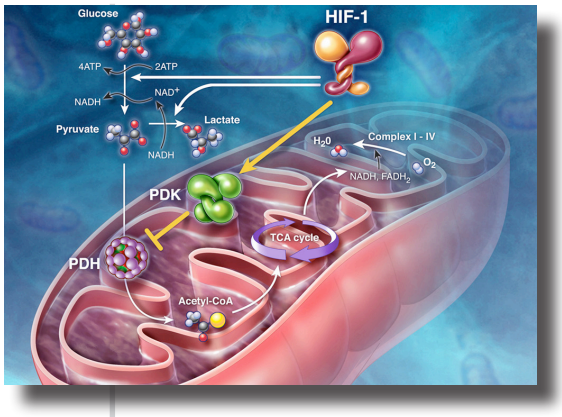
Mitochondrial Dysfunction and the NO/ONOO Cycle

FEATURING THE PARADIGMS OF MEDICINE

by Dr. Jack Tips

We live and die at the cellular level. Here is the 2nd Report about how Systemic nutrition addresses the modern-day plight of the cells as integral, if not foundational, to virtually all chronic disease. The first entitled, "*Free-Radicals and Mitochondrial Dysfunction: The Hidden Cause of Aging & Disease*" featured the Systemic ROX formula – a broad-spectrum anti-oxidant complex with Resveratrol. This 2nd Report is specific to Systemic's **EPIC** formula **– (Metabolic NO/ ONOO micro-antioxidant)**. The two formulas work together to provide critical components toward the mastery of the body's greatest challenge – the current onslaught of factors that damage the powerhouses of life's chemical energy—the mitochondria.




Dr. Shayne Morris

On the next page is a synopsis of a 2008 research study. It reflects Systemic Formula's mission for 2011 – *Total Support For Optimal Cellular Health* and that mission includes: **anti-inflammatory solutions, cell membrane support, mitochondrial mtDNA[1] repair, mitochondrial ATP[2] production, nucleus nDNA[3] repair, and methylation**. Systemic is a world leader of nutritional support for cellular health—cell membranes, organelles, nucleus and RNA/ DNA. Today Systemic's Product Development department, under the guidance of Doc Wheelwright's grandson, Dr. Shayne Morris, is developing cutting-edge herbal nutritional formulas to address the most critical challenges faced by patients, and thus natural health clinicians.

Cellular nutrition funds both cellular energy and the myriad cellular functions that support life stemming from the body's innate optimal health blueprint. This blueprint is encoded in the DNA and its expressions are elicited by the epigenetic matrix. Properly supported cells reward the body with vital energy, optimal function, graceful aging, accurate self-regulation, regeneration, clear thinking, inner strength, and that great 'well-being' feeling everyone desires. The cellular level is where clinicians must win each case for genuine and lasting health improvements. The cellular level is where we must address the *NO/ONOO* cascade of free-radical damage and inflammation that begins as the body's perfect reaction to the environmental challenges and rigors of life in the 21st Century, and becomes the seat of auto-immune diseases, aging, and chronic ailments when the process is unable to shut off itself.

mDNA and the Whole Cell. The mitochondria are much more than an "ATP energy factory" for the cells. It takes 3000 genes to make a mitochondrion. The mitochondrion itself only encodes 37 of the 3000 genes and the rest are encoded in the cell nucleus and then those resulting proteins are transported to the mitochondria. Of the 3000 mitochondrial genes, only 100 are used for making ATP. The remaining 2900 genes are used for specific duties associated with the cell's specialization. These differentiated cellular duties change over time,

1 mtDNA – the mitochondria's unique DNA, different from the cell's nuclear DNA.
2 ATP (Adenosine TriPhosphate) – the chemical energy of life manufactured in the cell's mitochondria organelles.
3 nDNA – the genetic code inside the cell's nucleus.

