’t solve is absolutely logical if we put energy at the center,” Dr. Wallace says.

Medicine fails to solve many of today's common, complex diseases, Wallace asserts, because the fundamental paradigm is wrong: the medical establishment has spent far too long focusing on anatomy and ignoring energy—specifically, mitochondria.



Electrons – An Overlooked Key Nutrient

All physical things are comprised of atoms. An atom consists of a central nucleus which is positively charged, and electrons which are negatively charged in shells or orbits around that central nucleus.

Atoms combine with one another because of their desire to lose, gain, or share electrons.

The phenomenon of electrons from one atom being shared with another atom is essential for construction of the complex biochemical compounds, organelles, cells, tissues, and organs comprising life.

The release of energy as electrons move from one energy level to another is responsible for the energy required in all body processes.

Modern living has created an electron-deficient environment that is creating electron-deficient bodies. Electron Deficiency is another way of saying something is **Acidic.**

Signs and Symptoms of Electron Deficiency

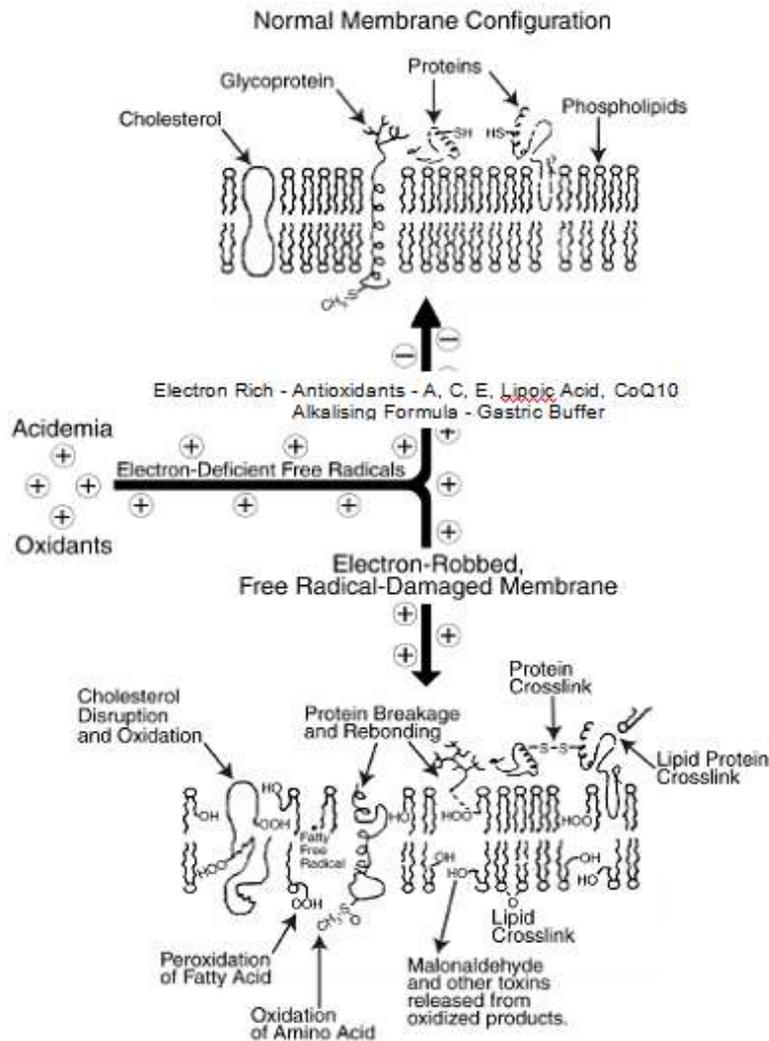
- Periodontal disease
- Dental caries
- Bleeding gums
- Calculus (calcium scale) on teeth
- Halitosis, bad breath
- Osteoarthritis
- Pseudo-gout
- High blood pressure / hypertension
- Cancer
- Obesity
- Osteoporosis
- Urinary stones
- Premature aging
- Muscle atrophy
- Allergies
- Autoimmune diseases
- Repeated infection
- Digestive problems
- Chronic nasal sinus congestion
- Headaches
- Poor sleep patterns
- Erratic mood swings
- Loss of good vision and hearing
- Depression and psychological maladies
- Loss of mental acuity
- Low energy
- Loss of vitality

Clinical Markers of Electron Deficiency

1. Urine pH below 5.5 and Salivary pH below 6.0
2. White Blood Cells or Bacteria in urine
3. Positive Urine Nitrate
4. Free Calcium Risk Index above 0.8
(calculated by multiplying phosphorus by 2.5 and subtracting that from measured calcium).
5. LDH (Lactic Dehydrogenase) < 200 mg./dl.
6. Oxygen Saturation Low
7. Phosphorus level below 3.6 mg./dl
8. Albumin level below 4.0 mg./ dl
9. Calcium Oxalate crystals in the Urine
10. Elevated Monocyte count
11. Elevated Globulin
12. Albumin - Globulin ratio of 1.7 or less
13. Elevated Fibrinogen
14. T-cell activation
15. Alteration in the Porphyrin profile
16. Elevated malondialdehyde
17. Elevated total conjugated dienes
18. Elevated Pentane, Ethane or Hydrocarbon levels
19. Increased loss of integrity of red blood cells as indicated by a Low-Normal G-6 PD / High Normal Total Bilirubin (0.9-1.3).

Oxidation and Reduction

Electron Robbing, Free Radical Damage



Electron excess and deficiency can also be understood in terms of oxidation and reduction.

An oxidant is a chemical that is deficient in electrons and tends to take them from others. If a compound has its electrons stolen by an oxidant, it is said to be oxidized.

A reducing agent is a chemical that donates electrons to another chemical. The chemical that receives the electrons is said to be reduced.

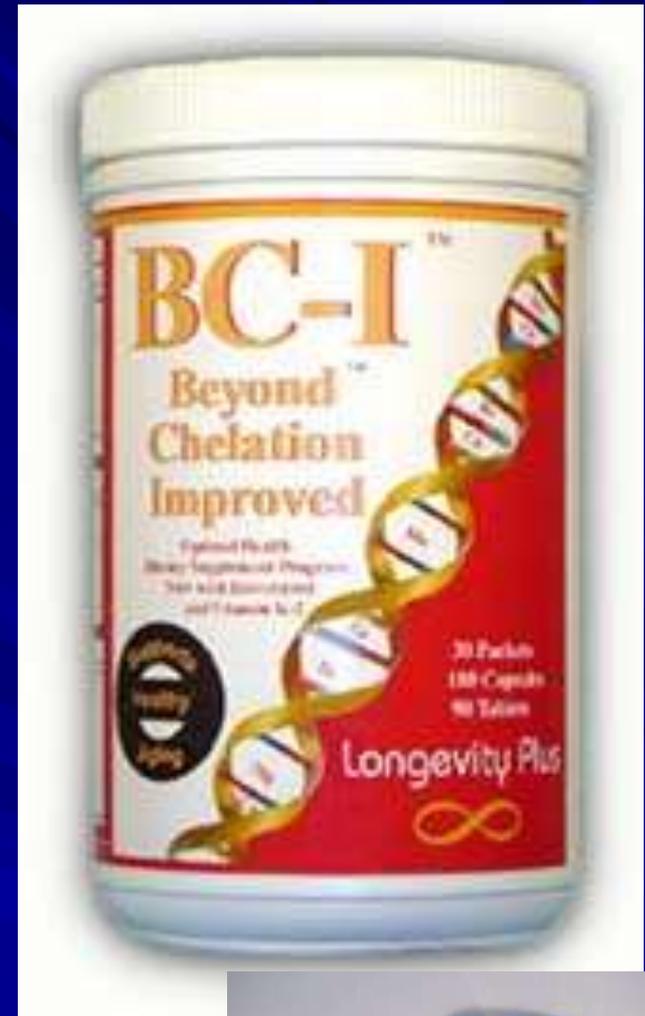
An oxidation-reduction chemical reaction is one in which some chemicals are receiving electrons and others are losing them.

Oxidation-reduction reactions occur continuously in the body.

Beyond Chelation Improved (BC-I)

Each canister of Beyond Chelation Improved™ contains 30 packets. Each packet consists of:

- 3 *Beyond Any Multiple*™ caplets with **Vitamin K2**, Resveratrol, Tocotrienols, and Utah Sea Minerals
- 3 *Essential Daily Defense*™ capsules (which deliver a combined total of 400 mgs of EDTA)
- 1 Omega 3 marine lipid concentrate
- 1 Evening Primrose Oil capsule
- 1 Phosphatidyl Ginkgo Biloba capsule.



Natural Nutrients, Chelators and Detoxifiers in BC-I

MSM, methylsulfonylmethane (METH-əl-sul-FON-il-METH-ane) provides sulfur, a vital building block of joints, cartilage, skin, hair and nails, and methyl groups, which support many vital biochemical processes in the body, including energy production.

MSM is a naturally-occurring nutrient found in small amounts of many foods. As a dietary supplement, MSM is synthesized. When made correctly, it is identical to that found in nature. MSM can be taken alone or in combination with other joint health supplements, such as glucosamine and chondroitin.

MALIC ACID is both derived from food sources and synthesized in the body through the citric acid (Krebs) cycle. Its importance to the production of energy in the body during both aerobic and anaerobic conditions is well established. Studies have concluded that the use of malic acid may be beneficial for patients suffering from fibromyalgia, as well as other conditions.

BETAINE HCL (hydrochloric acid) is used to increase the level of hydrochloric acid in the stomach. The stomach needs a ready supply of hydrochloric acid (HCl) to convert the inactive precursor pepsinogen into the active digestive enzyme pepsin, which is needed for the digestion of protein. HCl also protects the body from orally ingested pathogens, prevents bacterial and fungal overgrowth in the small intestine, and encourages the flow of both bile and pancreatic enzymes. It also helps the body to absorb folic acid, vitamin C, beta-carotene, iron, calcium, magnesium, and zinc.



Alfalfa Leaf

Alfalfa leaf has an extraordinary ability to alkalize and detoxify the body. It balances blood sugar and hormones, and acts as a diuretic

Barley Grass

Containing lots of chlorophyll and other essential nutrients that act in a way to help detoxify the body of toxins such as heavy metals and pollutants.



Cilantro

A perennial herb also known as coriander or Chinese parsley. It binds to heavy metals and helps remove them from your body.



Dandelion Leaf

Helps stimulate a sluggish gallbladder and promotes bile excretion from the liver so the body can more efficiently process foods and liquids while also purging harmful toxins.

Garlic

An effective blood purifier and liver/gastrointestinal detoxifier, garlic has native organosulfurs that boost levels of enzymes in the body that detoxify potential carcinogens.



Red Yeast Rice

Used for more than 1,000 years in China as both a food and a medicinal product. Today it is known as a nutrient that has been shown in clinical trials to lower LDL ('bad') cholesterol and triglyceride levels, and raise HDL ('good') cholesterol levels.



Carrageenan

A seaweed extract common in the Atlantic Ocean. A promising microbicide, The laboratory of Cellular Oncology at the National Cancer Institute reported that carrageenan is an extremely potent infection inhibitor for a broad range of sexually transmitted HPVs.



Chlorella

Chlorella is one of the top nutrients for absorption of toxic metals. Well known in the field of environmental toxicology, Chlorella readily absorbs toxins such as uranium, cadmium, and mercury.

Spirulina

Providing more than 12 times more digestible protein than beef, Spirulina is also known to be good natural bone medicine due to its high calcium content. It helps to regulate blood sugar, helps to detox the body from heavy metals, is good for the liver and assists with weight loss.



J Clin Biochem Nutr. 2012 May;50(3):195-8. Epub 2011 Nov 29.

