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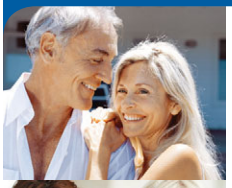
REPORTS



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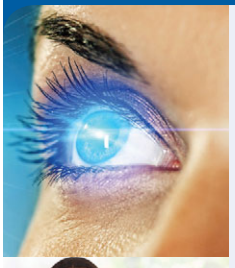

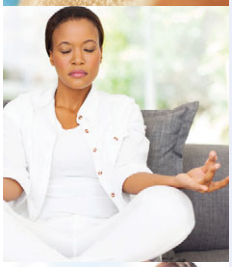

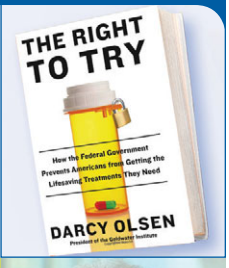

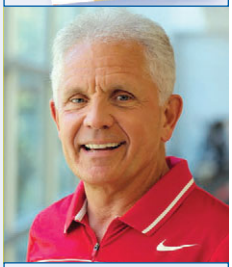

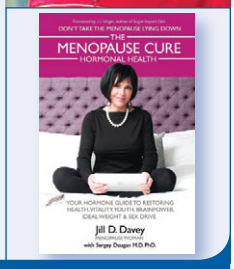

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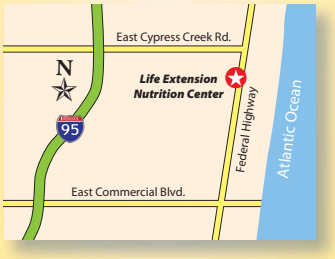

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Gustavo Tovar Baez, MD, operates the Life Extension Clinic in Caracas, Venezuela. He is the first physician in Caracas to specialize in anti-aging medicine.

Ricardo Bernales, MD, is a board-certified pediatrician and general practitioner in Chicago, IL, focusing on allergies, bronchial asthma, and immunodeficiency.

Mark S. Bezzek, MD, FACP, FAARM, FAAEM, is board-certified in internal medicine, emergency medicine, and anti-aging/regenerative medicine. He is the director of Med-Link Consulting, which specializes in bioidentical hormone replacement therapy, natural alternatives, anti-aging, and degenerative diseases. He holds US patents for a multivitamin/mineral supplement, an Alzheimer's/dementia compilation, and a diabetic regimen.

Anna M. Cabeca, DO, FACOG, ABAARM, is a board-certified gynecologist and obstetrician, as well as board-certified in anti-aging and regenerative medicine, an expert in functional medicine, and an expert in women's health. She specializes in bioidentical hormone replacement therapy and natural alternatives, successful menopause and age-management medicine.

Thomas F. Crais, MD, FACS, a board-certified plastic surgeon, was medical director of the microsurgical research and training lab at Southern Baptist Hospital in New Orleans, LA, and currently practices in Sun Valley, ID.

William Davis, MD, is a preventive cardiologist and author of *Wheat Belly: Lose the Wheat, Lose the Weight* and *Find Your Path Back to Health*. He is also medical director of the online heart disease prevention and reversal program, *Track Your Plaque* (www.trackyourplaque.com).

Martin Dayton, MD, DO, practices at the Sunny Isles Medical Center in North Miami Beach, FL. His focus is on nutrition, aging, chelation therapy, holistic medicine, and oxidative medicine.

John DeLuca, MD, DC, is a 2005 graduate of St. George's University School of Medicine. He completed his internal medicine residency at Monmouth Medical Center in Long Branch, NJ, in 2008 and is board-certified by the American Board of Internal Medicine. Dr. DeLuca is a Diplomate of the American Academy of Anti-Aging Medicine and has obtained certifications in hyperbaric medicine, pain management, nutrition, strength and conditioning, and manipulation under anesthesia.

Sergey A. Dzugan, MD, PhD, was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzugan's current primary interests are anti-aging and biological therapy for cancer, cholesterol, and hormonal disorders.

Patrick M. Fratellone, MD, **RH**, is the founder and executive medical director of Fratellone Associates. He completed his internal medicine and cardiology fellowship at Lenox Hill Hospital in 1994, before becoming the medical director for the Atkins Center for Complementary Medicine.

Carmen Fusco, MS, RN, CNS, is a research scientist and clinical nutritionist in New York City who has lectured and written numerous articles on the biochemical approach to the prevention of aging and degenerative diseases.

Norman R. Gay, MD, is proprietor of the Bahamas Anti-Aging Medical Institute in Nassau, Bahamas. A former member of the Bahamian Parliament, he served as Minister of Health and Minister of Youth and Sports.

Mitchell J. Ghen, DO, PhD, holds a doctorate in holistic health and anti-aging and serves on the faculty of medicine at the Benemerita Universidad Autonoma De Puebla, Mexico, as a professor of cellular hemapoetic studies.

Gary Goldfaden, MD, is a clinical dermatologist and a lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology of Hollywood, FL, and COSMESIS Skin Care.

Miguelangelo Gonzalez, MD, is a certified plastic and reconstructive surgeon at the Miguelangelo Plastic Surgery Clinic, Cabo San Lucas.

Garry F. Gordon, MD, DO, is a Payson, AZ-based researcher of alternative approaches to medical problems that are unresponsive to traditional therapies. He is president of the International College of Advanced Longevity Medicine.

Richard Heifetz, MD, is a board-certified anesthesiologist in Santa Rosa, CA, specializing in the delivery of anesthesia for office-based plastic/cosmetic surgery, chelation therapy, and pain management.

Roberto Marasi, MD, is a psychiatrist in Brescia and in Piacenza, Italy. He is involved in anti-aging strategies and weight management.

Maurice D. Marholin, DC, DO, is a licensed chiropractic physician and board-certified osteopathic family physician.While training at the University of Alabama, he completed Fellowships in Clinical Nutrition and Behavioral Medicine. He is currently in private practice in Clermont, FL.

Prof. Francesco Marotta, MD, PhD, of Montenapoleone Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy and hon. res. professor, Human Nutrition Dept, TWU, USA. He is the author of over 130 papers and 400 congress lectures.

Philip Lee Miller, MD, is founder and medical director of the Los Gatos Longevity Institute in Los Gatos, CA.

Michele G. Morrow, DO, FAAFP, is a board-certified family physician who merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches.

Filippo Ongaro, MD, is board-certified in anti-aging medicine and has worked for many years as flight surgeon at the European Space Agency. He is considered a pioneer in functional and anti-aging medicine in Italy where he also works as a journalist and a writer.

Herbert Pardell, DO, FAAIM, practices internal medicine at the Emerald Hills Medical Center in Hollywood, FL. He is a medical director of the Life Extension Foundation.

Lambert Titus K. Parker, MD, an internist and a board-certified anti-aging physician, practices integrative medicine from a human ecology perspective with emphasis on personalized brain health, biomarkers, genomics and total health optimization. He serves as the Medical Director of Integrative Longevity Institute of Virginia, a 501(c)3 Non-Profit Medical Research Institute. He also collaborates on education and research for Hampton Roads Hyperbaric Therapy.

Ross Pelton, RPh, PhD, CCN, is director of nutrition and anti-aging research for Intramedicine, Inc.

Patrick Quillin, PhD, RD, CNS, is a clinical nutritionist in Carlsbad, CA, and formerly served as vice president of nutrition for Cancer Treatment Centers of America, where he was a consultant to the National Institutes of Health.

Allan Rashford, MD, graduated from the University of Iowa Medical School. Upon completing medical training, he became chief of medicine at St. Francis Hospital in South Carolina, and he was later named president of the Charleston Medical Society.

Marc R. Rose, MD, practices ophthalmology in Los Angeles, CA, and is president of the Rose Eye Medical Group. He is on the staff of Pacific Alliance Medical Center, Los Angeles, and other area hospitals.

Michael R. Rose, MD, a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staff of the University of Southern California and UCLA.

Ron Rothenberg, MD, is a full clinical professor at the University of California San Diego School of Medicine and founder of California HealthSpan Institute in San Diego, CA.

Roman Rozencwaig, MD, is a pioneer in research on melatonin and aging. He practices in Montreal, Canada, as research associate at Montreal General Hospital, Department of Medicine, McGill University.

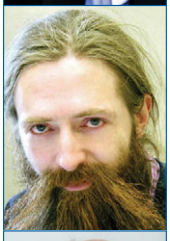
Michael D. Seidman, MD, FACS, is the director of otolaryngology-head and neck surgery for the Bloomfield satellite of Henry Ford Health System (HFHS), Detroit, MI, co-director of the Tinnitus Center, and co-chair of the Complementary/ Alternative Medicine Initiative for HFHS.

Ronald L. Shuler, BS, DDS, CCN, LN, is involved in immunoncology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis. He is board-certified in anti-aging medicine.

Paul Wand, MD, Fort Lauderdale, FL, is a clinical neurologist with special expertise in treating and reversing diabetic peripheral neuropathy and brain injuries from various causes.

Örn Adalsteinsson, PhD, is chairman of the Life Extension® Scientific Advisory board. He holds a master's and doctorate from the Massachusetts Institute of Technology (MIT). He has specialized in human therapeutics including vaccines, monoclonal antibodies, product development, nutraceuticals, formulations, artificial intelligence, hormones, and nutritional supplementation. He has also authored articles and contributed to peer-reviewed publications and served as an editor for the *Journal of Medicinal Food*.

John Boik, PhD, is the author of two books on cancer therapy, *Cancer and Natural Medicine* (1996) and *Natural Compounds in Cancer Therapy* (2001). He obtained his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University Department of Statistics. He is currently president of New Earth BioMed, a nonprofit cancer research corporation that studies mixtures of natural products.



Aubrey de Grey, PhD, is a biomedical gerontologist and Editor-in-Chief of *Rejuvenation Research*, the world's highest-impact peer-reviewed journal focused on intervention in aging. He received his BA and PhD from the University of Cambridge in 1985 and 2000 respectively. Dr. de Grey is a Fellow of both the Gerontological Society of America and the American Aging Association and sits on the editorial and scientific advisory boards of numerous journals and organizations.

Frank Eichorn, MD, is a urologist specializing in prostate cancer for 10 years. He has a private practice in Bad Reichenhall, Germany, and is prostate cancer consultant at the Urologische Klinik Castringius, Planegg, Munich. In his integrative approach to prostate cancer he works together with an international network of experts to improve treatment outcomes for prostate cancer patients with a special focus on natural and translational medicine.

Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the new University of Central Florida Medical School.

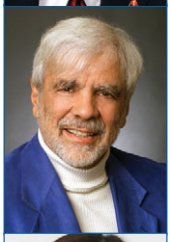
Steven B. Harris, MD, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA. Dr. Harris participates in groundbreaking hypothermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.

Peter H. Langsjoen, MD, FACC, is a cardiologist specializing in congestive heart failure, primary and statin-induced diastolic dysfunction, and other heart diseases. A leading authority on coenzyme Q10, Dr. Langsjoen has been involved with its clinical application since 1983. He is a founding member of the executive committee of the International Coenzyme Q10 Association, a fellow of the American College of Cardiology, and a member of numerous other medical associations.

Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP
Dr. Dipnarine Maharaj is the Medical Director of the South Florida Bone Marrow Stem Cell Transplant Institute and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University's Royal Infirmary.

Ralph W. Moss, PhD, is the author of books such as *Antioxidants Against Cancer*, *Cancer Therapy*, *Questioning Chemotherapy*, and *The Cancer Industry*, as well as the award-winning PBS documentary *The Cancer War*. Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs The Moss Reports, an updated library of detailed reports on more than 200 varieties of cancer diagnoses.

Michael D. Ozner, MD, FACC, FAHA, is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of *The Great American Heart Hoax,The Complete Mediterranean Diet* and *Heart Attack Proof*. For more information visit www.drozner.com.



Jonathan V. Wright, MD, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored or co-authored 14 books, selling over 1.5 million copies.

Xiaoxi Wei, PhD, is a chemist expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-Therma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.

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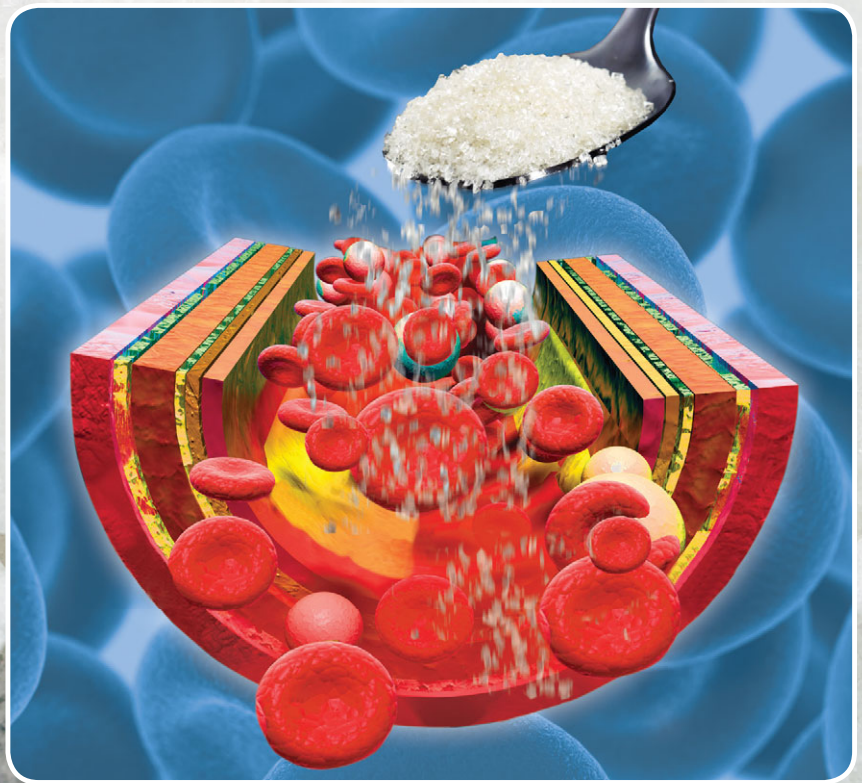

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References

1. *Nutr Metab (Lond)*. 2012;9(1):106.
2. *Nutr Res Pract*. 2012 Aug;6(4):322-7.
3. Available at: http://www.medscape.com/view-article/461349. Accessed September 24, 2013.
4. *J Med Food*. 2011 Jul-Aug;14(7-8):799-807.
5. *Am J Chin Med*. 2012;40(1):163-75.
6. *Nutr Res*. 2011 Nov;31(11):848-54.
7. *Diabetes*. 2012 Jan;61(1):187-96.
8. *Mol Biol Rep*. 2012 May;39(5):5299-306.

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Huge Study Validates Natural Approach to Prevent Blindness

BY WILLIAM FALOON

Loss of **eyesight** was once an inevitable consequence of aging.

Modern medicine has virtually eliminated the blinding impact of **cataracts**.

Macular degeneration is today's leading cause of vision loss.[1] The challenge up until now is that **macular degeneration** is still viewed as being incurable.[2]

In **1985**, Life Extension® introduced a carotenoid complex called **xanthophylls**. The three yellow pigments that make up xanthophylls are **zeaxanthin**, **lutein**, and ***meso*-zeaxanthin**.

What makes these carotenoids unique is that they provide **structural** density for the **macula** and protect it from UV light and oxidation.[3-7]

Previous studies looking at dietary intake of xanthophyll-rich foods have found protective effects against macular degeneration.[8-11] It was not clear, however, if these carotenoids could slow the ***worsening*** of macular degeneration after it occurs.

This concern has been clarified in a study published by the **American Medical Association** involving over **102,000** people who were followed for an average of **25 years**.[12] Intense and frequent monitoring of food intake enabled the researchers to develop predicted plasma **carotenoid** scores.

The findings showed that men and women with the highest **lutein/zeaxanthin** scores had a striking **41%** lower risk of advanced macular degeneration that often causes **blindness**. The researchers also discovered that **alpha-carotene** reduced the progression of macular degeneration towards blindness.[12]

The thoroughness of this long-term study provides fresh insight into how **macular degeneration** can be markedly delayed even after it is diagnosed.

This editorial describes how incidence of this blinding disease may soon dramatically decline.

The first article in this month's issue will enlighten you to brand new findings showing how typical **vision loss** that occurs with aging can be partially **restored**!

Scurvy was an epidemic disease when access to **vitamin C**-containing foods was limited. Simple measures like eating lemons or limes during times of food scarcity eliminated scurvy.

We may be moving towards a similar era when blindness-caused macular degeneration may no longer be a prevalent health issue. Here are three major controllable causes of macular degeneration:

- Cigarette smoking
- Exposure to ultraviolet solar rays
- Deficiency of lutein, zeaxanthin, and *meso*-zeaxanthin.

The prevalence for smoking has been declining, use of UV-blocking sunglasses is widespread, and intake of nutrients like lutein/zeaxanthin from spinach or supplements has increased.[13-15]

Younger people thus have the opportunity to potentially avoid the sight-robbing impact of macular degeneration as they grow older.

The Problem with Baby Boomers

I'm 61 years old. In my youth, I never wore sunglasses. Even if I did, most sunglasses did not shield against oxidizing UV rays. Failure to wear protective sunglasses in youth was common in those who are over age 50 now. We didn't know back then how damaging solar rays were to our eyes.

Increased consumption of cooked spinach can provide a good deal of lutein/zeaxanthin.[16,17] To obtain higher doses of these carotenoids, low-cost supplements are readily available.

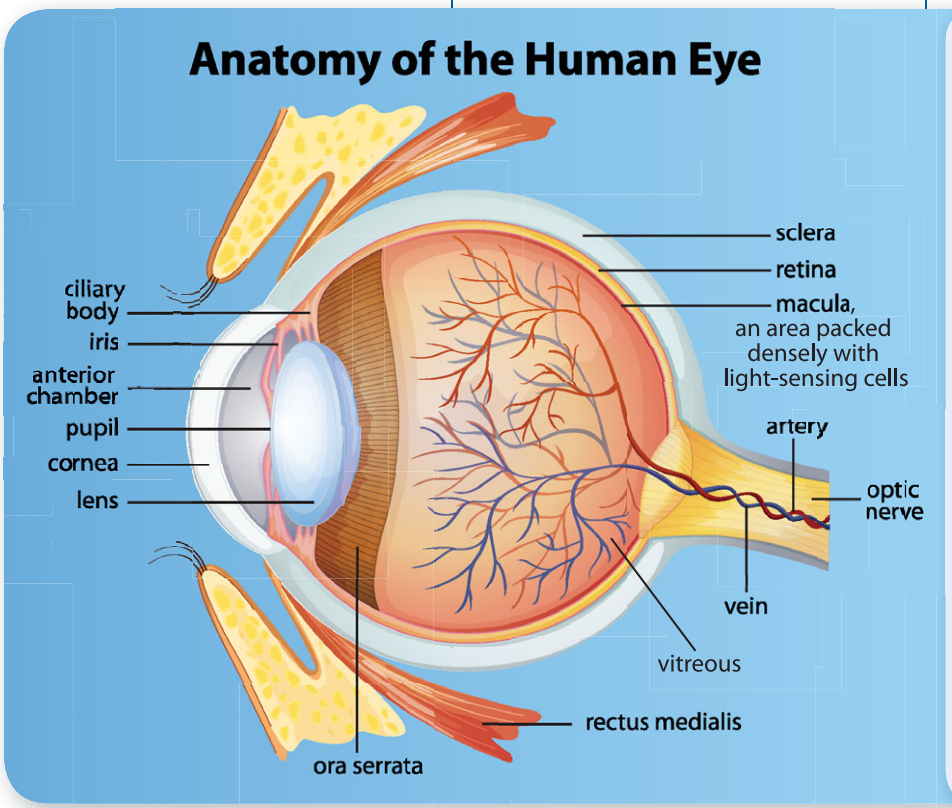
So what this means is that with proper education, younger people will wear UV-blocking sunglasses, avoid cigarettes, eat healthier and/or take the proper supplements. This will not only slash their risk of macular degeneration, but also delay cataract formation.

Most of us did not have this vision-protecting knowledge in our youth. As a result, many of us are in early stages of developing macular degeneration.

Fortunately, a large human study shows that it is not too late to initiate protective steps before advanced blinding macular degeneration manifests.

Findings from the Latest Human Study

A number of human studies reveal that those ingesting **lutein** and **zeaxanthin** have lower rates of macular degeneration.[22-25] Some of these studies show improvement in



What is Macular Degeneration?

Macular degeneration is the leading cause of blindness in aging adults.[18,19]

It results from progressive loss of light-sensing nerve cells in the macula, or central part of the retina. This is the area where these cells are most densely packed, which is why the macula provides us with the greatest level of visual acuity (the ability to distinguish fine details).[1,20]

As macular degeneration progresses, central vision is lost, gradually diminishing one's ability to engage in the many daily activities that require sharp vision.[21]

vision in those who take the higher amounts of these carotenoids found in certain dietary supplements.[26-29]

The question doctors have been asking is whether these carotenoids can prevent ***worsening*** of macular degeneration after it occurs. This and other questions about macular degeneration and carotenoids motivated researchers to perform an analysis of over 102,000 people aged 50 years or older.[12]

The study period lasted over 20 years and adjusted for confounding factors like cigarette smoking and eating patterns. The focus was to meticulously assess blood levels of **carotenoids** based on exhaustive and frequent food questionnaires. This well-designed study was published in the ***Journal of the American Medical Association-Ophthalmology***.[12]

The results showed that those with the ***highest*** intake of **lutein/zeaxanthin** had a marked **41%** lower risk of progressing to advanced macular degeneration.[12]

This kind of advanced eye disease is referred to as "neovascular" or "wet" macular degeneration. What happens in these advanced cases is that new blood vessels abnormally grow into the damaged macula. These new blood vessels may then bleed and leak fluid, causing the macula to bulge or lift up from its normally flat position, thus distorting or destroying central vision. Under these circumstances, vision loss may be rapid and severe.[1]

In this huge human study, those who consumed the most spinach had the highest **lutein/zeaxanthin** score and the lowest rate of advanced macular degeneration. The authors also found a **31%** lower risk of progression in those who consumed the most **alpha-carotene**.[12]

The conclusion of the study was:

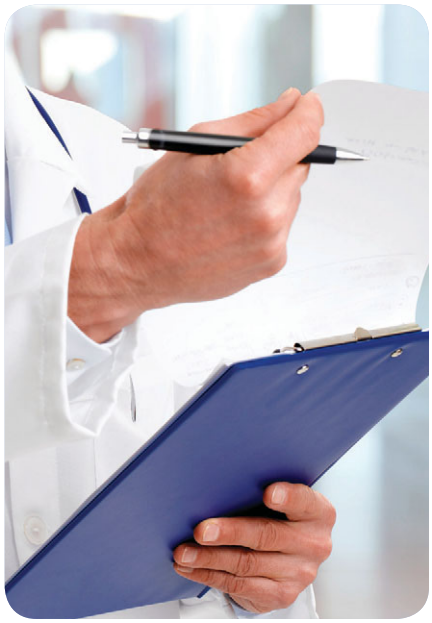
"Higher intakes of bioavailable carotenoids, particularly lutein/zeaxanthin and α-carotene, are associated with reduced risk of advanced AMD [age-related macular degeneration]."[12]

Even Greater Benefits Possible

In determining this **41%** reduction in advanced macular degeneration, the researchers adjusted their data to reflect smoking and other factors so that they could pinpoint that it was the **lutein/zeaxanthin** and **alpha-carotene** that was conferring the protection.

What's remarkable is that high intake of these carotenoids also protected former **smokers**.[12] The incidence of macular degeneration in former smokers is up to **threefold** higher than non-smokers.[30,31] This study showed that past smokers with the highest **lutein/zeaxanthin** scores also had sharply lower risk of advanced macular degeneration.[12]

This does not mean that anyone should continue smoking. It does corroborate published data showing the importance making sure to ingest enough **lutein/zeaxanthin** in your diet and/or supplement program. The value of wearing **sunglasses** that provide full-spectrum protection should not be overlooked.



While the **41%** reduction in developing advanced macular degeneration is a spectacular finding, compelling evidence exists to show an even ***greater*** defense against blindness is possible when an additional protective measure is taken.

A Missing Link in Maintaining Macular Density

Over the past 25 years, researchers discovered that people who regularly ate spinach, collard greens, and certain other vegetables had lower rates of age-related macular degeneration.[32]

Compared to those with the lowest carotenoid intake, people with the highest carotenoid intake have a **43%** reduction in their macular degeneration risk. Those who regularly ate spinach have an even greater reduction in macular degeneration incidence.[32]

When investigating what constituents of these vegetables protected the macula, lutein and zeaxanthin stood out as the most likely candidates. This was supported by research that involved testing the blood of people who contracted macular degeneration. Those with the highest plasma levels of lutein/zeaxanthin had the lowest rates of macular degeneration.[24]

Another reason scientists were so certain of their discovery is that in humans stricken with macular degeneration, the lutein/zeaxanthin content of their macula is severely depleted.[33]

If all people had to do was consume adequate lutein/zeaxanthin, then macular degeneration would theoretically disappear as a prevalent age-related disorder. Regrettably, macular degeneration still occurs even in some of those who regularly eat spinach.

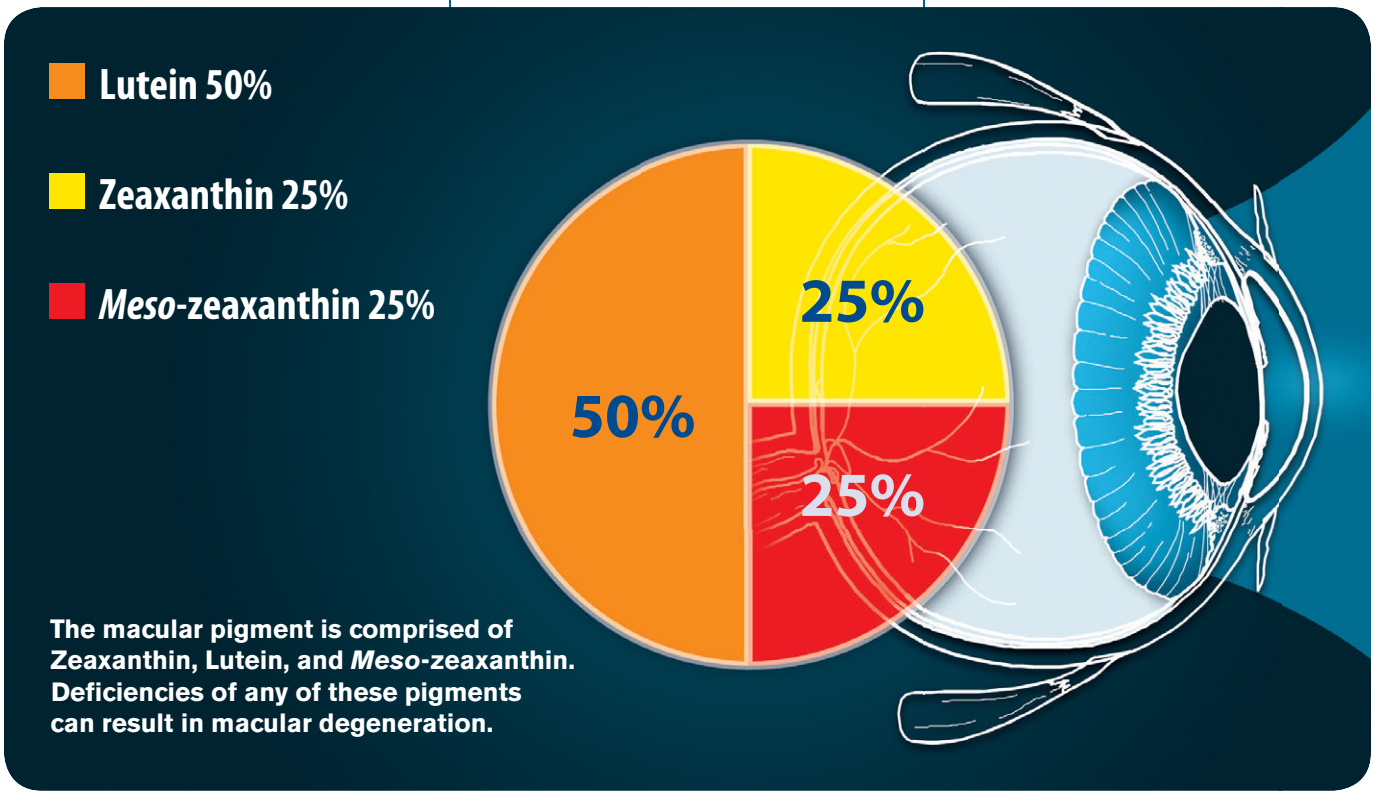
Overlooked in the prevention of this blinding disorder is a compound naturally produced in younger retinas called ***meso*-zeaxanthin**, which is needed to maintain macular density.[34]

Meso*-zeaxanthin** is not found in the normal diet.[34] It has been available for ten years in a dietary supplement used by ***Life Extension® supporters, but has not caught on with the general public.

In youth, the **lutein** people consume in their diet readily converts to ***meso*-zeaxanthin** in the macula.[34] As we age, this conversion process is disrupted, thus making it critical to orally ingest ***meso*-zeaxanthin**.

To fully appreciate the importance of this, please know the macular pigment is made up of the following three carotenoids:

- Lutein **50%**
- Zeaxanthin **25%**
- *Meso*-zeaxanthin **25%**



The macular pigment is comprised of Zeaxanthin, Lutein, and *Meso*-zeaxanthin. Deficiencies of any of these pigments can result in macular degeneration.

Vision Loss Seen in Those Stricken with Macular Degeneration

Normal Vision

The same scene viewed by a person with age-related macular degeneration

Macular degeneration is characterized by a reduction in the **density** of the macular pigment.[35] When taken as a supplement, ***meso*-zeaxanthin** is absorbed into the blood stream and effectively increases macular pigment levels.[7]

People with **macular degeneration** have been shown to have **30%** less *meso*-zeaxanthin in their macula compared to healthy eyes.[36] One reason for this deficiency of *meso*-zeaxanthin is lack of ingested lutein. Another explanation for the missing *meso*-zeaxanthin observed in macular degeneration is inability to adequately convert **lutein** to ***meso*-zeaxanthin**.

Meso-Zeaxanthin Deficiency Confirmed in Macular Degeneration

An autopsy study on donated eyes was done to measure levels of lutein, zeaxanthin, and *meso*-zeaxanthin in the retina of those with and without macular degeneration.

As expected, levels of all three carotenoids (lutein, zeaxanthin, and *meso*-zeaxanthin) were reduced in those with macular degeneration compared to control subjects.

The most significant finding, however, was the sharp decrease in ***meso*-zeaxanthin** in relation to zeaxanthin in the macula of macular degeneration subjects.[40]

This postmortem study helped confirm other studies indicating the importance of all three carotenoids (lutein, zeaxanthin and *meso*-zeaxanthin) in maintaining the structural integrity of the macula.[40,41]

Macular Degeneration-Induced Blindness: A Preventable Disease

The macula is the portion of the retina used to see details such as fine lines or the shape of an object. It is needed for both near and far vision.

The **macular pigment** is composed exclusively of lutein, zeaxanthin, and *meso*-zeaxanthin.[42] These three carotenoids protect the macula and the photoreceptor cells beneath.[43]

Those who wear protective sunglasses, don't smoke, and have a high intake of **lutein/zeaxanthin** (from either diet or dietary supplements) will likely enjoy a considerably lower incidence of macular degeneration.

The addition of **alpha-carotene** might afford additional protection based on the latest study published by the **American Medical Association**.

As I was concluding this editorial, an in-depth review of the chemistry and mechanisms of eye protection afforded by xanthophylls was being published.