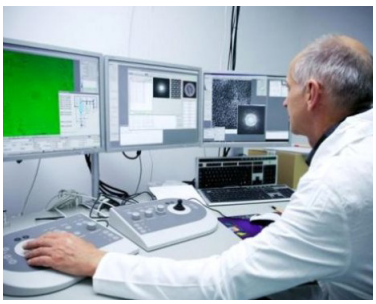
childhood to adulthood, and the mtDNA is intimately involved with the various cellular metabolic functions—the manufacture, building, breaking down, and recycling of the molecular building blocks. The mitochondria are engaged with cholesterol metabolism, estrogen/testosterone synthesis, detoxifying ammonia, assembling *heme* for hemoglobin, detoxification, and controlling the rate of cell metabolism[4]. Mitochondrial diseases are even more complex in adults because detectable changes in mtDNA occur as we age and, conversely, the aging process itself may result from deteriorating mitochondrial function. Additionally, mitochondrial diseases are tissue specific making the diagnosis even more difficult if you are not familiar with how abnormal mitochondrial function manifests in people. This means that dysfunctional mitochondria affect the entire cell, and the cell affects the tissue performance. *Maintaining healthy mitochondria is synonymous with maintaining good health.*

Depending on which cells are affected, symptoms of mitochondria dysfunction include: loss of motor control, muscle weakness and pain, gastro-intestinal disorders, difficulty swallowing, poor growth, fatigue, poor memory, cardiac disease, liver disease, respiratory difficulties, seizures, visual/hearing problems, diabetes, lactic acidosis, developmental delays and susceptibility to infection, to name a few.

Tissue Support Is Essential. Diseases of the mitochondria cause the tremendous damage to cells of the brain, heart, liver, skeletal muscles, kidneys, the entire endocrine, and respiratory systems. This means that frequent companions to the EPIC formula are tissue-targeted formulas: B (Brain), HQ (Heart Energy), KYRO (Muscle/Ligament), K (Kidney), Ga (Adrenal), Gf (Thyroid), Gb (Pituitary), F+ (Female), M+ (Male Endocrine), P (Pancreas), and R (Lung).

The following research study reveals a deeper cause of people's 'energy crises' and how natural health clinicians are indeed the vanguard of "The Solution." In a very tight correlation medical science affirms that **MITOCHONDRIAL DYSFUNCTION = CHRONIC, DEGENERATIVE, and AUTOIMMUNE DISEASE**. Here we'll look at solutions to the growing body of knowledge that links mitochondrial diseases to the terrible health afflictions affecting millions of people today. We live in exciting times where the latest scientific research testifies, again and again, that nutrition and Nature's therapies best address the consequences of living in a polluted environment, and are indeed the true medicine for human health.

From: American Journal of Biochemistry and Biotechnology 4 (2): 208-217, 2008. "*Evidence of Mitochondrial Dysfunction in Autism and Implications for Treatment*" by Daniel Rossignol, Jeffrey Bradstreet, Melbourne, FL 32934.



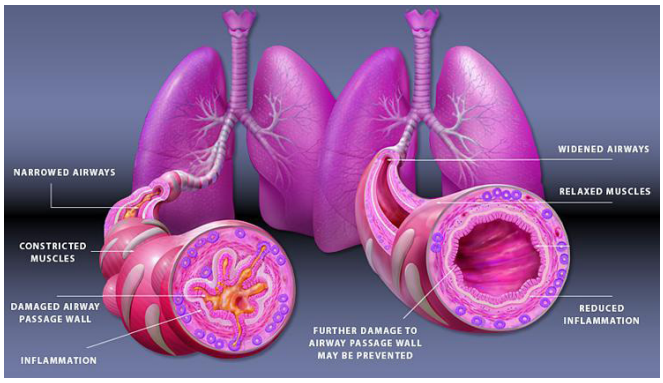
Classical mitochondrial diseases occur in a subset of individuals with autism and are usually caused by genetic anomalies or mitochondrial respiratory pathway deficits. However, in many cases of autism, there is evidence of mitochondrial dysfunction (MtD) without the classic features associated with mitochondrial disease. MtD appears to be more common in autism and presents with less severe signs and symptoms. It is not associated with discernable mitochondrial pathology in muscle biopsy specimens despite objective evidence of lowered mitochondrial functioning. Exposure to environmental toxins is the likely etiology for MtD in autism. This dysfunction then contributes to a number of diagnostic symptoms and comorbidities observed in autism including: cognitive impairment, language deficits, abnormal energy metabolism, chronic gastrointestinal problems, abnormalities in fatty acid oxidation and increased oxidative stress. MtD and oxidative stress may also explain the high male to female ratio found in autism due to increased male vulnerability to these dysfunctions. Biomarkers for mitochondrial dysfunction have been identified, but seem widely underutilized despite available therapeutic interventions. Nutritional supplementation to decrease oxidative stress along with factors to improve reduced glutathione, as well as hyperbaric oxygen therapy represent supported and rational approaches. The underlying pathophysiology and autistic symptoms of affected would be expected to either improve or cease worsening once effective treatment for MtD is implemented.