Natural zeolites chabazite/phillipsite/analcime increase blood levels of antioxidant enzymes.

Dogliotti G, Malavazos AE, Giacometti S, Solimene U, Fanelli M, Corsi MM, Dozio E.

Dipartimento di Morfologia Umana a Scienze Biomediche "Città Studi", University of Milan, Via Mangiagalli 31, 20133 Milan, Italy.



Abstract

Imbalance between reactive oxygen species generation and antioxidant capacity induces a condition known as oxidative stress which is implicated in numerous pathological processes. In this study we evaluated whether natural zeolites (chabazite/phillipsite/analcime) may affect the levels of different antioxidant enzymes (glutathione peroxidase, superoxide dismutase, glutathione reductase), total antioxidant status and oxidative stress in 25 clinically healthy men, both non-smokers and smokers. Measurements were performed on whole blood or on plasma samples before (T0) and after 4-weeks zeolites intake (T1).

At T1, glutathione peroxidase, superoxide dismutase and glutathione reductase increased compared to T0 levels, both considering all subjects as joint and after subdivision in non-smokers and smokers. Differently, a reduction in total antioxidant status was observed at T1. Anyway, total antioxidant status resulted higher than the reference values in both groups at each time point. **A decrease in lipid peroxidation, a major indicator of oxidative stress assessed by monitoring thiobarbituric acid reactive substances, was observed in all subjects at T1.** Our results suggested that natural zeolites may help to counteract oxidative stress in apparently healthy subjects exposed to different oxidative stress risk factors, such as smoking, thus representing a particular kind of food with potential antioxidant properties.

Anticancer Res. 2003 Mar-Apr;23(2B):1589-95.

Anticancer and antioxidative effects of micronized zeolite clinoptilolite.

Zarkovic N, Zarkovic K, Kralj M, Borovic S, Sabolovic S, Blazi MP, Cipak A, Pavelic K.
Ruder Boskovic Institute, Division of Molecular Medicine, Bijenicka 54, HR-10000 Zagreb, Croatia.



ABSTRACT

Treatment of cancer-bearing mice and dogs with micronized zeolite clinoptilolite (MZ) led to improvement of the overall health status, prolongation of life span and decrease of tumor size in some cases. It also reduced lipid peroxidation in the liver of mice.

MATERIALS AND METHODS:

The experiments were performed on various tumor cell cultures and tumor-bearing animals. Immunohistochemistry was used to analyze if MZ could interfere with Doxorubicin-induced lipid peroxidation and consequential production of 4-hydroxynonenal (HNE).

RESULTS:

MZ reduced the metabolic rate of cancer cells and increased binding of HNE to albumin in vitro. It selectively reduced generation of HNE in vivo in tumor stroma after Doxorubicin treatment leaving onset of lipid peroxidation intact in malignant cells. Combined treatment with Doxorubicin and MZ resulted in strong reduction of the pulmonary metastasis count increasing anticancer effects of Doxorubicin.

CONCLUSION:

Interference of MZ with lipid peroxidation might explain some of the beneficial effects of this particular zeolite in combined cancer therapy.

ZeoGold™ Has Superior DETOX Capacity and Performance

Generally, ZeoGold™ powder has superior DETOX capacity and performance for inorganic metallics vs. other zeolite DETOX products, because of the higher CEC capacity, ultrahigh surface area available for sorption and optimized particle size. The natural zeolites remove Pb or other metal cations present in water solutions and biological, aqueous milieu via:

- a) exchange for ions (e.g., Na, K, Ca, H⁺) in the zeolite, crystallites for the Pb or other metal cation.*
- b) by direct, surface sorption.*
- c) by physically, removing particulate forms of Pb or trace metals that get “trapped” in the zeolite, micro-crystals or pore structures.*
- d) indirectly, by altering the intestinal tract microflora and/or bio-film layer that can alter the utilization or processing of trace metals.*

The mechanism for removal of Pb and other toxic, trace metal cations for ZeoGold™ is the same as for Clinoptilolite products, but superior DETOX performance can be expected from the ZeoGold™ doses (100 to 250 mg/day) than the Clinoptilolite products.



ZeoGold™ Supplement Facts Panel

Suggested Use: Open 1 Individualized pre-measured serving (capsule) and HYDRATE contents in 4 ounces of water or liquid of choice, 1 or more times daily or as directed by your Health Professional

Supplement Facts

Serving Size: 1 Individualized pre-measured serving unit (capsule)
Servings Per Container: 30 capsules

Ingredient	Amount Per Serving	% Daily Value
Vitamin C (FASM L-ascorbate Crystals**)	60 mg	100%
GMS-Ribose ***	40 mg	*
MicroHydro Zeolite**** (Natural Na aluminosilicate)	100 mg	*
Glutathione Lipoate *****	60 mg	*

* Daily Value not established.

**FASM L-Ascorbate C crystals, with a Firmly Attached Sodium Molecule at a neutral pH, 7mg of attached sodium.

*** GMS-Ribose™ Glycine Methyl Sulfone Ribose, a patented proprietary blend of methylated glycine, as complexed with methyl sulfone (MSM), D-Ribose/Malate, Aloe, EDTA.

****MicroHydro Zeolite-Micronized HydroColloidal Zeolite-Natural Na aluminosilicate

***** Glutathione Lipoate- a water-soluble complex of L Glutathione, R Lipoate, and Human Grade purified Humic acid. Zeo Gold is a Micronized Hydro-colloid form of Zeolite. It forms in petrified bubbles of the clinoptilolite volcanic rock providing ultra high surface area and higher CEC (cation exchange capacity) for more effective utilization than any clinoptilolite without nano sizing.

Research has shown that Zeolite has an ideal structure for mopping up and removing toxins such as aluminium, arsenic, cadmium, lead, mercury and tin and what's more it appears that Zeolite does not remove "positive" beneficial minerals such as zinc and potassium etc., which can be the case with other detox treatments.

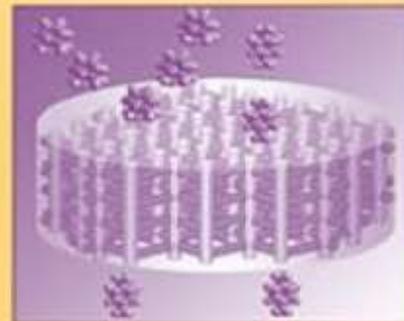
- It removes heavy metals and free radicals
- It helps to balance Ph levels
- It has the highest Cation exchange of any Zeolite product
- It passes out naturally through the body
- It contains sub micronized clinoptilolite Zeolite in nano distilled water
- It is 100% natural

24 – Medical Applications of Zeolite

Kresimir Pavelic and Mirko Hadzija
Ruder Boskovic Institute, Zagreb, Croatia

Zeolites are among the most important inorganic cation exchangers. The aluminosilicate structure is negatively charged and attracts cations that come to reside inside the pores and channels. Zeolites have large empty spaces, or cages, within their structures that can accommodate large cations, such as Na^+ , K^+ , Br^+ , and Ca^+ , and even relatively large molecules and cationic groups, such as water, ammonia, carbonate ions, and nitrate ions. The basic structure of zeolites is biologically neutral (pg 1141).

HANDBOOK OF ZEOLITE SCIENCE AND TECHNOLOGY



EDITED BY
SCOTT M. AUERBACH
KATHLEEN A. CARRADO
PRABIR K. DUTTA

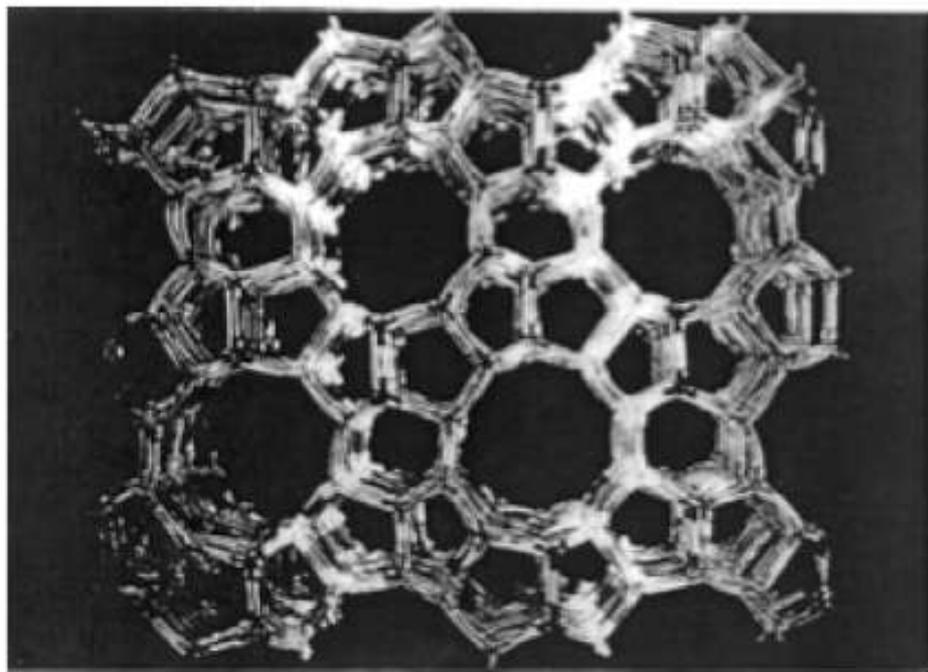


FIGURE 1 A repeated unit cell of the crystal structure of hydrophobic silica zeolite (MHZ™) molecular sieve; anesthetic agent is selectively captured in the honeycomb-shaped silica zeolite crystals. In just 500 g of silica zeolite, the total internal surface area available for capturing anesthetic would cover 70 football fields.

Therefore...

100 g of zeolite internal surface is equal to 14 football fields.

The internal surface area of the Micronized Hydro-Colloidal Zeolite crystal structure of only 7.15 g would cover the surface area of an entire 100 yard football field.

1 g of zeolite internal surface is equal to 14 yards of a football field.

100 mg (one ZeoGold capsule) = 1.4 yards of one football field.

IV. Removal Of Heavy Metals and Organopoisoning

Heavy metals released in wastewater are among the most worrisome pollution problems due to their cumulative effects along the food chain. The natural zeolites clinoptilolite, phillipsite, and chabazite are particularly useful in selectively eliminating ammonia and heavy metals such as Cd^{2+} , Pb^{2+} , Zn^{2+} , Cu^{2+} , and particularly Cr^{3+} . Generally, clinoptilolite is stable in an acidic environment and shows high selectivity for many heavy metals.

V. Antimicrobial Effects

Metal exchanged zeolites have been proposed in the last decade for controlled release of agents against microbial pollution. Zeolites containing copper ions exhibit good antibacterial activity for both gram-negative and gram-positive bacteria, and the effect developed in a short period of time.

Tissue conditioners containing silver-exchanged zeolite showed a strong in-vitro antimicrobial effect on *Candida albicans*, and also on nasocomial respiratory infections of *S. aureus* and *P. aeruginosa*. All microbes were killed whether they have been immersed in saliva or not.

VI. External Applications

The fact that zeolites can protect polymers from ultraviolet degradation opens a wide spectrum of external application of zeolites in cosmetics and dermatology. Zeolite powder has been found to be effective in the treatment of athlete's foot and to reduce the healing time of wounds and surgical incisions. There are some reports that tribomechanically micronized clinoptilolite helps healing of ulcer cruris and decubitus, and has some benefits in the treatment of psoriasis.

IX. Effects on Gastrointestinal Disorders

Due to low resorption rate from GI tract, weaker clinical signs of intoxication, and longer time span for the onset of specific therapy are factors that create conditions for inclusion of natural zeolite in the arsenal of rational prevention and therapy of organophosphate poisoning.