I end here with a quote from this new scientific review on the prevention of eye disease:

"The macular pigment carotenoids, lutein, zeaxanthin, and meso-zeaxanthin are widely recommended as dietary supplements for the prevention of visual loss from age-related macular degeneration and other ocular diseases, but the basic and clinical science supporting such recommendations is underappreciated by clinicians and vision scientists"[44]

For longer life,

William Faloon

Variable Nature of Xanthophylls Obtained from Food Sources

The quality and quantity of lutein and zeaxanthin varies considerably when ingesting these from food sources.[37]

Factors such as species, cultivation, part of the plant, degree of maturity at harvest, and post-harvest handling practices affect carotenoid levels.[37]

In addition, absorption of xanthophyll carotenoids from green leafy vegetables is low, and various dietary factors affect their bioavailability.[38]

Cooked spinach makes lutein and zeaxanthin more bioavailable. When eating raw spinach in a salad, make sure to use plenty of **olive oil** dressing to facilitate absorption of fat-soluble lutein and zeaxanthin.[39]

***Meso*-zeaxanthin** cannot be obtained in sufficient quantities from food sources and should be taken as part of a supplement that also provides lutein and zeaxanthin.[22]

References

1. Available at: https://nei.nih.gov/health/maculardegen/armd_facts. Accessed March 23, 2016.
2. Available at: https://www.macular.org/what-macular-degeneration. Accessed March 30, 2016.
3. Available at: http://newhope.com/regulatory/dsm-kemin-affirm-science-supporting-eye-health. Accessed March 30, 2016.
4. Bian Q, Gao S, Zhou J, et al. Lutein and zeaxanthin supplementation reduces photooxidative damage and modulates the expression of inflammation-related genes in retinal pigment epithelial cells. *Free Radic Biol Med.* 2012;53(6):1298-307.
5. Richer S, Stiles W, Statkute L, et al. Double-masked, placebo-controlled, randomized trial of lutein and antioxidant supplementation in the intervention of atrophic age-related macular degeneration: the Veterans LAST study (Lutein Antioxidant Supplementation Trial). *Optometry.* 2004;75(4):216-30.
6. Sabour-Pickett S, Beatty S, Connolly E, et al. Supplementation with three different macular carotenoid formulations in patients with early age-related macular degeneration. *Retina.* 2014;34(9):1757-66.
7. Bone RA, Landrum JT, Cao Y, et al. Macular pigment response to a supplement containing meso-zeaxanthin, lutein and zeaxanthin. *Nutr Metab (Lond).* 2007;4:12.
8. Moeller SM, Jacques PF, Blumberg JB. The potential role of dietary xanthophylls in cataract and age-related macular degeneration. *J Am Coll Nutr.* 2000;19(5 Suppl):522s-7s.
9. Whitehead AJ, Mares JA, Danis RP. Macular pigment: a review of current knowledge. *Arch Ophthalmol.* 2006;124(7):1038-45.
10. Moeller SM, Parekh N, Tinker L, et al. Associations between intermediate age-related macular degeneration and lutein and zeaxanthin in the Carotenoids in Age-related Eye Disease Study (CAREDS): ancillary study of the Women's Health Initiative. *Arch Ophthalmol.* 2006;124(8):1151-62.
11. Krinsky NI, Landrum JT, Bone RA. Biologic mechanisms of the protective role of lutein and zeaxanthin in the eye. *Annu Rev Nutr.* 2003;23:171-201.
12. Wu J, Cho E, Willett WC, et al. Intakes of lutein, zeaxanthin, and other carotenoids and age-related macular degeneration during 2 decades of prospective follow-up. *JAMA Ophthalmol.* 2015;133(12):1415-24.
13. Available at: http://www.ncbi.nlm.nih.gov/books/NBK99243/. Accessed April 6, 2016.
14. Maddock JE, O'Riordan DL, Lee T, et al. Use of sunglasses in public outdoor recreation settings in Honolulu, Hawaii. *Optom Vis Sci.* 2009;86(2):165-6.
15. Yang Z, Zhang Z, Penniston KL, et al. Serum carotenoid concentrations in postmenopausal women from the United States with and without osteoporosis. *Int J Vitam Nutr Res.* 2008;78(3):105-11.
16. Sommerburg O, Keunen JE, Bird AC, et al. Fruits and vegetables that are sources for lutein and zeaxanthin: the macular pigment in human eyes. *Br J Ophthalmol.* 1998;82(8):907-10.
17. Available at: http://www.medicine.ox.ac.uk/bandolier/band123/b123-2.html. Accessed March 31, 2016.
18. Nita M, Strzalka-Mrozik B, Grzybowski A, et al. Age-related macular degeneration and changes in the extracellular matrix. *Med Sci Monit.* 2014;20:1003-16.
19. Haddad S, Chen CA, Santangelo SL, et al. The genetics of age-related macular degeneration: a review of progress to date. *Surv Ophthalmol.* 2006;51(4):316-63.
20. Bok D. Evidence for an inflammatory process in age-related macular degeneration gains new support. *Proc Natl Acad Sci U S A.* 2005;102(20):7053-4.
21. Whitmore SS, Mullins RF. Transcriptome changes in age-related macular degeneration. *BMC Med.* 2012;10:21.
22. Abdel-Aal el SM, Akhtar H, Zaheer K, et al. Dietary sources of lutein and zeaxanthin carotenoids and their role in eye health. *Nutrients.* 2013;5(4):1169-85.
23. Mares-Perlman JA, Fisher AI, Klein R, et al. Lutein and zeaxanthin in the diet and serum and their relation to age-related maculopathy in the third national health and nutrition examination survey. *Am J Epidemiol.* 2001;153(5):424-32.
24. Gale CR, Hall NF, Phillips DI, et al. Lutein and zeaxanthin status and risk of age-related macular degeneration. *Invest Ophthalmol Vis Sci.* 2003;44(6):2461-5.
25. Parisi V, Tedeschi M, Gallinaro G, et al. Carotenoids and antioxidants in age-related maculopathy italian study: multifocal electroretinogram modifications after 1 year. *Ophthalmology.* 2008;115(2):324-33.e2.
26. Huang YM, Dou HL, Huang FF, et al. Effect of supplemental lutein and zeaxanthin on serum, macular pigmentation, and visual performance in patients with early age-related macular degeneration. *Biomed Res Int.* 2015;2015:564738.
27. Kvansakul J, Rodriguez-Carmona M, Edgar DF, et al. Supplementation with the carotenoids lutein or zeaxanthin improves human visual performance. *Ophthalmic Physiol Opt.* 2006;26(4):362-71.
28. Olmedilla B, Granado F, Blanco I, et al. Lutein, but not alpha-tocopherol, supplementation improves visual function in patients with age-related cataracts: a 2-y double-blind, placebo-controlled pilot study. *Nutrition.* 2003;19(1):21-4.
29. Yao Y, Qiu QH, Wu XW, et al. Lutein supplementation improves visual performance in Chinese drivers: 1-year randomized, double-blind, placebo-controlled study. *Nutrition.* 2013;29(7-8):958-64.
30. Tan JS, Mitchell P, Kifley A, et al. Smoking and the long-term incidence of age-related macular degeneration: the Blue Mountains Eye Study. *Arch Ophthalmol.* 2007;125(8):1089-95.
31. Velilla S, García-Medina JJ, García-Layana A, et al. Smoking and age-related macular degeneration: review and update. *J Ophthal.* 2013;2013:895147.
32. Seddon JM, Ajani UA, Sperduto RD, et al. Dietary carotenoids, vitamins A, C, and E, and advanced age-related macular degeneration. Eye Disease Case-Control Study Group. *JAMA.* 1994;272(18):1413-20.
33. Bone RA, Landrum JT, Dixon Z, et al. Lutein and zeaxanthin in the eyes, serum and diet of human subjects. *Exp Eye Res.* 2000;71(3):239-45.
34. Bone RA, Landrum JT, Hime GW, et al. Stereochemistry of the human macular carotenoids. *Invest Ophthalmol Vis Sci.* 1993;34(6):2033-40.
35. Landrum JT, Bonet RA, Kilburn MD. The Macular Pigment: A possible role in protection from age-related macular degeneration. In: Helmut S, ed. *Adv Pharmacol.* Vol Volume 38: Academic Press; 1996:537-56.
36. Available at: http://www.google.com/patents/US6329432. Accessed April 1, 2016.
37. Rodriguez-Amaya DB. Food carotenoids: analysis, composition and alterations during storage and processing of foods. *Forum Nutr.* 2003;56:35-7.
38. van Het Hof KH, West CE, Weststrate JA, et al. Dietary factors that affect the bioavailability of carotenoids. *J Nutr.* 2000;130(3):503-6.
39. Brown MJ, Ferruzzi MG, Nguyen ML, et al. Carotenoid bioavailability is higher from salads ingested with full-fat than with fat-reduced salad dressings as measured with electrochemical detection. *Am J Clin Nutr.* 2004;80(2):396-403.
40. Landrum JT, Bone RA. Preferential deficiency of meso-zeaxanthin and lutein relative to zeaxanthin in the macular pigment of subjects with age-related macular degeneration. *Invest Ophthalmol Vis Sci.* 2003;44(13):3559-.
41. Bone RA, Landrum JT, Friedes LM, et al. Distribution of lutein and zeaxanthin stereoisomers in the human retina. *Exp Eye Res.* 1997;64(2):211-8.
42. Landrum JT, Bone RA. Lutein, zeaxanthin, and the macular pigment. *Arch Biochem Biophys.* 2001;385(1):28-40.
43. Connolly EE, Beatty S, Thurnham DI, et al. Augmentation of macular pigment following supplementation with all three macular carotenoids: an exploratory study. *Curr Eye Res.* 2010;35(4):335-51.
44. Bernstein PS, Li B, Vachali PP, et al. Lutein, zeaxanthin, and meso-zeaxanthin: The basic and clinical science underlying carotenoid-based nutritional interventions against ocular disease. *Prog Retin Eye Res.* 2016;50:34-66.

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References
1. *Int Angiol.* 2014 Feb;33(1):20-6.
2. *Int J Clin Pharmacol Ther.* 202 Apr;40(4):158-68.
3. *Int Angiol.* 2015 Feb;34(1):43-52.
4. *Angiology.*2001 Oct;52 Suppl 2:S69-73.
5. *Angiology.*2001 Oct;52 Suppl 2:S19-25.

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References
1. *Indian Journal of Clinical Biochemistry*. 2002 Jul;17 (2):44-51.
2. *Jpn Pharmacol Ther*. 1992;20:235-44.
3. *Biochem Biophys Res Commun*. 2006 Jul 7;345(3):1215-23.
4. *Steroids*. 1994 Feb;59(2):136-41.
5. *World J Gastroenterol*. 2005 Dec 21;11(47):7499-507.
6. *J Antimicrob Chemother*. 2004 Jul;54(1):243-6.
7. *Appl Environ Microbiol*. 2005 Dec;71(12):8558-64.
8. *Helicobacter*. 2005 Apr;10(2):139-45.

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Nighttime Fasting Reduces Breast Cancer Risk

According to a study published in *JAMA Oncology*, fasting for more than 13 hours a night may reduce the risk of breast cancer recurrence.*

Ruth E. Patterson, PhD, of the University of California-San Diego, and colleagues tracked 2,413 participants—all diagnosed with breast cancer between the ages 27 and 70—in the Women's Healthy Eating and Living study to determine the potential effects of nightly fasting on breast cancer prognosis. None of the women had diabetes.

On average, 818 women reported fasting overnight for at least 13 hours. Women who fasted for fewer than 13 hours a night had a **36%** higher risk for breast cancer recurrence, compared with those who fasted for 13 or more hours.

The researchers can't say why overnight fasting may influence breast cancer risk, but they found that with every additional two hours of fasting, a woman's average blood sugar level went down.

Editor's Note: "Our study introduces a novel dietary intervention strategy and indicates that prolonging the length of the nightly fasting interval could be a simple and feasible strategy to reduce breast cancer recurrence," say the authors.

* *JAMA Oncology*. 2016 Mar 31.

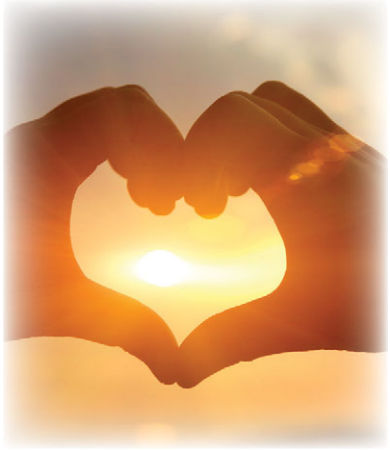
Vitamin D Improves Heart Function

According to a new five-year study presented at the American College of Cardiology 65th Annual Scientific Session & Expo in Chicago, a daily dose of **vitamin D3** improves heart function in people with chronic heart failure.*

The study by the University of Leeds School of Medicine included over 160 patients who were already being treated for their heart failure using proven treatments including beta-blockers, ACE-inhibitors, and pacemakers. Participants took either vitamin D or a placebo for one year.

In the 80 patients who took vitamin D3, the heart's pumping function improved from **26%** to **34%**. There was no change in cardiac function in the control group.

Editor's Note: This means that for some heart disease patients, taking vitamin D3 regularly may lessen the need for them to be fitted with an implantable cardioverter defibrillator (ICD), a device that detects dangerous irregular heart rhythms and can shock the heart to restore a normal rhythm. "ICDs are expensive and involve an operation," said study author Dr. Klaus Witte. "If we can avoid an ICD implant in just a few patients, then that is a boost to patients… as a whole."



*American College of Cardiology 65th Annual Scientific Session & Expo. 2016 Apr 4.

Metformin May Aid Heart Attack Recovery

Cardiovascular Diabetology published the results of research conducted by Jolanta Weaver and colleagues that provides evidence of **metformin's** benefit in heart attack recovery among diabetics. Use of metformin has been associated with a reduction in the incidence of cardiovascular disease in trials involving subjects with type II diabetes, however, its protective mechanism had until now remained undefined.*

In research that utilized umbilical cord-derived stem cell cultures, metformin was discovered to influence genes involved in angiogenesis: the formation of new blood vessels. (New blood vessel formation is delayed under the conditions of low oxygen and high glucose that occur in diabetic heart attack patients.) It was determined that metformin suppresses several angiogenic inhibitors while enhancing the expression of vascular endothelial growth factor A.

"Our research is exciting as it can instantly make a difference to the treatments we are exploring, offering a new approach to heart disease in diabetes and new therapies may now be developed," Dr. Weaver stated.

Editor's Note: "The outcome of cardiovascular disease interventions in patients with diabetes is much worse in comparison with nondiabetic individuals," noted Dr. Weaver. "As a result there is a demand for improved treatment approaches to enhance the outcomes of those with diabetes in order to increase heart attack survival rates."

* *Cardiovasc Diabetol*. 2016 Feb 9.

Broccoli May Provide Benefits against Liver Diseases

The March 1, 2016, issue of the *Journal of Nutrition* reported an association between a broccoli-supplemented diet and a lower risk of fatty liver and liver cancer in obese mice.*

"We decided that liver cancer needed to be studied particularly because of the obesity epidemic in the US," said lead researcher Elizabeth Jeffery, of the University of Illinois. "It is already in the literature that obesity enhances the risk for liver cancer and this is particularly true for men."

The researchers fed mice a Western diet high in lard and sucrose with or without freeze-dried broccoli, or a standard control diet. The animals subsequently received weekly injections of a carcinogen that has the potential to induce tumors in the liver and other organs.

"We found that the Westernized diet did increase fatty liver, but we saw that the broccoli protected against it. Broccoli stopped too much uptake of fat into the liver by decreasing the uptake and increasing the output of lipid from the liver," said Jeffrey.

Editor's Note: Previous research conducted by Dr. Jeffery found that chopping or steaming broccoli was the best way to enhance the availability of sulforaphane, broccoli's anti-cancer compound.

**J Nutr.* 2016 Mar;146(3):542-50.

Higher Vitamin C Intake Helps Slow Cataract Progression

Findings from a study published in the journal *Ophthalmology* suggest that consuming a high amount of **vitamin C** could slow the risk of cataract progression by a third compared to a low intake.*

Researchers at King's College London examined data from over 1,000 pairs of twins enrolled in the Twins UK registry. Questionnaire responses provided information concerning the intake of vitamin C and other nutrients. Digital imaging evaluated lens opacity in all subjects at age 60 and in 324 sets of twins 10 years later.

At the beginning of the study, participants whose diets contained abundant amounts of vitamin C had a **20%** lower reduction in cataract risk compared to those who consumed low amounts. After 10 years, subjects who consumed a high amount of the vitamin had a **33%** lower risk of cataract progression.

Editor's Note: Genetic factors were determined to account for **35%** of the difference in progression and environmental factors, including diet, accounted for the remainder. The study is the first to suggest that genetic factors are less important in cataract progression than those attributed to environment.

**Ophthalmology.* 2016 Mar 24.

Higher Lycopene Levels Linked to Lower Mortality Risk

The journal *Nutrition Research* recently published an article that revealed a significantly lower risk of dying over follow-up among metabolic syndrome patients who had high levels of **lycopene**.* Lycopene is a carotenoid that gives such food as tomatoes and watermelon their vivid red color.

A team from the University of Nebraska Medical Center in Omaha evaluated data from 2,499 participants who enrolled in the National Health and Nutrition Examination Survey (NHANES) from 2001-2006. Subjects were limited to those 20 years of age and older with metabolic syndrome. Blood samples collected upon enrollment were analyzed for serum lycopene concentrations.

Among subjects whose lycopene levels were among the top third of participants, the risk of dying over follow-up was **39%** lower than those in the lowest group, and for those whose levels were among the middle third, the risk was **33%** lower.

Editor's Note: The authors remark that, "Although the biological mechanisms by which metabolic syndrome increases the risk of mortality are not entirely clear, increased oxidative stress and inflammation may play an important role in the higher rate of mortality of individuals with metabolic syndrome."

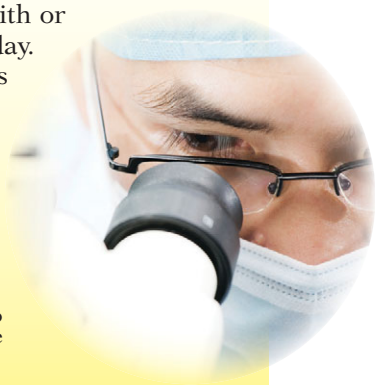
**Nutr Res*. 2016 Jan 9.*

Isoflavone Extends Life of Fruit Fly

A study reported in the February 2016 issue of *The FASEB Journal* found an association between supplementation of the diet with the **isoflavone prunetin** and longer life in males of the fly species *Drosophila melanogaster*.*

"To the best of our knowledge, the current study is the first to show that prunetin significantly improves both survival and long-term health in male *D. melanogaster*, the latter of which was indicated by improved climbing activity in aged flies," Anika Wagner, PhD, of Christian-Albrechts-University-Kiel in Germany and colleagues announced.

Dr. Wagner's team gave adult male flies diets with or without prunetin and monitored them every other day. They found that flies given prunetin had increases in expression of the longevity gene SIRT1, AMPK activation, fitness and average life span compared to the controls. Since female flies live longer than males, the authors suggest prunetin's estrogenicity as a mechanism supporting the effects uncovered by the study.



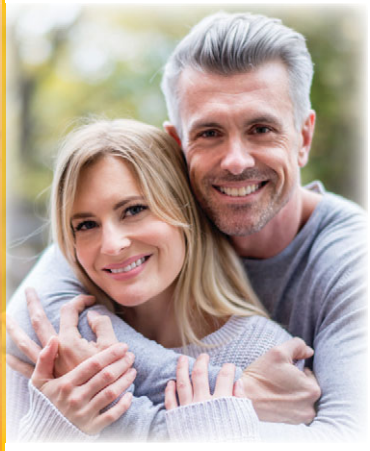
Editor's Note: Prunetin is a phytoestrogenic metabolite derived from soy or lima beans that had previously been found to affect cell signaling in experiments with cultured cells, yet little had been known of its effects in living organisms.

**FASEB J.* 2016 Feb;39(2)948-958.

Taurine Improves Erectile Dysfunction in Experimental Research

A study reported in the *Journal of Sexual Medicine* found improvement in the erectile function of rats with type I diabetes that received the amino acid **taurine**.* Diabetic humans are almost **three times** likelier to experience erectile dysfunction than nondiabetics.

The study utilized 18 rats that developed erectile dysfunction after being rendered diabetic by injection with streptozotocin. Eight nondiabetic rats served as controls. Half of the diabetic animals received intraperitoneally administered taurine and the remainder of the group received saline for four weeks.



At the end of the study, all erectile function variables were lower in diabetic compared to nondiabetic rats, however diabetic animals that received taurine experienced partial but significant recovery of erectile function. Taurine-treated animals had significantly reduced penile fibrosis as well as upregulation of endothelial nitric oxide synthase expression and improvement in other factors.

Editor's Note: Additionally, diabetic rats treated with taurine had higher testosterone levels than those that received saline.

**J Sex Med*. 2016 Mar 24.

Vitamin C Improves Survival in Deficient Mice

Supplementation with **vitamin C** corrects some of the deficits observed in mice bred to lack an enzyme that rendered them, like humans, unable to manufacture the vitamin.*

After weaning, the animals were supplemented with a low dose, high dose, or no vitamin C, and serum metabolites and other factors were measured at four months of age. Those that were not supplemented with the vitamin were euthanized within six weeks due to poor health and significant weight loss. While mice that received the low dose of vitamin C survived longer than unsupplemented mice, they also experienced poor health and weight loss over up to 16 months. However, animals that received the high dose experienced a median life span of 23 months and a maximum life span of 32 months, while the median achieved in non-modified untreated animals was 23.8 months and the maximum was 30 months.

Editor's Note: Supplementation with vitamin C was additionally associated with improved levels of several lipids and cardiovascular risk factors.

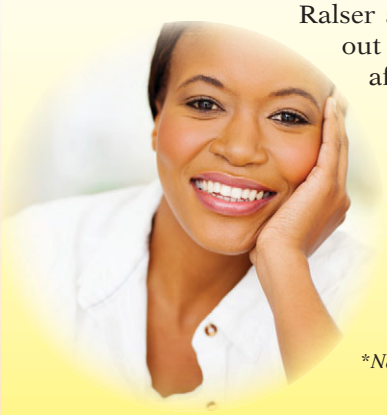
**Aging* (Albany NY). 2016 Feb 20.

Nutrients Affect Gene Behavior

An article published in *Nature Microbiology* reveals that genes not only influence metabolism, but that metabolic byproducts influence the behavior of genes as well.*

"The classical view is that genes control how nutrients are broken down into important molecules, but we've shown that the opposite is true, too: How the nutrients break down affects how our genes behave," stated lead researcher Markus Ralser of the University of Cambridge.

Previous research findings suggested that biochemical reactions occurring within an organism can affect gene regulation. These reactions depend on available nutrients, including sugars, amino acids, fatty acids, and vitamins derived from food. By manipulating the levels of metabolites in *Saccharomyces cerevisiae* (yeast) cells, Dr. Ralser and colleagues found that nearly nine out of 10 genes and their products were affected by the changes. "Cellular metabolism plays a far more dynamic role in the cells than we previously thought," Dr. Ralser stated.



Editor's Note: "Nearly all of a cell's genes are influenced by changes to the nutrients they have access to," Dr. Ralser remarked. "In fact, in many cases the effects were so strong, that changing a cell's metabolic profile could make some of its genes behave in a completely different manner."

**Nature Microbiol*. 2016 Feb 1.

Health Care Spending by Seniors Will Jump 21.6% by 2030

The senior population is growing across the globe, and people are living longer all around the world. The United Nations (UN) forecasts that the 60-and-over age group will grow from **12.3%** of the global population in 2015 to **16.5%** of the global population in 2030.*

In 2015, consumers aged 65 and older accounted for around $7 trillion, or approximately **17%**, of total worldwide consumer spending. In 2030, seniors are projected to account for around $15 trillion, or approximately **23.5%**, of the total.

It is estimated that seniors accounted for around **16.1%**, or $1.3 trillion, of **health care spending** globally in 2015; a number that will jump to **21.6%**, or **$3.5 trillion**, in 2030.

The UN forecasts that the 60 and older age group will swell by just over 500 million between 2015 and 2030, accounting for **44%** of the total global population growth of 1,152 million that is expected over the period. At this time, only two areas in the world have a population aged 60 and over that accounts for **25%** of their population—Southern and Western Europe and Japan. By 2030, Northern Europe, North America, Australia/New Zealand, and China will have joined them.

* Fung Business Retail & Technology. March 2016.

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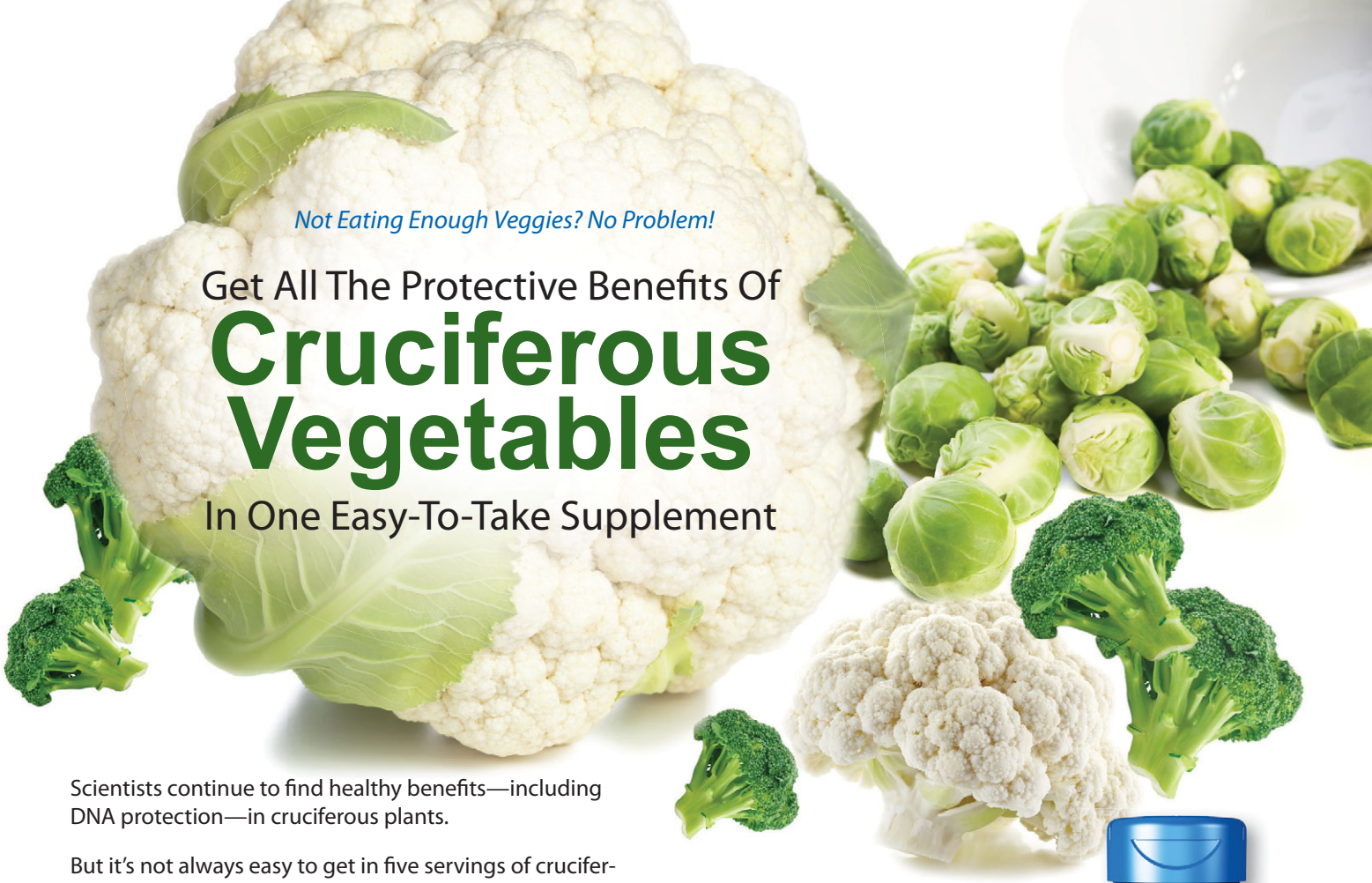

Scientists continue to find healthy benefits—including DNA protection—in cruciferous plants.

But it's not always easy to get in five servings of cruciferous vegetables a day—and even if you do, cooking can destroy many of the protective compounds found in **broccoli**, **Brussels sprouts**, **cauliflower**, and **cabbage**.

Life Extension®'s **Triple Action Cruciferous Vegetable Extract** combines vital plant extracts into a comprehensive formula to provide optimal DNA protection. Each capsule also contains:[1-9]

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- **Apigenin**, a powerful plant flavonoid, that boosts cell protection[1-9]

Those who want the additional benefits of *trans*-resveratrol can order **Triple Action Cruciferous Vegetable Extract with Resveratrol**. Each vegetarian capsule contains **20 mg** of *trans*-resveratrol in addition to the vegetable extract.

References

1. *Biochem Pharm.* 2002, 64;393-404.
2. *Toxicol Appl Pharm.* 2001 Jul 15;174(2):146-52.
3. *J Natl Cancer Inst.* 1997 May 21;89(10)718-23.
4. *Cancer Detect Prevent.* 2004;28:72-9.
5. *Carcinogenesis.* 2002 Apr;23(4):581-6.
6. *Mol Cancer Ther.* 2003 Oct;2(10):1045-52.
7. *Carcinogenesis.* 1998 Oct;19(10):1821-7.
8. *Carcinogenesis.* 1995 Sep;16(9):2057-62.
9. *J Clin Biochem Nutr.* 2009 May;44(3):260-5.

Triple Action Cruciferous Vegetable Extract

Item #01468 • 60 vegetarian capsules

	Retail Price	Your Price
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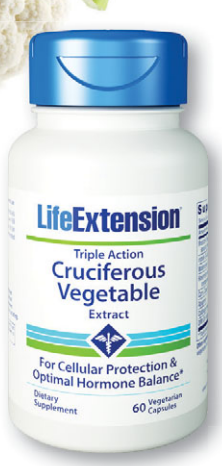
4 bottles		**$16.50 each**



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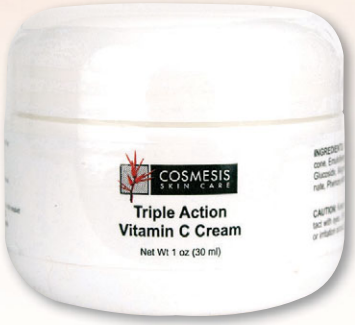
- Support natural defenses against photodamage,[2]
- Restore skin hydration,[5]
- Help inhibit discoloration of the skin,[3] and
- Help alleviate skin blemishes[6]



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References

1. *J Invest Dermatol.* 2001 Jun;116(6):853-9.
2. *Dermatol Surg.* 2005 Jul;31(7 Pt 2):814-7; discussion 818.
3. *Skin Res Technol.* 2006 May;12(2):105-13.
4. *J Invest Dermatol.* 2005;125(4):826-32.
5. *Photochem Photobiol.* 2012 May-Jun;88(3):748-52.
6. *Int J Cosmet Sci.* 2005 Jun;27(3):171-6.

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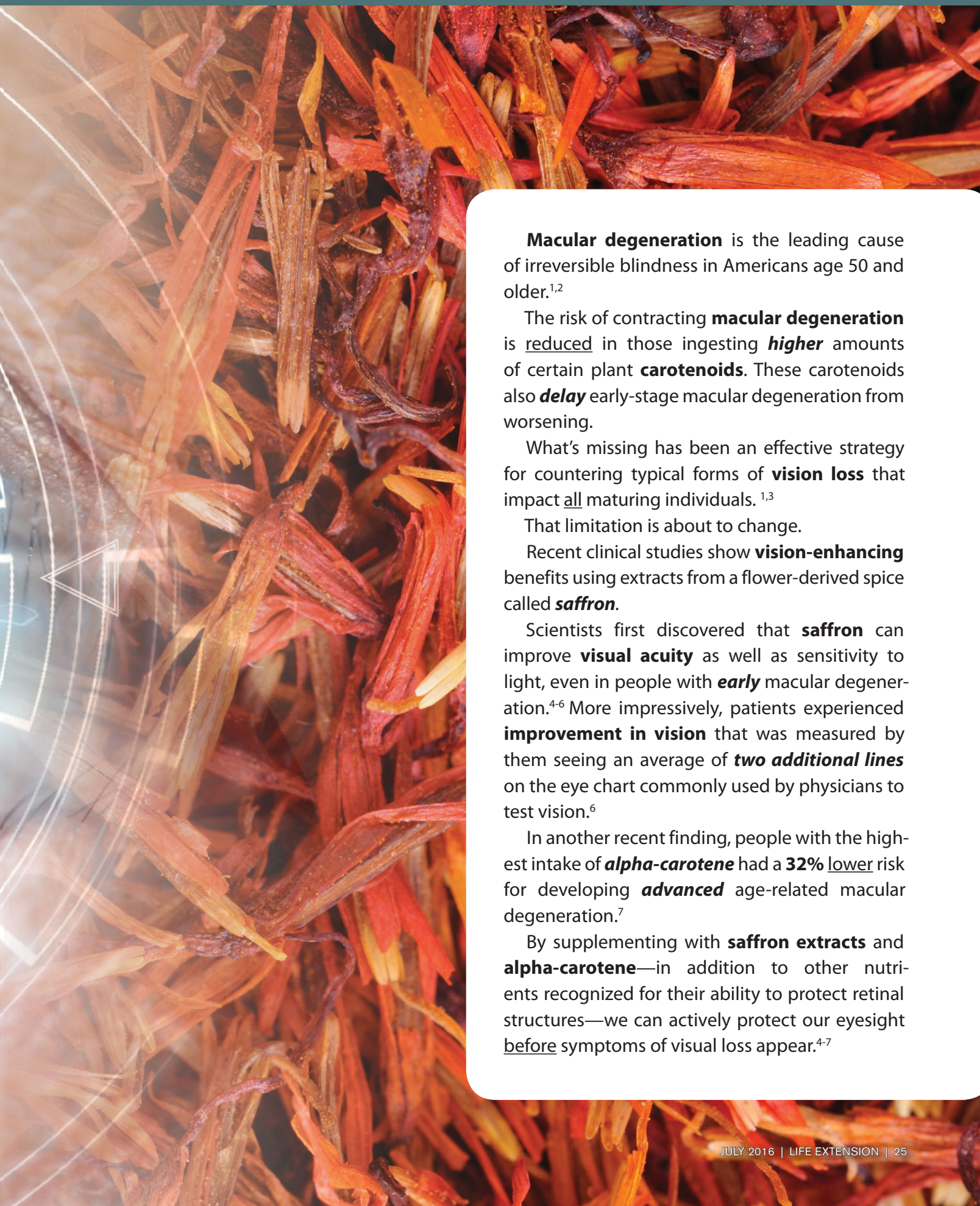
SAFFRON

Improves Vision in Aging Humans

BY LAURA FRIEDMAN



Macular degeneration is the leading cause of irreversible blindness in Americans age 50 and older.[1,2]

The risk of contracting **macular degeneration** is reduced in those ingesting ***higher*** amounts of certain plant **carotenoids**. These carotenoids also ***delay*** early-stage macular degeneration from worsening.

What's missing has been an effective strategy for countering typical forms of **vision loss** that impact all maturing individuals. [1,3]

That limitation is about to change.

Recent clinical studies show **vision-enhancing** benefits using extracts from a flower-derived spice called ***saffron***.

Scientists first discovered that **saffron** can improve **visual acuity** as well as sensitivity to light, even in people with ***early*** macular degeneration.[4-6] More impressively, patients experienced **improvement in vision** that was measured by them seeing an average of ***two additional lines*** on the eye chart commonly used by physicians to test vision.[6]

In another recent finding, people with the highest intake of ***alpha-carotene*** had a **32%** lower risk for developing ***advanced*** age-related macular degeneration.[7]

By supplementing with **saffron extracts** and **alpha-carotene**—in addition to other nutrients recognized for their ability to protect retinal structures—we can actively protect our eyesight before symptoms of visual loss appear.[4-7]

Natural Sunglasses for the Eyes

Up to **11 million** people in the United States have at least some degree of age-related macular degeneration.[2,8] While **2%** of 50 to 59 year olds suffer from the disease, that number surges to **30%** in those over 75 years.[2]

The ***macula***, the small spot at the center of the retina, is particularly rich in light-sensing cells, which are essential for our ability to sharply see things that are directly in front of us.[1] Because of its yellow color, the macula absorbs excess blue and ultraviolet light in order to prevent their destructive effects on light-sensing cells.[9-11] Think of it as protective sunglasses for the retina.

Age-related macular degeneration occurs in response to prolonged exposure of the eye to visible and **ultraviolet light**, as well as chemical stresses from a **glucose**- and **oxygen-rich** blood supply. Over time, these factors all contribute to the breakdown of our retinal light-sensing cells.

As degeneration of cells in the macula progresses, victims lose their ***central vision*** and become less able to see what they are trying to focus on.[1,12] Consequently, the ability to read, drive, do intricate work, and perform many other daily tasks can become impaired, even before the onset of legal blindness.

It is important to protect the structural integrity of the macula ***early*** in order to prevent it from degenerating to its more advanced stages.

Saffron Benefits Early Age-Related Macular Degeneration

Saffron is a culinary spice derived from parts of the crocus (*Crocus sativus*) flower. Newly published scientific studies demonstrate its ability to improve visual acuity and to improve sensitivity of the retina to light in people with ***early*** macular degeneration.[4-6]

Saffron protects and prevents the steady breakdown of **light-sensitive cells** in the center of the retina, the *macula*. This addresses the root cause of age-related macular degeneration and improves light sensitivity, a major manifestation of the disease.