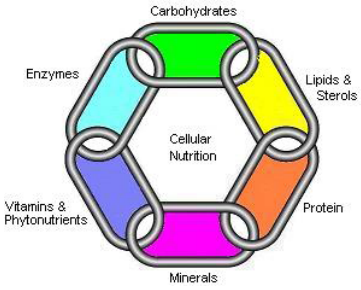
While the above research is focused on autism and the

4 Robert Naviaux's "*Overview, the Spectrum of Mitochondrial Disease" in the Mitochondrial and Metabolic Disorders,* Primary Care Physician's Guide, 2nd ed.

brain's mitochondria, it quickly affirms the key points:

1) The toxic environment (pesticides, vaccinations, air and water pollution, food additives, ionizing radiation, etc.) and the resulting free radicals are directly responsible for many of the modern diseases via mitochondrial (mtDNA) damage.





2) Localized free-radical damage and inflammation occurs in specific tissues resulting in malfunction of core life processes. (This is the NO/ONOO cycle of endless, self-perpetuating damage within the cells).

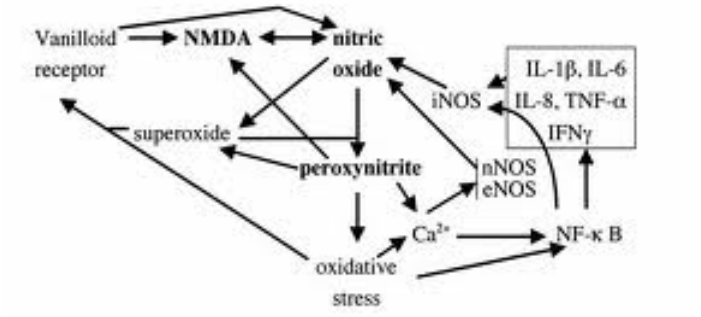
3) Specific tissue malfunction comes from mitochondrial dysfunction.

4) Mitochondrial dysfunction is the "cause" of practically all of the chronic, degenerative diseases.

5) The best treatments are nutrition and nutritional supplements.

The NO/ONOO Cycle – In a Nutshell.

When the body experiences a severe stress such as a pathogenic illness (virus, bacteria, toxoplasmosis), injury, psychological stress, or environmental poisoning (pesticides), it reacts with a localized inflammation process that starts with the highly effective cell-signaling molecule, Nitric Oxide (NO), that unleashes the body's healing processes (immune system repair faculties). NO serves the body in many capacities and is necessary for many healthy tissue functions particularly for the cardiovascular system. The immune system's phagocytes (monocytes, neutrophils, macrophages) utilize NO as a free radical to kill virus and bacteria.



However, NO is a free-radical/oxidizing molecule (seven electrons from nitrogen and eight electrons from oxygen leaving an unpaired electron): a destructive agent when there is not enough superoxide dismutase, glutathione, and catalase available to donate an electron to nullify its potentially damaging free-radical activity whereby the mitochondria are injured or destroyed. If there is an overabundance of NO released, as often happens from injuries, illnesses, and psychological trauma; NO can react with a free radical called "super oxide" and a very damaging free radical molecule is born called "peroxynitrite" (ONOO).

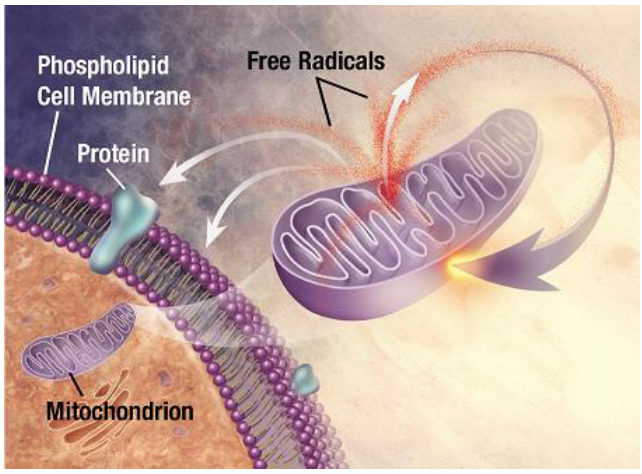
Not only is peroxynitrite damaging to the body, but there are 22 permutations of three primary metabolic pathways that turn ONOO back into NO, and the process starts all over again with increasing cell damage and increasing disease processes.