Zeolites can absorb cholera toxin and E-coli enterotoxins, and along with a variety of other common inorganic adsorbents, have a beneficial role for children suffering spontaneous diarrhea by reducing enterotoxin activity.

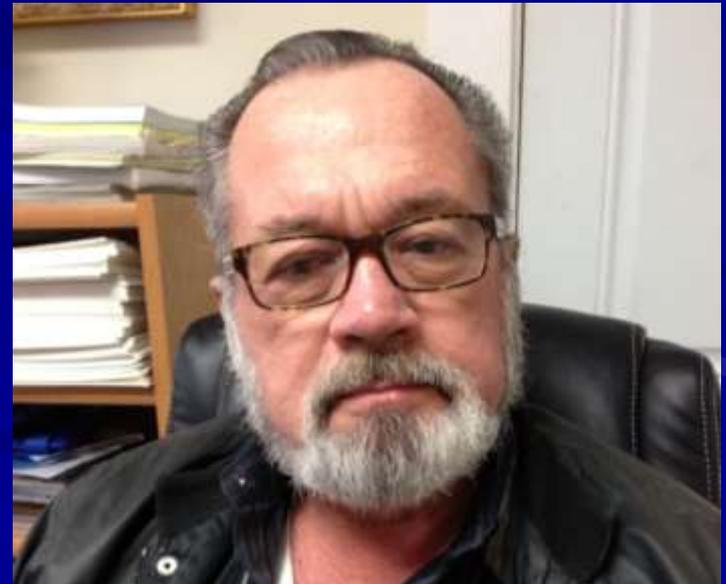
Visible benefit using Zeolite-based topical cream.

Zeolite has the ability to draw out impurities, and neutralize free radical damage that age the skin.



Zeolite as an antioxidant also helps to restore natural pH-value, balancing acid and irritated skin conditions.

Pre- and Post-treatment with ACZeolite



XI. Effects on Diabetes Mellitus

Zeolites are of potential use in the treatment of diabetes. Our unpublished data concerning alloxan-induced diabetic mice showed that natural clinoptilolite could prevent or diminish some late complications of diabetes, namely, development of polyneuropathies. There is some indication that natural zeolite may sorb small amounts of glucose, and the hydrothermal transformation of natural, purified clinoptilolite using FeSO_4 has been shown to cause selectivity for glucose adsorption.

Clinoptilolite showed positive effects on many diabetic symptoms. Significant differences between zeolite-treated and nontreated diabetic mice were noticed only in the amount of total Ca in sera. Nontreated diabetic animals had 1.92 mM/L Ca in sera, whereas clinoptilolite-treated diabetic mice had a higher concentration of Ca in sera, ranging from 2.15 to 2.3 mM/L. Iron (Fe^{2+}) containing, natural clinoptilolite interacts with glucose with formation of an iron-glucose complex in the clinoptilolite.

XVI. Toxicology of Clinoptilolite

In human medicine, zeolites have been used as anti-diarrheal remedies, for the external treatment of skin wounds and athlete's foot, and in kidney dialysis for the removal of ammonia ions from body fluids. There were not many data showing the systemic effects of zeolites on physiological systems of the body.

The beneficial effects of zeolites on hematopoiesis, and various disease states, including tumors, have been observed. No toxic effects were observed in our toxicology study of clinoptilolite. The physical status of examined animals showed no evidence of any harmful reaction during the studies.

Clinoptilolite is well suited for these applications because of its large pore space, high resistance to extreme temps, and chemically neutral framework. The conclusion from all toxicology studies available is that natural clinoptilolite is not toxic and can be used in human as well as veterinary medicine.

L-Glutathione

Glutathione is a powerful antioxidant. It is water-soluble and is primarily synthesized in the liver. It is involved in DNA synthesis and repair, protein and prostaglandin synthesis, amino acid transport, metabolism of toxins and carcinogens, immune system function, prevention of oxidative cell damage and enzyme activation.

Cellular glutathione levels increase during exercise.

Glutathione deficiency is associated with aging, age-related macular degeneration (AMD), diabetes, lung and gastrointestinal disease, pre-eclampsia, Parkinson's disease, other neurodegenerative disorders and poor prognosis in AIDS.

Glutathione may inhibit the activity of enzymes that help the flu virus colonize cells lining the mouth and throat. Flu-infected mice fed glutathione-enriched drinking water have lower tissue virus levels than untreated mice. Human studies are needed to determine the effects on flu infection.

Glutathione metabolism and its implications for health

Faculty of Nutrition, Texas A&M University, College Station, TX, 77843,



Glutathione (gamma-glutamyl-cysteinyl-glycine; GSH) is the most abundant low-molecular-weight thiol, and GSH/glutathione disulfide is the major redox couple in animal cells.

The synthesis of GSH from glutamate, cysteine, and glycine is catalyzed sequentially by two cytosolic enzymes, gamma-glutamylcysteine synthetase and GSH synthetase. Compelling evidence shows that GSH synthesis is regulated primarily by gamma-glutamylcysteine synthetase activity, cysteine availability, and GSH feedback inhibition. Animal and human studies demonstrate that adequate protein nutrition is crucial for the maintenance of GSH homeostasis.

Glutathione plays important roles in antioxidant defense, nutrient metabolism, and regulation of cellular events (including gene expression, DNA and protein synthesis, cell proliferation and apoptosis, signal transduction, cytokine production and immune response, and protein glutathionylation). Glutathione deficiency contributes to oxidative stress, which plays a key role in aging and the pathogenesis of many diseases (including kwashiorkor, seizure, Alzheimer's disease, Parkinson's disease, liver disease, cystic fibrosis, sickle cell anemia, HIV, AIDS, cancer, heart attack, stroke, and diabetes). New knowledge of the nutritional regulation of GSH metabolism is critical for the development of effective strategies to improve health and to treat these diseases.

PMID: 14988435 [PubMed - indexed for MEDLINE]

Regulation of glutathione in inflammation and chronic lung diseases.



Department of Environmental Medicine, Division of Lung Biology and Disease Program, University of Rochester Medical Center, Rochester, NY 14642, USA.

Oxidant/antioxidant imbalance, a major cause of cell damage, is the hallmark for lung inflammation. Glutathione (GSH), a ubiquitous tripeptide thiol, is a vital intra- and extra-cellular protective antioxidant against oxidative stress, which plays a key role in the control of signaling and pro-inflammatory processes in the lungs.

Recent evidences have indicated that Nrf2 protein, which binds to the erythroid transcription factor (NF-E2) binding sites, and its interaction with other oncoproteins such as c-Jun, Jun D, Fra1 and Maf play a key role in the regulation of GCL. Alterations in alveolar and lung GSH metabolism are widely recognized as a central feature of many chronic inflammatory lung diseases. Knowledge of the mechanisms of GSH regulation could lead to the pharmacological manipulation of the production and/or gene transfer of this important antioxidant in lung inflammation and injury.

This article describes the role of AP-1 and ARE in the regulation of cellular GSH biosynthesis and assesses the potential protective and therapeutic role of glutathione in oxidant-induced lung injury and inflammation.

PMID: 16054171 [PubMed - as supplied by publisher]

Nutritional regulation of glutathione in stroke

College of Pharmacy and Nutrition, The Cameco MS Neuroscience Research Center,
University of Saskatchewan, 110 Science Place, Saskatoon, SK S7N 5C9, Canada.



U.S. National Library of Medicine
National Institutes of Health

In contrast to cardiovascular disease, the impact of nutritional status on the prevention and outcome of stroke has received limited investigation. We present a mechanism based on animal studies, clinical data, and epidemiological data by which protein-energy status in the acute stroke and immediate post-injury periods may affect outcome by regulating reduced glutathione (GSH), a key component of antioxidant defense.

As cysteine is the limiting amino acid for GSH synthesis, the GSH concentration of a number of nonneural tissues has been shown to be decreased by fasting, low-protein diets, or diets limiting in sulfur amino acids. The mechanism may also be relevant in brain since GSH in some brain regions is responsive to dietary sulfur amino acid supply and to the pro-cysteine drug, L-2-oxothiazolidine-4-carboxylate. The latter is an intracellular cysteine delivery system used to overcome the toxicity associated with cysteine supplementation. These findings may provide the mechanism to explain both the inverse correlation between dietary protein and stroke mortality and the documented association between suboptimal protein-energy status and diminished functional status following a stroke.

Finally, micronutrient deficiencies that may accompany protein-energy malnutrition, such as selenium, should also be investigated for their role in antioxidant defense in cerebral ischemia.

PMID: 12835106 [PubMed]

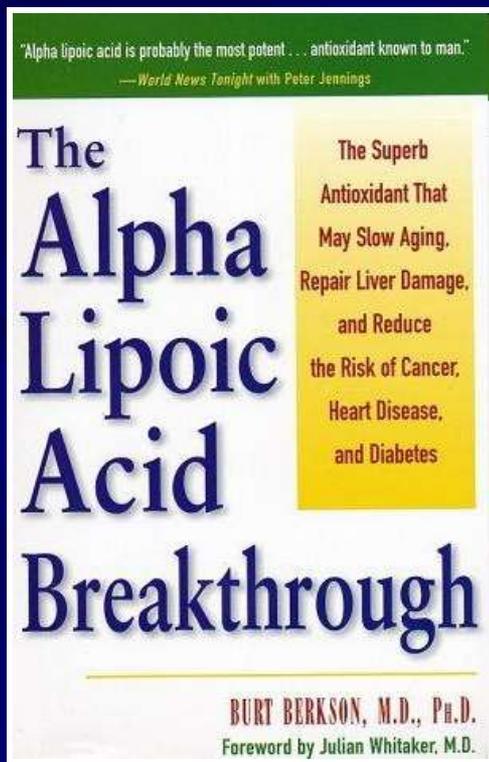
Glutathione status in critically-ill patients: possibility of modulation by antioxidants

Department of Anaesthesia and Intensive Care, KFC, Huddinge Hospital,
Stockholm, Sweden. Jan.Wernerman@anaesth.hs.sll.se

Muscle tissue serves as a protein reservoir which is mobilized to meet the specific metabolic needs associated with various catabolic conditions in human subjects, such as trauma and critical illness. Glutathione is one of the most abundant short-chain peptides and a major source of non-protein thiol in the body, and tissue glutathione concentration is related to its oxidative capacity.

Skeletal muscle is relatively unique with respect to a variety of metabolic properties, such as oxidative potential, patterns of amino acid utilization, and antioxidant enzyme activity. The glutathione concentration is not influenced by food intake, or by food deprivation. Moreover, there is no diurnal variation on muscle glutathione levels. Following elective surgery the muscle concentration of GSH (the reduced form) decreases by 40% 24 h post-operatively, while the concentration of GSSG (the oxidized form) remains unaltered. During critical illness a similar decrease in the GSH concentration is seen, but in addition a change in the redox status indicative of an elevated GSSG level occurs. Furthermore, correlations between the concentrations of glutamine as well as glutamate and GSH exist in these patients. From available evidence accumulated it is clear that glutathione plays a pivotal role in the maintenance of the intracellular redox status, the antioxidant vitamin levels, and the antioxidant enzyme functions under various metabolic conditions.

Burt Berkson, MD, PhD. 2011 Recipient of the Gladys T. McGarey Lifetime Achievement Award in Integrative Medicine



Alpha Lipoic Acid (ALA) is an excellent antioxidant and recycles other nutrients such as co-enzyme Q-10, vitamin C, and vitamin E.

ALA chelates heavy metals such as mercury, lead, and arsenic, and it stabilizes NF kappa B transcription factor so that it helps to inactivate deleterious genes.