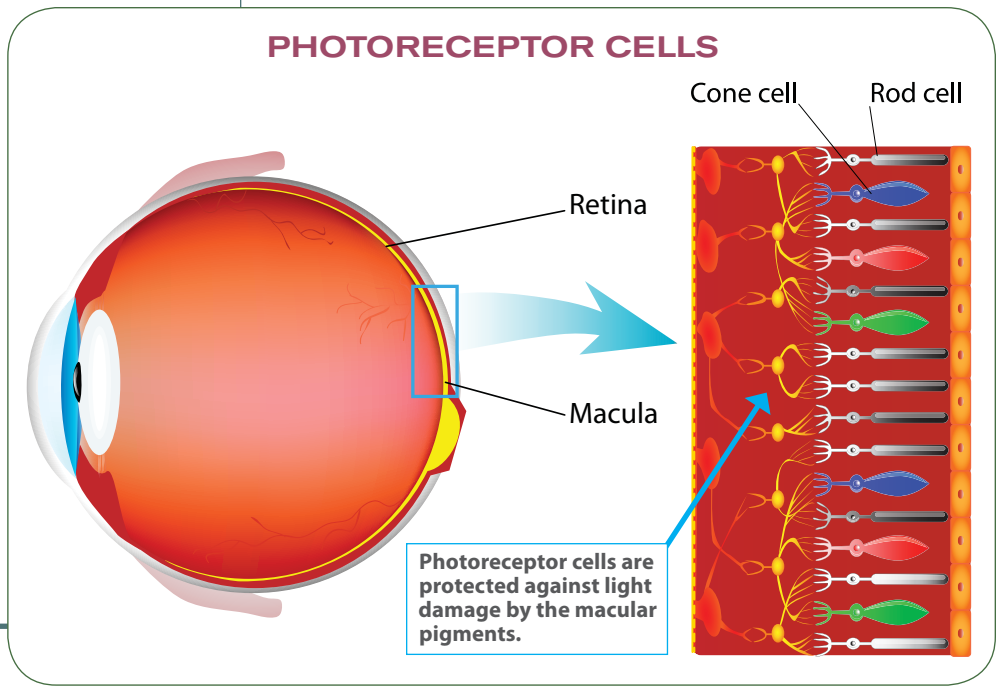
In the first study, patients with early age-related macular degeneration were randomly assigned to receive either **20 mg** per day of **saffron** or a **placebo**.

During the supplement phase, patients had stronger electrical responses to light overall.[4] Researchers were able to determine these improvements by using sophisticated testing that measures the electrical output of retinal cells in response to light stimulation. If these tests show relatively poor responses to light, it is an indicator of ailing retinal cells.[13]

The patients also had a better response to dim light during the supplement phase (meaning that their eyes were more sensitive to dim light images). No such changes were apparent during the placebo phase. This means that **saffron** supplementation improved the light-sensing abilities of retinal cells in early age-related macular degeneration.[4] This is an unprecedented finding.

In a second observation of this study, subjects who took saffron had a significant increase in *visual acuity*, a term that refers to the sharpness of vision at a distance. After three months of supplementation, patients had an average increase in visual acuity at a distance of one full line (**14.3%** better than baseline) on the familiar Snellen vision chart which measures visual acuity at a distance of 20 feet.[4] That means, for example, that someone whose **visual acuity** at a distance was **20/40** prior to supplementation would see with **20/30** vision afterwards. Once again, no improvement in distance vision was seen in placebo recipients.

These findings were replicated after three months, when the supplement/placebo treatments were re-assigned and then continued for another three months.[4] This suggests consistency and reproducibility of benefit for the dietary supplement with improving visual acuity at a distance.



What You Need to Know

Saffron Protects against Vision Loss

- Age-related macular degeneration (AMD) threatens all Americans with eventual vision loss and even blindness.
- To date, only advanced age-related macular degeneration has proved amenable to treatment, while prevention efforts have failed to slow the disease in its earliest stages, before substantial retinal damage has occurred.
- New studies reveal that saffron can enhance retinal responses and sensitivity to light and significantly improve visual acuity in people with early age-related macular degeneration.
- Saffron's benefits can be augmented by other proven vision-preserving nutrients, including alpha-carotene, lutein, zeaxanthin, and astaxanthin, as well as cyanidin-3-glucoside, which preserves dim-light vision.
- Together, these nutrients appear applicable to all people 50 years and older, offering protection against age-related macular degeneration at its earliest stages.

Longer-Term Benefits of Saffron

While these initial observations demonstrated meaningful and rapid visual improvements, scientists wanted to see if **saffron** could produce more long-term effects. That's why, in a follow-up study, the same researchers examined saffron supplementation (**20 mg** per day) in subjects with ***early*** macular degeneration over an average treatment period of **14 months**.[6]

In a similar finding to the first study, retinal sensitivity to light increased significantly by the end of three months—and impressively, it remained elevated for the entire course of the study. Even more impressive, the average visual acuity improved by not one, but ***two*** lines on the Snellen chart.[6] This shows us that longer supplementation periods produce further vision improvement.

A third human study confirms the previous findings and demonstrates nearly identical improvements in retinal light sensitivity over an average 11-month period. This study went a step further because it determined that **saffron** produces improvements in early age-related macular degeneration regardless of one's heredity.[5] This is important because it means that the results of these studies can be generalized to all adults with early age-related **macular degeneration**, not just those with specific genetic risk factors.

Reducing Risk of Advanced Age-Related Macular Degeneration

Alpha-carotene is another yellow pigment that offers a complement to saffron. Similar to saffron's key components, ***alpha-carotene*** is a **carotenoid** that protects the pigmented cells of the retina from light-induced oxidative damage. People who consume the most dietary alpha-carotene have a **32%** reduced risk for developing advanced age-related macular degeneration compared to those with the lowest consumption.[7]

This was demonstrated in the Nurses' Health Study and Health Professionals Follow-Up Study, which analyzed data from 63,443 women and 38,603 men 50 years old or older. These findings make it clear that **alpha-carotene** may be the perfect complement to saffron's ability to improve retinal function in early age-related macular degeneration.[7]

The Stages of Age-Related Macular Degeneration

Macular degeneration is characterized by ***drusen***, yellowish deposits of fat and protein beneath the retina that can only be seen in an examination conducted by a skilled vision professional. Small numbers of drusen appear to be a natural part of aging, but larger numbers, especially of medium to large drusen, suggest age-related macular degeneration.[1,39]

In ***early*** age-related ***macular degeneration***, drusen are of medium size and rarely produce symptoms.

In ***intermediate macular degeneration***, drusen are larger and dark clumps of pigment from broken-down retinal cells may appear on an eye examination. Again, even at this intermediate stage of retinal changes, symptoms are usually absent.

Late age-related macular degeneration is signaled by the appearance of visual symptoms, including blurring in the center of the visual field, blank spots in vision, and an apparent dimming of objects.

Late age-related macular degeneration has two forms, known as dry and wet (or neovascular) degeneration.[1,39]

Dry age-related macular degeneration is by far the most common type, affecting **90%** of those with the condition. People with this form of the disease continue to have progression and growth of retinal drusen and a gradual breakdown of retinal light-sensing cells, eventually leading to vision loss.[1,39]

Wet age-related macular degeneration only occurs in about **10%** of people with the condition, but it accounts for about **90%** of cases of blindness. Wet age-related macular degeneration is defined by the presence of tiny new blood vessels growing in the tissue layer beneath the retina, which can leak to produce swelling and damage to the macula itself. Wet age-related macular degeneration tends to progress rapidly and to greater severity than the dry form and is much likelier to produce severe vision loss.[1,39]

Additional Nutrients for Eye Health

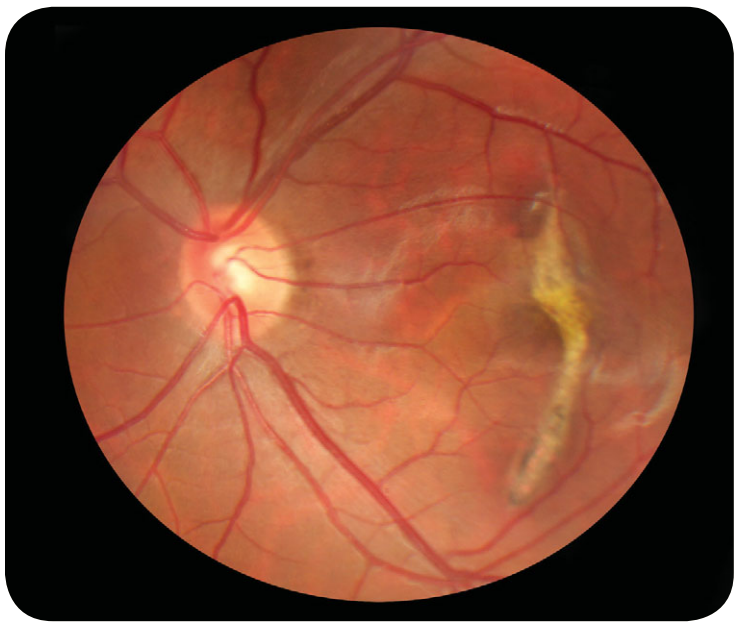
Lutein and ***zeaxanthin*** are found in high concentrations in several components of the eye, including the lens, the retina, and the sensitive macula.[14,15] These carotenoids have been used by most ***Life Extension***® supporters for the past several decades.

As with saffron and alpha-carotene, **lutein** and **zeaxanthin** are yellow pigments that efficiently absorb higher-energy (blue and ultraviolet) light, preventing it from damaging retinal tissues. As an added benefit, lutein and zeaxanthin scavenge oxygen free radicals and reduce their damaging impact on retinal cells.[14-17]

Studies of adults with age-related macular degeneration show that supplementing with **10** to **12 mg** of **lutein** per day raises the density of protective pigmented cells in the retina by up to **175%** compared with patients taking **placebo**.[18,19] This means that it enhances the eye's own ability to protect against damaging blue and ultraviolet light. It is important to note that lower doses, such as **6 mg** per day, have proved insufficient to significantly improve pigment density, and have only borderline effects on vision.[20]

In patients with early age-related macular degeneration, 48 weeks of supplementation with lutein at **10** or **20 mg** alone (or at **10 mg** in combination with **zeaxanthin**) produced significant increases in *electroretinogram signals*. This is a measure of the power of light-sensitive cells to produce electrical impulses after stimulation by light.[21]

Multiple large clinical studies have now demonstrated that supplementation with lutein and/or zeaxanthin can improve *retinal function*, increase the ability to see contrasting colors and shapes, and improve visual acuity.[19,21-24]



Protect against Night-Blindness

Cyanidin-3-glucoside *(C3G)* is a flavonoid compound found in many **berries**[25,26] that is particularly beneficial for **night vision**.

That's because **cyanidin-3-glucoside** enhances both the quality and function of ***rhodopsin***, a light-sensitive protein found in the rod cells of the retina.[26-29] Rod cells are the eye's most sensitive cells and they allow us to see in very dim light. Loss of rod cells is associated with night-blindness or reduced vision in dim light.[30]

Cyanidin-3-glucoside hastens the ability of rhodopsin to regenerate.[28,29]

It is this rapid **regeneration** of rhodopsin that has vision scientists excited about its potential benefits to enhance night vision.

A study of healthy volunteers showed that just **50 mg** of a berry extract concentrate containing **cyanidin-3-glucoside** allowed aging individuals to see better in **darkness** after 30 minutes.[31]

Protect against Retinal Cell Death

Astaxanthin is a reddish carotenoid molecule derived from marine algae. It has powerful free radical scavenging and anti-apoptotic properties that help protect retinal cells from death induced by chemical and physical stresses.[32-34]

Astaxanthin has been found to prevent the vision-damaging effects of wet macular degeneration and can also prevent cell damage related to increased pressure in the eye (glaucoma).[32,35,36]

Astaxanthin could be especially beneficial for diabetics. Eighty percent of people who have had diabetes for more than 10 years suffer from **diabetic retinopathy**, a condition that occurs when high blood sugar concentrations cause progressive damage to the retina. Studies in mice have demonstrated that astaxanthin prevents the early cell death in retinal nerve cells that results from high blood sugar concentrations.[33]

Two human studies have shown that the combination of astaxanthin, lutein, and zeaxanthin led to significant improvements in visual acuity in supplemented patients compared with untreated patients.[37,38]

Summary

Macular degeneration threatens every American over 50 with vision loss.

Certain **carotenoids** have been shown to help prevent this condition and delay progression in its intermediate to advanced (blinding) stages. The dilemma up until now was how to protect against so-called "normal" loss of visual acuity that occurs with aging.

New human studies indicate that supplementing with **saffron** can, for the first time, produce meaningful changes in the retina and improve visual acuity, even in people with ***early*** macular degeneration. This knowledge should allow everyone to protect their vision before symptoms appear, and before significant breakdown of retinal light-sensing cells occurs.

Saffron and **alpha-carotene** are now available in combination with other vision-protecting nutrients, including **lutein**, **zeaxanthin** (and their related compounds), and **astaxanthin**. These plant pigments powerfully absorb blue and ultraviolet light, which are the most damaging to retinal cells. The addition of **cyanidin-3-glucoside** helps protect against night blindness and reduced vision in dim light.

Widespread use of these plant-derived extracts could have enormous public health implications in providing meaningful ocular support as populations move into older age. ●

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

Can Alpha-Carotene Prevent Premature Death?

Alpha-carotene is getting a lot of attention as a vision-enhancing, retinal-protecting supplement. Recent studies, however, suggest another intriguing–and potentially ground-breaking–effect of alpha-carotene in the blood: prolonging life. There is now good support for a mechanism by which it could do so.

Large-scale studies have shown a significant association between serum levels of the carotenoid alpha-carotene and the risk of dying. In a study of more than 15,000 people, individuals with the highest alpha-carotene levels were **39%** less likely to die from all causes compared to those with the lowest levels.[40]

A 2016 study suggests one possible reason for this longevity-promoting feature of alpha-carotene: preventing the shortening of ***telomeres***, which are the stretches of DNA at the ends of chromosomes that are associated with aging. Shorter telomeres are associated with more advanced aging.

In a study of more than 3,600 people, those with higher levels of alpha-carotene and other carotenoid pigments in their blood had longer telomeres. Indeed, a doubling in blood alpha- and beta-carotene and beta-cryptoxanthin was associated with **2%** longer telomeres, and those with the highest levels had telomeres **5%** to **8%** longer than those with the lowest levels.[41]

Thus, a high intake of alpha-carotene and other carotenoid pigments could help aging individuals achieve a longer life through slowing telomere shortening.

References

1. Available at: https://nei.nih.gov/health/maculardegen/armd_facts. Accessed March 23, 2016.
2. Available at: http://www.brightfocus.org/macular/article/age-related-macular-facts-figures. Accessed March 23, 2016.
3. The Age-Related Eye Disease Study 2 Research G. Lutein + zeaxanthin and omega-3 fatty acids for age-related macular degeneration: The age-related eye disease study 2 (areds2) randomized clinical trial. *JAMA.* 2013;309(19):2005-15.
4. Falsini B, Piccardi M, Minnella A, et al. Influence of saffron supplementation on retinal flicker sensitivity in early age-related macular degeneration. *Invest Ophthalmol Vis Sci.* 2010;51(12):6118-24.
5. Marangoni D, Falsini B, Piccardi M, et al. Functional effect of saffron supplementation and risk genotypes in early age-related macular degeneration: a preliminary report. *J Transl Med.* 2013;11:228.
6. Piccardi M, Marangoni D, Minnella AM, et al. A longitudinal follow-up study of saffron supplementation in early age-related macular degeneration: sustained benefits to central retinal function. *Evid Based Complement Alternat Med.* 2012;2012:429124.
7. Wu J, Cho E, Willett WC, et al. Intakes of lutein, zeaxanthin, and other carotenoids and age-related macular degeneration during 2 decades of prospective follow-up. *JAMA Ophthalmol.* 2015;133(12):1415-24.
8. Rein DB, Wittenborn JS, Zhang X, et al. Forecasting age-related macular degeneration through the year 2050: the potential impact of new treatments. *Arch Ophthalmol.* 2009;127(4):533-40.
9. Semba RD, Dagnelie G. Are lutein and zeaxanthin conditionally essential nutrients for eye health? *Med Hypotheses.* 2003;61(4):465-72.
10. Moukarzel AA, Bejjani RA, Fares FN. Xanthophylls and eye health of infants and adults. *J Med Liban.* 2009;57(4):261-7.
11. Krinsky NI, Landrum JT, Bone RA. Biologic mechanisms of the protective role of lutein and zeaxanthin in the eye. *Annu Rev Nutr.* 2003;23:171-201.
12. Available at: http://www.brightfocus.org/macular/information. Accessed March 30, 2016.
13. Wood A, Margrain T, Binns AM. Detection of early age-related macular degeneration using novel functional parameters of the focal cone electroretinogram. *PLoS One.* 2014;9(5):e96742.
14. Ma L, Lin XM. Effects of lutein and zeaxanthin on aspects of eye health. *J Sci Food Agric.* 2010;90(1):2-12.
15. Roberts JE, Dennison J. The photobiology of lutein and zeaxanthin in the eye. *J Ophthalmol.* 2015;2015:687173.
16. Pongcharoen S, Warnnissorn P, Lertkajornsin O, et al. Protective effect of silk lutein on ultraviolet B-irradiated human keratinocytes. *Biol Res.* 2013;46(1):39-45.
17. Aimjongjun S, Sutheerawattananonda M, Limpeanchob N. Silk lutein extract and its combination with vitamin E reduce UVB-mediated oxidative damage to retinal pigment epithelial cells. *J Photochem Photobiol B.* 2013;124:34-41.
18. Garcia-Layana A, Recalde S, Alaman AS, et al. Effects of lutein and docosahexaenoic acid supplementation on macular pigment optical density in a randomized controlled trial. *Nutrients.* 2013;5(2):543-51.
19. Murray IJ, Makridaki M, van der Veen RL, et al. Lutein supplementation over a one-year period in early AMD might have a mild beneficial effect on visual acuity: the CLEAR study. *Invest Ophthalmol Vis Sci.* 2013;54(3):1781-8.
20. Sasamoto Y, Gomi F, Sawa M, et al. Effect of 1-year lutein supplementation on macular pigment optical density and visual function. *Graefes Arch Clin Exp Ophthalmol.* 2011;249(12):1847-54.
21. Ma L, Dou HL, Huang YM, et al. Improvement of retinal function in early age-related macular degeneration after lutein and zeaxanthin supplementation: a randomized, double-masked, placebo-controlled trial. *Am J Ophthalmol.* 2012;154(4):625-34.e1.
22. Ma L, Yan SF, Huang YM, et al. Effect of lutein and zeaxanthin on macular pigment and visual function in patients with early age-related macular degeneration. *Ophthalmology.* 2012;119(11):2290-7.

23. Richer S, Stiles W, Statkute L, et al. Double-masked, placebo-controlled, randomized trial of lutein and antioxidant supplementation in the intervention of atrophic age-related macular degeneration: the Veterans LAST study (Lutein Antioxidant Supplementation Trial). *Optometry.* 2004;75(4):216-30.
24. Weigert G, Kaya S, Pemp B, et al. Effects of lutein supplementation on macular pigment optical density and visual acuity in patients with age-related macular degeneration. *Invest Ophthalmol Vis Sci.* 2011;52(11):8174-8.
25. Tremblay F, Waterhouse J, Nason J, et al. Prophylactic neuroprotection by blueberry-enriched diet in a rat model of light-induced retinopathy. *J Nutr Biochem.* 2013;24(4):647-55.
26. Lee SH, Jeong E, Paik SS, et al. Cyanidin-3-glucoside extracted from mulberry fruit can reduce N-methyl-N-nitrosourea-induced retinal degeneration in rats. *Curr Eye Res.* 2014;39(1):79-87.
27. Matsumoto H, Nakamura Y, Tachibanaki S, et al. Stimulatory effect of cyanidin 3-glycosides on the regeneration of rhodopsin. *J Agric Food Chem.* 2003;51(12):3560-3.
28. Yanamala N, Tirupula KC, Balem F, et al. pH-dependent interaction of rhodopsin with cyanidin-3-glucoside. 1. Structural aspects. *Photochem Photobiol.* 2009;85(2):454-62.
29. Tirupula KC, Balem F, Yanamala N, et al. pH-dependent interaction of rhodopsin with cyanidin-3-glucoside. 2. Functional aspects. *Photochem Photobiol.* 2009;85(2):463-70.
30. Available at: http://www.ncbi.nlm.nih.gov/books/NBK10850/. Accessed March 29, 2016.
31. Nakaishi H, Matsumoto H, Tominaga S, et al. Effects of black current anthocyanoside intake on dark adaptation and VDT work-induced transient refractive alteration in healthy humans. *Altern Med Rev.* 2000;5(6):553-62.
32. Izumi-Nagai K, Nagai N, Ohgami K, et al. Inhibition of choroidal neovascularization with an anti-inflammatory carotenoid astaxanthin. *Invest Ophthalmol Vis Sci.* 2008;49(4):1679-85.
33. Dong LY, Jin J, Lu G, et al. Astaxanthin attenuates the apoptosis of retinal ganglion cells in db/db mice by inhibition of oxidative stress. *Mar Drugs.* 2013;11(3):960-74.
34. Li Z, Dong X, Liu H, et al. Astaxanthin protects ARPE-19 cells from oxidative stress via upregulation of Nrf2-regulated phase II enzymes through activation of PI3K/Akt. *Mol Vis.* 2013;19:1656-66.
35. Cort A, Ozturk N, Akpinar D, et al. Suppressive effect of astaxanthin on retinal injury induced by elevated intraocular pressure. *Regul Toxicol Pharmacol.* 2010;58(1):121-30.
36. Ishida S. Lifestyle-related diseases and anti-aging ophthalmology: suppression of retinal and choroidal pathologies by inhibiting renin-angiotensin system and inflammation. *Nippon Ganka Gakkai Zasshi.* 2009;113(3):403-22; discussion 23.
37. Parisi V, Tedeschi M, Gallinaro G, et al. Carotenoids and antioxidants in age-related maculopathy italian study: multifocal electroretinogram modifications after 1 year. *Ophthalmology.* 2008;115(2):324-33.e2.
38. Piermarocchi S, Saviano S, Parisi V, et al. Carotenoids in age-related maculopathy Italian study (CARMIS): two-year results of a randomized study. *Eur J Ophthalmol.* 2012;22(2):216-25.
39. Available at: http://www.brightfocus.org/macular/types. Accessed March 29, 2016.
40. Li C, Ford ES, Zhao G, et al. Serum alpha-carotene concentrations and risk of death among US Adults: the Third National Health and Nutrition Examination Survey Follow-up Study. *Arch Intern Med.* 2011;171(6):507-15.
41. Min KB, Min JY. Association between leukocyte telomere length and serum carotenoid in US adults. *Eur J Nutr.* 2016.

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Avoid use during pregnancy.

References

1. *Evid Based Complement Alternat Med.* 2012;2012:429124
2. *JAMA Ophthalmol.* 2015;133(12):1415-24.
3. *Nutrients.* 2013 April;5(4):1169-85.
4. *Nutrition*. 2011 Sep;27(9):960-6.
5. *Invest Ophthalmol Vis Sci.* 2010;51(12):6118-24.
6. *J Agric Food Chem. 2003* Jun 4;51(12):3560-3

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References
1. *N Engl J Med*. 2015 Oct 22;373(17):1618-26.
2. *Pathology*. 2013 Apr;45(3):331-41.
3. *Carcinogenesis*. 2013 May;34(5):1144-9.
4. *Carcinogenesis*. 2009 Jan;30(1):101-5.
5. *Phytother Res*. 2010 Mar;24(3):414-8.
6. *Nat Prod Res*. 2008;22(17):1544-51.
7. *J Am Acad Dermatol*. 2010 Mar;62(3):511-3.
8. *Photodermatol Photoimmunol Photomed*. 2016 Jan;32(1):22-7.

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BY EDWARD R. ROSICK, DO, MPH, DABIHM

NAD+

Shown to Reverse Aging Biomarkers

As we age, our vitality declines as cells can no longer produce the **energy** of youth.

An essential co-factor required for ***cellular energy transfer*** is **NAD+**, which plays a critical role in regulating the rate at which we biologically age.

NAD+ is used by every cell in the body. Harvard researchers have shown that increasing NAD+ levels in mammals can reverse several biochemical parameters associated with the aging process.[1]

In a recent study,[2] researchers have shown that NAD+ works in two distinct ways to mitigate aging. First, it increases mitochondrial activity and secondly, it activates specific ***sirtuins*** shown to regulate life span.[3-6]

The good news is that higher levels of NAD+ can be restored via a unique form of vitamin B3 called ***nicotinamide riboside***. With this advance, it is possible for aging individuals to boost their NAD+ cellular levels.

NAD+: An Essential Component of Life

Nicotinamide adenine dinucleotide (NAD+) is found in every cell in the body and is critical for regulating genes that accelerate aging.[7]

NAD+ also plays an important part in the transfer of energy released from fatty acids and glucose to the mitochondria to be converted into cellular energy.[8,9]

When NAD+ levels decline, energy transfer in cells breaks down, leading to ***mitochondrial dysfunction*** that results in many of the physical symptoms of aging.[1,10,11] Fortunately, by increasing intracellular levels of NAD+, age-related mitochondrial dysfunction can be reversed.[1]

NAD+ battles aging by activating key anti-aging enzymes called ***sirtuins***, specifically **SIRT1** and **SIRT3**. Sirtuins contribute to longevity by favorably controlling gene expression.[8,11-15]

SIRT1 and **SIRT3** modulate multiple biological processes summarized in the table at the end of this article.[3]

Sirtuins can be activated at any age through **caloric restriction**. In response to undereating, cellular levels of **NAD+** increase.[8]

Studies in yeast have shown that increasing NAD+ levels positively affects the function of sirtuins and significantly extends yeast life span.[18] A study done in worms (*C. elegans*) showed that older worms had lower levels of NAD+ when compared to younger worms. When NAD+ levels were decreased even further, the worms aged faster. When worms had their NAD+ levels restored, it prevented metabolic changes of aging and increased their life span.[5]

Of course, it is a large step—evolutionarily and biologically—from yeast and worms to mammals. However, studies done in mammals have also shown that NAD+ levels are critical for not only healthy cellular and mitochondrial functioning, but aging itself.

A study done at Harvard has shown that increasing NAD+ levels in mammals can reverse the aging process.[1] This study was done on mice that were bred to have a defect in SIRT1. These mice exhibited multiple signs of accelerated aging, including mitochondrial dysfunction. However, when the levels of NAD+ were increased in these 22-month-old mice, the results were nothing short of amazing: Key markers of aging, including insulin resistance, inflammation, and muscle wasting—all processes commonly associated as a "normal" part of aging—were lowered to that of mice aged 6 months.

Knowing that NAD+ is vital to cellular functioning and that NAD+ levels decrease as we age, many scientists believe a key process in slowing, stopping, or even reversing the aging process is to maintain healthy, youthful NAD+ levels. The interest in finding ways to maintain youthful NAD+ levels has given rise to a form of vitamin B3, **nicotinamide riboside**, which converts to NAD+ in the body.[19,20]

By increasing NAD+ levels, nicotinamide riboside has been shown in multiple studies to positively affect mitochondria. In addition, a recently released study[2] has shown that nicotinamide riboside can both increase healthy mitochondrial activity and activate specific sirtuins shown to regulate life span.[3-6]

What You Need to Know

The Importance of Optimal NAD+

- **Nicotinamide adenine dinucleotide, or NAD+, is a co-factor that plays a crucial role in many biochemical reactions.**
- **Optimal levels of NAD+ are essential for the proper functioning of mitochondria, the producer of energy for the body, and sirtuins, which are enzymes known to be an integral part of the aging process.**
- **While NAD+ levels decrease with age, the use of the natural compound nicotinamide riboside can restore NAD+ to healthy, youthful levels.**
- **Raising levels of NAD+ has been shown to reverse key indicators of aging.**

Let's now examine some of the well-studied mammalian sirtuins to better understand the importance of maintaining healthy NAD+ levels in preventing premature aging.

SIRT1 and Longevity

SIRT1 is the most extensively studied mammalian sirtuin. It plays an important part in multiple biological functions, including tumor suppression, apoptosis, metabolic regulation, and the aging process. Several mouse studies have demonstrated the influence of SIRT1 activity on extending life span.[34,35] Delayed bone loss, reductions in the incidence of sarcomas and carcinomas, and improved glucose control and wound healing have been shown in a model of SIRT1 transgenic mice.[34] In another transgenic mouse model, increased activity of brain-specific SIRT1 resulted in an approximate **11%** increase in median life span.[35]

An array of research has shown the connection of SIRT1 with premature cellular senescence, a process that contributes to accelerated aging.[36,37] By interacting with biological molecules like p53, SIRT1 regulates cellular senescence, apoptosis, metabolism, and cell cycle.[36] A study examining the effects of SIRT1 inhibition in human umbilical vein endothelial cells suggested the role of this enzyme in protecting against ***endothelial dysfunction***, one of the consequences of cellular senescence.[36]

SIRT1 is emerging as an outstanding housekeeper for the maintenance of stem cells by fighting *cellular senescence*. This was seen in a study involving human mesenchymal stem cells in which the reduction of SIRT1 activity resulted in accelerated cellular senescence. However when SIRT1 activity was increased in bone marrow-derived **stem cells**, it showed that senescence was delayed, leading the authors to conclude that SIRT1 may contribute to the prevention of human mesenchymal stem cell senescence.[38]

A more recent study discussed the importance of SIRT1 in the maintenance of hematopoietic stem cells' homeostasis and that loss of SIRT1 in hematopoietic stem cells resulted in DNA damage.[39]

It is well established that genomic instability and impaired DNA damage repair are some of the contributing factors that result in accelerated aging and cellular senescence.[40] Exciting findings show that SIRT1 fosters DNA damage repair[41] and that it protects vascular smooth muscle cells against DNA damage and atherosclerosis.[42] Neurodegenerative disorders and age-related cognitive decline have been linked with defects in DNA repair.

Researchers at MIT determined that SIRT1 activation reduces DNA damage and provides an important therapeutic path in neurodegenerative diseases.[43] Together, these findings confirm the protective roles that SIRT1 has not only in maintaining genomic integrity but also against neurodegeneration.

A study in mice found that an increase of SIRT1 activity in the brain increased longevity by an approximate **11%**, while at the same time reducing the incidence of cancer.[45] Yet a more recent study on age-related muscle loss or sarcopenia determined that activation of SIRT1 can improve muscle performance, one of the hallmarks of sarcopenia.[44] This is clear evidence that SIRT1 can fight premature aging and promote longevity.

SIRT3: A Key Mitochondrial Sirtuin

Primarily located in the mitochondria, SIRT3 plays an important role in the regulation of several mitochondrial processes.[45] It has been associated with fatty liver, obesity, hyperlipidemia, and insulin resistance in mice lacking SIRT3 and fed high-fat diets.[46]

Impacts of Age-Related Decline on NAD+

The defects in both gene- and energy-related functions caused by the age-related decrease in NAD+ characterize the disorders that we identify as aging.[11] The consequences of a decline in NAD+ levels and subsequent reduction in sirtuins are:

- **Neurodegeneration** in the brain,[11,21,22]
- **Vascular inflammation**, producing damage to blood vessels that can result in stroke or heart attack,[21,23,24]
- **Increased fat storage in the liver**, which can lead to non-alcoholic fatty liver disease (NAFLD),[25-27]
- **Increased fat production and deposition** in white adipose tissue, the primary fat storage form found in dangerous belly fat,[28,29]
- **Insulin resistance**, preventing cells from appropriately removing glucose from blood, producing higher blood sugar levels and leading directly to metabolic syndrome,[23,30,31]
- **Fatigue**, **loss of muscle strength**, **and fatty infiltration of muscles**, resulting in reduced fatty acid oxidation ("burning"), thereby depriving muscles of their normal sources of energy.[32,33]

A recent report found that increased SIRT3 activity improved the regenerative capacity of hematopoietic stem cells.[47] It is also recognized that this sirtuin is important in neurodegenerative disorders like Huntington's disease.[48] Clearly, the impact that SIRT3 has on metabolic regulation, neurodegenerative disorders, and stem cell regeneration plays a crucial role in premature aging when impaired.

Summary

Nicotinamide adenine dinucleotide, or NAD+, is a critically important molecule for multiple biochemical processes in the body.

Numerous studies show that maintaining optimal levels of NAD+ through the use of natural compounds such as **nicotinamide riboside** are necessary for the health of mitochondria.

Sirtuins, which are enzymes that play a crucial role in the aging process, are dependent upon NAD+ to perform their life-giving functions.

New and groundbreaking studies are showing that maintaining optimal NAD+ levels can positively impact indicators of aging such as insulin resistance, muscle wasting, and inflammation. This gives credence to the hypothesis that aging itself is not only preventable, but reversible. ●

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

References

1. Gomes AP, Price NL, Ling AJ, et al. Declining NAD(+) induces a pseudohypoxic state disrupting nuclear-mitochondrial communication during aging. *Cell.* 2013;155(7):1624-38.
2. Gariani K, Menzies KJ, Ryu D, et al. Eliciting the mitochondrial unfolded protein response via NAD repletion reverses fatty liver disease. *Hepatology.* 2015.
3. Ghosh S, Zhou Z. SIRTain regulators of premature senescence and accelerated aging. *Protein & Cell.* 2015;6(5):322-33.
4. Haigis MC, Guarente LP. Mammalian sirtuins—emerging roles in physiology, aging, and calorie restriction. *Genes Dev.* 2006;20(21):2913-21.
5. Mouchiroud L, Houtkooper RH, Moullan N, et al. The NAD(+)/Sirtuin pathway modulates longevity through activation of mitochondrial UPR and FOXO signaling. *Cell.* 2013;154(2):430-41.
6. Satoh A, Imai S-i. Systemic regulation of mammalian ageing and longevity by brain sirtuins. *Nat Commun.* 2014;5.
7. Imai S, Armstrong CM, Kaeberlein M, et al. Transcriptional silencing and longevity protein Sir2 is an NAD-dependent histone deacetylase. *Nature.* 2000;403(6771):795-800.
8. Sauve AA. NAD+ and vitamin B3: from metabolism to therapies. *J Pharmacol Exp Ther.* 2008;324(3):883-93.

