

Doctors Stories

Doctors View Points & Testimonials:

Dr. Code Testimonials # 135

Dr. Code Tells a compelling story of his **diagnosis with multiple sclerosis** and his personal journey to wellness.

Immunotec Health Message with Dr. William Code, MD, FRCPC

As Residency Program Director at the University of Saskatchewan, Dr. Code had a busy career of clinical work, research and teaching. The Financial Post Fortune 500 Edition profiled him as the quintessential baby boomer when he left his hectic lifestyle for the quieter surroundings of Vancouver Island in 1992. Dr. Code added the treatment of chronic pain problems to his clinical anesthesia practice but soon after, began to notice major problems with foot drop, fatigue and increasing weakness of his right side. Dr. Code tells a compelling story of his **diagnosis with multiple sclerosis** and his personal journey to wellness.

Dr. Code describes the development of a product that is destined to become the #1 nutritional supplement of choice worldwide and why the medical community should focus on nutritional-based, rather than drug-based interventions.

His recovery, as far as he is concerned, has been impacted by Immunocal, a nutraceutical, cystine delivery system product, "Immunocal" developed at McGill University Research Center by Dr. Gustavo Bounous.

[Dr. Code, tell us about your life before you were diagnosed with multiple sclerosis?](#)

As Residency Program Director at the University of Saskatchewan, I had a very busy career of clinical work, research and teaching. The Financial Post's Fortune 500 Edition profiled me as the quintessential baby boomer when I left my hectic lifestyle for the quieter surroundings of Vancouver Island in 1992.

[What is your medical background?](#)

I completed 13 years of medical training, which included 2 years of research on the brain. This permitted me to be a specialist in anesthesiology in Canada and the United States. My major interest within this field was pain management in long-term illnesses, such as multiple sclerosis, arthritis and fibromyalgia.

[What is multiple sclerosis?](#)

Multiple sclerosis is an autoimmune illness that strikes people most commonly in their 20's, 30's and 40's. It is now understood that MS results from some of our own white blood cells attacking the myelin (fatty) coating of the nerves in the brain and the spinal cord.

[How long have you had multiple sclerosis?](#)

I was diagnosed with multiple sclerosis in 1996. At the time, I was stumbling when walking and I couldn't empty a syringe with my right hand because it was so weak. This, coupled with severe fatigue, necessitated that I leave my practice of anesthesiology and pain management.

[What type of multiple sclerosis do you have?](#)

I have been diagnosed with either primary progressive or secondary progressive multiple sclerosis by some of the best **multiple sclerosis neurologists in North America**.

[Why do you use Immunocal/HMS 90?](#)

Immunocal/HMS 90 helps optimize and smooth the function of our immune system. It also helps by reducing the free radical injury to the myelin coating surrounding the nerves in the brain and the spinal cord.

[How much Immunocal/HMS 90 do you take and how long was it before you noticed a difference?](#)

I initially took a pack a day for three months and noticed no real difference. I then spoke with a number of experts who suggested that I take three packs per day (2 at once and then another later on an empty stomach.) Apparently those of us with MS usually only have 5% of our optimal glutathione! Within three to four weeks of increasing the amount of Immunocal/HMS 90 as suggested, I noticed a big improvement in my energy and my cognitive function.

Does Immunocal/HMS 90 interfere with any of the drugs used in the treatment of multiple sclerosis or the symptoms of MS?

No, it does not. In fact in many cases, it might reduce the unpleasant side effects of agents such as interferon.

What has Immunocal/HMS 90 done for you?

I know that Immunocal has greatly enhanced my energy levels and muscle strength. It has almost eliminated the shooting electrical pains that are quite common among up to 70% of people with multiple sclerosis. Certainly the extra stamina has helped me regain my balance and position awareness (proprioception.)

Certainly Immunocal/HMS 90 has been the largest piece of the puzzle in my recovery process.

I recommend this product to all the people who want to stay healthy, to those folks facing health challenges and to my medical colleagues. If medical professionals will just take the time to research this product they will look at it differently than **most alternative health products. Dr. Bill Code, MD, FRCPC**