It can also help people with diabetes mellitus by increasing the sensitivity of their cells to insulin, and helps reverse diabetic neuropathies.

The first large human clinical studies using ALA in the United States were carried out by Drs. Burt Berkson, Fredrick C. Bartter, and associates from the National Institutes of Health (NIH) in the 1970s.

Dr. Berkson and associates administered ALA to 79 people with severe and acute liver damage at various hospitals around the United States, and 75 recovered full liver function.

Dr. Berkson has used ALA to successfully treat various cancers for which no other treatment exists.

The long-term survival of a patient with pancreatic cancer with metastases to the liver after treatment with intravenous alpha-lipoic acid/low-dose naltrexone protocol.

Berkson BM, Rubin DM, Berkson AJ.

Integrative Medical Center of New Mexico and New Mexico State University, Las Cruces.



Abstract

The authors describe the long-term survival of a patient with pancreatic cancer without any toxic adverse effects. The treatment regimen includes the intravenous alpha-lipoic acid and low-dose naltrexone (ALA-N) protocol and a healthy lifestyle program. The patient was told by a reputable university oncology center in October 2002 that there was little hope for his survival. Today, January 2006, however, he is back at work, free from symptoms, and without appreciable progression of his malignancy.

The integrative protocol described in this article may have the possibility of extending the life of a patient who would be customarily considered to be terminal. The authors believe that life scientists will one day develop a cure for metastatic pancreatic cancer, perhaps via gene therapy or another biological platform. But until such protocols come to market, the ALA-N protocol should be studied and considered, given its lack of toxicity at levels reported. Several other patients are on this treatment protocol and appear to be doing well at this time.

Integr Cancer Ther. 2009 Dec;8(4):416-22.

Revisiting the ALA/N (alpha-lipoic acid/low-dose naltrexone) protocol for people with metastatic and nonmetastatic pancreatic cancer: a report of 3 new cases.

Berkson BM, Rubin DM, Berkson AJ.

The Integrative Medical Center of New Mexico, Las Cruces, NM, USA.



Abstract

Three additional pancreatic cancer case studies are presented in this article. At the time of this writing, the first patient, GB, is alive and well 39 months after presenting with adenocarcinoma of the pancreas with metastases to the liver. The second patient, JK, who presented to the clinic with the same diagnosis was treated with the ALA/N protocol and after 5 months of therapy, PET scan demonstrated no evidence of disease. The third patient, RC, in addition to his pancreatic cancer with liver and retroperitoneal metastases, has a history of B-cell lymphoma and prostate adenocarcinoma. After 4 months of the ALA/N protocol his PET scan demonstrated no signs of cancer.

In this article, the authors discuss the poly activity of ALA: as an agent that reduces oxidative stress, its ability to stabilize NF(k)B, its ability to stimulate pro-oxidant apoptotic activity, and its discriminative ability to discourage the proliferation of malignant cells. In addition, the ability of lowdose naltrexone to modulate an endogenous immune response is discussed. This is the second article published on the ALA/N protocol and the authors believe the protocol warrants clinical trial.

Lipoic acid may reduce the toxic effects of heavy metals

Submitted by shunsmuse on Tue, 03/19/2013 - 03:51

Toxicol Ind Health. 2013 Jan 4. Monitoring the toxic effects of Pb, Cd and Cu on hematological parameters of Wistar rats and potential protective role of lipoic acid and glutathione.

Nikolic R, Krstic N, Jovanovic J, Kocic G, Cvetkovic TP, Radosavljevic-Stevanovic N.

Faculty of Sciences and Mathematics, University of Nis, Nis, Serbia.

Heavy metal pollution is a serious environmental and health problem. The negative effects of heavy metals that can enter human body can be reduced by the addition of some supplements. In this study, the effects of lead (Pb), cadmium (Cd) and copper (Cu) on the hematological parameters in Wistar rats in the absence and presence of lipoic acid and glutathione were analyzed. Pb, Cd and Cu intoxication significantly affected the hematological parameters of treated animals. The main effects in the case of Pb and Cd intoxication were decreased values of erythrocytes, hemoglobin and hematocrit (up to 30% and 20% for these two metals, respectively) compared with the control group. Cu intoxication caused decrease in hematocrit, thrombocytes, mean cell volume values (c.a. 15%) and slight decrease in the erythrocyte number, while the value of hemoglobin increased (c.a. 7%). The treatment with lipoic acid and glutathione reduced the toxic effects of these metals in all cases.

Alpha Lipoic acid has beneficial effects on liver cell damage

Submitted by shunsmuse on Tue, 03/19/2013 - 03:54

Food Chem Toxicol. 2013 Mar;53:84-93. doi: 10.1016/j.fct.2012.11.026.

The effects of alpha lipoic acid on liver cells damages and apoptosis induced by polyunsaturated fatty acids.

Kaya-Dagistanli F, Tanriverdi G, Altinok A, Ozyazgan S, Ozturk M.

Source

Istanbul University, Cerrahpasa Medical Faculty Medical Biology Department, 34098 Cerrahpasa, Istanbul, Turkey.

Abstract

We studied the effect of alpha-lipoic acid (ALA) on the liver cell damages and apoptosis by n-6 polyunsaturated fatty acids (PUFA) rich diet in young rats. 24 Wistar rats were divided into four groups. During the study, 12 of them (control) were fed with standard chow and other 12 (n-6) were fed with the food containing high-fat n-6 for 8 weeks. At the end of the fourth week, control and n-6 groups were randomly divided into two groups and then, 4 weeks, 35mg/kg ALA are injected. Groups; control, control+ALA, n-6, n-6+ALA. The liver tissue glutathione (GSH) activity was determined. Immunohistochemistry for caspase-3 and TUNEL method for apoptosis were performed. The GSH levels have significantly decreased ($p < 0,001$), and vacuolization in the hepatocytes, infiltration and the collagen accumulation around the central vein, hepatic stellate cells in the sinusoids have increased in n-6 group compared with the other groups. TUNEL ($p < 0,001$) and caspase-3 ($p < 0,001$) positive cells increased in n-6 group whereas all degenerative observations decreased in n-6+ALA group. Our results demonstrate that the feeding with n-6 PUFA causes fatty liver, fibrosis development, inflammations and apoptosis in the liver of young rats. ALA has a beneficial effects on these degenerative effects.

Oral supplementation with antioxidant agents containing alpha lipoic acid: effects on postmenopausal bone mass.

Submitted by shunsmuse on Tue, 03/19/2013 - 03:43

Clin Exp Obstet Gynecol. 2012;39(4):489-93.

Mainini G, Rotondi M, Di Nola K, Pezzella MT, Iervolino SA, Seguino E, D'Eufemia D, Iannicelli I, Torella M. San Leonardo Hospital, Castellammare di Stabia, Naples, Italy.

Oxidative stress impacts many age-related degenerative processes, such as in postmenopausal bone loss and in antioxidant defenses that are significantly decreased in elderly osteoporotic women. The authors evaluated the effect of oral supplementation with antioxidant agents containing alpha lipoic acid (ALA) on bone mineral density (BMD) of osteopenic postmenopausal women.

Forty-four patients completed the one-year study: 23 in the ALA group, 21 in the control group. The treatment of ALA group led to a better estimated BMD compared to the control group (0.401 +/- 0.026 vs 0.388 +/- 0.025 g/cm²), although this difference barely achieved a statistical significance (p = 0.048).

These findings, although in a small population, could suggest that **oral supplementation with antioxidant agents containing ALA may mitigate bone loss in osteopenic postmenopausal women.**

Effects of R+ lipoic acid in wound healing

J Enzyme Inhib Med Chem. 2013 Jan 30.

Nasole E, Nicoletti C, Yang ZJ, Girelli A, Rubini A, Giuffreda F, Di Tano A, Camporesi E, Bosco G. Istituto Iperbarico SpA, Diving and Hyperbaric Medicine Unit in Villafranca , Verona , Italy .

Lipoic acid (LA) and hyperbaric oxygenation therapy (HBOT) improve chronic wound healing. Objective: We compared the effects of LA or its enantiomer R-(+)-lipoic acid (RLA) on wound healing. Materials and methods: Groups LA + HBOT (L), RLA + HBOT (R) and placebo + HBOT (P). Lesion areas measured before treatment and on 20th and 40th day. The biopsies and plasma were harvested before treatment and on 7th and 14th (measurements of VEGF, vascular endothelial growth factor; EGF, epidermal growth factor, TNF-a and IL-6).

Results: Ulcers improved more on RLA. In both L and R groups, EGF and VEGF increased in time. RLA decreased IL-6 on T(7) and T(14), which did not happen with LA. TNF-a levels decreased on T(14) in both LA and RLA.

Discussion: The improved wound healing is associated with increased EGF and VEGF and reduced plasma TNF-a and IL-6.

Conclusion: RLA may be more effective than LA in improving chronic wound healing in patients undergoing HBO therapy.

R-Lipoic acid protects against oxidative stress in retinal neurons

Submitted by shunsmuse on Fri, 03/15/2013 - 17:43

Brain Res. 2013 Jan 4. pii: S0006-8993(13)00003-6. doi: 10.1016/j.brainres.2012.12.041.

Oxidative stress plays a key role in neurodegeneration of CNS neurons such as Alzheimer disease, Parkinson's disease and glaucoma. R-a-lipoic acid (R-LA) has been shown to have a neuroprotective effect through its antioxidant activity. However, the mechanism underlying its neuroprotection is totally unknown in retinal neurons.

In this study, we show that R-LA has a dramatic neuroprotective effect against oxidative stress-induced death of the retinal neuronal RGC-5 cell line. R-LA produced reactive oxygen species (ROS), including hydrogen peroxide.

Results suggest that ROS production triggered by R-LA might modify Kelch-like ECH-associated protein (Keap1), which in turn induces HO-1 expression through the PI3K signaling pathway. Furthermore, R-LA significantly attenuated cell death and accumulation of 4-hydroxy-2-nonenal (4HNE) in the retina induced by optic nerve injury in vivo through an HO-1 activity-dependent mechanism.

These data demonstrate for the first time that R-LA exerts a neuroprotective effect against oxidative stress in retinal neurons in vitro and in vivo by inducing HO-1 through Keap1/Nrf2 signaling.

R-Lipoic Acid

Suna and Willow
are yellow Labrador
Retrievers.

They have the
same body mass,
the same blood
markers & activity
levels.

Suna (13 yrs) and Willow (3 yrs)



Suna is continuing to learn new tricks & has been begging for
22.5 mg/kg/day RLA for the last 7 years.

Suna is Willow's aunt, although they frequently pass as siblings.

R-(+)-Lipoic Acid reverses age-related decline

- RLA & ALCAR improved memory by reversed oxidative damage to nucleic acids & improving mitochondrial function. (Liu et al 2002)
- RLA increases Nrf2 translocation from the cytosol and accumulation in the nucleus. **SLA is not effective.** (Petersen-Shay et al 2008)

R-(+)-Lipoic Acid reverses age-related decline

- RLA reversed age-associated increase in susceptibility of hepatocytes to tert-butylhydroperoxide both in vitro and in vivo. SLA was ineffective. (Hagen et al 2000)
- RLA reversed the age-associated effects on ascorbic acid concentration, recycling and biosynthesis after oxidative stress. (Lykkesfeldt et al 2000)
- RLA improved mitochondrial metabolism in aging rat heart. (Hagen et al 2002)

Humates - Humic and Fulvic Acid



Humates contain both humic and fulvic acids. The fulvic acid is the chelator that carries the minerals. The humic acid acts as dilator increasing the cell wall permeability. This increased permeability allows easier transfer of minerals from the blood to the bone and cells.