Sirtuins and Their Impact on Pathways That Contribute to Premature Aging When Dysregulated[3,16,17]

Pathways that contribute to premature aging	SIRT1	SIRT3
Cellular senescence	✓	?
Genomic integrity maintenance	✓	✓
Inflammation	✓	?
Metabolic regulation	✓	✓
Neurodegeneration	✓	✓
Stem cells maintenance	✓	✓
Tumor regulation	✓	✓

✓: Confirmed roles ?: Possible roles

9. Gong B, Pan Y, Vempati P, et al. Nicotinamide riboside restores cognition through an upregulation of proliferator-activated receptor-gamma coactivator 1alpha regulated beta-secretase 1 degradation and mitochondrial gene expression in Alzheimer's mouse models. *Neurobiol Aging.* 2013;34(6):1581-8.
10. Prolla TA, Denu JM. NAD+ deficiency in age-related mitochondrial dysfunction. *Cell Metab.* 2014;19(2):178-80.
11. Imai S, Guarente L. NAD+ and sirtuins in aging and disease. *Trends Cell Biol.* 2014;24(8):464-71.
12. Belenky P, Racette FG, Bogan KL, et al. Nicotinamide riboside promotes Sir2 silencing and extends life span via Nrk and Urh1/Pnp1/Meu1 pathways to NAD+. *Cell.* 2007;129(3):473-84.
13. Hirschey MD, Shimazu T, Huang JY, et al. SIRT3 regulates mitochondrial protein acetylation and intermediary metabolism. *Cold Spring Harb Symp Quant Biol.* 2011;76:267-77.
14. Chen Y, Fu LL, Wen X, et al. Sirtuin-3 (SIRT3), a therapeutic target with oncogenic and tumor-suppressive function in cancer. *Cell Death Dis.* 2014;5:e1047.
15. Scher MB, Vaquero A, Reinberg D. SirT3 is a nuclear NAD+-dependent histone deacetylase that translocates to the mitochondria upon cellular stress. *Genes Dev.* 2007;21(8):920-8.
16. Kim HS, Patel K, Muldoon-Jacobs K, et al. SIRT3 is a mitochondria-localized tumor suppressor required for maintenance of mitochondrial integrity and metabolism during stress. *Cancer Cell.* 2010;17(1):41-52.
17. Alhazzazi TY, Kamarajan P, Verdin E, et al. Sirtuin-3 (SIRT3) and the Hallmarks of Cancer. *Genes Cancer.* 2013;4(3-4):164-71.
18. Imai S. A possibility of nutriceuticals as an anti-aging intervention: activation of sirtuins by promoting mammalian NAD biosynthesis. *Pharmacol Res.* 2010;62(1):42-7.
19. Khan NA, Auranen M, Paetau I, et al. Effective treatment of mitochondrial myopathy by nicotinamide riboside, a vitamin B3. *EMBO Mol Med.* 2014;6(6):721-31.
20. Belenky P, Stebbins R, Bogan KL, et al. Nrt1 and Tna1-independent export of NAD+ precursor vitamins promotes NAD+ homeostasis and allows engineering of vitamin production. *PLoS One.* 2011;6(5):e19710.
21. Sebastian C, Satterstrom FK, Haigis MC, et al. From sirtuin biology to human diseases: an update. *J Biol Chem.* 2012;287(51):42444-52.
22. Min SW, Sohn PD, Cho SH, et al. Sirtuins in neurodegenerative diseases: an update on potential mechanisms. *Front Aging Neurosci.* 2013;5:53.
23. Haigis MC, Sinclair DA. Mammalian sirtuins: biological insights and disease relevance. *Annu Rev Pathol.* 2010;5:253-95.
24. Oellerich MF, Potente M. FOXOs and sirtuins in vascular growth, maintenance, and aging. *Circ Res.* 2012;110(9):1238-51.
25. Kemper JK, Choi SE, Kim DH. Sirtuin 1 deacetylase: a key regulator of hepatic lipid metabolism. *Vitam Horm.* 2013;91:385-404.
26. Schug TT, Li X. Sirtuin 1 in lipid metabolism and obesity. *Ann Med.* 2011;43(3):198-211.
27. Tao R, Wei D, Gao H, et al. Hepatic FoxOs regulate lipid metabolism via modulation of expression of the nicotinamide phosphoribosyltransferase gene. *J Biol Chem.* 2011;286(16):14681-90.
28. Ahn J, Lee H, Jung CH, et al. MicroRNA-146b promotes adipogenesis by suppressing the SIRT1-FOXO1 cascade. *EMBO Mol Med.* 2013;5(10):1602-12.
29. Pang W, Wang Y, Wei N, et al. Sirt1 inhibits akt2-mediated porcine adipogenesis potentially by direct protein-protein interaction. *PLoS One.* 2013;8(8):e71576.
30. Frojdo S, Durand C, Molin L, et al. Phosphoinositide 3-kinase as a novel functional target for the regulation of the insulin signaling pathway by SIRT1. *Mol Cell Endocrinol.* 2011;335(2):166-76.
31. Sasaki T, Kim HJ, Kobayashi M, et al. Induction of hypothalamic Sirt1 leads to cessation of feeding via agouti-related peptide. *Endocrinology.* 2010;151(6):2556-66.
32. Feige JN, Lagouge M, Canto C, et al. Specific SIRT1 activation mimics low energy levels and protects against diet-induced metabolic disorders by enhancing fat oxidation. *Cell Metab.* 2008;8(5):347-58.
33. Green MF, Hirschey MD. SIRT3 weighs heavily in the metabolic balance: a new role for SIRT3 in metabolic syndrome. *J Gerontol A Biol Sci Med Sci.* 2013;68(2):105-7.
34. Herranz D, Munoz-Martin M, Canamero M, et al. Sirt1 improves healthy ageing and protects from metabolic syndrome-associated cancer. *Nat Commun.* 2010;1:3.
35. Satoh A, Brace CS, Rensing N, et al. Sirt1 extends life span and delays aging in mice through the regulation of Nk2 homeobox 1 in the DMH and LH. *Cell Metab.* 2013;18(3):416-30.
36. Ota H, Akishita M, Eto M, et al. Sirt1 modulates premature senescence-like phenotype in human endothelial cells. *J Mol Cell Cardiol.* 2007;43(5):571-9.
37. Langley E, Pearson M, Faretta M, et al. Human SIR2 deacetylates p53 and antagonizes PML/p53-induced cellular senescence. *Embo j.* 2002;21(10):2383-96.
38. Yuan HF, Zhai C, Yan XL, et al. SIRT1 is required for long-term growth of human mesenchymal stem cells. *J Mol Med (Berl).* 2012;90(4):389-400.
39. Rimmele P, Bigarella CL, Liang R, et al. Aging-like phenotype and defective lineage specification in SIRT1-deleted hematopoietic stem and progenitor cells. *Stem Cell Reports.* 2014;3(1):44-59.
40. Liu B, Wang J, Chan KM, et al. Genomic instability in laminopathy-based premature aging. *Nat Med.* 2005;11(7):780-5.
41. Jeong J, Juhn K, Lee H, et al. SIRT1 promotes DNA repair activity and deacetylation of Ku70. *Exp Mol Med.* 2007;39(1):8-13.
42. Gorenne I, Kumar S, Gray K, et al. Vascular smooth muscle cell sirtuin 1 protects against DNA damage and inhibits atherosclerosis. *Circulation.* 2013;127(3):386-96.
43. Dobbin MM, Madabhushi R, Pan L, et al. SIRT1 collaborates with ATM and HDAC1 to maintain genomic stability in neurons. *Nat Neurosci.* 2013;16(8):1008-15.
44. Mohamed JS, Wilson JC, Myers MJ, et al. Dysregulation of SIRT-1 in aging mice increases skeletal muscle fatigue by a PARP-1-dependent mechanism. *Aging (Albany NY).* 2014;6(10):820-34.
45. Giblin W, Skinner ME, Lombard DB. Sirtuins: guardians of mammalian healthspan. *Trends Genet.* 2014;30(7):271-86.
46. Hirschey MD, Shimazu T, Jing E, et al. SIRT3 deficiency and mitochondrial protein hyperacetylation accelerate the development of the metabolic syndrome. *Mol Cell.* 2011;44(2):177-90.
47. Brown K, Xie S, Qiu X, et al. SIRT3 Reverses aging-associated degeneration. *Cell reports.* 2013;3(2):319-27.
48. Fu J, Jin J, Cichewicz RH, et al. trans-(-)-epsilon-Viniferin increases mitochondrial sirtuin 3 (SIRT3), activates AMP-activated protein kinase (AMPK), and protects cells in models of Huntington Disease. *J Biol Chem.* 2012;287(29):24460-72.

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References
1. *Am J Clin Nutr.* 2006 Apr;83(4):842-50.
2. *Am J Ther.* 2014; Epub Nov 17.
3. *Innov Clin Neurosci.* 2011 Jan;8(1):19-28.
4. *Am J Hum Genet.* 2002 Mar;70(3):758-62.
5. *Coll Antropol.* 2004 Dec;28(2):647-54.
6. *Br J Pharmacol.* 2004 Mar;141(5):825-30.

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- Favorably modulate metabolism,[6]
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References

1. *PLoS One*. 2012;7(7):e42357.
2. *Cell*. 2013 Dec 19;155(7):1624-38.
3. *PLoS One*. 2008 May 21;3(5):e2267.
4. *Cell*. 2007 May 4;129(3):473-84.
5. *Nature*. 2000 Feb 17;403(6771):795-800.
6. *Cell Metab*. 2012 Jun 6;15(6):838-47.
7. *Curr Opin Clin Nutr Metab Care*. 2013 Nov;16(6):657-61
8. *EMBO Mol Med*. 2014 Apr 6;6(6):721-31.
9. *Neurobiol Aging*. 2013 Jun;34(6):1581-8.
10. *J Neurosci*. 2006 Aug 16;26(33):8484-91.
11. *Front Biosci*. 2007 Jan 1;12:1863-88.

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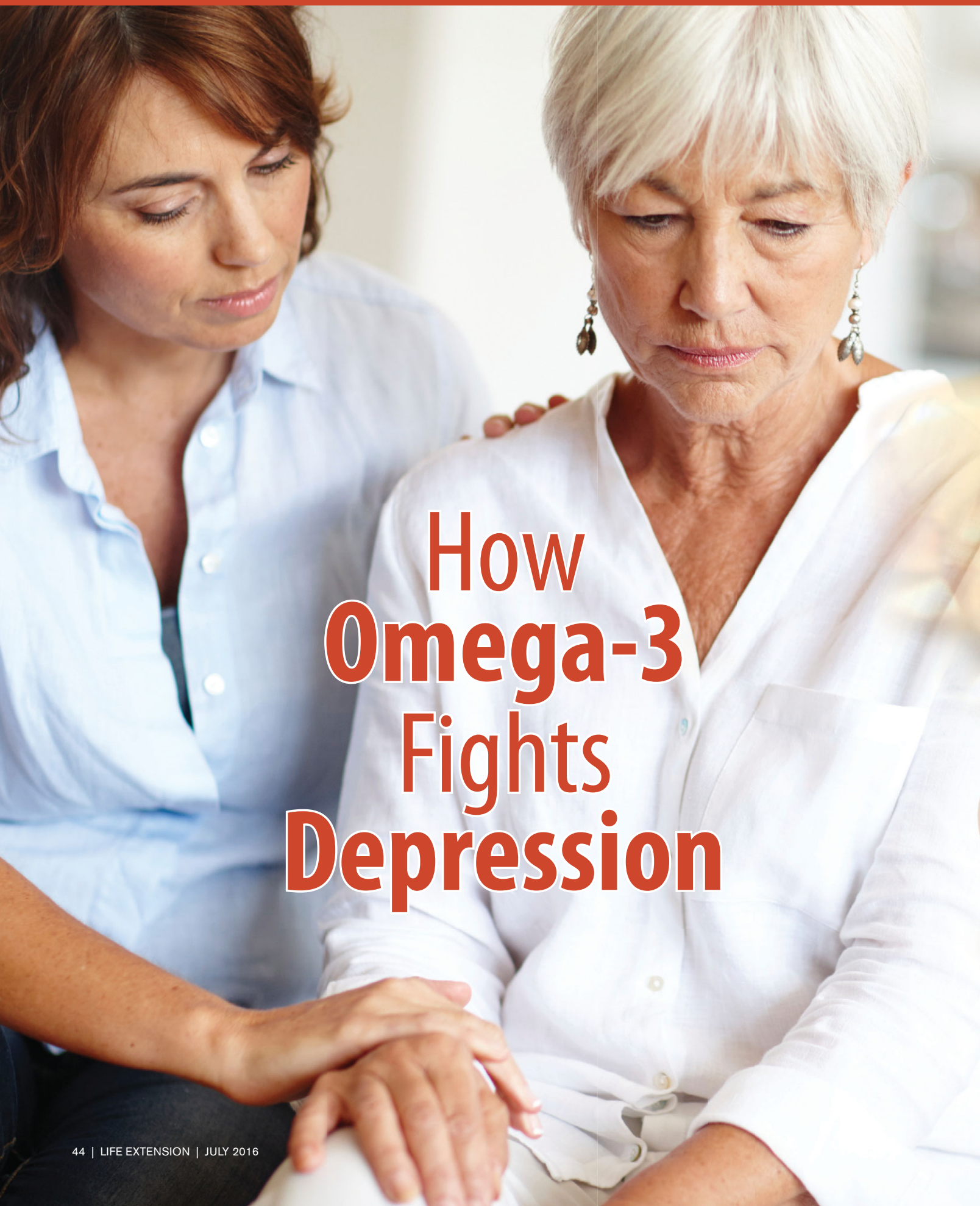

How Omega-3 Fights Depression

BY LESLIE STANTON

In a brand new study, scientists in **Japan** have documented a strong correlation between low blood levels of **omega-3** fatty acids and higher symptoms of **depression**.[1]

This study is important since depression is a growing worldwide health problem.[1]

Drugs to treat depression are only partially effective and produce side effects.

A growing body of consistent findings reveals a close link between **depressive symptoms** and **chronic inflammation**.[2-4]

What this means is that compounds like ***omega-3s***, with proven anti-inflammatory effects, may *also* alleviate **depression**—and that's what new studies are finding!

New Study from Japan

A Japanese study published in **2016** evaluated the connection between **blood levels** of **omega-3** fatty acids (EPA/DHA) and clinical **depression** scores.

This was a large rigorous "cross-sectional" study of 2,123 subjects (1,050 men and 1,073 women) aged 40 years or older. The researchers used a standard 20-question scale of depressive symptoms, which has previously been validated to show that scores of 16 or higher represent people with relevant depressive symptoms. Blood specimens were then drawn for analysis of various types of **fatty acids**.[1]

The first finding showed that people with the lowest levels of omega-3 fats were at the ***highest*** risk of depression, and vice versa.

What the scientists found was that those in the group with ***higher*** blood levels of omega-3s had a **43%** ***lower*** risk of depression.[1]

In order to examine this relationship more closely, the subjects were divided into specific groups based on their blood levels of the omega-3 fats **EPA** (*eicosapentaenoic acid)* and **DHA** (*docosahexaenoic acid)*.

Researchers found that subjects with the *lowest* level of EPA experienced more depressive symptoms. Subjects in the *highest* EPA range showed a **36%** lower risk of depression.[1]

When the researchers looked at DHA levels alone, they found that those with the *highest* levels of DHA had a **42%** lower risk for depression when compared to those with low levels of DHA.[1]

The implications of this latest study are profound. They strongly suggest that supplementation with fish oil rich in omega-3 fats, particularly EPA and DHA, should be considered by most people at risk for depressive illness.

And that probably means just about anyone over 40 years old should be supplementing with omega-3s, especially due to what is known about rising levels of **inflammation** with age and their impact not only on mental health but also on cardiovascular and metabolic health as well.[5]

Related Studies

There are already a number of small studies demonstrating the protective effects of fish oil/omega-3 supplementation on depression.

One study showed that, in patients with known major depressive disorder, the combination of the antidepressant drug citalopram (Celexa®) with an omega-3 supplement was superior to the drug alone in relieving depressive symptoms.[6]

The supplement dose was two **1 gram** capsules containing a total of **900 mg** EPA and **200 mg** DHA taken twice daily. Total EPA/DHA intake was **2,200 mg** daily, which would be considered a good daily dose of EPA/DHA by today's standards.

Those taking the omega-3 supplement plus citalopram showed significantly greater improvement in their scores on a standard depression rating scale, beginning at four weeks after initiation of therapy, compared to those on the drug alone.[6]

What You Need to Know

Two studies conducted in people on hemodialysis for end-stage kidney disease (who are at high risk for depression)[7] demonstrated the value of omega-3s and highlighted the connection with inflammation. One study showed that a daily omega-3 supplement totaling **360 mg** EPA and **240 mg** DHA, three times daily, produced significant reductions in markers of **inflammation**, while significantly reducing scores on a standard depression index after four months of therapy.[8] The second study showed that the same omega-3 dosing produced a highly significant reduction in depression index scores, while producing a significant improvement in quality-of-life scores.[9]

In still another study, patients taking interferon-alpha as treatment for chronic hepatitis C infection had significantly lower episodes of depression induced by the drug when they used a daily EPA supplement, compared with those taking placebo. Depression occurred in **10%** of EPA-supplemented patients compared to **30%** of placebo recipients. The onset of depression was delayed significantly in those on the EPA supplement.[2]

As we learn more and more about the role of **inflammation** in producing so many age-related disorders, including cardiovascular disease, diabetes, cancer, and depression, the value of taking a daily supplement of **omega-3** fatty acids becomes increasingly clear.

Omega-3 Fatty Acids and Depression

- **Many older adults suffer from depressive symptoms and major depression.**
- **It is now recognized that chronic inflammation is an important contributor to depression risk.**
- **Omega-3 fats are well-known for their powerful anti-inflammatory properties.**
- **A new study demonstrates close links between low omega-3 blood levels and risk for depressive symptoms, helping to further strengthen the inflammation-depression link.**
- **Earlier studies have already shown that the administration of omega-3 in conjunction with antidepressant treatment is superior to antidepressant treatment alone.**
- **Omega-3 supplementation should be a major part of any serious age-decelerating regimen, because of the widespread benefits of its anti-inflammatory properties.**

Summary

Depressive symptoms are widespread among older adults.

Ongoing **human** research has confirmed that depression has roots in chronic inflammatory processes.

A new human study has confirmed that people with ***higher*** omega-3 **blood levels** have significantly lower risk of depression, supporting earlier studies demonstrating both reductions in inflammatory markers and in depressive symptoms with omega-3 supplementation.

Omega-3 supplementation should be considered for anyone suffering depressive symptoms. It may take several months for beneficial effects to be realized. ●

If you have any questions on the scientific content of this article, please call a **Life Extension**® Wellness Specialist at 1-866-864-3027.

References

1. Horikawa C, Otsuka R, Kato Y, et al. Cross-sectional association between serum concentrations of n-3 long-chain PUFA and depressive symptoms: results in Japanese community dwellers. *Br J Nutr.* 2016;115(4):672-80.
2. Su KP, Lai HC, Yang HT, et al. Omega-3 fatty acids in the prevention of interferon-alpha-induced depression: results from a randomized, controlled trial. *Biol Psychiatry.* 2014;76(7):559-66.
3. Grosso G, Pajak A, Marventano S, et al. Role of omega-3 fatty acids in the treatment of depressive disorders: A comprehensive meta-analysis of randomized clinical trials. *PLoS ONE.* 2014;9(5):e96905.
4. Grosso G, Galvano F, Marventano S, et al. Omega-3 fatty acids and depression: scientific evidence and biological mechanisms. *Oxid Med Cell Longev.* 2014;2014:313570.
5. Zulyniak MA, Roke K, Gerling C, et al. Fish oil regulates blood fatty acid composition and oxylipin levels in healthy humans: A comparison of young and older men. *Mol Nutr Food Res.* 2016;60(3):631-41.
6. Gertsik L, Poland RE, Bresee C, et al. Omega-3 fatty acid augmentation of citalopram treatment for patients with major depressive disorder. *J Clin Psychopharmacol.* 2012;32(1):61-4.
7. Kimmel PL, Peterson RA. Depression in patients with end-stage renal disease treated with dialysis: has the time to treat arrived? *Clin J Am Soc Nephrol.* 2006 May;1(3):349-52.
8. Gharekhani A, Khatami MR, Dashti-Khavidaki S, et al. The effect of omega-3 fatty acids on depressive symptoms and inflammatory markers in maintenance hemodialysis patients: a randomized, placebo-controlled clinical trial. *Eur J Clin Pharmacol.* 2014;70(6):655-65.
9. Dashti-Khavidaki S, Gharekhani A, Khatami MR, et al. Effects of omega-3 fatty acids on depression and quality of life in maintenance hemodialysis patients. *Am J Ther.* 2014;21(4):275-87.

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References
1. *Food Chem.* 2013;139(1-4):129-37.
2. *Panminerva Med.* 2014;56(3 Suppl 1):1-6.

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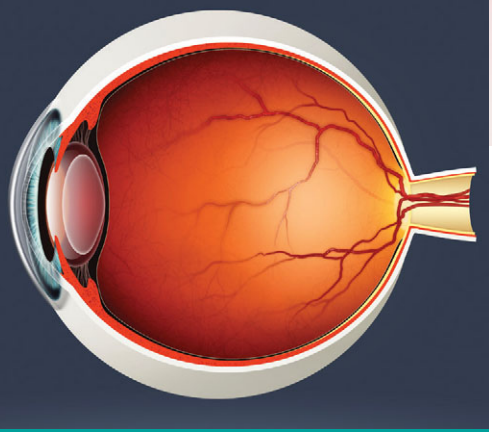
References

1. *Invest Ophthalmol Vis Sci*. 2009 Apr;50(4):1636-43.
2. *Curr Eye Res*. 2013 Nov;38(11):1110-7.
3. *J Clin Diagn Res*. 2015 Oct;9(10):NC06-9.



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Supportive but not conclusive research shows that consumption of EPA and DHA omega-3 fatty acids may reduce the risk of coronary heart disease.

Age-Reversal Research at Harvard Medical School

When I incorporated the **Life Extension Foundation**®, I envisioned a time when human longevity would not be constrained to a finite number of years.

I was confident technology would emerge to enable **science** to gain control over pathological **aging**. When this historic turning point occurs, healthy life spans will extend beyond what anyone imagines today.

Over the past two years, our early predictions have transformed into technical probability.

I am pleased that **Life Extension**® helped contribute to an emerging ***gene editing*** technique that you will learn about in this article.

Even more exciting are human ***age-reversal*** studies being designed right now that will be announced in upcoming issues of this publication.

"Editing" our Human Genome *In Vivo*

As we age, ***genes*** that maintain cellular health and vitality are down-regulated. At the same time, genes that promote disease and senescence become over-expressed.

Once physicians are able to precisely program or **"edit"** DNA genes, then youthful health may be systemically restored.

The name of this new technology is **CRISPR**. It offers a new way to rapidly transform **senescent cells** to regain ***youthful*** function and structure.

CRISPR is a DNA cutting system originally developed in nature by bacteria as a way to destroy the DNA of viruses that frequently attack them. A natural version of CRISPR has been adapted by scientists to enable the **reprogramming** of cellular DNA to rid cells of unfavorable genetic changes.

Once perfected, old cells may be rejuvenated and **never age again**.

Programming Our Cellular Genes like Computers

CRISPR is empowering scientists to do very controlled **gene editing**, which means adding, disrupting or changing the sequence of specific genes.

This has led to exciting new methods of transiently or permanently modifying gene action, either to increase or decrease the activities of targeted genes in a controllable way, potentially anywhere in the body and anywhere in one's complete set of genes and DNA (our genome).

Since key features of aging are powerfully controlled by how genes are activated or inactivated (expressed or suppressed) in the body, these are critically important developments.

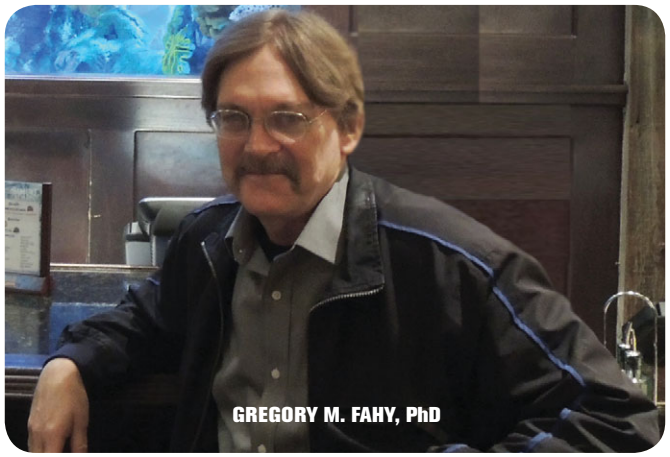
Introducing the Harvard Pioneer of CRISPR

Dr. George Church is a pioneer in the area of genome engineering and the development of gene editing tools based on the **CRISPR/Cas9** system (referred to as **CRISPR** here).

Dr. Church has already been able to ***reverse aging*** in human cells using CRISPR technology, and expects the first clinical trials of this technology to begin within as little as one year.

In response to these breakthroughs, ***Life Extension Magazine®*** sent Dr. Gregory M. Fahy to **Harvard University** to interview Dr. Church. We needed to clarify the opportunities for reversing human aging to save the lives of most of those reading this article now.

The next page contains an introductory article by Greg Fahy, PhD. It then continues with highlights of an exclusive interview with Dr. Church about how CRISPR may soon reverse human aging processes. Readers should appreciate that this novel technology is being developed for the purpose of rapid integration into the human clinical setting.



Is the End of Aging Near at Hand?

BY GREGORY M. FAHY, PhD

As a student of the aging process, I have been attending scientific meetings devoted to aging since the early 1980s, and I have seen and heard a lot of very exciting things. But when I attended George Church's talk at a conference sponsored by Aubrey de Grey's **SENS Foundation** near the end of 2014, I realized that I had just heard the most exciting talk of my life.

Why? For three very simple reasons.

First, as Dr. Church's talk highlighted, aging seems to be controlled to a large extent by the action of a rather small subset of your genes, and especially by master genes that control large numbers of other genes. Your genes, of course, are areas of your DNA that determine your eye color, your hair color, your sex, your height, and other characteristics of your body. But what is becoming more and more clear is that genes also determine how you age—and maybe even whether you age, at least in many respects—as well.

Second, Dr. Church described how science has now advanced to the point where the activity of your genes—whether the genes are "turned on" (expressed) or "turned off" (repressed, or down-regulated)—can increasingly be controlled, and not just in a test tube, but in whole bodies, and even in the brain.

And third, Dr. Church fully intends to deploy this technology clinically, i.e., in aging people!

Dr. Church's focus is on CRISPR technology, which is a relatively new and particularly powerful method for adjusting gene activity in many different ways, and even for "editing", or changing genes, which can be used to correct deleterious mutations, or to create deliberate mutations that can have good effects (such as in knocking out the effects of pro-aging genes).

So the implication is very clear: If aging is controlled by master genes, and if the activity of such genes can now be intentionally controlled, then we are beginning to approach the control of aging on a very fundamental level. And the same technology can be applied to the correction of many diseases as well, whether age-related or not.

It would do no good to have the power to control aging if there were no will to utilize that power and move aging control to the clinic. Fortunately, that is not the case with Dr. Church. He wants to make the control of aging a practical reality—and soon. And Dr. Church, as a highly distinguished professor of genetics and major figure at Harvard Medical School and in science worldwide, is in an excellent position to make his wishes come true.

In an interview with the *Washington Post* at the beginning of December 2015,[1] Dr. Church said that his lab is already reversing aging in mice, and that human applications may only be a few years away. Dr. Church stated:

"One of our biggest economic disasters right now is our aging population. If all those gray hairs could go back to work and feel healthy and young, then we've averted one of the greatest economic disasters in history."[1]

He said he sees:

"A scenario [in which] everyone takes gene therapy—not just curing rare diseases like cystic fibrosis, but diseases that everyone has, like aging."[1]

Dr. Church also described his personal passion in reversing human aging when he stated:

"I'm willing to become younger. I try to reinvent myself every few years anyway."[1]

So, what is "CRISPR," this new technology that may change the world, and our lives, as we know them?

The word "CRISPR" is an acronym. What it stands for is unintelligible to anyone but a geneticist, but that doesn't matter. What matters is that it's a technology originally developed to fight microorganisms by cutting their DNA, but that it has now been modified by scientists to enable them to make very well controlled changes in very specific places in DNA. Once physicians are able to regulate or "edit" the DNA medically, then youthful health may be restored to an individual.

How serious is the promise of CRISPR? Consider the following:

- A newer version of CRISPR was recently packed into a re-engineered virus delivery system and successfully used to correct the gene defect that causes Duchenne muscular dystrophy in a mouse model. This is done by direct injection into a leg muscle or infusion into the bloodstream. The results are improvements in the muscles throughout the body and even in the heart;[2]
- On January 7, 2016, Dr. Church's company, Editas Medicine, filed papers to launch a $100 million IPO, and the company is already being backed by Google Ventures and the Bill and Melinda Gates Foundation.[3]

In short, in my estimation, the CRISPR revolution is a game changer, with staggering implications. If it all works out, nothing is going to remain the same. The prospects are as transformative as—if not more transformative than—such revolutions as the advent of the electric light, telephones, automobiles, airplanes, personal computers, the internet, and cell phones. Only this time, it's not just about how you live, but whether you live, and how long you will live: your health, your longevity, and the effect that health and longevity will have on your enjoyment of life.

Will it really work? We will see. Opinions vary. Surely, there will be many tricks to learn and many twists and turns along the road ahead. And heavyweight scientist Craig Venter even says it will take 100 years to get it right. But George Church's lab is reversing aging in the laboratory today, and so far, it's looking very good, moving with incredible speed, and based on a very solid foundation of scientific observations about aging. My money is squarely on Church and others pursuing similar paths.

The **Life Extension Foundation** is dedicated to improving healthy longevity and has assisted Dr. Church by providing him data from a human supercentenarian research project **Life Extension** has funded.

What Dr. Church is working on pushes the ultimate limits of improving healthy longevity, with potentially open-ended possibilities. The following page begins with highlights from an extensive interview I had with Dr. Church in his office at Harvard Medical School.

I hope you appreciate the substantive nature of what we think is likely to be a coming revolution that may touch your life in important ways.


DR. GEORGE CHURCH

Gene Editing with CRISPR Technology

INTERVIEW OF DR. GEORGE CHURCH
CONDUCTED BY GREGORY M. FAHY, PhD

Fahy: If aging is driven by changes in ***gene expression***, then the ability to control gene expression using CRISPR technology could have profound implications for the future of human aging. Why do you think aging may be at least partly driven by changes in gene expression?

Church: We know that there are cells that deteriorate with age in the human body and that we have the ability to turn those back into young cells again. This means we can effectively reset the clock to zero and keep those cells proliferating as long as we want. For example, we can take old skin cells, which have a limited lifetime, and turn them into stem cells (stem cells are cells that can turn into other kinds of cells) and then back into skin cells. This roundtrip results in the skin cells being like baby skin cells.[4] It's as if my 60-year-old cells become 1-year-old cells. There are a variety of markers that are associated with aging, and those all get reset to the younger age.

Fahy: So CRISPR has allowed you to reverse aging in human cells. CRISPR is an exciting technology. The CRISPR molecular machine—consisting of a protein and some associated RNA—can now be made in the lab or in our own cells and can change genes and gene expression. It's extremely powerful. Please tell us more about it.

Church: CRISPR is the latest method for performing genome editing (editing of your whole set of genes). Its advantage is in part that a specific CRISPR tool can be created far more easily than other gene editing

tools, and CRISPR is about **5 times** more precise than other tools. The combination of the ease of construction, improved efficiency, and great flexibility makes it the most powerful gene-editing tool to date.

Fahy: Right now, with CRISPR, it is possible to modify, delete, insert, activate, and tone down or completely inactivate any gene, with considerable fine-tuning, either temporarily or permanently. The implications for aging may be profound. How does CRISPR edit genes?

Church: The way CRISPR works classically is by cutting DNA so many times in a specific place that eventually an error in DNA repair is made at the location of the cut, and you end up with a random change in the DNA—a mutation—at that location. For that kind of change, the longer CRISPR is around, the more likely you are to accomplish a random mutation, and that can be good if you want to inactivate a troublesome gene, since usually a random mutation will in fact inactivate the gene.

But newer versions of CRISPR are more interesting because they allow you to not just make cuts in DNA, they allow you to splice a particular new piece of DNA, which can do new things, into your genome at a precise location.

To Read Entire Dr. Church Interview

CRISPR technology is rapidly emerging and **Greg Fahy, PhD**, conducted an extensive interview with Dr. Church at Harvard that is too long to include in this issue of ***Life Extension Magazine***®.

For those who want to read this entire interview, it is available free of charge by logging on to:

LEF.org/CRISPR

Please be advised that some of the content of the expanded interview will include technical details that most readers will find difficult to comprehend.

What's important to know is that the ability to reverse human aging processes using **CRISPR/Cas9** technology may occur in as little as five years according to an article about Dr. Church's research appearing in a recent edition of the *Washington Post* (Dec 2, 2015) titled:

"A Harvard professor says he can cure aging, but is that a good idea?"

Our only question is why would anyone ask whether a "cure for aging" is good idea? We at **Life Extension**® view it as the most momentous initiative in medical history. Life Extension is simultaneously pursuing additional research initiatives aimed at reversing human aging via other mechanisms of action.

Fahy: To reverse human aging, CRISPR technology will ultimately have to be applied in the whole body, and not just to cells in a test tube. How feasible is it to apply CRISPR technology in the intact body?

Church: Gene therapy can be based on either ex vivo manipulations, in which cells are removed from the body, genetically modified, and then put back into the body, or on in vivo (within the body) methods, in which, for example, a modified virus might be used to carry a gene package into many different cells in the body. Each of these methods has pros and cons.

There are viral and non-viral delivery systems that could be used to deliver CRISPR constructs and that will leave the blood vessels and go into the tissues. The delivery system could contain the CRISPR plus guide RNA plus the donor DNA, or it could just comprise the CRISPR, guide RNA, and protein activator, and so on. But whether it's a viral delivery or a non-viral delivery method, the total mass of gene editing devices that has to be delivered will have to be considerable. But there is no rush, you can deliver them slowly.

Fortunately, there are ways to manufacture biologicals that are very economical. Things like wood and even food and fuel are all roughly in the dollar-per-kilogram range. If we could similarly make a kilogram of a viral delivery system and load it up with CRISPR, then it could become inexpensive enough to apply to the whole body.

Fahy: Is it going to be affordable for a human to reverse his or her aging process using this kind of approach?

Church: If you look at the current price, it looks very unaffordable. There are about 2,000 gene therapies that are in clinical trials, but the only gene therapy that's approved for human use costs over $1 million per dose. You only need one dose, but at that cost it's obviously unattainable for most people. It's the most expensive drug in history, as far as I know.

Fahy: What is that drug?

Church: It's called Glybera®. It treats a rare genetic form of pancreatitis. But sequencing the human genome used to cost $3 billion per person, and now has come down to just $1,000 per person, so I think getting from over $1 million down to the thousands shouldn't be that hard.

Fahy: Another cost saver for aging intervention would arise if we could roll back aging significantly just by modifying five to ten genes. That might get the overall cost down to something attractive.

Church: Right. The combination of having to hit, say, a trillion cells in the whole body and 10,000 genes would be daunting. But if you can do a subset of cells and a subset of genes, then it becomes more feasible to make it affordable.

Fahy: Is the fact that the FDA does not recognize aging as a disease a problem?

Church: The FDA is willing to regulate many symptoms of aging, such as osteoporosis, muscle decay, heart disease, mental agility, and so forth. It tends to be harder to prove a preventative than it is to prove a drug that cures an immediately and hugely harmful disease. And actually, since the FDA doesn't want you making unjustified health claims of any kind, they would have to take responsibility for regulating any health-related condition that one might want to make claims about. It doesn't have to actually be a disease.

Fahy: It has been proposed that the FDA should just evaluate safety and not efficacy. How do you feel about that?

Church: I really like that. The Internet will probably weed out the non-efficacious. The nutritional supplement market is a perfect example of safety being all that is needed for approval. You can get a nutritional supplement on the market just based on safety, but you can't get a prescription drug on the market just based on safety. It really should be the same rule.

Fahy: Perhaps if that were altered in favor of the standards for supplements, we'd have many more drugs and would all be a lot better off.

Church: Yes. Focusing on safety is probably the right model. ●

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

References

1. Available at: https://www.washingtonpost.com/news/achenblog/wp/2015/12/02/professor-george-church-says-he-can-reverse-the-aging-process/. Accessed April 12, 2016.
2. Available at: http://today.duke.edu/2015/12/crisprmousedmd. Accessed April 12, 2016.
3. Available at: http://www.dddmag.com/news/2016/01/google-backed-gene-editing-startup-files-100m-ipo. Accessed April 12, 2016.
4. Studer L, Vera E, Cornacchia D. Programming and reprogramming cellular age in the era of induced pluripotency. *Cell Stem Cell.* 2015;16(6): 591-600.