Asthma. For example, the inflammation of acute asthma is based on NO which is responsible for the extent of airway inflammation.

Once the NO/ONOO cascade gets started, it perpetuates itself and, according to the medical researcher, Dr. Martin Pall's groundbreaking research, demonstrates that the NO/ONOO cascade is the process that causes: Chronic Fatigue Syndrome, Fibromyalgia, Multiple Chemical Sensitivities, and Post Traumatic Stress Syndrome. Additionally, this process underlies the dreaded Chronic Degenerative Diseases and Autoimmune Diseases. All such conditions can be improved by antioxidant supplementation.[5]

5 Am. J. Respir. Crit. Care Med., Volume 164, Number 10, November 2001, 1823-1828 Dietary Antioxidants and Asthma in Adults / Population-based Case-Control Study, Seif Shaheen, Jon Sterne, Rachel Thompson, Christina Songhurst, Barrie Margetts, Pete Burney

Finally, A Solution for Fibromyalgia and Chronic Fatigue Syndrome! Dr. Pall also states that the solution to the NO/ONOO cascade is nutritional with a focus on anti-oxidants and glutathione precursors.



To summarize the NO/ONOO situation: poor dietary practices (Standard American Diet) means there is a pandemic deficiency in phytonutrients (*organic* raw fruit and vegetables) that provide antioxidants to the body. The environment is rampant with free-radical-generating chemicals. Coupled with the stresses and rigors of life in the 21st Century, this is a very concerning equation: < nutrition/antioxidants + onslaught of free radical toxins in food, water, air, (practically everywhere) = NO/ONOO cascade = pain, suffering, degenerative diseases.

A huge concern regarding the NO/ONOO free-radical cascade is that the mitochondria are vulnerable to damage. When the mitochondria become damaged, they can no longer make the energy – ATP (Adenosine Tri-Phosphate) required for cellular function. And worse, mitochondrial dysfunction leads to apoptosis (voluntary cell death) or aberrant cells that cannot perform tissue function and are candidates to become rogue, aberrant cells associated with fibrous/tumorous developments. This is also the basis of Fibromyalgia and Chronic Fatigue—two conditions that have puzzled medical researchers and natural health clinicians alike.

The Solution Already Exists!

Unlike the situation where a disease is "discovered" and then medical researchers work to find a suppressive drug and call it a "solution" or "cure", the new medical disease category, "Mitochondrial Diseases"—currently the topic of massive research—already has a viable solution. Medical practitioners must wait for the pharmaceutical companies to make and patent a synthetic, symptom-suppressive drug before they have a treatment for this new disease paradigm—Mitochondrial Disease and Dysfunction—unless they embrace the tenets of the body's healing laws and give the body the nutrition and nutritional therapeutics (antioxidants, B-Vitamins, herbs, nutriments) it requires to heal itself and restore its innate metabolic balance.

The 21st Century Paradigms of Disease.

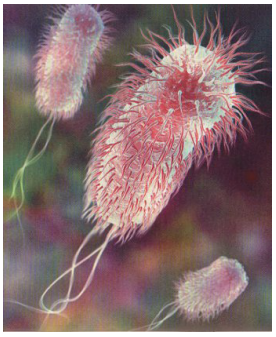
The medical institution teaches that there are limited 20th Century paradigms of disease. Today, there are emerging paradigms—**Mitochondrial Dysfunction Diseases**. Chronic, localized inflammation/free radicals based on the NO/ONOO cascade is the primary process of mitochondrial damage that stems from environmental toxins (heavy metals, pesticides), injuries and ionizing radiation (cell phones, X-rays, microwave communications, radar, etc). This is the process whereby cell phones are causing brain tumors – a very localized NO/ONOO process starts due to the antenna's ionizing radiation that damages mtDNA in susceptible people (everyone who eats the SAD), and continues its cellular inflammation and destruction for years.