Red blood cells have the capability of carrying higher percentages of oxygen when in the presence of humate. Healing of injuries, as a result of additional oxygen, is much quicker.

Literature reports additional transport of iodine from foods into the thyroid glands. Just as fulvic acid carries life-sustaining minerals to the body, it also captures and removes toxic metals from the body. Detoxification takes place within first three to four days of usage.

Humic substances, including peat and sodium humates, are known to exhibit anti-inflammatory properties. Inflammatory states of the cervix, especially cervical erosion (generally known as cervicitis) can be treated with humic preparations.

Humate takes an active part in the liver metabolism. The use of humate plays a role in the liver function and protects it somewhat from disease and/or disturbances

Detoxing and Chelating With Fulvic Acid

Even though not as touted and well known as zeolite products, fulvic acid has been around for a very long time. It has even been used in Ayurvedic Medicine, possibly the oldest accessible healing protocol in existence. It is a powerful overall detox and heavy metal chelation agent. It is well researched and used within the mainstream medicine halls of China, Russia, and India. The Tibetan Mountains offer possibly the richest source of pristine fulvic acid shales.



Fulvic acid is sometimes used as a liquid base for Zeolite molecules, even though it has its own chelation properties similar to zeolite. Fulvic acid has many other health restorative ramifications, which are supported by clinical reports. It has been used successfully in China to treat a variety of serous, stubborn lung disorders.

The lungs and the brain are the most obviously affected organs from chemtrail spraying. The health benefits observed and recorded for fulvic acid are too numerous to mention in this article. Check out the appropriate URL or link in the "sources area" below for a pdf medical report dealing with fulvic acid uses in clinics and hospitals. Fulvic acid is available and inexpensive.

Not all the products on the market under the name **Humates** are high quality! There are several different chemical structures of Humic Acid.

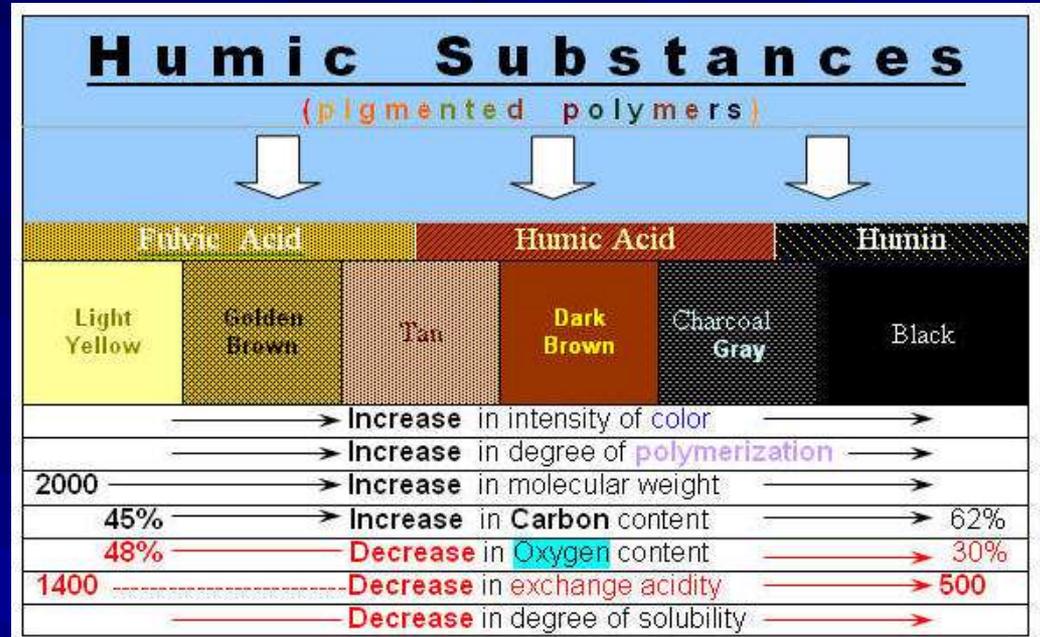
Both fulvic and humic acids are found in soil, and result from the chemical and biological degradation of dead organisms.

Fulvic acids provide multiple and natural chemical reactions in the soil, instigating positive influences on the plants' metabolic processes.

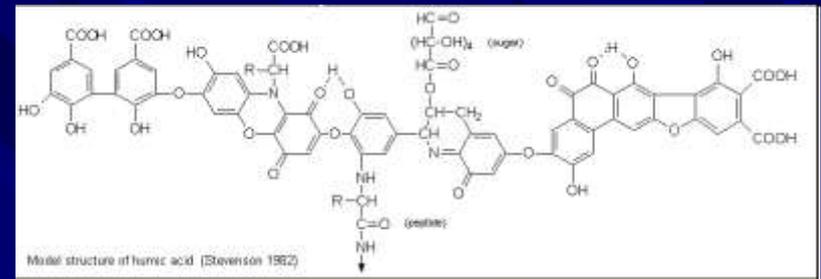
Fulvic acid is especially active in dissolving minerals and metals

when in solution with water. The metallic minerals simply dissolve into ionic form, and disappear into the fulvic structure becoming bio-chemically reactive and mobile.

The Fulvic acid actually transforms these minerals and metal into elaborate fulvic acid molecular complexes that have vastly different characteristics from their previous metallic mineral form. Fulvic acid is nature's way of "chelating" metallic minerals, turning them into readily absorbable bio-available forms.



Humates within the body work with DNA and cellular division.



It has been noted that the **humate tends to prevent cellular mutation during reproduction**. Several technical papers were noted during literature research for this paper regarding cancer research with humates. Natural humic acid administered prophylactically to rats can decrease significantly the amount of gastric mucus damage induced with ethanol. Humic acid also significantly accelerated the healing process of experimentally induced ulcers (52).

Humates exhibit anti-microbial and anti-viral properties, thus bolstering the immune system.

Dr. Daryl See, MD, formerly an Immunologist of UCI Medical School, suggests that the mechanism is related to the **humates ability to complex (assemble) sugars within the body**.

The abundance of these complexed sugars allows the body to manufacture glyco proteins (glyco nutrients) that attach to the killer and T cell acting as a modulator or communication link between the cells.

8 Essential Sugars - Glyconutrients

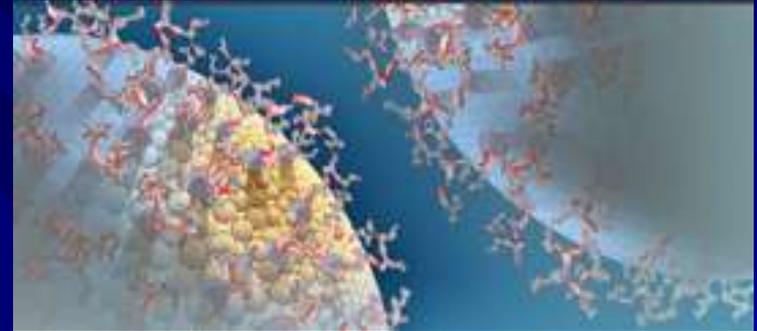
Glyconutrients are known as the 8 essential sugars needed for optimal health and functioning in humans.

Nutritional scientists and glycobiochemists have identified over 200 glyconutrients found in nature but only 8 are essential for cell-to-cell communication in people.

All of the 8 essential sugars (saccharides) aid in intercellular communication, but each glyconutrient also has special properties as well on a cellular level.

Here is a list of the 8 essential sugars:

1. Glucose
2. Mannose
3. Galactose
4. Fucose (*not to be confused with fructose*)
5. N-AcetylGalactosamine
6. N-AcetylGlucosamine
7. N-AcetylNeuraminic Acid
8. Xylose



Glyconutrients are plant carbohydrates (monosaccharides). There are over 200 carbohydrates or sugars but only 8 are essential to bodily function. They help your digestive system know which food components to absorb into the blood stream and which to ignore... which cells to attack and destroy, and which to protect and nurture.

Glyconutrient & Glyco Science Validation

Royal Society of Medicine



Society for
Glycobiology

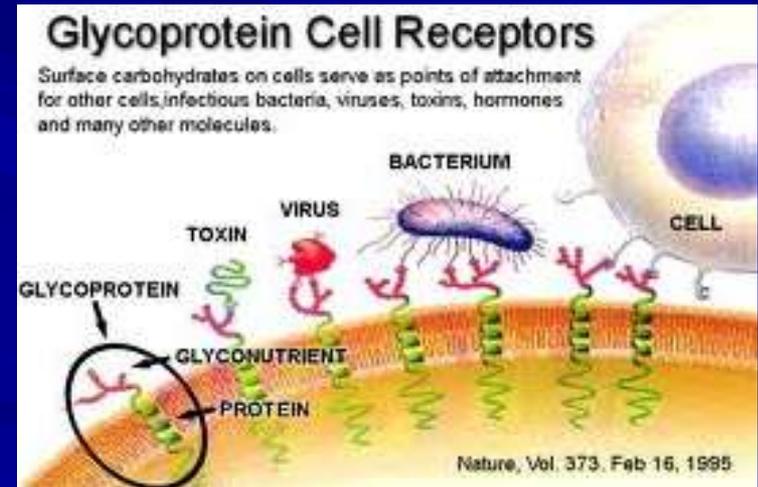
Certain carbohydrates (glyconutrients) are vital for the correct structure, function relationship of the following:

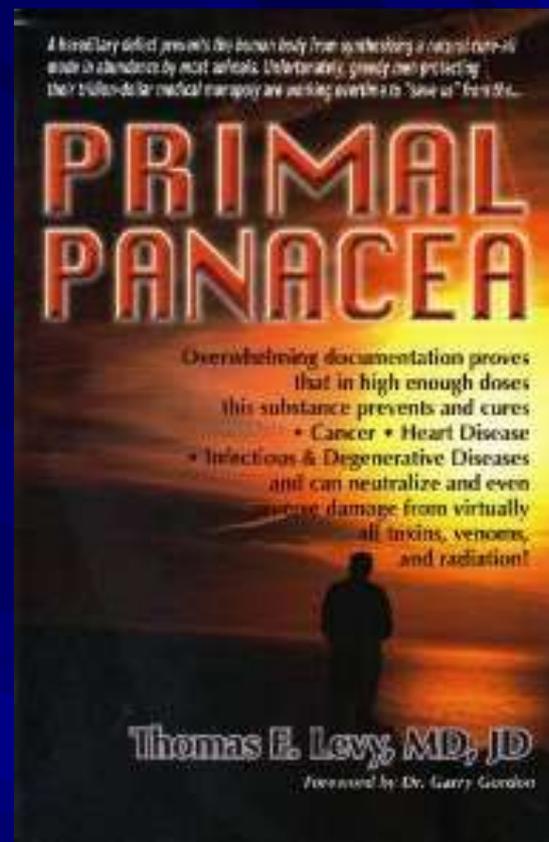
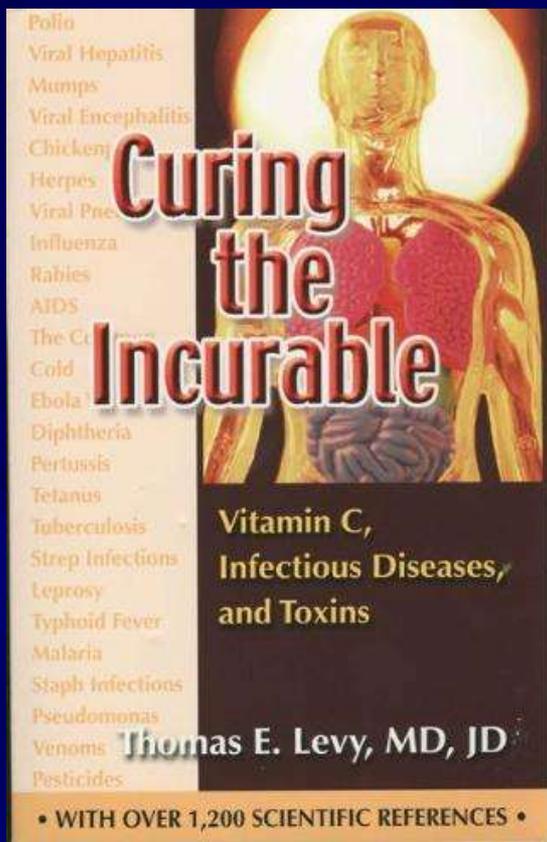
- Cells
- Membranes
- Enzymes
- Hormones
- Signaling
- Messenger molecules
- Tumor spread
- And all biological systems
- Every cell in your entire body

Your body will repair itself, regenerate itself, restore itself, and defend itself as long as you provide your body with the right tools it requires to function correctly.