Life Extension Foundation Funding of CRISPR Research

BY BEN BEST

The May 2013 issue of this publication reported on how the **Life Extension Foundation** was funding the collection and analysis of ***genes*** of **supercentenarians** (people living to age 110 or older) to discover protective genes that allow them to live so long.

This funding was provided to a group called Androcyte LLC that initially consisted of CEO James Clement and his assistant, Parijata Mackey. They traveled the world to collect tissue samples from approximately 60 supercentenarians and their family members. Harvard Medical School geneticist Dr. George Church was collaborating with Androcyte to analyze the genes.

Since then, Dr. Church has achieved additional fame as being a co-inventor and pioneer in the new CRISPR gene-editing technology. Also since then, the Life Extension Foundation continued to fund Androcyte to open a laboratory in California dedicated to applying CRISPR to deliver longevity genes, initially to mice. Androcyte CEO James Clement continues to work with Dr. Church in doing this research.

Androcyte currently has a colony of 300 mice, and growing. Sixty of these mice were received from the National Institutes of Aging and are between 26 and 36 months of age–the equivalent of very old humans.

Androcyte has targeted about 25 promising longevity genes, which are being tested in the mice via CRISPR/Cas9 gene therapy. Particular attention is being paid to the elderly mice to see if they can be restored to youth and good health.

To keep costs low, Androcyte purchased a one-acre property with an existing 1,500 square foot building which is an hour's drive from Los Angeles. As it outgrew its initial vivarium (housing for mice), it added two office trailers to the property to provide additional vivarium and laboratory space.

In addition to Dr. Church and other expert consultants, Androcyte CEO James Clement has acquired the assistance of two new interns: Ellie Dubrovina and David Falzarao, who were referred by Aubrey de Grey's **SENS Foundation**. Ellie assists with the scientific work, whereas David assists with the care of the mice.

Androcyte has also received two elderly Arabian mares 28 and 30 years old (age-equivalent to 80-year-old humans) from a sanctuary. If genes delivered by CRISPR to the mice are able to restore youth and health, CRISPR delivery of those genes will be tested on the horses to show that large animals can also benefit. Success with the horses could pave the way for using CRISPR to bring better health and greater longevity to humans.

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References

1. *Age (Dordr)*. 2014 Apr;36(2):641-63.
2. *Clin Sci (Lond)*. 2013 Apr;124(8):491-507.
3. *J Mol Med (Berl)*. 2011 Jul;89(7):667-76.
4. *Biotechnol Lett*. 2012 Sep;34(9):1607-16.
5. *Obesity (Silver Spring)*. 2014 Jan;22(1):63-71.

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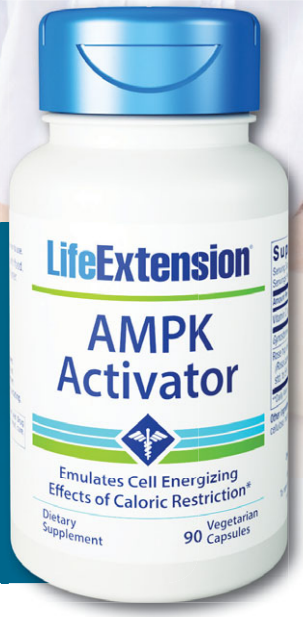

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References

1. *J Med Food*. 2009 Apr;12(2):259-70.
2. *Crit Rev Food Sci Nutr*. 2002;42(3 Suppl):273-8.
3. *Wien Med Wochenschr*. 2007;157(13-14):325-30.
4. Cran-Max® versus Ocean Spray Cranberry Juice cocktail bioactive comparison. Independent laboratory analysis. Tucson, AZ: Atlas Bioscience, Inc.; 2006.

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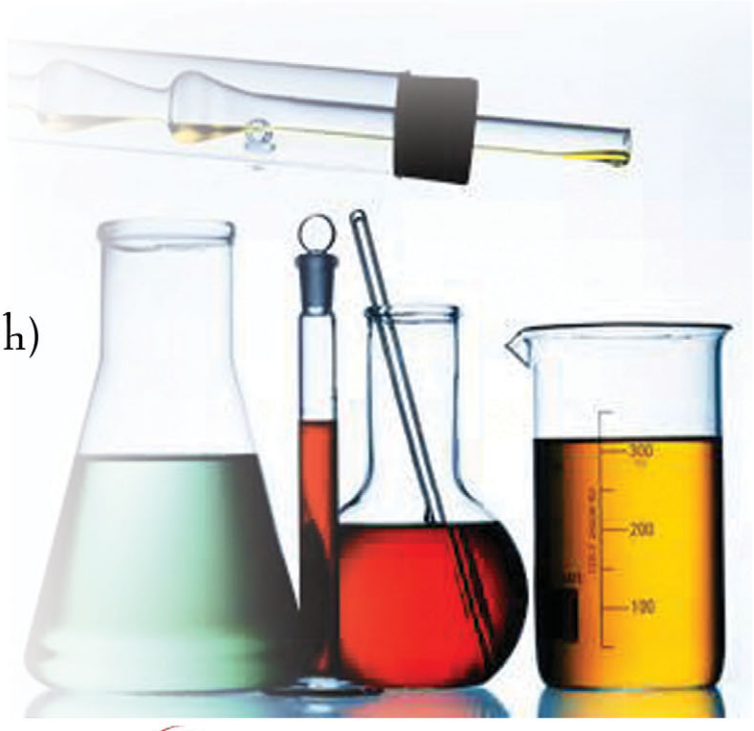

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BY MICHAEL DOWNEY

Neurosteroidal Treatment *for* Traumatic Brain Injury

The insidious damage caused by **traumatic brain injury** has emerged from the shadows and is receiving the medical focus it requires.

Much of this change has occurred due to two of the main victims of traumatic brain injury—soldiers returning from the wars in Iraq and Afghanistan and impact sports that include football and boxing.

Of course, civilians also incur traumatic brain injury from automobile accidents, falls, and assaults. According to the Centers for Disease Control, **3 to 5 million** Americans are living with traumatic brain injury-related disability.[1]

Current medical practice has little to provide these victims, who may go on to suffer cognitive problems ranging from dizziness and headaches to depression and dementia throughout their lifetime.

One visionary physician, Mark Gordon, MD, has successfully treated both veterans and civilians with traumatic brain injury by restoring neurosteroid levels.

Working with veterans who have sustained significant combat injuries to the brain, Dr. Gordon has restored wholeness to their lives. Hopefully, his innovative work with neurosteroids will find its way into mainstream medicine to help the millions suffering with traumatic brain injury.

In February, the United States Office of Naval Research announced its support of university research that appears to explain how shock waves cause **traumatic brain injury**. Energy waves cause tiny bubbles, or "microcavitations," to form, pop, and disappear so quickly that they can't be detected by brain-imaging—but can seriously unbalance an array of cellular pathways.[2] The result is a spectrum of neurological conditions that are currently difficult to treat through standard therapies.

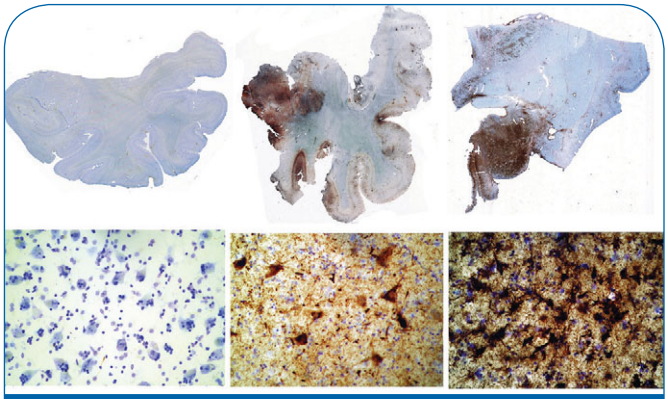
This unbalance of cellular pathways has been successfully treated by interventional endocrinologist Dr. Mark Gordon. His approach recognizes that disrupted neurosteroidal function—not simply physical brain damage—creates traumatic brain injury's neurological deficits.[3-5]

Dr. Mark Gordon

By restoring neurosteroids levels, Gordon successfully treats the depression, outbursts, anxiety, and mood swings commonly suffered by traumatic brain injury patients.

This condition constitutes an unrecognized epidemic. The nearly 1.7 million Americans afflicted annually[1] include accident victims, construction workers, fall-prone individuals, and athletes. Traumatic brain injury is the leading cause of trauma-caused disability and of brain damage in children and young adults.[6-8]

Unfortunately, the government is slow to accept the link between traumatic brain injury and neurosteroid deficiencies, and many veterans are instead treated for post-traumatic stress disorder. Thanks to innovative therapy, growing numbers of veterans and others are getting their lives back on track.



Brain tissue images with tau protein deposition (brown). Left: normal brain. Middle: former football player. Right: former boxer.

Traumatic Brain Injury Often Goes Untreated

Soldiers' body armor can withstand bomb shrapnel. But armor cannot protect them from an invisible but devastating threat—the blast wave.

"Shock waves travel faster than sound," says Dr. Timothy Bentley, program manager in the Warfighter Performance Department at the Office of Naval Research, "…energy waves can cause subtle yet damaging effects on the brain."[2]

The Office of Naval Research is supporting research at the University of Texas at Arlington focused on the idea that shock waves cause energy-packed bubbles—under 1/25th of an inch (one millimeter) across—to form and pop so quickly that they damage surrounding cells and tissue while remaining undetectable via magnetic resonance imaging or scans.[2]

This research may explain why so many traumatic brain injuries often go untreated.

Brain-synthesized steroid hormones—*neurosteroids*—regulate neuron growth, myelination, and formation of synapses between neurons in the nervous system (synaptogenesis).[9]

Neurosteroid dysfunction can trigger depression, anxiety, panic attacks, phobias, psychoses, and frequently, suicide. Neurosteroids also regulate neuroactive steroids in glands throughout the body.[10]

Shock waves—without causing physical brain damage—can disrupt neurosteroid production and, consequently, body-wide hormonal balance. How? Through secondary injury processes that occur after initial injury.

Secondary Effects

Traumatic brain injury patients can suffer broad effects, often appearing decades later.[3] Conventional medical treatment seldom achieves substantial recovery, and these symptoms can become extremely disabling.[4]

Often, there is both primary and secondary injury.[11] Primary injury occurs at time of injury and is considered irreversible.[12-14] However, complex secondary mechanisms crucially affect the delayed progression of brain damage—presenting unique opportunities for therapeutic strategies. One secondary process potentially promoting latent neuronal death is post-traumatic inflammation, which increases blood-brain barrier permeability, resulting in cerebral edema, intracranial pressure, and neuronal dysfunction.[14]

Some of the 330,000 soldiers afflicted in the past 15 years with traumatic brain injury from blast waves seem to have recovered initially, but studies suggest that many suffer lingering cognitive problems.[15]

What Dr. Gordon has discovered is that traumatic brain injury symptoms are often caused by neuro-steroid hormone deficiencies.

Multiple Imbalances

Studies demonstrate that **hypopituitarism**—where the pituitary gland fails to produce normal hormone levels—is relatively common following traumatic brain injury.[5,16-18] Sometimes, however, hypopituitarism is not diagnosed for over 20 years post-injury.[19]

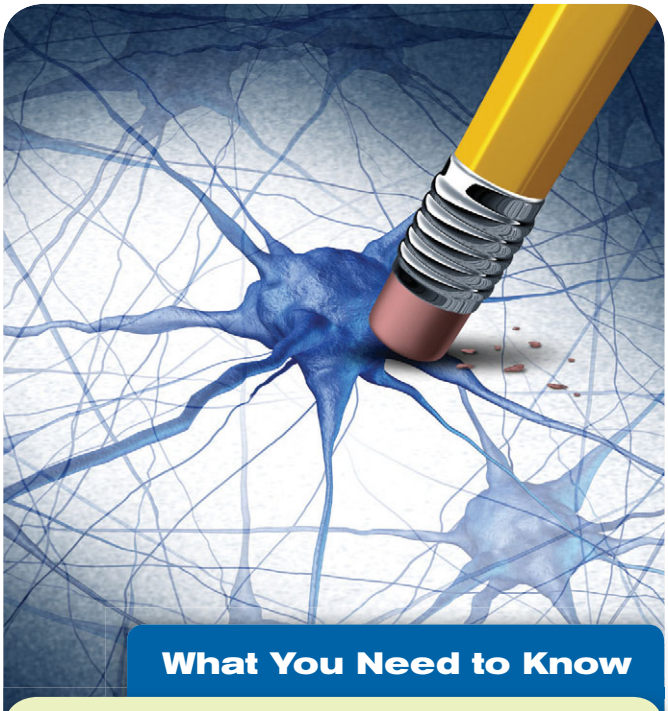
Many traumatic brain injury patients have a growth hormone deficiency, exhibiting greater deficits in attention, executive functioning, memory, and emotion than patients with normal levels.[20] Growth hormone binds to brain receptors that are especially dense in regions responsible for learning and memory[21,22]—perhaps explaining why declining levels are associated with poorer cognition.

Critically, growth hormone increases survival of damaged nerve cells and promotes nerve tissue regeneration.[23,24] It increases body-wide receptors for other hormones, helping overcome the effects of their deficiencies.[25-27]

Growth hormone levels fall with age and are especially low in Alzheimer's disease,[28-31] the symptoms of which often mirror traumatic brain injury symptoms.

Other hormones are also closely related to cognitive stability. These hormones can function directly as neurotransmitters in the central nervous system.[32] At least **16%** of long-term traumatic brain injury survivors develop hypogonadism, meaning that male testes or female ovaries produce insufficient sex hormone levels. However, these deficiencies are not identified or treated in most individuals.[5]

Sex-hormone insufficiency doesn't simply relate to sexual desire. Whether due to traumatic brain injury or aging, low sex-hormone levels are increasingly linked to dementia. Age-related sex-hormone declines significantly contribute to Alzheimer's risk.[33] In a study involving over 500 aging men and women, optimum **testosterone** levels were linked with better cognitive performance.[34] Other studies concluded that testosterone levels are positively associated with multiple aspects of cognition.[35,36]



What You Need to Know

Treatment for Traumatic Brain Injury

- **Shock waves leave millions of traumatic brain injury victims physically, emotionally, and cognitively impaired.**
- **Mainstream medicine offers little to treat these pathologies, frequently misdiagnosing them as post-traumatic stress disorder.**
- **Dr. Mark Gordon found that traumatic brain injury damages the hypothalamus and triggers pituitary dysfunction. He treats patients by restoring neuro-steroid deficiencies.**
- **Many patients are experiencing compelling success with Gordon's innovative therapy.**

Recovery of patients with traumatic brain injury is greater in those with higher testosterone.[37] "For traumatic brain injury patients," says Dr. Mark L. Gordon, ***"any proper diagnosis and treatment protocol should begin with baseline testing of testosterone, growth hormone, thyroid, cortisol, insulin, and vitamin D."***

Despite copious evidence that traumatic brain injury patients suffer hypothalamic-pituitary hormonal imbalances—and ample recommendations for rigorous hormone testing—few physicians bother to test neurosteroid levels in these patients.[19-21] Thanks to groundbreaking work by Gordon, and a few forward-thinking physicians, there is promise for afflicted Americans.[38,39]

Hope for Traumatic Brain Injury Patients

Using neurosteroid replacement techniques, Gordon and colleagues are changing the way we think about traumatic brain injuries and effective treatment. He continues to develop new protocols that may revolutionize the devastation of traumatic brain injuries.

"Whether caused by direct impact or by acceleration alone, secondary injuries that can result from brain trauma occur in the minutes and days following injury," says Gordon. "These can include alterations in cerebral blood flow and increased intra-skull pressure—contributing substantially to damage from the initial injury."

An array of resulting physical, cognitive, emotional, and behavioral symptoms often go unrecognized, especially in mild cases.[40]

How a Dedicated Green Beret Is Helping Other Veterans

The Warrior Angels Foundation (WAF) is a nonprofit charitable organization, cofounded and managed by Andrew Marr, former Army Special Forces Green Beret–and traumatic brain injury patient of Dr. Mark Gordon.

Marr is spearheading a fund-raising campaign to allow other traumatic brain injury-affected vets to benefit from Gordon's therapy. He says that it changed his life, while his previously prescribed medications only made things worse.

The government, slow to accept the link between traumatic brain injury and neurosteroid deficiencies, will not pay for Gordon's protocol in spite of the fact, Marr says, that it's vastly less costly than the multiple prescriptions and other therapies that the Veterans' Administration (VA) currently provides.

In 2006, the army's surgeon-general established the Traumatic Brain Injury Task Force to assess how the army addressed aspects of traumatic brain injury care and recommend improvements. However, Gordon believes a task force can do little if the military doesn't want to pay for treatment.

Conventional medical dosage for testosterone is **200** to **300 mg** per week, which Gordon has shown is far too high for these cases.

"A typical 25- to 35-year-old male naturally generates **4-10 mg** daily or **60 mg** per week," he explains. "Using supraphysiological dosages of testosterone–as military doctors do–can have significant side-effects if not monitored closely. We can achieve similar benefits at one-quarter the dose without the risks."

Veterans have described to Gordon the sheer difficulty of getting anything done through the military.

"Part of the reason is that the military and doctors see testosterone as a *bodybuilder drug*, rather than a natural substance produced in our bodies," explains Gordon. "It makes no sense that they can readily accept insulin use for diabetes, but not testosterone. They're both natural hormones."

Many Warrior Angels Foundation-assisted patients who have received Gordon's neurosteroid-balancing protocol experienced significant turnaround within weeks of beginning treatment.

"We're taking out the middleman of the waiting room and [Veteran's Affairs] and reducing the costs of what the VA and government spends on traumatic brain injury patients," says Marr. He notes that, as an individual's therapy continues–and fewer tests and treatments are required–expenses go down.

In its first year, the Warrior Angels Foundation raised over $100,000 to aid in the treatment of more than 100 service members and veterans–but the organization has a waiting list of over 700 veterans. The VA does not offer Dr. Gordon's neurosteroid-balancing treatment, nor will they pay for it.

Those wishing to learn more or to help with fundraising can visit http://waftbi.org/

The ways that neurosteroid deficiencies can manifest are numerous, says Gordon, including:

- Depression
- Outbursts of anger
- Anxiety
- Mood swings
- Memory loss
- Inability to concentrate
- Learning disabilities
- Sleep deprivation
- Increased risk for heart attacks
- Strokes
- High blood pressure
- Diabetes
- Loss of libido
- Menstrual irregularities
- Premature menopause
- Obesity
- Loss of lean body mass
- Muscular weakness, and
- A number of other medically documented conditions.

Especially tragic among veterans, says Gordon, is the fact that psychological damage due to traumatic brain injury is often erroneously diagnosed as post-traumatic stress disorder, commonly known as PTSD.

Dr. Gordon's neurosteroid-balancing therapy is changing lives, especially among military veterans. And this remarkable advance originated when, on a hunch, he mined published literature to better understand what was occurring in patients whose symptoms long outlasted the immediate effects of acute injury.

The Link to Pituitary Dysfunction

Gordon's research strongly suggested that traumatic brain injury often causes pituitary dysfunction, confirming his hunch.[41]

Research suggests that **50%-76%** of traumatic brain injury victims show loss of pituitary neurosteroid function.[16,17] Generally, the more severe the original injury, the more profound the deficits. However, neurosteroid deficiency or insufficiency—in the low-normal range—is seen even in patients with *mild* traumatic brain injury.[42-45]

Although **58%** of patients recover normal pituitary function within a year, a shocking **52%** develop new pituitary neurosteroid deficiencies a year *after* injury.[46] These deficits include reductions in many pituitary hormones, including those that regulate the thyroid, the adrenal glands (which produce cortisol, DHEA, and other vital hormones), the gonads (where estrogen and testosterone are produced), and growth hormone.[5,17,18,47]

The severity of neurosteroid deficiencies correlated strongly with the kinds of symptoms that Gordon was seeing. Patients with growth hormone insufficiency had worse disability scores, greater depression, greater fatigue, and poorer emotional well-being, compared to brain injury patients with normal neurosteroid levels.[48,49]

Gordon's research confirmed that traumatic brain injury victims often had pituitary neurosteroid insufficiencies, especially in growth hormone. And they're closely associated with persistent neurological, psychological, and emotional deficits tragically common in brain injury survivors.

Changing Victims' Lives

Gordon's clinic employs comprehensive testing to assess how well the hypothalamic-pituitary system is functioning, and secondary testing to determine how the target endocrine glands are affected. Those findings are correlated with a complete history and detailed physical examination to create an individualized treatment protocol.

Physiologic doses, not mega doses, are used for each neurosteroid to slowly restore levels to the middle of the optimum range, monitoring cognitive and physical functions monthly.

Gordon's patient success stories confirm that restoring neurosteroid levels to their optimal levels produces remarkable recovery of many impaired functions. Patients typically respond dramatically within weeks.

"The military and doctors see testosterone as a *body-builder drug*," explains Gordon, "rather than a natural substance produced in our bodies."

"We now know exactly where growth hormone works on mood, what pathways it uses," he says. "The military is simply not prepared to go to the depths that we have in the private sector."

Gordon's patient Andrew Marr is one of many veterans who can attest to that. The former Army Special Forces Green Beret suffered multiple traumatic brain injuries but is now heading a fund-raising campaign to help other veterans benefit from this therapy. He says that it has changed his life, while his numerous, previously prescribed medications only made things worse.

"It's highly individualized," Marr explains. "Whatever you're found to be insufficient in, that's exactly what's going to be replaced."

Summary

Shock waves may cause momentary "bubbles" in the brain, leaving traumatic brain injury victims with impaired physical, emotional, and cognitive health.

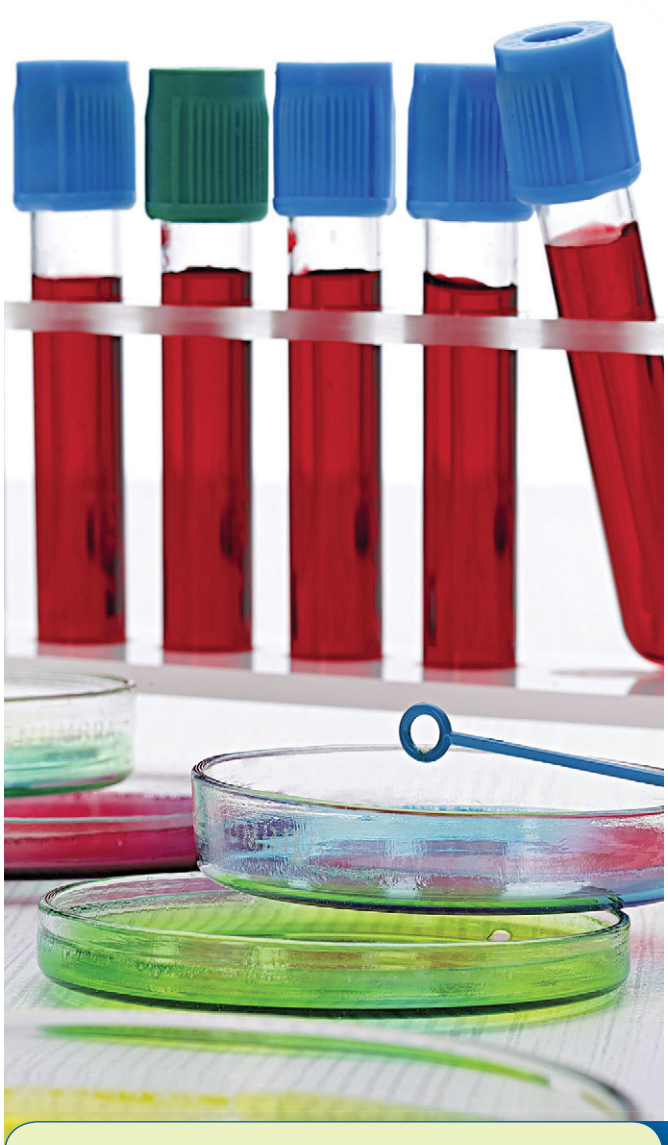
Military veterans' traumatic brain injuries are often misdiagnosed as depression or post-traumatic stress disorder.

Discovering that traumatic brain injury damages the hypothalamus and triggers pituitary gland dysfunction, Dr. Mark Gordon now identifies and treats the neurosteroid deficiencies in traumatic brain injury patients.

Many now attest to the remarkable success of Gordon's innovative, individualized therapy. ●

Patients with traumatic brain injury, or their family members, may visit Millennium's website at http://www.tbimedlegal.com/, where a new patient intake form can be filled out to start the process of evaluation. Information at the website also lets patients know what a typical course of treatment involves.

If you have any questions on the scientific conten t of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.



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References

1. Available at: http://www.cdc.gov/traumaticbraininjury/pdf/Blue-book_factsheet-a.pdf. Accessed April 18, 2016.
2. Available at: http://www.onr.navy.mil/en/Media-Center/Press-Releases/2016/Explosive-Shock-Waves-Brain-Injury.aspx. Accessed April 18, 2016.
3. Gavett BE, Stern RA, McKee AC. Chronic traumatic encephalopathy: a potential late effect of sport-related concussive and subconcussive head trauma. *Clin Sports Med.* 2011;30(1):179-88, xi.
4. High WM, Jr., Briones-Galang M, Clark JA, et al. Effect of growth hormone replacement therapy on cognition after traumatic brain injury. *J Neurotrauma.* 2010;27(9):1565-75.
5. Hohl A, Mazzuco TL, Coral MH, et al. Hypogonadism after traumatic brain injury. *Arq Bras Endocrinol Metabol.* 2009;53(8):908-14.
6. Alves ÓL, Bullock R. Excitotoxic damage in traumatic brain injury. In: Clark RSB, Kochanek P, eds. *Brain Injury*. Boston, MA: Springer US; 2001:1-36.
7. Zink BJ. Traumatic brain injury outcome: concepts for emergency care. *Ann Emerg Med.* 2001;37(3):318-32.
8. Gean AD, Fischbein NJ. Head trauma. *Neuroimaging Clin N Am.* 2010;20(4):527-56.
9. Reddy DS. Neurosteroids: endogenous role in the human brain and therapeutic potentials. *Prog Brain Res.* 2010;186:113-37.
10. Erbay LG, Kartalci S. Neurosteroid levels in patients with obsessive-compulsive disorder. *Psychiatry Investigation.* 2015;12(4):538-44.
11. Kumar A, Loane DJ. Neuroinflammation after traumatic brain injury: opportunities for therapeutic intervention. *Brain Behav Immun.* 2012;26(8):1191-201.
12. Margulies S, Hicks R. Combination therapies for traumatic brain injury: prospective considerations. *J Neurotrauma.* 2009;26(6):925-39.
13. Wei J, Xiao GM. The neuroprotective effects of progesterone on traumatic brain injury: current status and future prospects. *Acta Pharmacol Sin.* 2013;34(12):1485-90.
14. Si D, Li J, Liu J, et al. Progesterone protects blood-brain barrier function and improves neurological outcome following traumatic brain injury in rats. *Exp Ther Med.* 2014;8(3):1010-4.
15. Available at: http://www.foxnews.com/health/2015/09/11/former-army-sergeant-raising-funds-for-hormone-replacement-therapy-to-treat.html?intcmp=hphz02. Accessed April 18, 2016.
16. Klose M, Juul A, Struck J, et al. Acute and long-term pituitary insufficiency in traumatic brain injury: a prospective single-centre study. *Clin Endocrinol (Oxf).* 2007;67(4):598-606.
17. Agha A, Rogers B, Mylotte D, et al. Neuroendocrine dysfunction in the acute phase of traumatic brain injury. *Clin Endocrinol (Oxf).* 2004;60(5):584-91.
18. Agha A, Rogers B, Sherlock M, et al. Anterior pituitary dysfunction in survivors of traumatic brain injury. *J Clin Endocrinol Metab.* 2004;89(10):4929-36.
19. Aimaretti G, Ghigo E. Traumatic brain injury and hypopituitarism. *ScientificWorldJournal.* 2005;5:777-81.
20. Leon-Carrion J, Leal-Cerro A, Cabezas FM, et al. Cognitive deterioration due to GH deficiency in patients with traumatic brain injury: a preliminary report. *Brain Inj.* 2007;21(8):871-5.
21. van Dam PS, Aleman A, de Vries WR, et al. Growth hormone, insulin-like growth factor I and cognitive function in adults. *Growth Horm IGF Res.* 2000;10 Suppl B:S69-73.
22. Creyghton WM, van Dam PS, Koppeschaar HP. The role of the somatotropic system in cognition and other cerebral functions. *Semin Vasc Med.* 2004;4(2):167-72.
23. Pathipati P, Gorba T, Scheepens A, et al. Growth hormone and prolactin regulate human neural stem cell regenerative activity. *Neuroscience.* 2011;190:409-27.
24. Devesa J, Diaz-Getino G, Rey P, et al. Brain recovery after a plane crash: Treatment with growth hormone (GH) and neurorehabilitation: A case report. *Int J Mol Sci.* 2015;16(12):30470-82.
25. Herndon DN, Hawkins HK, Nguyen TT, et al. Characterization of growth hormone enhanced donor site healing in patients with large cutaneous burns. *Ann Surg.* 1995;221(6):649-56; discussion 56-9.
26. Qin Y, Tian YP. Hepatic adiponectin receptor R2 expression is up-regulated in normal adult male mice by chronic exogenous growth hormone levels. *Mol Med Rep.* 2010;3(3):525-30.
27. Wyse B, Sernia C. Growth hormone regulates AT-1a angiotensin receptors in astrocytes. *Endocrinology.* 1997;138(10):4176-80.
28. Bartke A. Growth hormone and aging: A challenging controversy. *Clinical Interventions in Aging.* 2008;3(4):659-65.
29. Gasperi M, Castellano AE. Growth hormone/insulin-like growth factor I axis in neurodegenerative diseases. *J Endocrinol Invest.* 2010;33(8):587-91.
30. Gomez JM. Growth hormone and insulin-like growth factor-I as an endocrine axis in Alzheimer's disease. *Endocr Metab Immune Disord Drug Targets.* 2008;8(2):143-51.
31. Ghigo E, Nicolosi M, Arvat E, et al. Growth hormone secretion in Alzheimer's disease: studies with growth hormone-releasing hormone alone and combined with pyridostigmine or arginine. *Dementia.* 1993;4(6):315-20.
32. Balthazart J, Ball GF. Is brain estradiol a hormone or a neurotransmitter? *Trends Neurosci.* 2006;29(5):241-9.
33. Vest RS, Pike CJ. Gender, sex steroid hormones, and Alzheimer's disease. *Horm Behav.* 2013;63(2):301-7.
34. Hogervorst E, Matthews FE, Brayne C. Are optimal levels of testosterone associated with better cognitive function in healthy older women and men? *Biochim Biophys Acta.* 2010;1800(10):1145-52.
35. Moffat SD, Zonderman AB, Metter EJ, et al. Longitudinal assessment of serum free testosterone concentration predicts memory performance and cognitive status in elderly men. *J Clin Endocrinol Metab.* 2002;87(11):5001-7.
36. Barrett-Connor E, Goodman-Gruen D, Patay B. Endogenous sex hormones and cognitive function in older men. *J Clin Endocrinol Metab.* 1999;84(10):3681-5.
37. Young TP, Hoaglin HM, Burke DT. The role of serum testosterone and TBI in the in-patient rehabilitation setting. *Brain Inj.* 2007;21(6):645-9.
38. Available at: http://www.ncbi.nlm.nih.gov/books/NBK326734/. Accessed April 18, 2016.
39. Available at: http://www.legion.org/documents/legion/pdf/TBI.PTSD_hinds.pdf. Accessed April 18, 2016.
40. Available at: http://www.ncbi.nlm.nih.gov/books/NBK326717/. Accessed April 18, 2016.
41. Leal-Cerro A, Flores JM, Rincon M, et al. Prevalence of hypopituitarism and growth hormone deficiency in adults long-term after severe traumatic brain injury. *Clin Endocrinol (Oxf).* 2005;62(5):525-32.
42. Krahulik D, Zapletalova J, Frysak Z, et al. Dysfunction of hypothalamic-hypophysial axis after traumatic brain injury in adults. *J Neurosurg.* 2010;113(3):581-4.
43. Urban RJ, Harris P, Masel B. Anterior hypopituitarism following traumatic brain injury. *Brain Inj.* 2005;19(5):349-58.
44. Ives JC, Alderman M, Stred SE. Hypopituitarism after multiple concussions: a retrospective case study in an adolescent male. *J Athl Train.* 2007;42(3):431-9.
45. Tanriverdi F, Unluhizarci K, Kelestimur F. Pituitary function in subjects with mild traumatic brain injury: a review of literature and proposal of a screening strategy. *Pituitary.* 2010;13(2):146-53.
46. Tanriverdi F, Senyurek H, Unluhizarci K, et al. High risk of hypopituitarism after traumatic brain injury: a prospective investigation of anterior pituitary function in the acute phase and 12 months after trauma. *J Clin Endocrinol Metab.* 2006;91(6):2105-11.
47. Hohl A, Daltrozo JB, Pereira CG, et al. Late evaluation of the pituitary-gonadal axis in survivors of severe traumatic brain injury. *Arq Bras Endocrinol Metabol.* 2009;53(8):1012-9.
48. Bavisetty S, Bavisetty S, McArthur DL, et al. Chronic hypopituitarism after traumatic brain injury: risk assessment and relationship to outcome. *Neurosurgery.* 2008;62(5):1080-93; discussion 93-4.
49. Kelly DF, McArthur DL, Levin H, et al. Neurobehavioral and quality of life changes associated with growth hormone insufficiency after complicated mild, moderate, or severe traumatic brain injury. *J Neurotrauma.* 2006;23(6):928-42.

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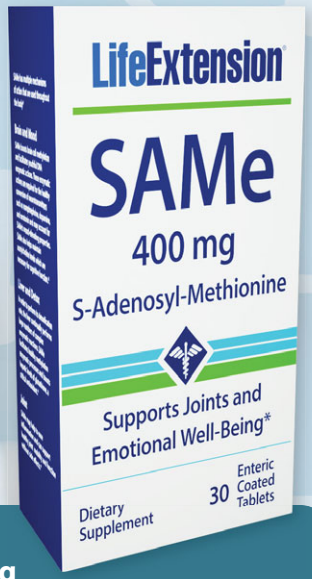
References

1. *Am J Psychiatry.* 2010 Aug;167(8):942-8.
2. *Naunyn Schmiedebergs Artch Pharmacol.* 2000 Jan;361(1)47-52.



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References

1. *J Clin Endocrinol Metab*. 1992 Oct;75(4):1002-4.
2. *J Clin Endocrinol Metab*. 1997 Aug;82(8):2396-402.
3. *Clin Chim Acta*. 2004 Mar;341(1-2):1-15.
4. *Am J Physiol Endocrinol Metab*. 2006 Nov;291(5):E1003-8.
5. *Atherosclerosis*. 2011 Jan;214(1):47-57.
6. *Clin Endocrinol (Oxf)*. 2006 Mar;64(3):260-4.
7. *J Clin Endocrinol Metab*. 2003 Jul;88(7):3190-5.
8. *Jama*. 2004 Nov 10;292(18):2243-8.
9. *Eur J Endocrinol*. 2001 Oct;145(4):457-61.
10. *Front Neuroendocrinol*.2009 Jan;30(1):65-91.
11. *Biogerontology*. 2008 Aug;9(4):235-46.
12. *Ann N Y Acad Sci*. 2006 Nov;1088:139-52.
13. *Psychopharmacology (Berl)*. 2006 Nov;188(4):541-51.
14. *J Clin Endocrinol Metab*. 2006 Aug;91(8):2986-93.
15. *Am J Physiol Endocrinol Metab*. 2006 Nov;291(5):E1003-8.
16. *J Gerontol A Biol Sci Med Sci*. 1997 Jan;52(1):M1-7.