This means that the medical model of disease has, loosely, nine paradigms or categories. And now there is a new proposed paradigm as pharmaceutical companies scramble to patent mitochondrial drugs. Of course there are many other paradigms needed if medicine is going to meet the challenges of the 21st Century – paradigms that encompass the tenets of bio-energy (acupuncture, homeopathy, Systemic herbology) and the body's innate intelligence (vital force). The current challenge for medicine is all the '*no known cause, no known cure*' diseases that are slipping through the cracks of the medical model – the very diseases that are killing millions of people each year. And now, this newly proposed paradigm scoops them all up as "mitochondrial diseases" and we find that this new paradigm is involved in all the other paradigms, so it holds great promise for more effective medical regimens.

Medicine's Paradigms of Disease. Let's take a look at the main Medical Paradigms of Disease, and while doing so, we can better understand the evolution of the natural health

movement as it, too, has attempted to address each of the paradigms with natural remedies.

Paradigm #1. Infectious disease. This refers to all the pathogens such as bacteria, mycobacteria, virus, fungus, parasites, and other intelligent organisms that infect the body, particularly when the terrain (pH, toxicity in the extra-cellular matrix) is favorable to their proliferation. In natural health we understand that the actual role of many pathogens in Nature is not to hurt people, but to help the body clean up debris (*aka* toxins in the terrain). And yes, there are dangerous pathogens and parasites (e.g. *Wuchereria bancrofti*, *Brugia malayi*, and *B. timori* that cause elephantiasis, and *plasmodium* species that causes malaria) seeking a suitable host that must be eliminated before health can be restored. (This is why detoxification is so important—it cleans the terrain so the pathogens are not invited in to do that job).



Medicine treats all pathogens as enemies and has developed powerful weapons to kill them, often with alarming side effects. When the cell membranes are not inflamed and the mitochondria make ample ATP, cells maintain a clean terrain and have the energy to defend themselves from pathogens as well as signal the immune system for proper support.

Pathogenic cause of the no/onoo cycle: EPIC. Key support formulas: #3, GOLD, VIVI, #4, Cats-A-Tonic, EV, ABC.

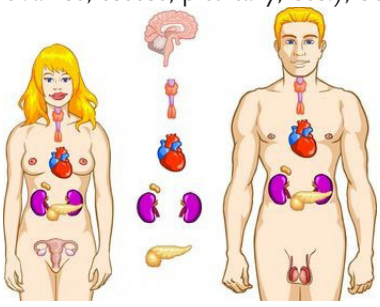
Paradigm #2. Genetic disease. Illnesses that come from genetic abnormalities. There are over 4000 diseases that can result from a single gene defect. This includes a new and important interest for medicine —the mitochondrial diseases—because the mitochondria have their own genetics and must maintain and repair their own genetic code. While medicine investigates gene splicing and identification of the genome position of various genetic expressions, the body has an inherent method to repair and maintain both the nucleus' nDNA as well as the mitochondrial mtDNA. The enzymes and peptides that repair DNA require abundant ATP, cellular identity factors, and basic nutrition at the cellular level.

Key formulas: EPIC to allow cells to repair DNA, MoRS for methylation support. Other support formulas: The appropriate BioFunction formula, HQ, ROX, and ACCELL Ther.

Paradigm #3. Nutritional deficiency diseases. This refers to diseases such as scurvy, beriberi, iron deficiency anemia, pellagra, rickets, etc. where the body expresses a disease because of a lack of a vitamin or mineral, and cures itself very quickly when the required nutrient is provided dietarily. Understanding that nutritional deficiencies can lead to overt disease begs the question, "What about suboptimal nutrition, as opposed to overt deficiency, being a factor in many diseases?" The role of nutrition is to provide the body with the building blocks of health as well as the fuel for energy—ATP. See: *The Pro-Vita! Plan For Optimal Nutrition* (www.apple-a-day-press.com)

Nutritional deficiency initiating the NO/ONOO cycle: EPIC. Key support formulas: All BioNutriments (Blue Label), ACCELL Ther, ACCELL Meal