Glycoforms, with their hair like cell surface structures, interact and communicate with other cell surfaces.

Science is validating that virtually every disease has altered and missing structures of glycoforms on the cell of the person affected with the specific disease... where a healthy person has the proper structure and assembly of glycoforms coating their cells.





VITAMIN C

Vitamin C, given at sufficiently high doses, by itself, can cure life-threatening infections and neutralize many otherwise fatal toxin exposures, according to author Thomas E. Levy, MD, JD in his extensively referenced book, *Vitamin C, Infectious Diseases, and Toxins: Curing the Incurable*, and his newest book "Primal Panacea".

Thomas Levy's books are unmatched in the medical literature. According to Dr. E. Cheraskin, more than 80,000 scientific papers and reports have been written about vitamin C since its chemical nature was first discovered early in the 20th century. The Vitamin C Foundation credits Levy with "doing an almost impossible feat of reading, analyzing and clearly explaining the meaning of the massive science behind vitamin C."

http://findarticles.com/p/articles/mi_m0ISW/is_2003_May/ai_100767885/



Bio En'R-G'y C is an exciting new form of Ribose Nucleotide Activated (RNA) Vitamin C containing Riboperine metabolites that safely allows patients to take daily high doses without stomach upset, cramping, or diarrhea.

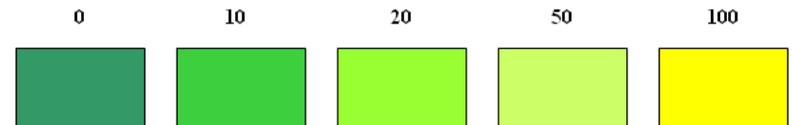
Each serving of Bio En'R-G'y C 's unique form of L-Ascorbate C crystals, has been further enhanced with 2000 mg of GMS-Ribose for increased bio-availability.

Preliminary double blind, human trials on one or more of the ingredients of GMS-Ribose taken with Vitamin C have been shown to enhance the uptake of Vitamin C plasma levels above 30% of subjects on placebo.



A BRIGHT SPOT
on this urine stick
test means
you will have a
brighter future!

COLOR CHART – mg/dL vitamin C (Ascorbic Acid)



Directions:

1. Dip reagent strip in freshly collected urine and remove immediately or alternatively, wet the reagent strip by passing through the urine stream.
2. While removing, run the edge of the strip against the rim of the urine collection cup to remove excess urine.
3. 30 seconds after removing from urine, compare reagent side of test area with corresponding color chart.

Relation between plasma ascorbic acid and mortality in men and women in EPIC-Norfolk prospective study: a prospective population study

Prof Kay-Tee Khaw FRCP, Sheila Bingham PhD, Ailsa Welch BSc, Robert Luben BSc, Nicholas Wareham MRCP, Suzy Oakes, Nicholas Day PhD

THE LANCET

Volume 357, Issue 9257, Pgs 657 - 663

3 March 2001

doi:10.1016/S0140-6736(00)04128-3

Plasma ascorbic acid concentration was **inversely related to mortality from all-causes**, and from cardiovascular disease, and ischaemic heart disease in men and women.

Risk of mortality in the top ascorbic acid quintile was about half the risk in the lowest quintile ($p < 0.0001$).

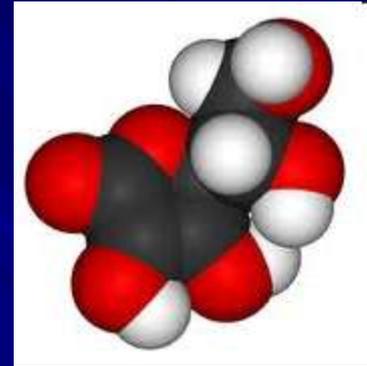
The relation with mortality was continuous through the whole distribution of ascorbic acid concentrations. A 20 $\mu\text{mol/L}$ rise in plasma ascorbic acid concentration, equivalent to about 50 g per day increase in fruit and vegetable intake, was associated with about a 20% reduction in risk of all-cause mortality ($p < 0.0001$), independent of age, systolic blood pressure, blood cholesterol, cigarette smoking habit, diabetes, and supplement use.

Medical Hypotheses; May 1991: 35:32-37

A UNIQUE FUNCTION FOR ASCORBATE

By Dr. Robert F. Cathcart, M.D.

Allergy, Environmental, and Orthomolecular Medicine



Vitamin C is a reducing substance, an electron donor.

When vitamin C donates its two high-energy electrons to scavenge free radicals, much of the resulting dehydroascorbate is rereduced to vitamin C and therefore used repeatedly.

Conventional wisdom is correct in that only small amounts of vitamin C are necessary for this function because of its repeated use. The point missed is that the limiting part in nonenzymatic free radical scavenging is the rate at which extra high-energy electrons are provided through NADH to rereduce the vitamin C and other free radical scavengers. **When ill, free radicals are formed at a rate faster than the high-energy electrons are made available.** Doses of vitamin C as large as 1 to 10 grams per 24 hours do only limited good. However, **when ascorbate is used in massive amounts, such as 30 to 200+ grams per 24 hours, these amounts directly provide the electrons necessary to quench the free radicals of almost any inflammation.**

Additionally, in high concentrations ascorbate reduces NAD(P)H and therefore can provide the high-energy electrons necessary to reduce the molecular oxygen used in the respiratory burst of phagocytes. In these functions, the ascorbate part is mostly wasted but the necessary high-energy electrons are provided in large amounts.

Anticancer Res. 1997 Sep-Oct;17(5A):3513-20.

Modulating factors of radical intensity and cytotoxic activity of ascorbate (review).

Sakagami H, Satoh K.



Ascorbate acts both as an antioxidant and as an oxidant, depending upon the environment in which the molecule is present.

We have reported that millimolar concentrations of ascorbate induced apoptotic cell death, characterized by cell shrinkage, nuclear fragmentation and internucleosomal DNA cleavage, in human myelogenous leukemic cell lines. Ascorbate derivatives, which can induce the apoptosis, produced the radical(s), elevated the oxidation potential and stimulated the methionine oxidation in the culture medium, whereas inactive derivatives did not. This suggests that the ascorbate induce the apoptosis by its prooxidant action.

The effects of various factors, such as temperature, pH, metal, metal antagonist, redox agent, serum protein, polyphenol and (natural, chemically modified) polysaccharide on the radical intensity and apoptosis-inducing activity of ascorbate are reviewed.

PMID: 9413196 [PubMed - indexed for MEDLINE]

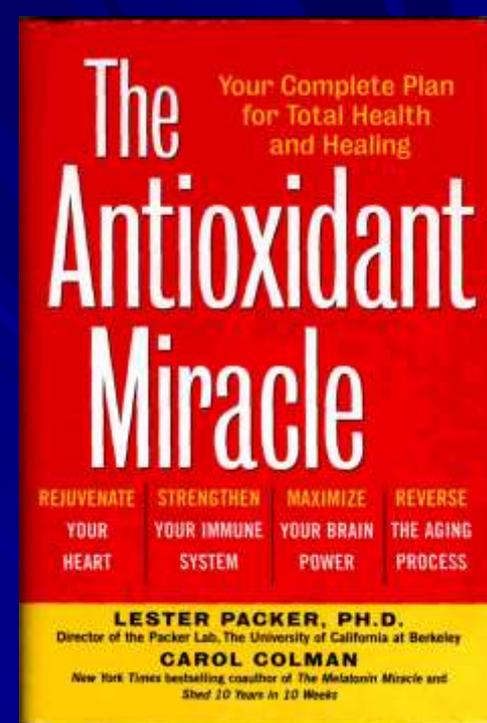
MSM, methylsulfonylmethane (METH-əl-sul-FON-il-METH-ane) provides sulfur, a vital building block of joints, cartilage, skin, hair and nails, and methyl groups, which support many vital biochemical processes in the body, including energy production.

MSM is a naturally-occurring nutrient found in small amounts of many foods. As a dietary supplement, MSM is synthesized. When made correctly, it is identical to that found in nature. MSM can be taken alone or in combination with other joint health supplements, such as glucosamine and chondroitin.

GMS Ribose - a patented, proprietary blend of glycine complexed with methyl sulfone and Ribose providing methyl sulfur metabolites with Riboperine. Methyl sulfone is an important nutrient (the prime source of bio-available sulfur) used by the body for healthy and proper enzyme activity and natural hormone balance. Methyl-sulfone is a natural form of organic sulfur found in all living organisms, including humans' body fluids and tissues. Sulfur along with Vitamin C is necessary for making collagen, the primary constituent of cartilage and connective tissue.

Using Multiple Pathways A Possible Explanation

1. Normally Glucose and Vitamin C are taken up by the Glucose pathway; as adapted from Lester Packer - *The Vitamin E, Ascorbate and Alpha Lipoate Antioxidant Defense System*. "Glucose and Vitamin C are taken up into the cells by the same transport system."
2. It is theorized by more than one researcher that some forms of C with **GMS Ribose** and **B.E.E.T.™** Metabolites do not use the Glucose pathway exclusively for transport but use multiple, entirely different, separate and unique pathways to the cell. Many nutrients utilize the Glucose pathway for absorption, however it appears that some forms of C do not have to **"WAIT IN LINE"** to be absorbed into the cell.



WHAT'S HYDROGEN GOT TO DO WITH IT?

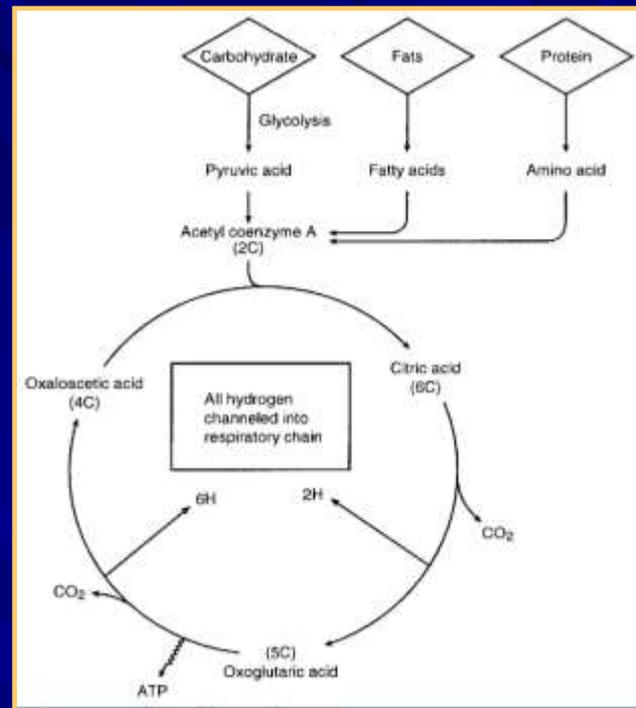
Albert Szent-Gyorgyi, the Hungarian Nobel Prize winning biochemist who discovered Vitamin C, said that hydrogen rather than oxygen, is the fuel of life.