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BY BRIAN ROSS

REISHI Mushrooms Prevent Obesity in Mice

Obesity and persistent weight gain are caused by a host of complex factors.

Researchers are extensively exploring the role the **bacteria** in our gut (our **microbiome**) have on health and disease.

A new lab study has found preliminary data that ***Reishi mushrooms*** and their extracts, long known for their **immune** benefits, can reduce body weight and prevent weight gain and fat accumulation in an unexpected way in mice fed a high-fat diet. While this is preliminary data, not tested in humans, the mechanism of action and the benefits are intriguing and show potential. Over time, **Life Extension**® will keep you informed of more developments and research with regard to Reishi mushrooms.

What has been discovered is the Reishi mushrooms act as a unique ***prebiotic*** to favorably change the composition of the intestinal microbial community in a way that favors biological weight reduction.[1]

What the New Study Showed

An international group of scientists has published a report of the effects of Reishi mushrooms (*Ganoderma lucidum*) on body weight and obesity-related disorders.[1]

Using a mouse model of obesity for their study, the researchers found that the mice fed a high-fat diet alone for 8 weeks had a significant increase in body and liver weight, as well as in the size of fat deposits within the body. Furthermore, the obese mice showed increased deposition of fat inside liver and fat cells, just as it is seen in obese humans.

A second group of mice was started on the **high-fat** diet at the same time, but received, in addition, supplementation with an extract from Reishi mushrooms at varying concentrations. Both of these mouse groups became **obese** in response to this high-fat diet.

Compared to the non-supplemented group, the mice supplemented with **Reishi** mushrooms showed:[1]

- A decrease in body weight of approximately **8%** to **16%**.
- Decreases in the fat deposited within the body cavity of about **20%** to **29%**.
- Decreases in the fat deposited beneath the skin of approximately **44%** to **59%**.
- A decrease in liver weight, the site of abnormal fat deposition that leads to fatty liver disease, of about **17%**.
- Reduction in the size and fat content of adipocytes, the cells that produce and store fat.

In addition to these reductions in weight and fat distributions, this study identified significant reductions in markers of **inflammation**.[1] This is not surprising, given that fat cells pour out inflammatory signaling molecules (cytokines).

The reduction in pro-inflammatory cytokine production was more pronounced at higher mushroom doses. The supplemented mice also showed significant reductions in the activity of a potent inflammation inducer called **nuclear factor-kappa B** (NFkB).

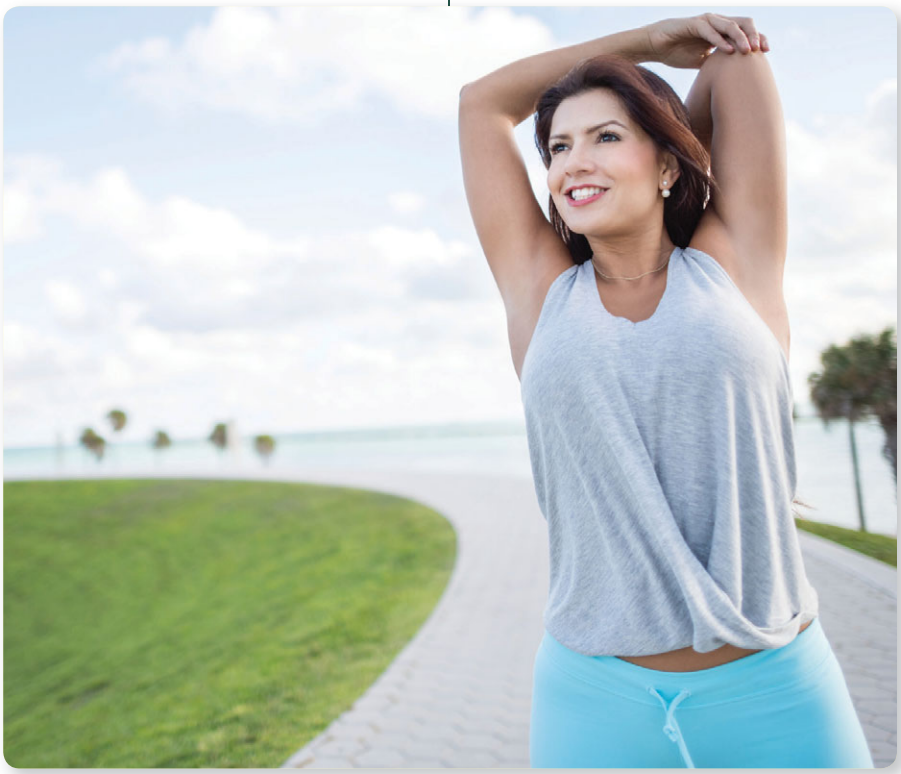
Furthermore, supplemented animals showed significant reductions in amounts of bacterial toxins in their bloodstreams, compared with obese, high-fat fed mice.[1] This is critical, because overfed obese animals (and humans) develop "leaky guts," allowing intestinal bacterial products to enter the bloodstream, where they trigger both inflammation and insulin resistance, which leads to diabetes.[2]

Finally, further molecular evidence of how the mushroom supplement reduced weight gain and body weight was demonstrated by the finding of reduction in the expression of genes involved in fat production.[1] This led to a reduction in fat concentrations in the blood of the supplemented animals.

Previous Studies Offered Hints of Reishi's Metabolic Benefits

Reishi mushrooms have been used for hundreds of years to promote good health and long life.[1,3] And, although this is the first-ever proof of Reishi mushrooms' direct effects on body weight and fat distribution, there had been previous hints that these time-honored fungi could favorably influence fat and sugar metabolism.

Reishi extracts are rich in compounds called *triterpenes* and *polysaccharides*, which have been shown to inhibit full development of fat cells, and to lower blood



sugar in diabetic animals.[1,4,5] And other studies have shown that different compounds from Reishi can produce blood fat- and glucose-lowering effects, while providing free radical scavenging activity.[1,6]

An entirely separate line of research, meanwhile, has demonstrated that the trillions of microorganisms living in our intestinal tract may have an impact on obesity and other metabolic disorders such as diabetes and metabolic syndrome.[1,7] These organisms, formerly thought to be just "along for the ride," are now recognized to contribute importantly to the ways our bodies acquire nutrients and regulate energy.[1,8,9]

In particular, the composition of our internal bacterial communities seems to influence our metabolic status. Changes in the percentage of gut bacteria's individual species, as well as in their ratios to each other, have been shown to promote, or oppose, the development of obesity in animals.[1,10,11]

Furthermore, an imbalance of the gut organism community can damage the intestinal lining in such a way that it leaks, permitting inflammation-promoting compounds to enter the bloodstream, which ultimately produces body-wide inflammation and insulin resistance, triggering further risk of obesity and metabolic derangements.[1,2,12-15]

At this point it is natural to ask: if imbalanced gut microbial communities can ***cause*** metabolic disturbances leading to obesity, can restoring that balance ***restore*** metabolic equilibrium?

There is now evidence that this is indeed the case. Studies show that antibiotics aimed at specific organisms can reduce leakage of inflammatory materials from the intestine into the bloodstream in obese mice.[1,12]

But antibiotics bring with them a host of problems, including not only immediate side effects, but also long-term risks of drug-resistant organisms, and no one is seriously proposing widespread antibiotics as a cure for obesity.

Importance of Prebiotics

A more natural way to change the composition of the gut microbial community is to change what it eats.

Prebiotics are fermentable fiber and carbohydrate molecules that nourish specific bacterial groups in the intestine, helping to restore a natural balance.

Prebiotic treatment has been shown to reduce body weight and inflammation by boosting communities of beneficial organisms, which in turn may help suppress less beneficial groups.[1,16,17] Furthermore, prebiotic treatment can enhance the "tightness" of the intestinal wall, preventing leakage of inflammatory material into the circulation.[2]

The scientists who carried out the study reported here wondered, then, whether the beneficial effects they were seeing on body weight and fat distribution might arise from some ***prebiotic*** properties of Reishi mushrooms. To answer that question, they examined the composition of their animals' intestinal microbial communities.

Reishi Mushrooms Offer Prebiotic Support

In response to Reishi, humans and obese mice showed a serious alteration in their intestinal microbial community. What researchers found was that both obese mice and humans had an elevated population of inflammation-promoting microbes with a decrease in anti-inflammatory microbes.[1,18,19]

When the scientists examined the microbial population of the mice's intestines, they found that the obese, high-fat-fed mice had the expected patterns of intestinal microbial imbalance associated with obesity.[1] But when the obese mice were supplemented with Reishi mushrooms, the mice

displayed a more "normal" and less inflammatory microbial pattern. When the mice were fed the two higher doses of Reishi mushrooms, it restored the obese mice's microbial patterns to levels similar to control mice.

In other words, Reishi supplementation had a prebiotic effect, feeding beneficial organisms at the expense of deleterious ones, and triggering a chain of events beginning with normalization of the microbial community, and leading to reduction of inflammation, tightening of leaky intestinal walls, reduced insulin resistance, diminished fat production, and ultimately to the observed weight reduction compared with unsupplemented mice.

Summary

Reishi mushrooms and their polysaccharide extracts were shown to produce powerful prebiotic effects in obese, high-fat-fed mice, which led to distinctive changes in their intestinal microbial communities.

Those changes, in turn, set off a beneficial chain reaction resulting in reduced body weight, slower weight gain, improved fat deposition in the body, and a host of beneficial biochemical changes associated with optimized metabolic health.

Given that human intestinal microbes exert similar control over metabolism and weight, there is reason to investigate whether similar results from oral supplementation with Reishi mushroom extracts will manifest in people. ●

Human Studies Needed

The weight control benefits for Reishi have only been demonstrated in laboratory mammals. We hope this Research Update spurs human studies to ascertain the ideal dose of Reishi to assist humans in preventing age-associated weight gain.

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

References

1. Chang CJ, Lin CS, Lu CC, et al. Ganoderma lucidum reduces obesity in mice by modulating the composition of the gut microbiota. *Nat Commun*. 2015;6:7489.
2. Cani PD, Possemiers S, Van de Wiele T, et al. Changes in gut microbiota control inflammation in obese mice through a mechanism involving GLP-2-driven improvement of gut permeability. *Gut*. 2009;58(8):1091-103.
3. Sanodiya BS, Thakur GS, Baghel RK, et al. Ganoderma lucidum: a potent pharmacological macrofungus. *Curr Pharm Biotechnol*. 2009;10(8):717-42.
4. Thyagarajan-Sahu A, Lane B, Sliva D. ReishiMax, mushroom based dietary supplement, inhibits adipocyte differentiation, stimulates glucose uptake and activates AMPK. *BMC Complement Altern Med*. 2011;11:74.
5. Li F, Zhang Y, Zhong Z. Antihyperglycemic effect of ganoderma lucidum polysaccharides on streptozotocin-induced diabetic mice. *Int J Mol Sci*. 2011;12(9):6135-45.
6. Pan D, Zhang D, Wu J, et al. Antidiabetic, antihyperlipidemic and antioxidant activities of a novel proteoglycan from ganoderma lucidum fruiting bodies on db/db mice and the possible mechanism. *PLoS One*. 2013;8(7):e68332.
7. Ridaura VK, Faith JJ, Rey FE, et al. Gut microbiota from twins discordant for obesity modulate metabolism in mice. *Science*. 2013;341(6150):1241214.
8. Dethlefsen L, McFall-Ngai M, Relman DA. An ecological and evolutionary perspective on human-microbe mutualism and disease. *Nature*. 2007;449(7164):811-8.
9. Backhed F, Ding H, Wang T, et al. The gut microbiota as an environmental factor that regulates fat storage. *Proc Natl Acad Sci U S A*. 2004;101(44):15718-23.
10. Turnbaugh PJ, Ley RE, Mahowald MA, et al. An obesity-associated gut microbiome with increased capacity for energy harvest. *Nature*. 2006;444(7122):1027-31.
11. Goodman AL, Kallstrom G, Faith JJ, et al. Extensive personal human gut microbiota culture collections characterized and manipulated in gnotobiotic mice. *Proc Natl Acad Sci U S A*. 2011;108(15):6252-7.
12. Cani PD, Bibiloni R, Knauf C, et al. Changes in gut microbiota control metabolic endotoxemia-induced inflammation in high-fat diet-induced obesity and diabetes in mice. *Diabetes*. 2008;57(6):1470-81.
13. Cani PD, Amar J, Iglesias MA, et al. Metabolic endotoxemia initiates obesity and insulin resistance. *Diabetes*. 2007;56(7):1761-72.
14. Wellen KE, Hotamisligil GS. Inflammation, stress, and diabetes. *J Clin Invest*. 2005;115(5):1111-9.
15. Shi H, Kokoeva MV, Inouye K, et al. TLR4 links innate immunity and fatty acid-induced insulin resistance. *J Clin Invest*. 2006;116(11):3015-25.
16. Nakamura YK, Omaye ST. Metabolic diseases and pro- and prebiotics: Mechanistic insights. *Nutr Metab (Lond)*. 2012;9(1):60.
17. Everard A, Lazarevic V, Derrien M, et al. Responses of gut microbiota and glucose and lipid metabolism to prebiotics in genetic obese and diet-induced leptin-resistant mice. *Diabetes*. 2011;60(11): 2775-86.
18. Brun P, Castagliuolo I, Di Leo V, et al. Increased intestinal permeability in obese mice: new evidence in the pathogenesis of nonalcoholic steatohepatitis. *Am J Physiol Gastrointest Liver Physiol*. 2007;292(2):G518-25.
19. Ley RE, Turnbaugh PJ, Klein S, et al. Microbial ecology: human gut microbes associated with obesity. *Nature*. 2006;444(7122):1022-3.

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References
1. *Hum Psychopharmacol.* 2011;26(7):470-6.
2. *Eur J Clin Nutr.* 2004;58(11):1518-24.
3. *Curr Concepts Nutr.* 1983;12:1-12.
4. *Br J Pharmacol.* 2004 Mar;141(5):825-30.

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References
1. *Food Chem.* 2012 Dec 15;135(4):2222-8.
2. *Anti-Aging Med.* 2011;8(2):7-14.
3. *Am J Chin Med.* 2011;39(1):15-27.

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1. *FASEB.* 2012;26;373.2.

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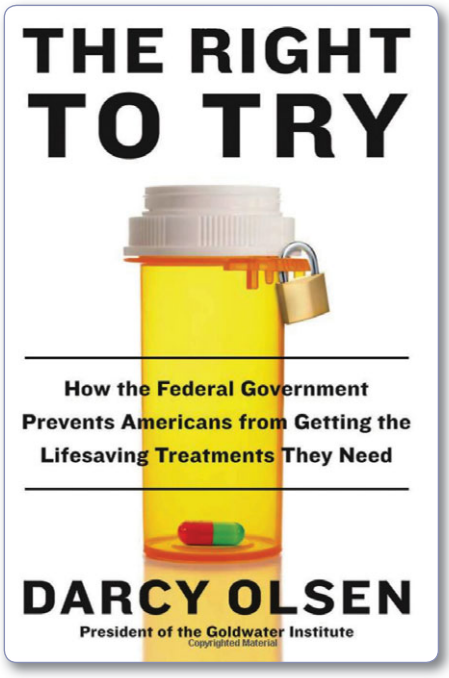
References

1. *Eur J Clin Nutr*. 2013 Feb;67(2):161-7.
2. *Curr Top Microbiol Immunol*. 2013;358:273-89.
3. *Br J Nutr*. 2013 May 28;109(10):1866-72.
4. *Nutr Hosp*. 2011 Jan-Feb;26(1):228-35.
5. *Eur J Cancer Prev*. 2013 Jan;22(1):46-51.
6. *Pediatr Int*. 2012 Oct;54(5):682-7.
7. *Microbiology*. 2007 Oct;153(Pt 10):3563-71.

BY ASTRID DERFLER KESSLER



An Interview with Darcy Olsen

THE RIGHT TO TRY:

How the Federal Government Prevents Americans from Getting the Lifesaving Treatments They Need

In 2015, Darcy Olsen, the president and CEO of the Goldwater Institute, a national policy and litigation organization that has changed more than 200 laws nationwide, released a book titled *The Right to Try: How the Federal Government Prevents Americans from Getting the Lifesaving Treatments They Need*. Throughout the book, Olsen states that the FDA's approval process for new lifesaving medications is needlessly costing tens of thousands of American lives each year. She reveals disturbing statistics that underscore the depth of this worsening problem.

"The FDA," says Olsen, "takes as long as 15 years to bring a new medicine to market and Americans are waiting **60%** longer for the FDA to approve lifesaving devices than they did just seven years ago. Instead of speeding medical innovation, the FDA is slowing it down—demanding more data, more tests, and more procedures on more subjects before it will approve a drug."

The book begins with the story of Ted Harada, a father of three who was diagnosed with amyotrophic lateral sclerosis (ALS) at age 38. Amyotrophic lateral sclerosis, also known as Lou Gehrig's disease, is **100%** fatal, with death occurring within two to five years.

But Harada was fortunate. In 2011, he underwent experimental stem cell surgery at Emory University in Atlanta, Georgia, that reversed his symptoms completely. A second surgery was done in 2012—and two months later, Harada had recovered enough to participate in an ALS fundraising walk.

Then the FDA intervened and decided Harada could not have any further surgeries. He is also unable to undergo surgery outside of the study because the treatment has not yet been approved by the FDA. This lifesaving surgery is also unavailable to the nearly 24,000 people who have died since the clinical trials began. Every 90 minutes, someone with ALS dies.

In an interview with Darcy Olsen, Harada posed the question: "If I have twice shown the surgery is safe and effective, why should I have to ask the FDA for permission to do it? If I have a doctor and a drug company willing to provide this to me, and I obviously have informed consent, why should I ever have to be in a position to go hat in hand to the FDA asking for their permission for something that has been shown to work for me twice? Why should my life rest in their hands?"

LE: You became involved in advocating for Right to Try after the then-CEO of Cancer Treatment Center of America, Steve Bonner, came to the Goldwater Institute for help in getting access to innovative treatments that could save lives.

DO: As I listened to Bonner and his colleagues, I immediately thought of my uncle Kenny. He died when I was about four from Hodgkin's lymphoma—a form of cancer for which there are now multiple treatments with high cure rates. He was my father's only brother, and I remember my dad saying that Uncle Kenny died just a few months before a new treatment was approved. At that moment it hit me: If Kenny had been allowed to try that treatment earlier, my father might still have his brother and my cousins might still have their father. The idea that the federal government was standing in the way of people fighting for their lives was infuriating. It's one thing for people to die because science has not come up with a treatment for their illness yet. It's quite another for someone to die when a promising **treatment exists**, but a patient can't get access to it because of government obstacles. If Washington would not fix the problem, then it was our job to step in.

LE: You compare your plan of action, taking the fight to the **state level** as opposed to the federal level, with medical marijuana laws and the right of assisted suicide. Can you explain your thought process?

DO: I am a firm believer in federalism, the constitutional authority and responsibility of states to check and balance Washington's overreach. If states have the authority to give their citizens access to marijuana and drugs to end their lives, certainly they have the authority to allow patients access to investigational medicines to save their lives. If you have the *Right to Die*, you have the *Right to Try*. And you don't have to wait for Washington to secure it.

LE: What was involved in the initial draft law?

DO: It would protect a person's fundamental right to try and save his own life by expanding access to promising new drugs that await the FDA if:

1. The patient has a terminal diagnosis and has exhausted all treatment options
2. The patient's doctor has advised the use of an investigational medication
3. The medication has successfully completed basic safety testing and is part of the FDA's ongoing approval process
4. The patient has provided "informed consent" acknowledging the potential risk of the drug and
5. The company developing the medication is willing to make it available to the patient.

LE: The first Right to Try law passed in May 2014. In just a little over a year from that date, Right to Try has passed in 24 states and counting. When it comes to legislation, the speed with which it was voted into law is astounding.

DO: In the state legislatures, there have collectively been 3,045 votes in favor of Right to Try and just 26 against. To put that in perspective, if those were the votes in an election, Right to Try would have won by a margin of **99%** to **1%**. The only place in the world you'd find results more lopsided than that is North Korea!

LE: The FDA argues that they have what is called Expanded Access or a compassionate use program that allows terminal patients access to clinical trials. In fact, Richard Klein, the director of the FDA's patient liaison program said, "The agency has a pathway. It seems to work quite well and I'm not sure what the state Right to Try bills really add to that."

DO: Except they don't work. Just ask the hundreds of thousands of Americans stymied each year in their efforts to get the drugs they need to save their lives. The FDA has buried its head in the sand. Its expanded access system is badly broken. Not only has the FDA created obstacles for patients and doctors, it created a system that discourages drug companies from offering innovative treatments on a compassionate basis.

LE: How many patients per year, on average, are accepted under the Expanded Access program?

DO: [There are] an average of 1,200 requests per year. The FDA says it has high approval rates [when it comes to compassionate use]. But what is striking is the infinitesimally small number of requests. About 1,615 people die of cancer **every single day**. Yet the FDA receives only **1,200** requests for compassionate use of investigational drugs **in an entire year**! According to research, **40%** of all cancer patients attempt to join a clinical trial. But only **3%** of adult cancer patients actually succeed in getting into a trial. And yet the FDA says it's a system that "works quite well!"

Compassionate use is so rare that a leading cancer specialist at one of the nation's leading cancer research hospitals has never seen it happen in the last 10 years.

LE: A complaint regarding the FDA's compassionate use program is that the application is difficult to understand and extremely difficult to fill out. In February 2015, the FDA pledged to "simplify and accelerate" the application process.

DO: The agency promised a new application process that would take less than an hour to complete. Sadly, the agency hasn't fulfilled that promise.

LE: One family's experience sums up so poignantly why Right to Try is necessary to overcome government roadblocks and save lives. Let's discuss the McNary family—Jenn and her two sons Austin and Max and the tragedy that surrounded them.

DO: Imagine the joy of watching your dying son experience a miraculous recovery thanks to an experimental medicine. Then imagine the horror of watching your other son slowly die from the exact same disease because the federal government prevented him from receiving the same lifesaving treatment as his brother. That's the nightmare my friend Jenn has lived for the past three years.

One day Jenn began to notice that Austin was not keeping up with his friends [or] meeting developmental marks. The doctor told her that Austin had Duchenne muscular dystrophy, a disorder that leads to muscle degeneration and eventually death. When she discovered the disease was fatal, she had her 3-month-old son Max tested—and to her horror, found out he also had Duchenne.

LE: Austin didn't qualify to join any of the clinical trials testing an experimental drug called eteplirsen, which is designed to partially repair one of the common genetic mutations that causes Duchenne. Until the Food and Drug Administration approves it, no one can receive eteplirsen outside of an approved clinical trial. What happened with both boys, who were in wheelchairs with limited mobility?

DO: Max was enrolled in a double-blind, placebo-controlled trial. About 16 weeks after his infusions began, Jenn started noticing changes in Max. He asked to play outside [and] started regaining his fine motor skills. After a year, he abandoned his wheelchair and hasn't used it since. He was getting better.

LE: And Austin?

DO: Jenn's joy was bittersweet. At the time she was watching one beloved son recover, she was watching her other beloved son continue to deteriorate. "Austin is very angry right now," [Jenn said to me]. "He doesn't understand why the grown-ups in his world can't figure this out and make things happen faster for him. It is one thing if your child is dying from an untreatable disease, but to have your child dying from a treatable disease is devastating. I never

thought it would be the government I'd be working against."

LE: Three years after Sarepta [the pharmaceutical company that developed eteplirsen] first demonstrated that it's safe and helping Duchenne kids, the FDA still hadn't invited Sarepta to apply for approval of the drug. How many kids were hurt by these delays?

DO: There are about 15,000 to 20,000 boys in the US with Duchenne, and eteplirsen can help about **13%** of them. That is about 1,950 to 2,600 boys who desperately need this drug. But Sarepta estimates that its broader portfolio of compounds based on same technology as eteplirsen can help about **80%** of these kids. That's 12,000 to 16,000 kids in the United States alone—and tens of thousands more across the globe. Jenn says there [were] only 12 children in the world receiving the medicine. The rest are wasting away and dying.

LE: After 39 months of fighting, Jenn finally succeeded in getting Austin into a clinical trial. Of course, the drug cannot reverse the debilitating declines Austin suffered while fighting for access. But how is he doing now?

DO: [According to Jenn], it's not going to make him walk again, but it could stabilize his progression so he doesn't get worse. For 170 weeks, Austin watched his brother get better while he got worse. He lost the ability to transfer himself from chair to bed, from chair to toilet, to wash his hair, dress himself, cut his food… The most frustrating part of the FDA is that they already have the tools they need to approve a drug like this. We weren't asking them to go against the rules, against the law, or make an exception.

LE: What is happening in the approval process now?

DO: In April 2015, the CEO of Sarepta resigned—a casualty of the company's struggles with the FDA. A few weeks later, the FDA invited Sarepta to submit a new drug application. If all goes well, and the drug is approved, it will be because an innovative CEO and a group of moms joined forces to fight for faster approval.

LE: Why do you think the Right to Try has taken the country by storm?

DO: It's simple. Almost everywhere it has passed, courageous Americans fighting terminal illnesses have stepped forward to fight for it. These patients and their families have testified before state legislatures, lobbied their elected leaders, and shared their stories with the media—asking their fellow citizens to stand with them in the fight to save their lives. Their stories captured the imaginations of legislators of both parties and inspired millions to rally around the terminally ill. These Americans moved hearts—and votes—in support of the principal that every American has a fundamental right to try to save his or her own life.

LE: Thank you for sharing your experience and the work you're doing. ●

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

Darcy Olsen is the president of the Goldwater Institute, a national research and legal organization that has changed over 200 laws throughout the US. An authority on education reform, economic policy, and government reform, Olsen is a regular guest on national media programs. Her opinions have been widely published in outlets such as the *Wall Street Journal*, *USA Today*, and *National Review*.

Olsen has received numerous awards and recognitions including a 2014 Bradley Prize, which recognizes individuals of extraordinary talent and dedication who seek to preserve and defend the institutions of free government and private enterprise, and the national Roe Award for achievement in public policy.

To contact the Goldwater Institute, please visit www.goldwaterinstitute.org or call 1-602-462-5000.

To order a copy of *The Right to Try*, call 1-800-544-4440 or visit LifeExtension.com

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References
1. *Annu Rev Physiol.* 2006;68:51-66.
2. *Altern Med Rev.* 2008 Jun;13(2):128.
3. *Adv Biomed Res.* 2014 Mar 25;3:100.
4. Available at: http://www.cordiart.com/. Accessed March 22, 2016.
5. *Eur Ann Allergy Clin Immunol.* 2007 Feb;39(2):45-50.
6. *Phytother Res.* 2004 Dec;18(12):957-62.

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** J Diet Suppl.* 2011 Jun; 8(2):158-68

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References

1. *Indian J Pharm Sci*. 2008 Jul-Aug;70(4):445-9.
2. *AAPS J*. 2014 Jul;16(4):649-57.
3. *Ceska Slov Farm*. 2014 Feb;63(1):26-31.
4. *AAPS J*. 2009 Sep;11(3):495-510.
5. *Anesth Analg*. 2014 Jun;118(6):1336-44.
6. *Zhongguo Zhong Yao Za Zhi*. 2014 Oct;39(19):3846-9.
7. *Platelets*. 2011;22(4):270-6.
8. *Phytother Res*. 2014 Oct;28(10):1553-60.
9. *Pharmacol Res*. 2015 May-Jun;95-96C:71-81.
10. *Int J Pharmocol*. 2009;5(6):333-45.
11. *Food Nutr Res*. 2009;48(3):148-52.

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References

1. *Mutagenesis.* 2015;30(1):129-37.
2. *Curr Opin Clin Nutr Metab Care.* 2013;16(6):688-97.
3. *Circ J.* 2010;74(3):578-88.
4. *Nutrition.* 2014;30(3):337-42.
5. *BMC Musculoskelet Disord.* 2009;10:110.
6. *J Transl Med.* 2015;13:79.

Note: **EGCG** is the acronym for **epigallocatechin gallate**, which is the polyphenol in green tea that has demonstrated the most robust health benefits.

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BY MICHAEL DOWNEY

Own Your Health: Mackie Shilstone

Researchers now recognize that regular, strenuous exercise is a powerful anti-aging tool. If that's the case, then Mackie Shilstone may live forever. He's an exercise *machine*.

Shilstone is arguably America's most influential fitness and performance expert, having played a pivotal role in the success and career extension of more than 3,000 professional athletes and teams.

His clients have included baseball greats Ozzie Smith and Brian Dozier, boxers Michael Spinks, Riddick Bowe, Roy Jones Jr., and Bernard Hopkins, tennis ace Serena Williams, and two-time Superbowl-winning quarterback Peyton Manning. Shilstone is among the top 50 most influential people in boxing history, says *KO Magazine*. He helped his friend, actor John Goodman, drop 125 pounds—so far—and former Playboy Model of the Year Breann McGregor credits him for her striking figure.

Shilstone offers recommendations for ***Life Extension***® readers that cover exercise routines, dietary choices, and supplements.

Do As I Do—Well, At Least, Try

Stretching the twilight era of the careers of many professional athletes well past their expected retirement age has brought Mackie Shilstone his greatest fame. Ozzie Smith devoted part of his Hall-of-Fame induction speech to Shilstone, acknowledging that his training with the premier sports performance manager enabled him to extend his career by an additional 11 years.

Two factors in Shilstone's workouts are particularly impressive—almost unbelievable.

To understand the first factor, it's critical to know that he is not the kind of trainer who stands next to his pro-athlete clients, urging them to work harder. He says that the best way to train top athletes is to analyze the physical skills of their sport, break them down into their essential elements, design a tailored program accordingly, and then perform those specialized exercises right alongside them. The truly impressive part? None of his star-athlete clients can keep up with him!

The second, and most compelling, factor is that he has just received his Medicare card. Yes, the trainer that none of his pro-athlete clients can keep up with just turned age 65 in March.

Shilstone calls tennis great Serena Williams—one of his clients—Lois. Why? Because she calls him Superman.

"Mackie is not human," says Williams. "No one has ever been able to beat him—champion or not. I'm still working on it."

Another client who credits Shilstone's extreme workouts with his career longevity—and who also couldn't keep up with the famous trainer—is former New Orleans Saints kicker Morten Andersen, who retired in 2008 at age 48.

"I would be going full speed," says Anderson, "and he would be jogging *backwards*, saying to me, 'Let's go—that the best you've got?'"

Shilstone seems not be aging. At 65, he looks much younger, weighs 147 pounds, and has **10%** body fat, blood pressure of 105/65, and a resting pulse rate between 42 and 48. The enthusiasm in his eyes when he talks simply beams energy.

Sure, he's incredibly fit. But how is it possible for him to keep up with—and *outperform*—professional athletes less than half his age?

The answer is a highly nutritious diet that includes supplements, a punishing daily exercise regimen, keeping mentally active—he has written seven books, co-owns eight GNC franchises, and spent seven years as the Director of Health and Fitness for the John Ochsner Heart and Vascular Institute—and above all, a capacity for suffering that is as much motivational as physical.

When clients ask his secret, he has a stock answer. "I'm trying to kill myself," he tells them. "But you're just trying to survive."

And now, he can taunt his 20-something clients who are unable to keep up with him by waving his Medicare card in their faces.

Shilstone has read ***Life Extension*** Magazine® for five years and offers advice to fellow readers.

"For a longer, healthier life—aiming for compressed morbidity at a much later part of your life—follow a Mediterranean-style eating plan, do regular cardiovascular and resistance exercise and take appropriate nutritional supplementation," he says, adding, "and a positive outlook on life, prayer, and good family associations."

Diet and Supplements

Shilstone hasn't eaten red meat in 35 years.

A typical breakfast includes a blended drink containing water, fruits, **5,000 mg** of vitamin C, a teaspoon of green vegetable powder, two tablespoons of Bulgarian yogurt, **20 grams** of whey protein isolate, and a teaspoon of cod liver oil with vitamin D. After that, he

may have a slice of rye toast with omega-3 peanut butter.

Lunch is often salmon or turkey, with salad and water.

Dinner, following a 20-minute bike ride, is frequently grilled chicken, fish, or a turkey burger, with green vegetables and a glass of white wine.

He takes an array of nutritional supplements daily, including:

- An omega-3 (**1,280 mg**) with added vitamin D3 (**1,000 IU**), twice daily with breakfast and dinner
- Cod liver oil with vitamin D3 (with his morning blender drink)
- Life Extension®'s Super Bio-Curcumin (**400 mg**), at breakfast
- Life Extension®'s Optimized Resveratrol (**250 mg**), with breakfast
- Glucosamine/chondroitin formula (**1,500/1,200 mg**), with breakfast
- DHA fatty acid (**830 mg**)
- Probiotics (12 billion live colony-forming units), before breakfast
- Magnesium citrate (**150 mg** and another **300 mg** at bedtime)
- Zinc citrate (**50 mg**), twice daily after meals
- BioSil™ hair, skin, and nails formula
- Life Extension®'s CoffeeGenic® Green Coffee Extract (**400 mg**), before dinner
- Life Extension®'s TMG (Trimethylglycine, **1,000 mg**), at dinner, and
- A premium multivitamin formula with dinner

For youthful skin, he uses RejuveneX® Factor Firming Serum, morning and night.

"After three decades of working with star athletes, I know that what you put in your mouth can make the difference between winning, losing, or just competing," Shilstone says. "And after three decades of conducting hospital-based weight management and wellness programs, I've seen the end results of poor eating habits and a lack of exercise—susceptibility to cancer, metabolic syndrome, visceral fat gain, diabetes, and heart disease."

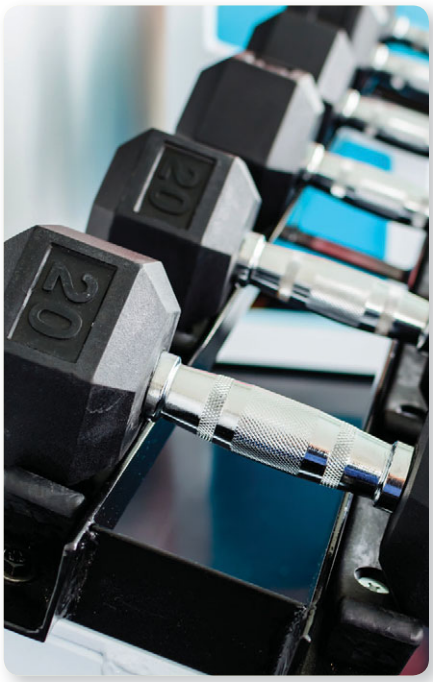
Power Workouts

Shilstone's day starts at 4:48 am. He spends an hour catching up on ***Life Extension***® and various technical journals. "I don't feel I've started my day unless I've expanded my mind," he says.