Paradigm #4. Hormone dysfunction diseases. This Paradigm encompasses the entire neuro-endocrine, endocrine and exocrine processes of hormone messengers and the body's ability to regulate its metabolism. The largest issue here is not the hormone producing tissue (thyroid, ovaries, testes, pituitary, etc.), but the ability of the targeted cells to receive the hormone messengers. If the messenger is blocked at the cell membrane by toxins (particularly pesticides and the resulting cellular inflammation), then the message never gets delivered and hormonal mayhem results. The cells require ATP to manage their membranes, induct nutrients through the cell membrane (active transport), and handle toxic molecules. Detoxification of the extracellular



matrix allows better hormone receptivity by the cells. Better communication solves many of the body's regulatory issues.

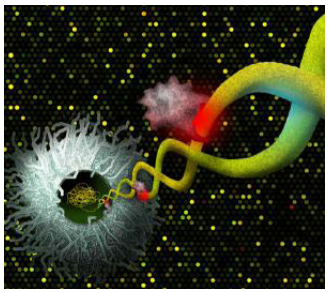
Hormonal dysfunction as a result of inflamed cells and the NO/ONOO cycle: EPIC, ROX. Key support formulas: Gb, B, #1, ACX, CLNZ, REL . Adjunctive support: Gf, Ga, F+, Fpms, Gt, P, M+, M+X, DV3.

Paradigm #5. Allergies. This paradigm deals with an immune system disorder of hypersensitivity to what should be harmless substances (food, environment). Here, medicine grapples with allergens, antigens, and antibodies to help desensitize (suppress) the immune system regarding pollens, foods, and environmental products. Underlying all unnecessary allergic inflammations (hives, asthma, hay fever, eczema) is the role the cells play in alerting the immune system via messenger molecules and the need for ATP for proper cell signaling.

Allergies can be viewed as: 1) a lack of proper cellular communication, 2) errant communications (lack of alphabet), 3) cellular miscommunication resulting in an over-exuberant immune response. Nutrition supports proper communication, helps avoid errant communications, and thus ensures that proper messages are sent and received, even with allergy-sensitive genomes.

Allergic responses based on cellular inflammation and the NO/ONOO cycle: EPIC, ROX. Key support formulas: ACX, L, Ls, Ga, DV3.

Paradigm #6. Autoimmune diseases. This paradigm addresses when the immune system's lock-and-key system becomes errant and the immune system finds that its keys fit the body's own tissues – a big mistake in communication and construction of antigen/antibody systems, unless the cells need to be destroyed due to damaged DNA. If cells are continuously being damaged by the NO/ONOO cycle, the immune system learns that it must keep destroying aberrant cells to prevent free-radical pathologies. Thus if the immune system attacks the thyroid gland, medicine can label it Hashimoto's Disease; if the immune system attacks the joints, it's medically labeled as Rheumatoid Arthritis; if the

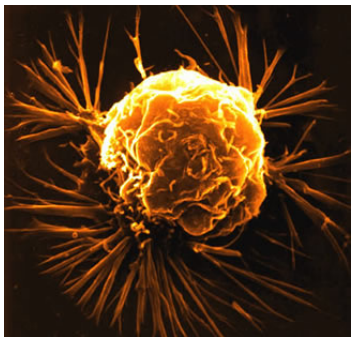


immune system attacks the intestines, it's called Crohn's Disease by diagnosing physicians, and so forth.

Why did the immune system get the message to attack something necessary to the body? One theory is that 'leaky gut syndrome' can be a factor where particles of food enter the bloodstream before they are properly digested and trigger the immune system's reaction. [There are reports[6] of commercial cow milk being linked to the autoimmune destruction of the beta cells (insulin producers) in the pancreas.] Another theory is that the cell-signals from an ailing tissue are improperly constructed or confused. Cells require adequate ATP and good nutrition (glycopeptides) to operate its signaling processes accurately. Damaged cells must be destroyed or aberrant function results.

NO/ONOO support for all autoimmune diseases: EPIC. Key support formulas: General Sedate, Energy Sedate, Gt, ABC, ACCELL, AO.