Doctors View Points & Testimonials #: 136

Glutathione (GSH) Deficiency and the Pathogenesis of Multiple Sclerosis

Recent findings in tissue from multiple sclerosis victims corroborate the mechanisms documented in a growing body of research based evidence as to the steps leading to disease expression. "Observed depletion of GSH, elevation of ceramide level and apoptosis in banked human brains from patients with neuroinflammatory diseases (e.g. x-adrenoleukodystrophy and multiple sclerosis) suggest that the intracellular level of GSH may play a crucial role in the regulation of cytokine-induced generation of ceramide leading to apoptosis of brain cells in these diseases."1 Cytokine, tumor necrosis factor-alpha (TNF-) or interleukin-1 beta (IL-1)-mediated activation of sphingomyelinases (SMases), leads to degradation of sphingomyelin to ceramide, a sphingolipid 1,2, and the universal lipid second messenger. This potentiated a 2-fold increase in H2O2 generation, leading to lipid peroxidation and loss of activity of respiratory chain complex IV in the GSH depleted state compared to GSH-replete mitochondria 3. "Mitochondria are a target of ceramide produced in the signaling of TNF.3" Pretreatment of cells so as to increase intracellular GSH inhibited the TNF--induced sphingomyelin hydrolysis and ceramide generation as well as cell death 4. The literature implicates excessive or inappropriate generation of nitric oxide (NO) in Parkinson's Disease, Alzheimer's Disease, multiple sclerosis, stroke and amyotrophic lateral sclerosis 5. "Human astrocytes released abundant NO upon stimulation with the pro-inflammatory cytokine (IL)-1 , which was potentiated by interferon (IFN)-gamma and TNF-. IL-1 receptor antagonist protein markedly attenuated astrocyte NO production.6" "It is now well documented that NO and its toxic metabolite, peroxynitrite (ONOO-) can inhibit components of the mitochondrial respiratory chain ... 5" "...neurones, in contrast to astrocytes, appear particularly vulnerable to the action of these molecules.5" "...the susceptibility of different brain cells to NO and ONOO-exposure may be dependent on factors such as the intracellular GSH concentration ... 5" "Evidence is now available to support this scenario for neurological disorders, such as multiple sclerosis.5"

Variable vulnerability to oxidative stress has been well documented in various neurological cell types. "Astrocytes maintain high intracellular concentrations of certain antioxidants, making these cells resistant to oxidative stress relative to oligodendrocytes and neurons.7" In fact, astrocytes appear to play a central role in the antioxidant defense of the brain.7 One of the major antioxidants used by astrocytes is GSH and, "...astroglial cells prefer cystine from [instead of] cysteine for GSH synthesis ... 8"

Other conditions give insight into the effect of GSH on SMases and ceramide. "Cell culture studies of hypoxic PC12 cell death... suggest that GSH protects cells from hypoxic injury by direct inhibition of neutral SMases activity and ceramide formation ... 9" This protection appears to be lost in MS patients as GSH is decreased in plaques10, and was absent in the CSF in MS.11 Protective mechanisms involving GSH appear to occur in MS, "...blood GSH was increased (p<0.01) [in MS] during exacerbation and remission as well. This rise in this thiol is likely to be a compensatory mechanism defending the cells from further oxidant injuries.12"

The relationship between cytokines and GSH has been demonstrated in cell cultures of TNF-resistant (TNFr) and TNF-sensitive (TNFs) cell lines. "The basic level of GSH was significantly higher in the TNFr cells than in TNFs cells. Treatment with 20 microM ceramide decreased cellular GSH in TNFs cells by 50% in contrast to an insignificant decrease in the TNFr cells.13"

Also, the effect of intracellular GSH on neutrophil and lymphoid apoptosis give further insight into the crucial regulator role played by this important thiol. "Because apoptosis is a critical mechanism regulating PMN survival in vivo, manipulation of PMN intracellular thiols may represent a novel therapeutic target for the regulation of cellular function.¹⁴" "Thiol compounds, such as L-cysteine and GSH, play crucial roles in the regulation of lymphocyte proliferation.¹⁵" "These data suggest that the inability to neutralize oxidative stress results in the apoptosis of lymphoid cells under Lcystine-and GSH-depleted conditions. The protective effects of rADF may be explained by ... enhancing the L-cystine internalization and elevating the intracellular GSH content.¹⁵"

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Doctors View Points & Testimonials # 137:

Dr. Cheney

This is from an interview with Dr. Cheney, who first coined the phrase "Chronic Fatigue Syndrome." He found that the **organism mentioned here for MS** was wiped out in the people he was treating for Fibromyalgia - Chronic Fatigue Syndrome, in 6 months of taking HMS 90, even those who were taking only one pack a day. The ones taking 2 packs did do better with their other symptoms. Here's to unravelling the puzzle of MS.

From a radio interview with Dr. Cheney: "This is exciting stuff. We wanted to see not only if this product (Immunocal/HMS 90) improved glutathione functionality, which it did, but we also wanted to see if it knocked out micro-organisms, like the PNS article said it would. So we measured for IgM (visa?) the inverse dilutions of IgM for chlamydia pneumoniae. Chlamydia pneumoniae is an intracellular pathogen. It's a common cause of hospital-acquired pneumonia. It ubiquitously infects the population, but seems to activate under certain conditions. And if it activates, some of the clinical conditions of this organism are chronic sinusitis, pharyngitis, and laryngitis. But it also gets into the central nervous system.