Then he cycles 12 minutes from his New Orleans home to Newman High School, where he prepared Peyton Manning for the 2015 Super Bowl season. There, he follows his grueling, six-days-a-week regimen. Packed into 12- to 15-minute blocks—for a tight total of 90 minutes of actual movement, excluding resting and walking times—are running, jumping, stability-ball exercises, traditional weight routines, static and dynamic stretching, medicine-ball throws, kettle-bell exercises, chin-ups, lunges and rotations with resistance cords, squats and squat jumps, and jumping crossovers.

He then stretches for 12 minutes before riding his bicycle back home—taking 15 minutes this time, instead of 12. "I take it a little easier after my workout," he says.

Medicare card or not, he has no plans to cut back on his workouts. And his passion for promoting healthy life extension goes well beyond helping professional athletes and celebrities to seniors who have never followed a nutritious diet or regularly exercised. He has helped hundreds of non-athletes, both through his books and personally, and says that there are no barriers between professional athletes and the average person—"only different target goals and differing training times to reach those goals."



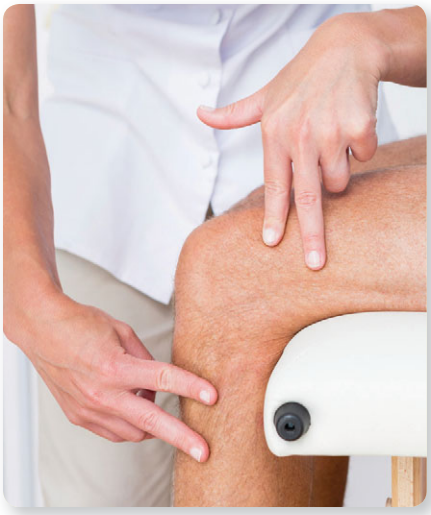
Advice for Aging Readers

For ***Life Extension***® readers with limited time who still want to optimize their health and prevent the age-related muscle loss known as sarcopenia, Shilstone recommends high-intensity interval (HIT) training—an exercise strategy that alternates brief periods of highly intense exercise at the limit of one's ability with longer less-intense recovery periods, greatly shortening the overall time

required for high-value workouts. He says high-intensity training has, in some ways, provided the same cardiovascular benefits of extended, continuous, cardiovascular exercise.

"Exercise using interval cardiovascular training four times a week and work out with resistance-type exercise three or four times a week," he suggests, "and increase your protein intake [with] diet and whey isolate protein during the day, along with casein protein before bed." He also suggests a muscle-building amino acid product once or twice daily, as well as **3 grams** of a compound known as HMB or (beta-hydroxy-beta-methylbutyrate), which may enhance strength gains, especially on untrained athletes just starting a strength-training program.

Aging individuals who feel that bad knees, stiff joints, chronic fatigue, or other movement issues may prevent them from exercising, let alone using high-intensity training, might take a lesson from Shilstone's experience. Rather than preventing exercise, he suggests, these problems may result from a lack of it. After a lifetime of staying extremely active, Shilstone has only experienced minimal knee discomfort—and he doesn't attribute this to great luck or good genes.



"I attribute it to my resistance-exercise routine with emphasis on eccentric quadriceps and hamstrings and my comprehensive hip-strengthening (glutes) routine, along with a daily core exercise routine."

Fatigue is often a result of poor sleep quality, but daily exercise can enhance restorative sleep.

But Shilstone stresses that rigorous daily exercise isn't a goal in itself. "I don't live for my workout," he says. "I workout to live." In his down time, he enjoys reading books about great leaders, present and past.

As examples of how much living he has experienced outside of the gym, Shilstone has served as a Clinical Instructor of Public Health and Preventative Medicine at Louisiana State Health Sciences Center, Adjunct Instructor in the School of Allied Health at Nicholls State University, and Adjunct Professor at the A. B. Freeman School of Business at Tulane University. He has also served as a special advisor to the US Olympic Committee on Sports Nutrition and an advisor to the Louisiana Governor's Council on Physical Fitness and Sports.

Of his seven books on fitness and healthy lifestyles, the one best-suited to aging individuals might be *Stop Renting Your Health—Own It: A Three Step Approach*. This 165-page guide covers the metabolism changes that accompany aging and how to promote wellness and prevent the muscle loss of sarcopenia. Critically, it outlines the same unique, science-based approach that Shilstone uses with celebrities and sports professionals—and it is available as a free download from his website.

As for the not-insignificant challenge of finding the motivation to just get started and keep going, Shilstone says, "Some people dream of success, while others wake up and work hard to try and make it happen. It takes a commitment for a person to get his or her health-and-performance age *below* that of their chronological age—and commitment means that you are either all-in or you're out.

"It's never too late to get healthy," he adds, "but you need to start with a vision and ask yourself how you want to die. The answer will show you how to live."

So how does *he* want to die? "I'm not going to go out broken," he stresses. "I'm going out standing up."

He muses on what science may be able to contribute to human longevity.

"I think science is on the brink of extending life with the human genome project, blood testing for genetic markers, caloric restriction to attack cancer cells and achieve apoptosis, along with breakthroughs in exercise science such as the use of high-intensity interval training." ●

Mackie Shilstone's book, *Stop Renting Your Health–Own It: A Three Step Approach*, is available as a free download at http://www.mackieshilstone.com/stop-renting-your-health-own-it/ Readers can learn about, and buy, any of his other books by visiting http://www.mackieshilstone.com/category/publications/ or by visiting amazon.com

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

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- Help maintain lean muscle mass,
- Support healthy immune function, and
- Protect against free radical attack.

Available in both **natural chocolate** and **natural vanilla** flavors.

References

1. *J Appl Physiol.* 2003. 95(4):1717-27.
2. *Curr Genomics.* 2012 Dec;13(8):589-602.
3. *Altern Med Rev.* 2004 Jun;9(2):136-156.
4. *J Nutr Biochem.* 2003 May;14(5):251-8.
5. *Toxicol In Vitro.* 2003 Feb;17(1):27-33.
6. *Br J Nutr.* 2011 May;105(10):1465-70.
7. *Int J Sport Nutr Exerc Metab.* 2006 Oct;16(5):494-509.

Contains milk.
Non-GMO

New Zealand Whey Protein Concentrate (Vanilla)

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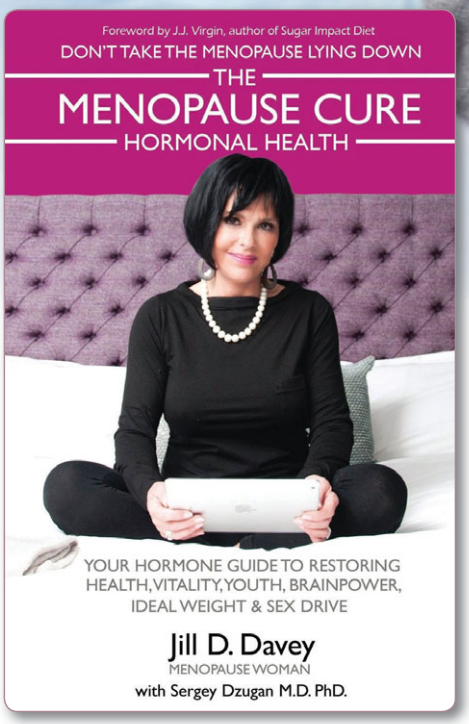
References

1. *J Natl Cancer Inst.* 2000 Dec 20;92(24):1966-7.
2. *Atherosclerosis.* 1999 May;144(1):117-22.
3. *J Nutr.* 1992 Dec;122(12):2440-6.
4. *Lipids.* 1995 Nov;30(11):1019-28.

Caution: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

BY LAURIE MATHENA



THE MENOPAUSE CURE

HORMONAL HEALTH

The new book, *The Menopause Cure: Hormonal Health*, provides an in-depth guide to restoring health, vitality, youth, brainpower, ideal weight, and sex drive to women facing perimenopause and menopause. Author Jill D. Davey, who collaborated with Sergey Dzugan, MD, PhD, shares how the use of bioidentical hormone restorative therapy can help women have a happy, healthy, strong, and sexually vibrant life in their 40s, 50s, and beyond. In this interview with ***Life Extension*** *Magazine*®, Jill discusses some important highlights from *The Menopause Cure*.

LE: Is suffering through the symptoms of menopause simply a fact of life for women?

JD: We have become used to accepting aging and menopause as a normal process—accepting getting fat, a diminished sex drive, suffering hot flashes and night sweats, being unable to sleep peacefully anymore, sudden brain fog and senior moments. Accepting becoming ill, feeble, weak, and depressed. Accepting heart disease, high blood pressure, diabetes, osteoporosis, dementia, and more. We do not have to accept this anymore. There is an alternative, a safe method to redress all menopausal symptoms, and the disease they now call aging, along with all of its age-related diseases.

LE: You believe that an alternative can be found in restorative medicine. Can you explain what that is?

JD: Restorative medicine views our body and health in a complete sense; a whole body approach. Being of optimal health is what we are looking at. Being emotionally, mentally, and spiritually connected—the hormonal network along with internal organs and systems functioning at maximum efficiency. Restorative medicine looks at prevention, not only cure, by keeping things in balance.

At a basic level what I am saying is that restorative medicine corrects and balances instead of suppressing and hiding those niggling symptoms, which will, at a later date, become something not so very nice.

The overall goal of restorative medicine is to prevent these symptoms ever occurring by keeping hormones balanced, synchronized, or, let's say, in harmony with the use of bioidentical hormones, vitamins, supplements, and minerals, all of which are important for a long and healthy life. Restorative medicine approaches the body with true health and prevention in mind.

LE: There has been a lot of controversy about hormone replacement therapy over the years. What distinguishes bioidentical hormones from synthetic hormones?

JD: Bioidentical hormones are not pharmaceutical drugs. They are biologically identical to the hormones that are produced in our body, identical in molecular structure, hormone replicas. They come from plant extracts that are bioengineered in a lab to become an exact copy of the human hormone.

Synthetic hormones are completely different from bioidentical hormones. A synthetic hormone is a substance that is not found in nature, rather, it is reinvented from nature so as to be patented.

The drug Premarin® is a horse estrogen. It is derived from the urine of pregnant mares. Some people may, mistakenly, believe that because of this, it can be classified as being natural and is safe. This is not the case. Although Premarin® does contain estrogens natural to humans (e.g. estrone), it also contains estrogens natural to a horse (equilin, equilenin). What is our body going to do with these horse estrogens? We are not horses. Premarin® is not bioidentical to human requirements.

Unlike natural or bioidentical hormones, synthetic, alien, or pseudohormones cannot be metabolized safely and efficiently without producing toxic byproducts in the body. The fact is that the body has an inbuilt system that metabolizes bioidentical hormones easily.

Synthetic hormones are foreign compounds that are never actually produced inside the body. Bioidentical hormones are natural to the human body and provide many health benefits.

LE: How can balancing hormone levels through the use of bioidentical hormones help some of the key complaints of women going through menopause?

JD: We'll start with the most superficial of things, the skin. Quite suddenly and drastically after menopause our skin seems to shrivel up and become paper-thin, wrinkles deepen and become more apparent. There's no stretch anymore. The skin becomes drier and we bruise more easily and heal less quickly. These changes in the skin are partly due to a decline in estrogen levels. Balanced estrogen levels help keep skin from aging so drastically. By simply replacing with bioidentical estrogens when there is a decline we can maintain and even erase some of the years of aging skin.

Another common symptom of menopause is "leaky bladder" and pain or difficulty in urinating. This syndrome is due to a weakened muscle in the bladder and urethra. The overall health and strength of these muscles is largely dependent on balanced estrogen levels and when there is a low estrogen level, we get the leak! Estrogens help restore normal blood flow to the tissue and muscles that sustain and regulate the urinary tract. Restoring our body with bioidentical hormones can very easily treat, and even prevent, this common problem.

Unexpected weight gain is very common in perimenopause. One of the reasons we gain weight in perimenopause is because there is an imbalance of hormones. That hormonal environment is usually one of high insulin, along with low estrogens and thyroid function. We cannot lose weight if we have high insulin or if our thyroid is dysfunctional. When we have low thyroid it doesn't matter how much we diet or exercise, the weight will NOT come off. Our body cannot metabolize the food we eat effectively, turning calories into fat instead of using them for energy. Women with balanced hormones are less likely to gain weight than those without.

LE: One question we hear from a lot of readers relates to sex after menopause. Can bioidentical hormones help women maintain a healthy sex life during and after menopause?

JD: The majority of women at this stage of their lives will be disinterested in sex. This is because our sex hormones are declining. We are entering perimenopause, and menopause and postmenopause don't get any better. Both estrogens and progesterone are needed to maintain women's sexual organs in a normal and healthy condition. Testosterone is needed for sexual desire, arousal, and fantasy.

Ovarian estrogens have many functions, one of which is to aid our sexual happiness. It supports the blood flow to the vaginal lining but with a decline of this hormone, the blood flow to the genital area becomes lesser, which causes genital tissue to lose its sensitivity, leading to reduced arousal and greater difficulty in achieving orgasm. Also, vaginal tissue tends to become dryer and thinner, leaving the vaginal walls more susceptible to infection and irritation, making sexual intercourse painful and uncomfortable.

It is important to restore your body if you want to enjoy sex again. Vaginal dryness and atrophy are commonplace in menopausal women. Balance your body and you will avoid these problems and at the same time protect yourself from illness and age-related diseases.

LE: Do women need to be concerned about their hormone levels even beyond menopause?

JD: Women are so used to being told, "It's only menopause, it'll pass." Totally untrue. Yes, your hot flashes and night sweats will pass, but internally the body is experiencing total breakdown due to hormonal loss. It doesn't pass, it gets worse. This is why we become weak, frail, have bent-up bodies, and get sick as we age. The major part of it has to do with hormonal loss.

Hot flashes are transitory, they are a symptom telling our body that something is not functioning correctly; something has gone awry. Transitory because they apparently pass, they last only as long as it takes for the body to adapt to this new situation. This new situation is dangerous and will eventually lead to chronic disease and aging, so it needs to be corrected. Declining hormones need to be restored for the body to function optimally, and to slow that "body

breakdown" process. Hormones have incredible influence on the body—they control us, they make or break us, build us up or tear us down. With declining hormone levels we age at a greater rate, and die at a greater speed.

LE: Can you discuss the connection between hormones and aging?

JD: Declining hormone levels are almost always associated with chronic illness and all age-related diseases. This is what I call the common denominator to aging: hormonal loss. The fact is, we begin our descent into aging and its related illnesses because our hormones decline, not the other way around. In other words, our hormones do not decline because we age or become ill. We become ill because our hormones decline. When you restore them, you will protect yourself.

Dr. Dzugan believes that, by corresponding physiology and therefore restoring the body to optimal levels with the use of bioidentical hormones, vitamins, supplements, and minerals, which are all interrelated, we can slow the aging process and use restorative medicine to treat age-related diseases.

LE: What are some practical steps readers can take to begin their restorative medicine journey?

JD: Restorative medicine is a very precise medicine that requires specific blood tests. We are all different and therefore require different supplements in different amounts. Once your blood samples are analyzed, you can acquire bioidentical hormones, supplements, vitamins, and minerals based on where your optimal levels should be.

If your blood tests show that you are low on magnesium, calcium, or iron, you will need to bring [yourself] within optimal ranges. Another example is that if you are low on the two female sex hormones, progesterone and estrogen, they will need to be brought into their optimal ranges. Bioidentical hormones, vitamins, supplements and minerals work together in the body…they are all interrelated.

As Dr. Dzugan said to me, "Your blood doesn't lie, it is not guesswork, this is precise medicine. Your bloodwork shows what is missing and what is needed at that time. This medicine tells you want your body needs and what it doesn't need." ●

If you have any questions on the scientific content of this article, please call a Life Extension® Wellness Specialist at 1-866-864-3027.

To order a copy of *The Menopause Cure: Hormonal Health*, call 1-800-544-4440 or visit LifeExtension.com

Jill D. Davey was born in England, but for the past 27 years she has lived in Italy. She began researching restorative medicine/bioidentical hormones after entering menopause. Sergey A. Dzugan, MD, PhD, is co-founder and Chief Scientific Officer of the Dzugan Institute of Restorative Medicine. He is the author of 151 publications in medical journals, and these publications include surgical, oncological, academic, and anti-aging topics. He was the former President of Life Extension® Scientific Information Inc. Previous publications include *The Migraine Cure: How to Forever Banish the Curse of Migraines*, *The Magic of Cholesterol Numbers: A Step Away from the Cholesterol-Lowering Drugs*, and *Your Blood Doesn't Lie! Aging, Disease and Illnesses Are Linked to One Cause... and One Solution*!

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References
1. *Br J Nutr.* 2012 Nov 14;108(9):1652-7.
2. *Asia Pac J Clin Nutr.* 2013;22(3):492-6.
3. *Blood.* 2007 Apr 15;109(8):3279-83.

Warning to Coumadin® (warfarin) Drug Users: Patients prescribed vitamin K-antagonist anticoagulant prescription drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Super Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental K. Ask your doctor if you can take a low dose (**45 mcg** a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for your vitamin K supplement. Life Extension® provides several forms of low-dose vitamin K for physician consideration.

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○ **DHEA-SULFATE (LC004020)** — $61
This test shows if you are taking the proper amount of DHEA.

○ **MALE BASIC HORMONE PANEL (LC100012)** — $75
DHEA-S, Estradiol, Free and Total Testosterone, PSA

○ **FEMALE BASIC HORMONE PANEL (LC100013)** — $75
DHEA-S, Estradiol, Free and Total Testosterone, Progesterone

○ **DIHYDROTESTOSTERONE (DHT)* (LC500142)** — $50
Measures serum concentrations of DHT.

○ **ESTRADIOL (LC004515)** — $33
For men and women. Determines the proper amount in the body.

○ **INSULIN FASTING (LC004333)** — $29.90
Can predict those at risk of diabetes, obesity, heart and other diseases.

○ **PREGNENOLONE* (LC140707)** — $116
Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing's syndrome.

○ **PROGESTERONE (LC004317)** — $55
Primarily for women. Determines the proper amount in the body.

○ **SEX HORMONE BINDING GLOBULIN (SHBG) (LC082016)** — $33
This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.

GENERAL HEALTH

○ **VITAMIN D (250H) (LC081950)** — $47
This test is used to rule out vitamin D deficiency.

○ **FERRITIN (LC004598)** — $28
Ferritin levels reflect your body's iron stores and is also a biomarker for insulin resistance.

○ **PSA (PROSTATE SPECIFIC ANTIGEN) (LC010322)** — $31
Screening test for prostate disorders and possible cancer.

Blood tests available in the continental United States only. Restrictions apply in NY, NJ, RI, and MA. Not available in Maryland. Kits not available in Pennsylvania.

This is NOT a complete listing of LE blood test services. Call **1-800-208-3444** for additional information.

* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit and will incur an additional $35 charge. If the customer is having blood drawn at a LabCorp facility, this extra charge does not apply.
** This test is packaged as a kit.

ORDER LIFE SAVING BLOOD TESTS FROM VIRTUALLY ANYWHERE IN THE US!

TERMS AND CONDITIONS

This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and Life Extension® contract with a physician who will order your test(s), but will not diagnose or treat you. Both the physician and the testing laboratory are independent contractors and neither National Diagnostics, Inc., nor Life Extension® will be liable for their acts or omissions. Always seek the advice of a trained health professional for medical advice, diagnosis, or treatment. When you purchase a blood test from Life Extension/National Diagnostics, Inc., you are doing so with the understanding that you are privately paying for these tests. There will be absolutely no billing to Medicare, Medicaid, or private insurance. I have read the above Terms and Conditions and understand and agree to them.

Signature

X

CUSTOMER NO.

○ Male ○ Female

Name

Date of Birth (required) / /

Address

City

State Zip

Phone

Credit Card No.

Expiration Date /

Mail your order form to:

LifeExtension®
National Diagnostics, Inc.
3600 West Commercial Boulevard
Fort Lauderdale, FL 33309

Phone your order to: **1-800-208-3444**
Fax your order to: **1-866-728-1050**

PRODUCTS

Amino Acids

Arginine/L-Ornithine Capsules
Arginine Ornithine Powder
Branched Chain Amino Acids
D,L-Phenylalanine Capsules
L-Arginine Caps
L-Carnitine
L-Glutamine
L-Glutamine Powder
L-Lysine
L-Taurine Powder
L-Tyrosine Powder
Super Carnosine
Taurine

Blood Pressure & Vascular Support

Advanced Olive Leaf Vascular Support with Celery Seed Extract
Arterial Protect
Blood Pressure Monitor Arm Cuff
Endothelial Defense™ with Pomegranate Complete and CORDIART™
Endothelial Defense™ with GliSODin®
Natural BP Management
NitroVasc with CORDIART™
Pomegranate Complete
Pomegranate Fruit Extract

Bone Health

Bone Restore
Bone Restore with Vitamin K2
Bone Strength Formula with KoAct®
Bone-Up™
Calcium Citrate with Vitamin D
Dr. Strum's Intensive Bone Formula
Strontium Caps

Brain Health

Acetyl-L-Carnitine
Acetyl-L-Carnitine Arginate
Blast
Brain Shield® Gastrodin
Cognitex® Basics
Cognitex® with Brain Shield®
Cognitex® with Pregnenolone & Brain Shield®
Cognizin® CDP-Choline Caps
DMAE Bitartrate (dimethylaminoethanol)
Dopa-Mind™
Ginkgo Biloba Certified Extract™
Huperzine A
Lecithin Granules
Migra-Eeze™
Neuro-Mag® Magnesium L-Threonate
Neuro-Mag® Magnesium L-Threonate with Calcium and Vitamin D3
Optimized Ashwagandha Extract
Prevagen™
PS (Phosphatidylserine) Caps
Vinpocetine

Cholesterol Management

Advanced Lipid Control
Cho-Less™
CHOL-Support™
Red Yeast Rice
Theaflavins Standardized Extract
Vitamin B3 Niacin Capsules

Digestion Support

Artichoke Leaf Extract
Carnosoothe with PicroProtect™
Digest RC®
Effervescent Vitamin C - Magnesium Crystals
Enhanced Super Digestive Enzymes
Enhanced Super Digestive Enzymes w/Probiotics
Esophageal Guardian
Extraordinary Enzymes
Fem Dophilus
Fiber-Immune Support
Ginger Force®
Organic Golden Flax Seed
Pancreatin
Regimint
Tranquil Tract™
TruFiber™
WellBetX PGX plus Mulberry

Energy Management

Adrenal Energy Formula
Asian Energy Boost
D-Ribose Powder
D-Ribose Tablets
Forskolin
Mitochondrial Basics with BioPQQ®
Mitochondrial Energy Optimizer with BioPQQ®
NAD+ Cell Regenerator™
Peak ATP® with GlycoCarn®
PQQ Caps with BioPQQ®
Rhodiola Extract
RiboGen™ French Oak Wood Extract
Triple Action Thyroid

Eye Health

Astaxanthin with Phospholipids
Brite Eyes III
Certified European Bilberry Extract
Eye Pressure Support with Mirtogenol®
MacuGuard® Ocular Support
MacuGuard® Ocular Support with Astaxanthin
Tear Support with MaquiBright®

Fish Oil & Omegas

OMEGA FOUNDATIONS® Mega EPA/DHA
OMEGA FOUNDATIONS® Mega GLA with Sesame Lignans
OMEGA FOUNDATIONS® Super Omega-3 EPA/DHA with Sesame Lignans & Olive Extract
OMEGA FOUNDATIONS® Super Omega-3 Plus EPA/DHA with Sesame Lignans, Olive Extract, Krill & Astaxanthin
Organic Golden Flax Seed
OMEGA FOUNDATIONS® Provinal® Purified Omega-7
OMEGA FOUNDATIONS® Vegetarian DHA

Food

Extra Virgin Olive Oil
Rich Rewards® Breakfast Blend
Rich Rewards® Breakfast Blend Natural Mocha Flavor
Rich Rewards® Breakfast Blend Natural Vanilla Flavor
Rich Rewards® Breakfast Blend Whole Bean Coffee
Rich Rewards® Decaf Roast
Stevia Sweetener

Glucose Management

CinSulin® with InSea2® and Crominex® 3+
Mega Benfotiamine
Natural Glucose Absorption Control
Tri Sugar Shield®

Heart Health

Aspirin (Enteric Coated)
BioActive Folate & Vitamin B12 Caps
Cardio Peak™ with Standardized Hawthorn and Arjuna
Fibrinogen Resist™ with Nattokinase
Optimized Carnitine with GlycoCarn®
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with BioPQQ®
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene
TMG Powder
TMG Liquid Capsules

Hormone Balance

DHEA (Dehydroepiandrosterone)
Inner Power
Pregnenolone
Triple Action Cruciferous Vegetable Extract with Resveratrol
Triple Action Cruciferous Vegetable Extract

Immune Support

AHCC®
Echinacea Extract
Enhanced Zinc Lozenges
i26 Hyperimmune Egg
Immune Modulator with Tinofend®
Immune Protect with PARACTIN®
Immune Senescence Protection Formula™
Kinoko® Gold AHCC
Kyolic® Garlic Formula 102
Kyolic® Garlic Formula 105
Kyolic® Reserve
Lactoferrin (apolactoferrin) Caps
NK Cell Activator™
Optimized Garlic
Optimized Quercetin
Peony Immune
ProBoost Thymic Protein A
Reishi Extract Mushroom Complex
Standardized Cistanche
Ten Mushroom Formula®
Zinc Lozenges

Inflammation Management

5-LOX Inhibitor with AprèsFlex®
Advanced Bio-Curcumin® with Ginger & Turmerones
Black Cumin Seed Oil with Bio-Curcumin®
Black Cumin Seed Oil
Boswella
Cytokine Suppress™ with EGCG
Nervia®
Serraflazyme
Specially-Coated Bromelain
Super Bio-Curcumin®
Zyflamend® Whole Body

Joint Support

Arthro-Immune Joint Support
ArthroMax® Advanced with UC-II® & AprèsFlex®
ArthroMax® with Theaflavins & AprèsFlex®
Bio-Collagen with Patented UC-II®
Fast-Acting Joint Formula
Glucosamine/Chondroitin Capsules
Krill Healthy Joint Formula
MSM (Methylsulfonylmethane)

Kidney & Bladder Support

Cran-Max® Cranberry Whole Fruit Concentrate
Optimized Cran-Max® with Ellirose™
Uric Acid Control
Water-Soluble Pumpkin Seed Extract

Liver Health & Detoxification

Anti-Alcohol Antioxidants with HepatoProtection Complex
Calcium D-Glucarate
Chlorella
Chlorophyllin
European Milk Thistle
Glutathione, Cysteine & C
HepatoPro
Liver Efficiency Formula
N-Acetyl-L-Cysteine
PectaSol-C®
Silymarin
SODzyme® with GliSODin® & Wolfberry

Longevity & Wellness

AMPK Activator
AppleWise Polyphenol Extract
Berry Complete
Blueberry Extract
Blueberry Extract with Pomegranate

CR Mimetic Longevity Formula
DNA Protection Formula
Enhanced Berry Complete with Acai
Essential Daily Nutrients
Grapeseed Extract with Resveratrol & Pterostilbene
Mega Green Tea Extract (decaffeinated)
Mega Green Tea Extract (lightly caffeinated)
Optimized Fucoidan with Maritech® 926
Optimized Resveratrol
Optimized Resveratrol with Nicotinomide Riboside
pTeroPure®
Pycnogenol® French Maritime Pine Bark Extract
Resveratrol with Pterostilbene
RNA (Ribonucleic Acid)
Super Alpha-Lipoic Acid
Super R-Lipoic Acid
X-R Shield

Men's Health

Mega Lycopene Extract
PalmettoGuard® Saw Palmetto with Beta-Sitosterol
PalmettoGuard® Saw Palmetto/Nettle Root Formula with Beta-Sitosterol
Prelox® Natural Sex for Men®
Super MiraForte with Standardized Lignans
Triple Strength ProstaPollen™
Ultra Natural Prostate

Minerals

Boron
Chromium Ultra
Iron Protein Plus
Magnesium (Citrate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Super Selenium Complex
Vanadyl Sulfate
Zinc Caps

Miscellaneous

Solarshield® Sunglasses

Mood & Stress Management

5 HTP
L-Theanine
Natural Stress Relief
SAMe (S-Adenosyl-Methionine)

Multivitamins

Children's Formula Life Extension Mix™
Comprehensive Nutrient Packs ADVANCED
Life Extension Mix™ Capsules without Copper
Life Extension Mix™ Capsules
Life Extension Mix™ Powder without Copper
Life Extension Mix™ Powder
Life Extension Mix™ Tablets with Extra Niacin
Life Extension Mix™ Tablets without Copper
Life Extension Mix™ Tablets
Once-Daily Health Booster
One-Per-Day Tablets
Two-Per-Day Capsules
Two-Per-Day Tablets

Personal Care

Anti-Aging Rejuvenating Scalp Serum
Biosil
Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
European Leg Solution Featuring Certified Diosmin 95
Face Master Platinum Facial Toning System
Hair, Skin & Nail Rejuvenation Formula w/VERISOL®
Hair Suppress Formula
Life Extension Toothpaste
Sinus Cleanser
Venotone
Xyliwhite Mouthwash

Pet Care

Cat Mix
Dog Mix

Probiotics

Bifido GI Balance
BroccoMax®
FLORASSIST® Heart Health Probiotic
FLORASSIST® Oral Hygiene
FLORASSIST® Balance
FLORASSIST® Mood
FLORASSIST® Throat Health
Theralac® Probiotics
TruFlora® Probiotics

Skin Care

Advanced Anti-Glycation Peptide Serum
Advanced Lightening Cream
Advanced Peptide Hand Therapy
Advanced Triple Peptide Serum
Advanced Under Eye Serum with Stem Cells
Amber Self MicroDermAbrasion
Anti-Aging Face Oil
Anti-Aging Mask
Anti-Aging Rejuvenating Face Cream
Anti-Glycation Serum with Blueberry & Pomegranate Extracts
Antioxidant Facial Mist
Anti-Oxidant Rejuvenating Foot Cream
Anti-Oxidant Rejuvenating Foot Scrub
Anti-Oxidant Rejuvenating Hand Cream
Anti-Redness & Adult Blemish Lotion
Bioflavonoid Cream
Broccoli Sprout Cream
Collagen Boosting Peptide Serum
Corrective Clearing Mask
DNA Repair Cream
Essential Plant Lipids Reparative Serum
Face Rejuvenating Anti-Oxidant Cream
Fine Line-Less
Healing Formula
Healing Mask
Healing Vitamin K Cream
Hyaluronic Facial Moisturizer
Hyaluronic Oil-Free Facial Moisturizer
Hydrating Anti-Oxidant Facial Mist
Hydroderm
Lifting & Tightening Complex
Lycopene Cream
Melatonin Cream
Mild Facial Cleanser
Multi Stem Cell Skin Tightening Complex
Neck Rejuvenating Anti-Oxidant Cream
Pigment Correcting Cream
Rejuvenating Serum
Rejuvenex® Body Lotion
RejuveneX® Factor Firming Serum
Renewing Eye Cream
Resveratrol Anti-Oxidant Serum
Shade Factor
Skin Lightening Serum
Skin Restoring Phytoceramides with Lipowheat®
Skin Stem Cell Serum
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
Triple-Action Vitamin C Cream
Ultra Eyelash Booster
Ultra Lip Plumper
Ultra Rejuvenex®
Ultra RejuveNight®
Ultra Wrinkle Relaxer
Under Eye Refining Serum
Under Eye Rescue Cream
Vitamin C Serum
Vitamin D Lotion
Vitamin E-ssential Cream
Youth Serum

Sleep

Bioactive Milk Peptides
Enhanced Natural Sleep® with Melatonin
Enhanced Natural Sleep® without Melatonin
Fast-Acting Liquid Melatonin
Glycine
L-Tryptophan
Melatonin
Optimized Tryptophan Plus

Sports Performance

Creatine Capsules
Creatine Whey Glutamine Powder (Vanilla Flavor)
New Zealand Whey Protein Concentrate (Natural Chocolate and Vanilla Flavor)
Tart Cherry Extract
Whey Protein Isolate (Chocolate and Vanilla Flavor)

Vitamins

Ascorbyl Palmitate
Benfotiamine with Thiamine
Beta-Carotene
BioActive Complete B-Complex
Biotin
Buffered Vitamin C Powder
Daily C+
Fast-C® with Dihydroquercetin
Gamma E Tocopherol with Sesame Lignans
Gamma E Tocopherol/Tocotrienols
High Potency Optimized Folate
Inositol Caps
Liquid Emulsified Vitamin D3
Liquid Vitamin D3
Low-Dose Vitamin K2
Methylcobalamin
MK-7
Natural Vitamin E
No Flush Niacin
Optimized Folate (L-Methylfolate)
Pantothenic Acid (Vitamin B-5)
Pyridoxal 5'-Phosphate Caps
Super Absorbable Tocotrienols
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K with Advanced K2 Complex
Vitamin B12
Vitamin B6
Vitamin C with Dihydroquercetin
Vitamin D3 with Sea-Iodine™
Vitamin D3
Vitamins D and K with Sea-Iodine™

Weight Management

7-Keto® DHEA Metabolite
Advanced Anti-Adipocyte Formula
Advanced Natural Appetite Suppress
CalReduce Selective Fat Binder
DHEA Complete
Garcinia HCA
HCActive™ Garnicia Cambogia Extract
Integra-Lean®
Mediterranean Trim with Sinetrol™-XPur
Optimized Irvingia with Phase 3™ Calorie Control Complex
Optimized Saffron with Satiereal®
Super Citrimax®
Super CLA Blend with Guarana and Sesame Lignans
Super CLA Blend with Sesame Lignans
Waist-Line Control™

Women's Health

Advanced Natural Sex for Women® 50+
Breast Health Formula
Femmenessence MacaPause®
Natural Estrogen
ProgestaCare® for Women
Super-Absorbable Soy Isoflavones
Ultra Soy Extract