Hydrogen is the body's most needed nutrient, our Primordial ANTI-OXIDANT!

Everyone is deficient in H-. A machine called the BTA or Biological Terrain Analyzer developed by a Dr. Morrell which tests blood, saliva and urine for H+, H- and minerals found 100% of people low in H-, especially as they got older. They were all over oxidized. The absence of electrons causes numerous diseases.

Electrons don't move in the body unless they are associated with hydrogen. A body in good health has abundant H- ionised molecules.

When you hydrate the cells they plump and become healthy and the body goes into an anabolic state - when the cells become dehydrated, the body goes into a catalytic state and eats its own muscles.



A Breath of Fresh Microbubbles

by Sarah C. P. Williams on 27 June 2012
for Science Now Magazine

In a new study, published online today in *Science Translational Medicine*, Boston Children's Hospital pediatric critical care physician, Dr. John Kheir and colleagues report the **development of microparticles filled with oxygen gas that can be injected directly into the bloodstream**. The particles quickly dissolve, releasing the gas and keeping organs, such as the brain, from suffocating.

These microparticles are tiny bubbles whose surface membranes are already used clinically to administer chemotherapy drugs and ultrasound dyes.

But while those microparticles release their contents slowly, Kheir and his collaborators designed oxygen-containing particles that would dissolve as soon as they hit the bloodstream. They tested the microbubbles in rabbits breathing air low in oxygen. Within seconds of receiving the microbubbles, the **levels of oxygen in the rabbits' blood rose from a dangerously low 70% to nearly 100% saturation, the ideal level**.



Just breathe...
an injected microparticle (yellow) can hand off oxygen molecules to red blood cells (red) to carry throughout the body.

Studies on the Properties and Real Existence of Aqueous Solution Systems that are Assumed to Have Antioxidant Activities by the Action of "Active Hydrogen"

Atsushi Hiraoka,^{*,a} Masumi Takemoto,^a Takahiro Suzuki,^a Atsuko Shinohara,^b Momoko Chiba,^b Mika Shirao,^c and Yoshihiro Yoshimura^d

^aDepartment of Pathological Biochemistry, Kyorin University School of Health Sciences, 476 Miyashita-cho, Hachioji-shi, Tokyo 192-8508, Japan, ^bDepartment of Epidemiology and Environmental Health, Juntendo University School of Medicine, 2-1-1 Hongo, Bunkyo-ku, Tokyo 113-8421, Japan, ^cDepartment of Human Nutrition, Jissen Women's College, 1-13-1 Shinmei, Hino-shi, Tokyo 191-0016, Japan, and ^dDepartment of Analytical Chemistry, Faculty of Pharmaceutical Science, Hoshi University, 2-4-41 Ebara, Shinagawa-ku, Tokyo 142-8501, Japan

(Received March 2, 2004; Accepted June 9, 2004)

We evaluated the properties and real existence of **an electrolyzed-reduced water**, which we prepared, and three commercially purchased water goods, that are advertised to have antioxidant activities by the action of "active hydrogen," on the basis of the results of examinations for inhibitory effects on the oxidative reactions of biomolecules, quantitative analyses of the minerals, and the ESR spectral data in measurement of the scavenging ability for reactive oxygen species. The results suggested that all of the examined aqueous solution systems **undoubtedly have antioxidant activities *in vitro*** and that such effects are derived from ordinary molecular hydrogen (hydrogen gas) and/or (a) reductive vanadium ion(s). "Active hydrogen" seems to be absent as an effective component of the antioxidant activities of these aqueous solution systems.

Key words ——— reduced water, antioxidant activity, oxygen-radical scavenger, ESR spectrometry, hydrogen, vanadium

Hydrogen acts as a therapeutic antioxidant by selectively reducing cytotoxic oxygen radicals

Ikuroh Ohsawa¹, Masahiro Ishikawa¹, Kumiko Takahashi¹, Megumi Watanabe^{1,2}, Kiyomi Nishimaki¹, Kumi Yamagata¹, Ken-ichiro Katsura², Yasuo Katayama², Sadamitsu Asoh¹ & Shigeo Ohta¹

Acute oxidative stress induced by ischemia-reperfusion or inflammation causes serious damage to tissues, and persistent oxidative stress is accepted as one of the causes of many common diseases including cancer. We show here that hydrogen (H_2) has potential as an antioxidant in preventive and therapeutic applications. We induced acute oxidative stress in cultured cells by three independent methods. H_2 selectively reduced the hydroxyl radical, the most cytotoxic of reactive oxygen species (ROS), and effectively protected cells; however, H_2 did not react with other ROS, which possess physiological roles. We used an acute rat model in which oxidative stress damage was induced in the brain by focal ischemia and reperfusion. The inhalation of H_2 gas markedly suppressed brain injury by buffering the effects of oxidative stress. Thus H_2 can be used as an effective antioxidant therapy; owing to its ability to rapidly diffuse across membranes, it can reach and react with cytotoxic ROS and thus protect against oxidative damage.

Oxidative stress arises from the strong cellular oxidizing potential of excess reactive oxygen species (ROS), or free radicals^{1–5}. Most of the superoxide anion radical ($O_2^{\bullet-}$) produced is generated in mitochondria by electron leakage from the electron transport chain and the Krebs cycle⁶. $O_2^{\bullet-}$ is also produced by metabolic oxidases, including NADPH oxidase and xanthine oxidase⁷. Superoxide dismutase converts $O_2^{\bullet-}$ into hydrogen peroxide (H_2O_2)⁸, which is detoxified into H_2O by

RESULTS

H_2 selectively reduces $\bullet OH$ in cultured cells

H_2 reduces the $\bullet OH$ that is produced by radiolysis or photolysis of water¹²; however, whether H_2 can effectively neutralize $\bullet OH$ in living cells has not been directly investigated. As the cellular damage produced by spontaneous generation of $\bullet OH$ is not sufficient to be detectable, we induced $O_2^{\bullet-}$ production in BCL2 cultured cells. To do

The hydrogen highway to reperfusion therapy

Katherine C Wood & Mark T Gladwin

Hydrogen gas debuts as a selective antioxidant with explosive potential as cytoprotective therapy for ischemia-reperfusion injury and stroke.

Just when we thought we had exhausted our tool kit of therapeutic gases, Ohsawa *et al.*¹ provide evidence that inhaled hydrogen gas (H_2) has antioxidant and antiapoptotic activities that protect the brain against ischemia-reperfusion injury and stroke¹.

During the ischemic phase of thromboembolic stroke, a blood clot travels to and lodges in the distal blood vessels in the brain, blocking blood flow to the oxygen-starved tissue for a period of hours. This is followed by the reperfusion phase, when the blood clot is broken down by natural or pharmacological means and blood flow is restored. Although restoration of blood flow is critical, the reintroduction of molecular oxygen triggers a cytotoxic cascade during which reactive oxygen species are generated by the mitochondria. This burst of reactive oxygen species irrevocably drives downstream signaling networks that lead to cellular necrosis and apoptosis. For both stroke and myocardial infarction, there are now highly successful approaches to restore blood flow to the ischemic tissue. So far,

however, we have completely failed to relieve this pathological cascade of oxidative damage after reperfusion injury. In this issue, Ohsawa *et al.*¹ report that highly diffusible hydrogen gas can target intracellular sources of reactive oxygen species and dose-dependently inhibit reperfusion-induced oxidative damage.

Numerous studies have consistently demonstrated a burst of reactive oxygen species on restoration of blood flow after a stroke^{2,3}. Reactive oxygen species, such as superoxide, have been suggested to be the primary activator of the mitochondrial permeability transition pore, a large multiprotein conductance channel⁴. The opening of this channel causes a loss of membrane potential, mitochondrial swelling with membrane rupture, cytochrome C release and apoptotic cell death.

After ischemic damage to the mitochondrial electron transport chain, there is inefficient transfer of electrons to molecular oxygen, leading to the generation of superoxide. What's more, activation of superoxide-producing enzymes, such as xanthine oxidase and NADPH oxidase, following isch-

respiratory complexes I and III prevent reperfusion reactive oxygen species generation and improve cellular viability⁵⁻⁷.

The lightweight gas diatomic hydrogen (H_2), a major component of interstellar space and the fuel that sustains the stars, is rare on Earth. Hydrogen gas directly and violently reacts with oxidizing elements such as chlorine and fluorine and is highly flammable, a property evident in the 1937 Hindenburg zeppelin fire and its use as propellant fuel for the space shuttle. Hydrogen gas is highly diffusible and reacts with hydroxyl radical to produce water⁸.

Ohsawa *et al.* set out to see if hydrogen gas could be used as a therapeutic mitochondrial antioxidant to neutralize oxidative stress after ischemia-reperfusion injury¹. To induce the production of reactive oxygen species, the authors treated cultured cells with a mitochondrial respiratory complex I inhibitor or subjected them to oxygen or glucose deprivation. After oxidative damage, cells underwent pathological mitochondrial depolarization, ATP depletion, DNA oxidation, lipid peroxidation, and cellular necrosis and apoptosis

Effectiveness of Hydrogen Rich Water on Antioxidant Status of Subjects with Potential Metabolic Syndrome—An Open Label Pilot Study

Atsunori Nakao^{1,*}, Yoshiya Toyoda¹, Prachi Sharma², Malkanthi Evans² and Najla Guthrie²

¹*Heart, Lung and Esophageal Surgery Institute, Department of Surgery, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, 15213, USA*

²*KGK Synergize, Inc., London, ON, postal code, Canada, N6A 5R8*

Received 15 October, 2009; Accepted 6 November, 2009; Published online 24 February, 2010

Summary Metabolic syndrome is characterized by cardiometabolic risk factors that include obesity, insulin resistance, hypertension and dyslipidemia. Oxidative stress is known to play a major role in the pathogenesis of metabolic syndrome. The objective of this study was to examine the effectiveness of hydrogen rich water (1.5–2 L/day) in an open label, 8-week study on 20 subjects with potential metabolic syndrome. Hydrogen rich water was produced, by placing a metallic magnesium stick into drinking water (hydrogen concentration; 0.55–0.65 mM), by the following chemical reaction; $\text{Mg} + 2\text{H}_2\text{O} \rightarrow \text{Mg}(\text{OH})_2 + \text{H}_2$. The consumption of hydrogen rich water for 8 weeks resulted in a 39% increase ($p < 0.05$) in antioxidant enzyme superoxide dismutase (SOD) and a 43% decrease ($p < 0.05$) in thiobarbituric acid reactive substances (TBARS) in urine. Further, subjects demonstrated an 8% increase in high density lipoprotein (HDL)-cholesterol and a 13% decrease in total cholesterol/HDL-cholesterol from baseline to week 4. There was no change in fasting glucose levels during the 8 week study. In conclusion, drinking hydrogen rich water represents a potentially novel therapeutic and preventive strategy for metabolic syndrome. The portable magnesium stick was a safe, easy and effective method of delivering hydrogen rich water for daily consumption by participants in the study.

**COMING
SOON!**

ZEO GOLD "Enhanced"



Medical Applications of Zeolite (pg 1141).

Zeolites are among the most important inorganic cation exchangers.

The aluminosilicate structure is negatively charged and attracts cations that come to reside inside the pores and channels.

Zeolites have large empty spaces, or cages, within their structures that accommodate large cations, such as Na⁺, K⁺, Br⁺, and Ca⁺, and even large molecules and cationic groups, such as water, ammonia, carbonate ions, and nitrate ions. The basic structure of zeolites is biologically neutral.