In a study published by a neurologist out of Vanderbilt showed tha chlyamdia pneumoniae may be a very important pathogen in multiple sclerosis. Indeed, data they shared with me recently (and this is coming to publication soon) showed that 80 percent of the cerebral spinal fluid of MS patients is actively infected with this organism. Versus 15 percent of other neurological diseases that are not MS. In a journal-published article on neurology, aggressive treatment for **chlyamdia pneumoniae** rapidly reversed an acute exacerbation of multiple sclerosis.

So we measured IgM levels for this pathogen at Vanderbilt. Most laboratory measurements of this organism are not very good, so this is a research grade assessment, and probably may not generalize to the run-of-the-mill types of tests that you might get in your local labs. But IgM elevations of 1 to 1600 (?) dilutions is evident of significant active infection with this organism. Six months later, it just wiped it out. IgM just fell to normal levels. It didn't really matter whether you were taking one pack a day or two packs a day. Just wiped it out. Makes you wonder what this might do for MS. Think about that."

Doctors View Points & Testimonials #: 138

J Neurosci Res. 2002 Nov 15;70(4):580-7.

Nitric oxide synthase is present in the cerebrospinal fluid of patients with active multiple sclerosis and is associated with increases in cerebrospinal fluid protein nitrotyrosine and S-nitrosothiols and with changes in glutathione levels.

Calabrese V, Scapagnini G, Ravagna A, Bella R, Foresti R, Bates TE, Giuffrida Stella AM, Pennisi G.

Biochemistry and Molecular Biology Section, Department of Chemistry, Faculty of Medicine, University of Catania, Catania, Italy.

Nitric oxide (NO) is hypothesized to play a role in the immunopathogenesis of multiple sclerosis (MS). Increased levels of NO metabolites have been found in patients with MS. Peroxynitrite, generated by the reaction of NO with superoxide at sites of inflammation, is a **strong oxidant capable of damaging tissues** and cells. Inducible NO synthase (iNOS) is up-regulated in the CNS of animals with experimental allergic encephalomyelitis (EAE) and in patients with MS. In this study, Western blots of cerebrospinal fluid (CSF) from patients with MS demonstrated the presence of iNOS, which was absent in CSF from control subjects. There was also NOS activity present in both MS and control CSF. Total NOS activity was increased (by 24%) in the CSF from MS patients compared with matched controls. The addition of 0.1 mM ITU (a specific iNOS inhibitor) to the samples did not change the activity of the control samples but decreased the NOS activity in the MS samples to almost control levels. The addition of 1 mM L-NMMA (a nonisoform specific NOS inhibitor), completely inhibited NOS activity in CSF from control and MS subjects. Nitrotyrosine immunostaining of CSF proteins was detectable in controls but was greatly increased in MS samples. There were also significant increases in CSF nitrate + nitrite and oxidant-enhanced luminescence in MS samples compared with controls. Additionally, a significant decrease in reduced **glutathione** and significant increases in oxidized glutathione and S-nitrosothiols were **found in MS samples** compared with controls. Parallel changes in NO metabolites were observed in the plasma of MS patients, compared with controls, and accompanied a significant increase of reduced glutathione. These data strongly support a role for nitrosative stress in the pathogenesis of MS and indicate that therapeutic strategies focussed on decreasing production of NO by iNOS

and/or scavenging peroxyntirite may be useful in alleviating the neurological impairments that occur during MS relapse. Copyright 2002 Wiley-Liss, Inc.

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Doctors View Points & Testimonials # 139:

Patricia A. L. Kongshavn, Ph.D.