Paradigm #7. Somatic mutation/selection. This is the cancer paradigm where cells' DNA becomes damaged by free radicals and the cells start to behave abnormally, often encouraged by a hormone, with tumor proliferation. Cells require ATP to make their own antioxidants that provide protection from free radicals via glutathione, superoxide dismutase, and catalase; and ATP helps maintain and repair both the cellular and mitochondrial DNA. ATP also supports the proper utilization of hormones by the hormone-targeted cells.

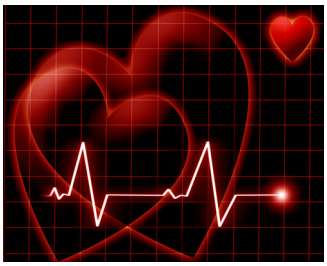


Further, with adequate ATP for cell communication, the cell-signaling process can alert the immune system to destroy aberrant cells before they become uppity and establish their own blood supply.

6 New England Journal of Medicine. *A Bovine Albumin Peptide as a Possible Trigger of Insulin-Dependent Diabetes Mellitus*, Jukka Karjalainen, M.D., Julio Martin, M.D., Mikael Knip, M.D., Jorma Ilonen, M.D., Brian Robinson, Ph.D., Erkki Savilahti, M.D., Hans Akerblom, M.D., and Hans-Michael Dosch, M.D. N Engl J Med 1992; 327:302-307 July 30, 1992

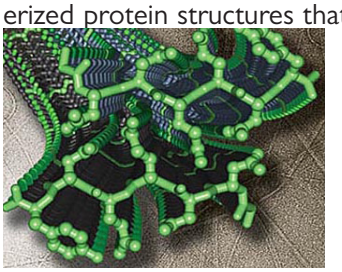
Key support formulas: EPIC, OXCC, OXOX, OXAA, #5, DV3, ROX.

Paradigm #8. Ischemic cardiovascular disease. This paradigm focuses on the reduction in blood supply to a tissue and the resulting low oxygen environment created there. Low oxygen is a favorable terrain for tumors and pathogens, and it also chokes off the mitochondria's ability to make ATP energy. Often, lesions in the arteries cause a narrowing of the blood passageways. Lesions are the result of free radical damage that ATP-produced glutathione and other anti-oxidants should control—if there is adequate ATP and good nutrition. The body's ability to make its own free-radical quenchers (antioxidants) is based on ATP which is based on nutrition.



Key support formulas: EPIC, ROX, DV3, Hcv, HQ.

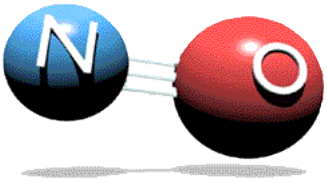
Paradigm #9. Amyloid[7] (Including Prion[8]) diseases. This is the paradigm of mad cow disease (prions) and Alzheimer's, according to the medical literature. Amyloids are large, insoluble, hard-to-manage protein-aggregates that foul up tissue functions and lead to neurodegenerative diseases. Such proteins can aggregate where there is low-level, localized chronic inflammation. Thus they are mutated, polymerized protein structures that aberrantly assemble, often in a low ATP environment, or terrain where toxins block the tissues' metabolic pathways. Excessive amyloid congestion results in dehydration of the cells which warps the cell membrane and can lead to improper cell signaling, improper electrical charge, and cellular malnutrition.



You can readily see where cellular nutrition can support the energy and signaling processes to help the body avoid the creation of amyloid structures, as well as provide the necessary energy for the body to resist pathogens via the energy of good health.

Key support formulas: EPIC, Eventa, PRO, ROX, DV3, OMGA LQ, B.

Paradigm #10. NO/ONOO Cycle Diseases. There is a proposed 10th Paradigm of Disease that is being considered to join the paradigm club. The letters, pronounced, "No, Oh No!" represent the phrase "Nitric Oxide, Peroxynitrate" in biochemistry terminology. Basically, this is the paradigm of localized, chronic, self-perpetuating inflammation based on the inability of the cells to make enough antioxidants to control free radical damage and the resulting inflammation. This is a paradigm that, like several others, overlaps all the other paradigms, but is becoming the repository for Chronic Fatigue Syndrome, Fibromyalgia, Post Traumatic Stress Disorder, and Multiple Chemical Sensitivities.