ZEO GOLD ENHANCED

Advanced Zeolite Product containing an Advanced MicroHydro Colloidal Zeolite, with Cation Exchange ActiVator, Bio En'R-G'y C, GMS Ribose, And Glutathione Lipolate.

Zeo Gold uses a Purified, Micronized HydroColloidal certified Food Grade form of Zeolite. It was formed in petrified bubbles of the clinoptilolite volcanic rock providing ultra high surface area and higher CEC (cation exchange capacity) for more effective utilization that any other clinoptilolite with or without nano sizing.

When MicroHydro Zeolite CEA (Cation Exchange ActiVator™) is added to water, the pH shifts to a slightly alkaline state as multitudes of negative ions, as stable **MICROBUBBLES** cascade into solution. The effect is a rapid change of the oxidation - reduction potential (ORP) toward the high negative millivolt range.

The resulting beverage provides exceptionally powerful electron donating properties, by donating more than 105 Active Nutritional Hydrogen Minus electrons for possible enzyme, ROS/free radical scavenging (oxidative stress), Detox, and Energy Enhancing functions.

THE ENHANCED ZEOLITE that creates negatively charged micro-bubbles of Hydrogen.

Hydrogen is the most needed nutrient as it assists in maintaining the **electrical balance** that enables cell structures to communicate and function properly.

When MicroHydro Zeolite CEA (cation exchange activator) is added to water, the pH shifts to a slightly alkaline state as multitudes of negative ions, as stable **MICROBUBBLES**, cascade into solution.

The effect is a rapid change of the **oxidation-reduction potential (ORP)** toward the high negative millivolt (mv) range.

M.I.C.E. = Magnetically Induced Cellular *EXERCISE*

Advanced Detoxification

*With Electro-Nutrient Therapy (ENT) requiring
PEMF as M.I.C.E (Magnetically Induced Cellular Exercise)*



*Active H-Minus Hydrogen
Bio En'R-Gy' - C
Beyond Chelation Improved (BC-I)
Zeo-Gold*

*Zeo-Gold
Bio En'R-Gy' - C
Beyond Fiber
EDTA (calcium edta)*

J Altern Complement Med. 2007 Nov;13(9):955-67.

Can electrons act as antioxidants? A review and commentary.

Oschman JL. PMID: 18047442 [PubMed - indexed for MEDLINE]



It is well established, though not widely known, that the surface of the earth has a limitless and continuously renewed supply of free or mobile electrons as a consequence of a global atmospheric electron circuit.

Wearing shoes with insulating soles and/or sleeping in beds that are isolated from the electrical ground plane of the earth have disconnected most people from the earth's electrical rhythms and free electrons.

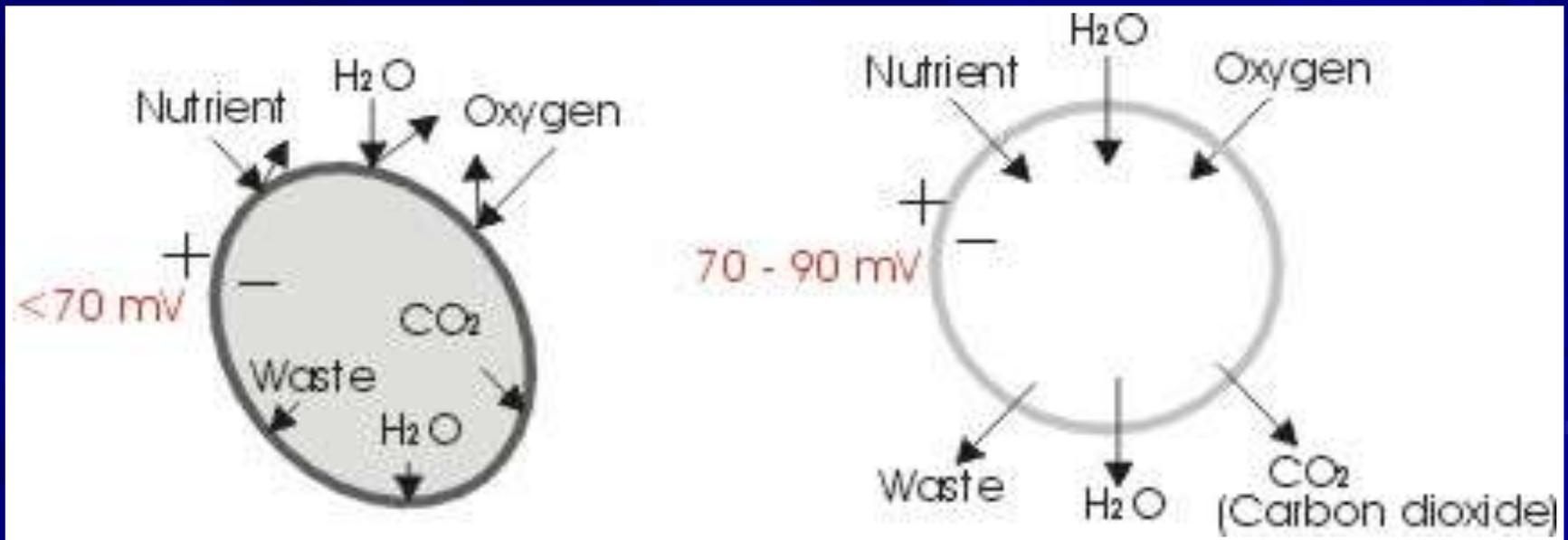
Studies have demonstrated that connecting the human body to the earth during sleep (earthing) normalizes the daily cortisol rhythm and improves sleep. It is also suggested that free electrons from the earth neutralize the positively charged free radicals that are the hallmark of chronic inflammation. The research summarized here and in subsequent reports provides a basis for a number of earthing technologies that restore and maintain natural electrical contact between the human body and the earth throughout the day and night in situations where going barefoot on the earth is impractical.

It is proposed that free or mobile electrons from the earth can resolve chronic inflammation and pain by serving as natural antioxidants.

PEMF Exercise Therapy can Increase the Effectiveness of Anti-oxidants 100 Fold!

PEMF creates a Negative-Potential energy field to induces subtle current flows and generate a very large amount of negative ions inside human body. Negative Ions stimulate the activity of the **Na⁺/K⁺-ATPase** to enhance **Na⁺/K⁺ pump** and to maintain the cell potential at 70 – 90 mV.

Increasing cellular energy and membrane potential assists in uptake of oxygen, H₂O, anti-oxidants and other critical nutrients into the cell...while toxins, cellular waste and carbon dioxide are purged.



Low energy "sick" cell < 70mV

Normal healthy cell = 70-90 mV

Electromagnetic Therapy

for energy production and cellular detoxification

In an article published in *Plos One*, November 2010, volume 5, issue 11 (Wang), page 4, Johns Hopkins' researchers found a **38% increase** in ATP production in P12 cells that were placed in a static magnetic field device that we supplied.

This increase could be much higher *in vivo* with the brain's pulsed DC electromagnetic field interacting with an enhanced earth-type field resulting in increased resonance of the mitochondria. All of this leading to enhance electron transfer in the creb cycle resulting in more ATP production.

↑ ATP equals ↑ Na⁺ K⁺ pump function
which leads to ↑ charge of the cell
wall and ↑ metal excretion.

The Case Against Detoxing

Why detoxing can actually make your body more toxic...

Most toxins are stored in your fat cells. When you begin a detox program, you pull these toxins out of your fat cells and into your bloodstream, where they can travel through your body to your vital organs, your brain, invade your joints and tissues, triggering pain and inflammation, cause headaches, memory loss and premature brain aging.

And they can invade your heart, where they can cause blood pressure problems.

Because these toxins do not dissolve in water, your body cannot eliminate them easily. Before it eliminates them, it has to make them water-soluble. Your liver makes the toxins water-soluble so they can be excreted in the urine or via the bile. That's why your bile is full of toxins. Every day, your liver dumps bile into your intestines so the toxins can be eliminated through your stool.

The problem is that the toxins must first bind with fiber in your intestines. And if you don't eat enough fiber, the toxins are simply re-absorbed through your intestines, and sent right back into your body!



FIGHT for Your Health with Dr. Gordon's Power Drink

Beyond Fiber - 1 rounded tsp

Bio En'R-G'y C - 1 rounded tsp

MACA Powder - 1/2 tsp

**Dr. Gordon's Organic
Best of Greens - 1 rounded tsp**

ZeoGold* - 1 capsule (twist open and dissolve in drink)



Detoxification is a LIFETIME challenge

LEAD in bones requires years of continuous oral chelation with EDTA and/or Zeolite.

Because bones take an average of 15 years to fully regenerate, IV EDTA chelation therapy over several months only removes lead and other toxic metals from the body's blood and tissues, NOT from bones.

Harvard studies prove that bone lead leads to heart disease and cataracts, as Bones are the MAJOR storehouse of lead in the body.

**For more information see the
507 References Supporting Oral EDTA**

On the Gordon Research Institute Website at

www.gordonresearch.com

FACT Membership is FREE to any Qualified Health professional desiring to achieve **OPTIMAL WELLNESS** for themselves and their clients. This includes Nurses, Nutritionists, Scientists, Researchers, and others on a case by case basis.



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Next Energy Medicine Webinar on 3/4/2013

Join Dr. Gordon on Monday, 3/4/13 at 3 pm AZ time. "Energy Medicine, Lasers and Degenerative Disease." Click photo.



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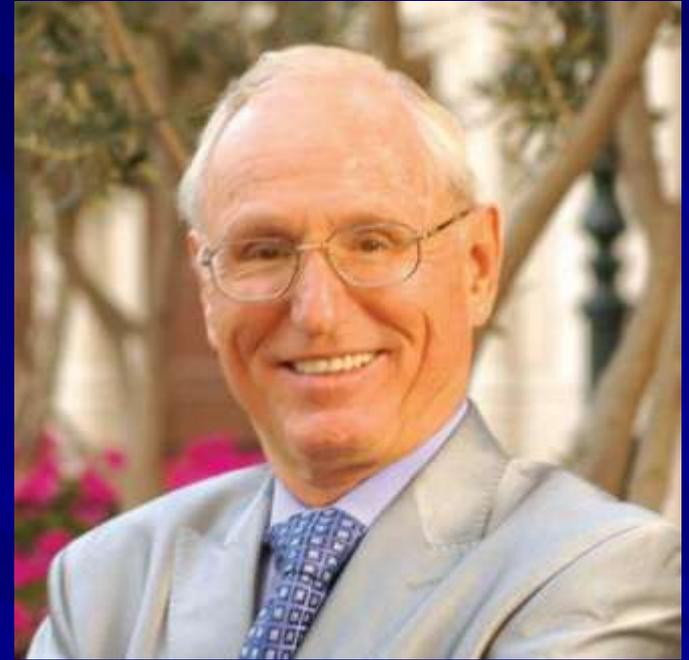
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**More on Humic Acid in NEXT WEBINAR to follow
ON TUES APRIL 23rd at 3:00 PM (AZ)**

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Fee is \$300 per 1/2 hour.

Appointments may include a review of all prior medical records and/or any new tests that can be ordered in preparation for your personalized consultation. Test panels can be more focused on ANTI-AGING, or cancer, depending on your concerns.

Since Dr. Gordon does not accept insurance, he has made arrangements for cash paying patients to obtain substantial discounts of 70% or more for any blood tests that he orders. In Addition, Dr. Gordon now offers the most advanced and comprehensive 72 gene test panel available anywhere for \$425.

For more information please contact Gordon Research Institute
Ph 928-472-4263 x134, Fax 928-474-3819,
or email info@gordonresearch.com

THANK YOU



Garry F. Gordon MD, DO, MD(H)