Neurodegenerative Diseases – Alzheimer's and Parkinson's By Patricia

Alzheimer's and Parkinson's are neurodegenerative diseases in which cell damage and degeneration is seen in certain specific areas of the brain. In Parkinson's disease nerve cells slowly degenerate in the part of the mid-brain (the substantia nigra layer of the basal ganglia) that controls movement, resulting in progressive loss of muscular coordination and balance. In Alzheimer's disease brain cells degenerate, brain mass shrinks and characteristic neurofibrillary tangles and neural plaques are seen post mortem. Increasing lines of evidence suggest that mitochondrial damage plays a key role in Parkinson's, Alzheimer's and some other neurodegenerative diseases (1-5). This, in turn, increases the generation of reactive oxygen species and the onset of oxidative stress, leading to oxidative damage and programmed cell death. At the same time, glutathione homeostasis is disturbed (6-9). In one study, glutathione levels were reduced by 40% in the substantia nigra in early stage Parkinson's disease (7). These levels fall even much further in later stages, the magnitude of reduction in glutathione seeming to parallel the severity of the disease (9). The lowered glutathione values and increased oxidative stress are thought to be responsible for the loss of dopamine producing cells in the substantia nigra in Parkinson's disease patients (7, 8). The use of antioxidants, particularly glutathione, for the treatment of neurodegenerative diseases is an obvious consideration (6-9). In an in vitro study, glutathione was shown to protect human neural cells from apoptosis i.e. cell death, induced by dopamine (8). Sechi et al. showed that intravenous injection of glutathione was effective in reducing symptoms (42% decline in disability) in early Parkinson's disease patients and possibly retarded the progression of the disease (9). Other treatment options to increase brain concentrations of glutathione are better choices for long-term treatment. Banaclocha has reviewed the putative usefulness of N-acetyl cysteine for this purpose in the treatment of Parkinson's, Alzheimer's and other age-associated neurodegenerative diseases (1). Immunocal is an even better choice than this drug, being entirely non-toxic and proven to raise intracellular glutathione (10).

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Doctors View Points & Testimonials

Professor Dr. Wulf Droge,

Professor Dr. Wulf Droge, Immunologist and former head of Cancer Research at the Heidelberg Cancer Institute, Heidelberg, Germany

Professor Wulf Droge is now Medical Director of Immunotec Research in charge of research with Immunocal.

The human immune system is extremely dependent on adequate glutathione levels to perform properly, in the words of Wulf Droge et. al. : "Thiols And The Immune System: Effect of N-Acetyl cysteine on T Cell System in Human Subjects"; *Methods in Enzymology*, Vol. 251; 255-270,1995):

"Even a partial depletion of the intracellular glutathione pool has a dramatic consequence for the process of blast transformation and proliferation, and for the generation of cytotoxic T cells." (T –cells are those cells which help the body defend against diseases.)

Abstract: – [Cysteine and glutathione in catabolic conditions and immunological dysfunction](#). *Current Opinion in Clinical Nutrition & Metabolic Care*. 2(3):227-233, May 1999. *Droge, Wulf*

The conspicuous increase in the plasma cysteine disulphide/thiol ratio in elderly persons and cancer patients indicates a shift of the plasma redox state.

The most important redox buffers in skeletal muscle tissue and blood plasma, i.e. glutathione and albumin, respectively, are significantly decreased in different models of cachexia. Treatment with N-acetyl cysteine, i.e. a thiol-containing antioxidant, was found to increase the plasma albumin level and to ameliorate the loss of body cell mass in cancer patients and healthy individuals. The treatment of HIV infection with N-acetyl cysteine, in contrast, serves mainly as a tool to ameliorate the physiological and immunological consequences of the virus-induced cysteine deficiency. NOTE: Immunocal, a natural cysteine delivery system, developed and researched at McGill University Medical Research Center (often referred to by Doctors in the USA as "The Harvard of the North" in Montreal, Canada, was found to increase glutathione and the plasma albumin levels in vitro, in animal and human studies.

Dr. Wulf Droge is now Medical Director of Immunotec Research's Medical Advisory Board, in charge of research with Immunocal. Here is a list of his ACADEMIC CREDENTIALS:

- | | |
|-------------|---|
| 1958 – 1964 | Studied chemistry and biochemistry at the Universities of Hanover and Freiburg, Germany Masters degree in chemistry |
| 1964 - 1967 | PH.D. thesis at the Max-Planck-Institute of Immunology, Freiburg (topic of thesis, Bacterial Lipopolysaccharides) |
| 1967 | PH.D. in biochemistry, University of Freiburg postdoctoral DFG fellowship at the Max-Planck-Institute of Immunology, Freiburg |
| 1968 | Visiting fellow at the University of Minnesota, Minneapolis |
| 1968-1971 | Postdoctoral research fellow at Harvard University, Biological Laboratories, Cambridge, Mass. with professor Strominger |
| 1971-72 | Fellow at the Max-Planck-Institute in Munchan, Germany |
| 1973-76 | Scientific member at the Basel Institute for Immunology |
| 1974 | Habilitation at University of Freiburg |

Since 1976 Professor, faculty of Biology at the University of Heidelberg and head of the Department of Immunochemistry

RESEARCH AREAS:

- Redox regulation and signaling pathways in lymphocytes
- Pathogenesis of HIV infection
- Mechanism of disease related wasting and aging
- Action of tumor necrosis factor
- 1977-1980- and 1983-1986- Acting Director of the Institute of Immunology and Genetics, Heidelberg, Germany

MEMBERSHIPS:

- European Association for Cancer Research
- American Association of Immunologists
- British Society of Immunology
- Gesellschaft für Immunologie