The discovery by Dr. Martin Pall at Washington State University that those four disorders all share a common situation where a short-term stressor (illness, accident, pesticides and toxins, emotional upheaval, ionizing radiation, pathogenic infection) initiates the nitric oxide/peroxynitrite-mediated inflammation process. But instead of ending soon, it gets locked into a self-feeding, endless cycle resulting in chronic pain and chronic adherence to a disease process. Dr. Pall's solution is to interrupt the disease cycle by supplementing with glutathione precursors and antioxidant nutrients.

Key Support Formulas: EPIC, ROX, DV3, CLNZ, REL, ACCELL Ther.

Proposed Paradigm #11. Lack of Adequate Cellular Production of ATP. As long as the human mind is disposed to creating paradigms to grapple with the concept of diseases, I feel compelled to propose an eleventh paradigm as the "mother of all other paradigms." This mother paradigm is the lack of ATP production at the cellular level. We know that the cells need oxygen, nutrients, and fuel (saccharides) to make ATP. Thus we know that our cellular health depends upon: 1) exercise, 2) whole foods straight from Nature, 3) ability to detoxify, 4) ability to properly signal the immune system, and 5) ability to repair – all of which

7 Amyloid – insoluable fibrous protein associated with neural diseases.

8 Prion – an infectious agent consisting of a misfolded protein. Affects the brain and neural tissues.

require abundant ATP. Because of our current cultural directives (e.g. ignorance) to: 1) avoid exercise, 2) grow quantity instead of quality foods, 3) create vast environmental toxicity, 4) and to eat junk food quickly; everyone is engaged, at some level, with the inhibition of the mitochondrial ATP manufacturing processes. Inevitably, this *is the start of virtually every disease*.

Find Out Your and Your Patient's Oxidative Stress Levels – The Meta-Oxy Test

2500 years ago, Prince Gautama Siddhartha said, "*Every human being is the author of his own health or disease.*" So the questions are: 1) Are your cells living optimally or is there oxidative damage occurring right now? 2) Are your patients "rusting and aging" faster than they should? The way to know for sure can be so easily tested via Systemic's Meta-Oxy Test.

What clinicians like about the Meta-Oxy test is that it is quick and inexpensive.

It reveals the general oxidative stress level in the body, and it shows the efficacy of the antioxidant portion of your programs. The clinician can have a patient take this test on arrival and literally one minute later know if that person is suffering oxidative damage to the cell membranes that could be: 1) responsible for endocrine hormonal issues, 2) causing neuro-endocrine confusion, 3) a root cause of low ATP cellular energy, 4) blocking detoxification pathways, 5) causing chronic fatigue, 6) setting the stage for free-radical pathologies, 7) a hidden cause behind practically all health concerns. This means that people need to know if their bodies are struggling with free-radical and NO/ONOO damage. And so important to clinicians, if this matter is not addressed, the patient will not improve as much on the selected program. Addressing the NO/ONOO cycle opens the door to a new level of clinical effectiveness.

View the short webinar, "NO/ONOO Vicious Cycle of Cellular Free Radical Destruction and How To Turn It Off" and download protocols and a discount coupon. Call Systemic 800-445-4647 for the password.

TAKE ACTION NOW:

1. Order the Meta-Oxy Test vials from Systemic, 800-445-4647.
2. Order ROX (and EPIC)
3. Test yourself and learn your daily anti-oxidant requirements
4. Implement Meta-Oxy in your practice – you'll see more rapid improvements

Disclaimer: This Research Report does not propose a method for diagnosing or treating any disease whatsoever—a process exclusive to the practice of medicine by licensed individuals. This information refers only to whole body nutrition to support the body in caring for itself. It features insights from one individual's clinical perspective and does not constitute labeling for any product.

How to utilize this information:

Protocol for Memory Improvement

With 2 meals a day take:

- 1 EPIC
- 1 ROX
- 1 DV3
- 1 B
- 1 VISTA (1 & 2)
- 1 ENRG

EPIC is a cutting edge formula that addresses one of the deepest causes of people's health issues today – chronic, cellular localized free-radical inflammation and damage to the mitochondrial DNA. It applies nutrition where it is so desperately needed—inside the cells. As our cells overcome negative environmental influences, so does the body. EPIC is an important formula to help the cells reduce mitochondrial damage and function more optimally.

– Dr. Jack Tips