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	A						
01524	**ACETYL-L-CARNITINE** • 500 mg, 100 veg. caps	34.00	25.50	22.50			
01525	**ACETYL-L-CARNITINE ARGINATE** • 100 veg. caps	59.00	44.25	38.24			
01628	**ADRENAL ENERGY FORMULA** • 60 veg. caps	24.00	18.00	16.50			
01630	**ADRENAL ENERGY FORMULA** • 120 veg. caps	46.00	34.50	31.50			
01828	**ADVANCED LIPID CONTROL** • 60 veg. caps	30.00	22.50	20.25			
00681	**AHCC®** • 500 mg, 30 caps	59.98	44.99				
29727	**AHCC® (KINOKO® GOLD)** • 500 mg, 60 veg. caps	74.95	52.47				
00457	**ALPHA-LIPOIC ACID W/BIOTIN** (Super) • 250 mg, 60 caps	37.00	27.75	24.00			
01907	**AMPK ACTIVATOR** • 90 veg. caps	48.00	36.00	33.00			
01440	**ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO** • 100 caps	26.00	19.50	17.25			
01509	**ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN®** (Advanced) • 60 veg. caps	39.00	29.25	27.00			
01625	**APPLEWISE POLYPHENOL EXTRACT** 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	**ARGININE/ORNITHINE** • 500/250, 100 caps	17.99	13.49				
00038	**ARGININE/ORNITHINE POWDER** • 150 grams	22.95	17.21	14.25			
01624	**(L)-ARGININE CAPS** • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	**ARTERIAL PROTECT** • 30 veg. caps	48.00	36.00	33.00			
01617	**ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX®** 120 veg. caps	44.00	33.00	30.00			
01618	**ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX®** 60 caps	36.00	27.00	24.00			
01404	**ARTHRO-IMMUNE JOINT SUPPORT** • 60 veg. caps	32.00	24.00	21.00			
00919	**ARTICHOKE LEAF EXTRACT** • 500 mg, 180 veg. caps	30.00	22.50	21.00			
01533	**ASCORBYL PALMITATE** • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	**ASHWAGANDHA EXTRACT** (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	**ASIAN ENERGY BOOST** • 90 veg. caps	24.00	18.00	16.50			
01066	**ASPIRIN** • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01923	**ASTAXANTHIN WITH PHOSPHOLIPIDS** • 4 mg, 30 softgels	16.00	12.00	10.50			
	B						
00920	**BENFOTIAMINE W/ THIAMINE** • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	**BENFOTIAMINE** (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
01206	**BERRY COMPLETE** • 30 veg. caps	21.00	15.75	14.00			
01496	**BERRY COMPLETE W/ACAI** (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	**BETA-CAROTENE** • 25,000 IU, 100 softgels	11.25	8.44				
01622	**BIFIDO GI BALANCE** • 60 veg. caps	20.00	15.00	13.50			
01073	**BILBERRY EXTRACT** • 100 mg, 100 veg. caps	42.00	31.50	28.50			
01512	**BIOACTIVE MILK PEPTIDES** • 30 caps	18.00	13.50	12.00			
01631	**BIO-COLLAGEN W/PATENTED UC-II®** • 40 mg, 60 small caps	36.00	27.00	24.00			
*01006	**BIOSIL™** • 5 mg, 30 veg. caps	18.95	15.16				
*01007	**BIOSIL™** • 1 fl oz	31.99	25.59				
00102	**BIOTIN** • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	**BLACK CUMIN SEED OIL** • 60 softgels	16.00	12.00	10.50			
01710	**BLACK CUMIN SEED OIL W/BIO-CURCUMIN®** • 60 softgels	32.00	24.00	22.50			
01008	**BLAST™** • 600 grams of powder	26.95	20.21				
70000	**BLOOD PRESSURE MONITOR (ACCUFIT™)** • med/lg cuff	79.99	49.99				
70004	**BLOOD PRESSURE MONITOR** • Digital wrist cuff	69.95	52.46				

SUBTOTAL OF COLUMN 1

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01214	**BLUEBERRY EXTRACT** • 60 veg. caps	22.50	16.88	15.00			
01438	**BLUEBERRY EXTRACT W/ POMEGRANATE** • 60 veg. caps	30.00	22.50	20.25			
01506	**BONE FORMULA** (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	**BONE RESTORE** • 120 caps	22.00	16.50	14.25			
01727	**BONE RESTORE W/VITAMIN K2** • 120 caps	24.00	18.00	16.50			
01725	**BONE STRENGTH FORMULA W/KOACT®** • 120 caps	45.00	33.75	30.00			
00313	**BONE-UP®** • 240 caps	28.95	21.71	20.41			
01661	**BORON** • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	**BOSWELLA** • 100 caps	38.00	28.50	22.50			
01802	**BRAIN SHIELD® GASTRODIN** • 300 mg, 60 veg. caps	33.00	24.75	22.50			
01253	**BRANCHED CHAIN AMINO ACIDS** • 90 caps	19.50	14.63	12.75			
01942	**BREAST HEALTH FORMULA** • 60 caps	34.00	25.50	22.50			
00893	**BRITE EYES III** • 2 vials, 5 ml each	34.00	25.50	24.00			
26576	**BROCCO MAX®** • 60 veg. caps	26.95	20.21				
01203	**BROMELAIN** (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
	C						
01653	**CALCIUM CITRATE W/VITAMIN D** • 300 caps	24.00	18.00	15.94			
01651	**CALCIUM D-GLUCARATE** • 200 mg, 60 veg. caps	18.00	13.50	11.25			
†01823	**CALREDUCE SELECTIVE FAT BINDER** 120 mint chewable tablets	45.00	33.75	28.50			
01700	**CARDIO PEAK™ w/STANDARDIZED HAWTHORN & ARJUNA** 120 veg. caps	36.00	27.00	24.00			
00916	**CARNITINE W/GLYCOCARN®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01532	**L-CARNITINE** • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01258	**CARNOSOOTHE W/PICROPROTECT™** • 60 veg. caps	30.00	22.50	20.25			
01829	**CARNOSINE** • 500 mg, 60 veg. caps	36.00	27.00	24.00			
01687	**CARNOSINE** (Super) • 500 mg, 90 veg. caps	66.00	49.50	45.00			
01932	**CAT MIX** • 100 grams powder	14.00	10.50	8.25			
01899	**CHILDREN'S FORMULA LIFE EXTENSION MIX™** 100 chewable tablets	20.00	15.00	13.50			
00550	**CHLORELLA** • 500 mg, 200 tablets	23.50	17.63				
01571	**CHLOROPHYLLIN** • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	**CHO-LESS™** • 90 capsules	35.00	26.25				
01910	**CHOL-SUPPORT™** • 60 liquid veg. caps	48.00	36.00	32.00			
01477	**CHROMIUM ULTRA** • 100 veg. caps	24.00	18.00	15.75			
01504	**CHROMIUM W/CROMINEX®** 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	**CINSULIN® W/INSEA2® AND CROMINEX® 3+** • 90 veg. caps	38.00	28.50	25.50			
01906	**CISTANCHE** (Standardized) • 30 veg. caps	20.00	15.00	12.00			
01818	**CITRIMAX®** (Super) • 180 veg. caps	40.00	30.00	28.50			
00818	**CLA BLEND W/SESAME LIGNANS** (Super) 1,000 mg, 120 softgels	36.00	27.00	24.75	19.75		
00819	**CLA BLEND W/GUARANA & SESAME** (Super) 1,000 mg, 120 softgels	42.00	31.50	28.75			
01896	**COGNITEX® W/BRAIN SHIELD®** • 90 softgels	60.00	45.00	39.00	36.00		
01897	**COGNITEX® W/PREGNENOLONE & BRAIN SHIELD®** 90 softgels	62.00	46.50	39.75	37.50		
01421	**COGNITEX® BASICS** • 60 softgels	38.00	28.50	26.25	24.00		

SUBTOTAL OF COLUMN 2

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01659	**COGNIZIN® CDP CHOLINE CAPS** • 250 mg, 60 veg. caps	36.00	27.00	25.50			
01945	**COMPLETE B-COMPLEX** (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02098	**COMPREHENSIVE NUTRIENT PACKS ADVANCED** • 30 packs	90.00	67.50	61.50			
01949	**COQ10 w/*d*-LIMONENE** (Super-Absorbable) 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
01948	**COQ10 w/*d*-LIMONENE** (Super-Absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25		
01929	**COQ10** (Super ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	**COQ10 w/BIOPQQ®** (Super ubiquinol) • 100 mg, 30 softgels	54.00	40.50	33.00	30.00		
01426	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00			
01431	**COQ10 w/ENH MITOCHONDRIAL SUPPORT™** (Super ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	**CRAN-MAX®** • 500 mg, 60 veg. caps	17.50	13.13	11.25			
01424	**CRAN-MAX® WITH ELLIROSE™** (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	**CREATINE CAPSULES** • 120 veg. caps	10.95	8.21	6.94			
01746	**CREATINE WHEY GLUTAMINE POWDER** • 454 grams (vanilla)	30.00	22.50	20.25			
01429	**CR MIMETIC LONGEVITY FORMULA** • 60 veg. caps	39.00	29.25	27.00			
00407	**CURCUMIN®** (Super Bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25			
01924	**CURCUMIN® W/GINGER & TURMERONES** (Advanced bio) 30 softgels	30.00	22.50	20.25			
01804	**CYTOKINE SUPPRESS™ W/EGCG** • 30 veg. caps	30.00	22.50	20.25			
	COSMESIS						
80157	**ADVANCED ANTI-GLYCATION PEPTIDE SERUM** • 1 oz	53.00	39.75	34.50			
80154	**ADVANCED LIGHTENING CREAM** • 1 oz	65.00	48.75	42.75			
80155	**ADVANCED PEPTIDE HAND THERAPY** • 4 oz	46.00	34.50	29.25			
80152	**ADVANCED TRIPLE PEPTIDE SERUM** • 1 oz	65.00	48.75	42.75			
80140	**ADVANCED UNDER EYE SERUM W/STEM CELLS** • .33 oz	49.00	36.75	31.50			
80139	**AMBER SELF MICRODERMABRASION** • 2 oz	49.00	36.75	31.50			
80158	**ANTI-AGING FACE OIL** • 1 oz	59.00	44.25	39.00			
80118	**ANTI-AGING MASK** • 2 oz	72.00	54.00	47.52			
80151	**ANTI-AGING REJUVENATING FACE CREAM** • 2 oz	65.00	48.75	42.75			
80153	**ANTI-AGING REJUVENATING SCALP SERUM** • 2 oz	46.00	34.50	29.25			
80134	**ANTI-GLYCATION SERUM W/BLUEBERRY & POMEGRANATE EXTRACTS** • 1 oz	33.00	24.75	23.51			
80133	**ANTIOXIDANT FACIAL MIST** • 2 oz	32.00	24.00	22.80			
80127	**ANTIOXIDANT REJUVENATING FOOT CREAM** • 2 oz	45.00	33.75	32.10			
80128	**ANTIOXIDANT REJUVENATING FOOT SCRUB** • 2 oz	59.00	44.25	38.94			
80117	**ANTIOXIDANT REJUVENATING HAND CREAM** • 2 oz	64.00	48.00	43.12			
80105	**ANTI-REDNESS & ADULT BLEMISH LOTION** • 1 oz	74.50	55.88	49.17			
80147	**BIOFLAVONOID CREAM** • 1 oz	46.00	34.50	29.25			
80144	**BROCCOLI SPROUT CREAM** • 1 oz	46.00	34.50	29.25			
80156	**COLLAGEN BOOSTING PEPTIDE SERUM** • 1 oz	59.00	44.25	39.00			
80120	**CORRECTIVE CLEARING MASK** • 2 oz	64.50	48.38	42.57			
80141	**DNA REPAIR CREAM** • 1 oz	49.00	36.75	31.50			

SUBTOTAL OF COLUMN 3

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
80108	**ESSENTIAL PLANT LIPIDS REPARATIVE SERUM** • 1 oz	74.95	56.21	49.46			
80123	**FACE REJUVENATING ANTIOXIDANT CREAM** • 2 oz	69.50	52.13	45.87			
80107	**FINE LINE-LESS** • 1 oz	74.50	55.88	49.17			
80131	**HAIR SUPPRESS FORMULA** • 4 oz	59.00	44.25	38.94			
80137	**HEALING FORMULA ALL-IN-ONE CREAM** • 1 oz	53.00	39.75	34.07			
80115	**HEALING MASK** • 2 oz	64.50	48.38	42.57			
80102	**HEALING VITAMIN K CREAM** • 1 oz	79.50	59.63	52.47			
80109	**HYALURONIC FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80110	**HYALURONIC OIL-FREE FACIAL MOISTURIZER** • 1 oz	58.00	43.50	38.28			
80138	**HYDRATING ANTIOXIDANT FACE MIST** • 4 oz	39.95	29.96	28.50			
80103	**LIFTING & TIGHTENING COMPLEX** • 1 oz	74.50	55.88	49.17			
80146	**LYCOPENE CREAM** • 1 oz	28.00	21.00	19.05			
80135	**MELATONIN CREAM** • 1 oz	33.00	24.75	20.33			
80114	**MILD FACIAL CLEANSER** • 8 fl. oz	59.00	44.25	38.94			
80159	**MULTI STEM CELL SKIN TIGHTENING COMPLEX** • 1 oz	59.00	44.25	39.00			
80122	**NECK REJUVENATING ANTIOXIDANT CREAM** • 2 oz	64.00	48.00	42.24			
80111	**PIGMENT CORRECTING CREAM** • 1/2 oz	74.00	55.50	48.84			
80106	**REJUVENATING SERUM** • 1 oz	74.50	55.88	49.17			
80150	**RENEWING EYE CREAM** • 1/2 oz	65.00	48.75	42.75			
80142	**RESVERATROL ANTI-OXIDANT SERUM** • 1 oz	46.00	34.50	29.25			
80112	**SKIN LIGHTENING SERUM** • 1/2 oz	85.00	63.75	56.10			
80130	**SKIN STEM CELL SERUM** • 1 oz	74.00	55.50	51.75			
80143	**STEM CELL CREAM W/ALPINE ROSE** • 1 oz	66.00	49.50	43.50			
80148	**TIGHTENING & FIRMING NECK CREAM** • 2 oz	39.00	29.25	26.25			
80161	**TRIPLE ACTION VITAMIN C CREAM** • 1 oz jar	59.00	44.25	39.00			
80160	**ULTRA EYELASH BOOSTER** • 0.25 oz (2 units $39)	59.00	44.25				
80116	**ULTRA LIP PLUMPER** • 1/3 oz	64.00	48.00	42.24			
80101	**ULTRA WRINKLE RELAXER** • 1 oz	89.95	67.46	59.82			
80113	**UNDER EYE REFINING SERUM** • 1/2 oz	74.50	55.88	49.17			
80104	**UNDER EYE RESCUE CREAM** • 1/2 oz	74.50	55.88	49.17			
80129	**VITAMIN C SERUM** • 1 oz	85.00	63.75	56.10			
80136	**VITAMIN D LOTION** • 4 oz	36.00	27.00	25.25			
80145	**VITAMIN E-ESSENTIAL CREAM** • 1 oz	28.00	21.00	19.50			
80149	**YOUTH SERUM** • 1 oz	65.00	48.75	42.75			
	D						
01912	**DAILY C+ CITRUS FLAVOR** • 30 stick packs	21.00	15.75	14.25			
00658	**7-KETO® DHEA METABOLITE** • 25 mg, 100 caps	28.00	21.00	18.00			
01479	**7-KETO® DHEA METABOLITE** • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	**DHA** (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50			
00607	**DHEA** • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
01478	**DHEA COMPLETE** • 60 veg. caps	48.00	36.00	32.40			
00335	**DHEA** • 25 mg, 100 caps	16.00	12.00	11.00			
00454	**DHEA** • 15 mg, 100 caps	14.00	10.50	9.00			
00882	**DHEA** • 50 mg, 60 caps	19.00	14.25	12.75			
01689	**DHEA** • 100 mg, 60 veg. caps	24.00	18.00	16.50			

SUBTOTAL OF COLUMN 4

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01358	**DIGEST RC®** • 30 tablets	19.95	14.96	12.75			
02021	**DIGESTIVE ENZYMES** (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00			
02022	**DIGESTIVE ENZYMES w/PROBIOTICS** (Enhanced Super) • 60 veg. caps	28.00	21.00	18.00			
01671	**D, L-PHENYLALANINE** • 500 mg, 100 veg. caps	18.75	14.06	12.00			
01540	**DMAE BITARTRATE** • 150 mg, 200 veg. caps	18.00	13.50	11.25			
01570	**DNA PROTECTION FORMULA** • 60 veg. caps	34.00	25.50	24.00			
01931	**DOG MIX** • 100 grams powder	18.00	13.50	11.25			
02006	**DOPA-MIND™** • 60 veg. tabs	48.00	36.00	32.00			
00321	**DR. PROCTOR'S ADVANCED HAIR FORMULA** • 2 oz	39.95	29.96	24.00			
00320	**DR. PROCTOR'S HAIR SHAMPOO** • 8 oz	24.95	18.71	16.50			
	E						
01528	**ECHINACEA EXTRACT** • 250 mg, 60 veg. caps	14.35	10.76	9.38			
01997	**ENDOTHELIAL DEFENSE™ w/POMEGRANATE COMPLETE AND CORDIART™** • 60 softgels	68.00	51.00	46.50			
00997	**ENDOTHELIAL DEFENSE™ w/GLISODIN®** • 60 veg. caps	54.00	40.50	36.00			
01937	**EPA/DHA** (Mega) • 120 softgels	20.00	15.00	13.50			
01737	**ESOPHAGEAL GUARDIAN** (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00			
01042	**EUROPEAN LEG SOLUTION DIOSMIN 95** 600 mg, 30 veg. tabs	20.00	15.00	13.50			
01706	**EXTRAORDINARY ENZYMES** • 60 caps	26.00	19.50	18.00			
02008	**EXTRA VIRGIN OLIVE OIL** • 500 ml (16.9 fl. oz)	33.00	24.75	22.50			
01514	**EYE PRESSURE SUPPORT W/MIRTOGENOL®** • 30 veg. caps	38.00	28.50	25.50			
	F						
*01054	**FACE MASTER® PLATINUM** • Facial Toning System	199.00	199.00				
00965	**FAST-ACTING JOINT FORMULA** • 30 caps	39.00	29.25	27.00			
01717	**FAST-C® W/DIHYDROQUERCETIN** • 120 veg. tabs	26.00	19.50	18.00			
20053	**FEM DOPHILUS®** • 30 caps	25.95	19.46				
20055	**FEM DOPHILUS®** • 60 caps	39.95	29.96				
01064	**FEMMENESSENCE MACAPAUSE®** • 120 veg. caps	34.99	26.24				
02007	**FIBERIMMUNE SUPPORT** (Apple Cinnamon) • 235 grams	34.00	25.50	23.50			
00718	**FIBRINOGEN RESIST™** • 30 veg. caps	49.00	36.75	33.00			
01749	**FLAX SEED** (Organic golden) • 14 oz	11.67	8.75				
01821	**FLORASSIST® HEART HEALTH PROBIOTIC** • 60 veg. caps	32.00	24.00	21.00			
02019	**FLORASSIST® ORAL HYGIENE** • 30 lozenges	18.00	13.50	12.75			
01825	**FLORASSIST® BALANCE** • 30 liquid veg. caps	32.00	24.00	21.00			
02000	**FLORASSIST® MOOD** • 60 caps	33.00	24.75	22.50			
01920	**FLORASSIST® THROAT HEALTH** • 30 lozenges	20.00	15.00	13.50			
01913	**FOLATE HIGH POTENCY** (Optimized) • 5,000 mcg, 30 veg. tablets	25.00	18.75	16.50			
01939	**FOLATE** (Optimized) • 1,000 mcg, 100 veg. tablets	19.00	14.25	12.75			
01842	**FOLATE + VITAMIN B12** (BioActive) • 90 veg. caps	12.00	9.00	8.00			
01544	**FORSKOLIN** • 10 mg, 60 veg. caps	16.00	12.00	10.50			
01513	**FUCOIDAN W/MARITECH® 926** (Optimized) • 60 veg. caps	36.00	27.00	24.75			
	G						
00559	**GAMMA E TOCOPHEROL/TOCOTRIENOLS** • 60 softgels	42.00	31.50	27.75			
00759	**GAMMA E TOCOPHEROL W/SESAME LIGNANS** • 60 softgels	32.00	24.00	21.75			
01394	**GARLIC** (Optimized) • 200 veg. caps	24.95	18.71	15.75			
**01122	**GINGER FORCE®** • 60 liquid caps	34.95	26.21				

SUBTOTAL OF COLUMN 5

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01658	**GINKGO BILOBA CERTIFIED EXTRACT™** 120 mg, 365 veg. caps	46.00	34.50	31.50			
00756	**GLA WITH SESAME LIGNANS** (Mega) • 60 softgels	19.50	14.63	13.50			
00345	**(L-) GLUTAMINE CAPSULES** • 500 mg, 100 veg. caps	14.95	11.21	10.13			
00141	**(L-) GLUTAMINE POWDER** • 100 grams	22.00	16.50	15.00			
00522	**GLUCOSAMINE/CHONDROITIN CAPSULES** • 100 caps	38.00	28.50	24.00			
01541	**GLUTATHIONE, CYSTEINE & C** • 100 veg. caps	20.00	15.00	13.50			
01669	**GLYCINE** • 1,000 mg, 100 veg. caps	12.00	9.00	8.10			
01411	**GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE** 100 mg, 60 veg. caps	36.00	27.00	25.50			
01620	**GREEN COFFEE EXTRACT COFFEEGENIC®** 400 mg, 90 veg. caps	32.00	24.00	21.00			
00953	**GREEN TEA EXTRACT** (Mega) • lightly caffeinated, 100 veg. caps	30.00	22.50	18.00			
00954	**GREEN TEA EXTRACT** (Mega) • decaffeinated, 100 veg. caps	30.00	22.50	18.00			
	H						
01074	**5 HTP** • 100 mg, 60 caps	27.95	20.96				
**02002	**HAIR, SKIN & NAIL REJUVENATION FORM W/VERISON®** 90 tabs	32.00	24.00	22.00			
01738	**HCA** (Garnicia) • 90 veg. caps	17.00	12.75	11.25			
29754	**HCACTIVE™ GARCINIA CAMBOGIA EXTRACT** • 90 caps	30.00	22.50				
01393	**HEPATOPRO** • 900 mg, 60 softgels	50.00	37.50	34.50			
01527	**HUPERZINE A** • 200 mcg, 60 veg. caps	40.00	30.00	27.00			
00661	**HYDRODERM®** • 1 oz	79.95	59.96	49.00			
	I						
*01060	**I26 HYPERIMMUNE EGG** • 140 grams powder	54.99	46.75				
01704	**IMMUNE MODULATOR W/TINOFEND®** • 60 veg. caps	17.00	12.75	11.25			
00955	**IMMUNE PROTECT W/PARACTIN®** • 30 veg. caps	29.50	22.13	19.91			
02005	**IMMUNE SENESCENCE PROTECTION FORMULA™** • 60 veg. tabs	40.00	30.00	27.00			
01049	**INNERPOWER™** • 530 grams powder	42.00	31.50				
01674	**INOSITOL CAPSULES** • 1,000 mg, 360 veg. caps	62.00	46.50	43.50			
01292	**INTEGRA-LEAN® AFRICAN MANGO IRVINGIA** 150 mg, 60 veg. caps	28.00	21.00	18.00			
01677	**IRON PROTEIN PLUS** • 300 mg, 100 caps	28.00	21.00	19.50			
01492	**IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX** (Optimized African Mango) • 120 veg. caps	56.00	42.00	36.00			
	J, K, L						
00056	**JARRO-DOPHILUS EPS®** • 60 veg. caps	22.95	17.21				
01834	**K W/ADVANCED K2 COMPLEX** (Super) • 90 softgels	30.00	22.50	20.25			
01600	**KRILL HEALTHY JOINT FORMULA** • 30 softgels	32.00	24.00	21.75			
01050	**KRILL OIL** • 60 softgels	33.95	25.46				
00316	**KYOLIC® GARLIC FORMULA 102** • 200 veg. caps	26.45	19.84				
00214	**KYOLIC® GARLIC FORMULA 105** • 200 caps	27.45	20.59				
00789	**KYOLIC® RESERVE** • 600 mg, 120 caps	27.95	20.96				
01681	**LACTOFERRIN** • 60 caps	52.00	39.00	36.00			
00020	**LECITHIN** • 16 oz granules	18.00	13.50	12.00			
02055	**LIFE EXTENSION MIX™** • 315 tablets	80.00	60.00	52.00	43.75		
02057	**LIFE EXTENSION MIX™ W/EXTRA NIACIN** • 315 tablets	80.00	60.00	52.00	43.75		
02054	**LIFE EXTENSION MIX™** • 490 caps	90.00	67.50	58.00	47.50		
02056	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz	80.00	60.00	52.00	43.75		

SUBTOTAL OF COLUMN 6

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
02065	**LIFE EXTENSION MIX™** • 315 tablets w/o copper	80.00	60.00	52.00	43.75		
02064	**LIFE EXTENSION MIX™** • 490 caps w/o copper	90.00	67.50	58.00	47.50		
02066	**LIFE EXTENSION MIX™ POWDER** • 14.81 oz w/o copper	80.00	60.00	52.00	43.75		
01608	**LIVER EFFICIENCY FORMULA** • 30 veg. caps	18.00	13.50	12.00			
01639	**5-LOX INHIBITOR W/APRÈSFLEX®** • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	**L-LYSINE** • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	**LYCOPENE** (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
	M						
01992	**MACUGUARD® OCULAR SUPPORT** • 60 softgels	25.00	18.75	17.50			
01993	**MACUGUARD® OCULAR SUPPORT w/ASTAXANTHIN** 60 softgels	44.00	33.00	30.00			
01459	**MAGNESIUM CAPS** • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	**MAGNESIUM (CITRATE)** • 160 mg, 100 veg. caps	9.00	6.75	5.63			
01908	**MEDITERRANEAN TRIM WITH SINETROL™-XPUR** 60 veg. caps	18.00	13.50	12.00			
01668	**MELATONIN** • 300 mcg, 100 veg. caps	5.75	4.31	3.75			
01083	**MELATONIN** • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	**MELATONIN** • 1 mg, 60 caps	5.00	3.75	3.47			
00330	**MELATONIN** • 3 mg, 60 veg. caps	8.00	6.00	5.16			
00331	**MELATONIN** • 10 mg, 60 veg. caps	28.00	21.00	18.00			
00332	**MELATONIN** • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
01734	**MELATONIN** (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
01787	**MELATONIN TIMED RELEASE** • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	**MELATONIN TIMED RELEASE** • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	**MELATONIN TIMED RELEASE** • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
01536	**METHYLCOBALAMIN** • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	**METHYLCOBALAMIN** • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	**MIGRA-EEZE™** (Butterbur) • 60 softgels	29.50	22.13	19.75			
01522	**MILK THISTLE** (European) • 60 veg. caps	34.00	25.50	22.50			
01922	**MILK THISTLE** (European) • 60 softgels	28.00	21.00	18.75			
01925	**MILK THISTLE** (European) • 120 softgels	44.00	33.00	30.00			
01940	**MIRAFORTE w/STANDARDIZED LIGNANS** (Super) • 120 veg caps	62.00	46.50	42.00			
01869	**MITOCHONDRIAL BASICS W/BIOPQQ®** • 30 caps	44.00	33.00	30.00			
01868	**MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®** • 120 caps	72.00	54.00	48.00			
00065	**MK-7** • 90 mcg, 60 softgels	28.00	21.00	18.75			
00451	**MSM** (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
	N						
01534	**N-ACETYL-L-CYSTEINE** • 600 mg, 60 veg. caps	14.00	10.50	10.13			
01904	**NAD+ CELL REGENERATOR™** • 100 mg, 30 veg. caps	34.00	25.50	19.50			
00066	**NATTOKINASE** • 60 softgels	25.50	19.13				
01807	**NATURAL APPETITE SUPPRESS** (Advanced) • 60 veg. caps	38.00	28.50	25.50			
00984	**NATURAL BP MANAGEMENT** • 60 tablets	44.00	33.00	30.00			
01892	**NATURAL ESTROGEN** • 60 veg. tabs	38.00	28.50	25.50			
01626	**NATURAL SEX FOR WOMEN® 50+** (Advanced) • 90 veg. caps	59.00	44.25	34.00			
01444	**NATURAL SLEEP®** • 60 veg. caps	13.00	9.75	7.50			
01551	**NATURAL SLEEP® w/ MELATONIN** (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	**NATURAL SLEEP® W/O MELATONIN** (Enhanced) • 30 caps	20.00	15.00	13.50			

SUBTOTAL OF COLUMN 7

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01445	**NATURAL SLEEP® MELATONIN** • 5 mg, 60 veg. caps	18.00	13.50	12.00			
00987	**NATURAL STRESS RELIEF** • 30 veg. caps	28.00	21.00	18.00			
30741	**NERVIA®** • 90 softgels	53.95	40.46				
01603	**NEURO-MAG® MAGNESIUM L-THREONATE** • 90 veg. caps	40.00	30.00	27.00			
01602	**NEURO-MAG® MAGNESIUM L-THREONATE w/CALCIUM & VITAMIN D3** • 25 grams • Lemon flavor	40.00	30.00	27.00			
01990	**NITROVASC w/CORDIART™** • 30 veg. caps	18.00	13.50	12.00			
01903	**NK CELL ACTIVATOR™** • 30 veg. tablets	45.00	33.75	31.50			
00373	**NO-FLUSH NIACIN** • 800 mg, 100 caps	19.00	14.25	12.75			
	O						
01824	**OLIVE LEAF VASCULAR SUPPORT w/CELERY SEED EXTRACT** (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	**OMEGA-3 PLUS EPA/DHA w/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN** (SUPER) • 120 softgels	45.00	33.75	31.50	24.75		
01983	**OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	**OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	**OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT** (Super) • 240 small softgels	32.00	24.00	21.00	17.25		
01991	**ONCE-DAILY HEALTH BOOSTER** • 60 softgels	54.00	40.50	38.00			
02001	**ONE-PER-DAY** • 60 tablets	22.00	16.50	15.00			
01328	**ONLY TRACE MINERALS** • 90 veg. caps	15.00	11.25	9.38			
	P						
01789	**PALMETTOGUARD® SAW PALMETTO W/BETA-SITOSTEROL** 30 softgels	15.00	11.25	10.50	9.00		
01790	**PALMETTOGUARD® SUPER SAW PALMETTO/ NETTLE ROOT W/BETA-SITOSTEROL** • 60 softgels	28.00	21.00	19.50	18.00		
01323	**PEAK ATP® WITH GLYCOCARN®** • 60 veg. caps	54.00	40.50	37.50			
*00342	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 454 grams powder	109.95	93.46				
*01080	**PECTA SOL-C® MODIFIED CITRUS PECTIN** • 270 veg. caps	79.95	67.96				
01811	**PEONY IMMUNE** • 60 veg. caps	36.00	27.00	24.00			
00673	**PGX® PLUS MULBERRY** (WellBetX®) • 180 veg. caps	34.95	26.21				
01676	**PHOSPHATIDYLSERINE CAPS** • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01953	**POMEGRANATE COMPLETE** • 30 softgels	24.00	18.00	15.75			
00956	**POMEGRANATE FRUIT EXTRACT** • 30 veg. caps	19.50	14.63	13.16			
01500	**PQQ CAPS W/BIOPQQ®** • 10 mg, 30 veg. caps	24.00	18.00	13.50	12.00		
01647	**PQQ CAPS W/BIOPQQ®** • 20 mg, 30 veg. caps	40.00	30.00	24.00	21.00		
00302	**PREGNENOLONE** • 50 mg, 100 caps	26.00	19.50	16.50			
00700	**PREGNENOLONE** • 100 mg, 100 caps	30.00	22.50	20.25			
**01373	**PRELOX® NATURAL SEX FOR MEN®** • 60 tablets	52.00	39.00	36.00			
01576	**PREVAGEN®** • 30 caps	60.00	45.00				
*01577	**PREVAGEN® ES** • 30 caps	70.00	60.00				
00525	**PROBOOST™ THYMIC PROTEIN A** • 30 packets	66.60	49.95				
01441	**PROGESTACARE® FOR WOMEN** • 4 oz cream	36.39	27.29	25.72			

SUBTOTAL OF COLUMN 8

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01928	**PROSTATE FORMULA** (Ultra NAT) • 60 softgels	38.00	28.50	26.25	24.00		
01909	**PROSTAPOLLEN™** (Triple strength) • 30 softgels	28.00	21.00	18.75			
01742	**PROTEIN-ISOLATE** (Whey) Vanilla • 403 grams	30.00	22.50	20.25			
01743	**PROTEIN-ISOLATE** (Whey) Chocolate • 1 lb. powder	30.00	22.50	20.25			
01770	**PROTEIN CONCENTRATE** (New Zealand Whey) Vanilla 500 grams	30.00	22.50	19.95			
01771	**PROTEIN CONCENTRATE** (New Zealand Whey) Chocolate 660 grams	30.00	22.50	19.95			
01812	**PROVINAL® PURIFIED OMEGA-7** • 30 softgels	27.00	20.25	18.00			
01508	**PTEROPURE®** Pterostilbene• 50 mg, 60 veg. caps	32.00	24.00	22.50			
01209	**PUMPKIN SEED EXTRACT** (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	**PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT** 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	**PYRIDOXAL 5'-PHOSPHATE** • 100 mg, 60 veg. caps	22.00	16.50	14.85			
	Q, R						
01309	**QUERCETIN** (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
01030	**RED YEAST RICE** (Bluebonnet) • 600 mg, 60 veg. caps	16.95	13.56				
00605	**REGIMINT** • 60 enteric-coated caps	19.95	14.96	14.00			
01708	**REISHI EXTRACT MUSHROOM COMPLEX** • 60 veg. caps	30.00	22.50	20.25			
01448	**REJUVENEX® BODY LOTION** • 6 oz	24.00	18.00	14.85	12.75		
01621	**REJUVENEX® FACTOR FIRMING SERUM** • 1.7 oz	65.00	48.75	37.50			
01220	**REJUVENEX®** (Ultra) • 2 oz	52.00	39.00	33.00	29.25		
00676	**REJUVENIGHT®** (Ultra) • 2 oz	39.95	29.96	27.00			
01410	**RESVERATROL W/PTEROSTILBENE** • 100 mg, 60 veg. caps	36.00	27.00	24.00			
02031	**RESVERATROL W/NICOTINAMIDE RIBOSIDE** (Optimized) • 30 veg. caps	42.00	31.50	27.00			
02030	**RESVERATROL** (Optimized) • 60 veg. caps	46.00	34.50	31.00			
00889	**RHODIOLA EXTRACT** • 250 mg, 60 veg. caps	14.00	10.50	9.00			
01900	**RIBOGEN™ FRENCH OAK WOOD EXTRACT** 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	**(D) RIBOSE POWDER** • 150 grams	27.50	20.63	18.56			
01473	**(D) RIBOSE TABLETS** • 100 veg. tabs	32.00	24.00	21.00			
01609	**RICH REWARDS® BREAKFAST GROUND COFFEE** • 12 oz. bag	13.00	9.75				
01730	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Mocha • 12 oz. bag	15.00	11.25	10.50			
01729	**RICH REWARDS® BREAKFAST BLEND GROUND COFFEE** Natural Vanilla • 12 oz. bag	15.00	11.25	10.50			
01612	**RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE** 12 oz. bag	13.00	9.75				
01610	**RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE** 12 oz. bag	14.00	10.50				
01208	**R-LIPOIC ACID** (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	**RNA CAPSULES** • 500 mg, 100 caps	17.95	13.46	12.12			
	S						
01432	**SAFFRON W/SATIEREAL®** (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01935	**SAMe** (S-ADENOSYL-METHIONINE) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
01933	**SAMe** (S-ADENOSYL-METHIONINE) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			
01934	**SAMe** (S-ADENOSYL-METHIONINE) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			

SUBTOTAL OF COLUMN 9

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
01740	**SEA-IODINE™** • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
00046	**SELENIUM** • 2 fl. oz dropper	11.95	8.96				
01879	**SE-METHYL L-SELENOCYSTEINE** • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
00318	**SERRAFLAZYME** • 100 tablets	18.00	13.50	12.00			
01938	**SHADE FACTOR** • 120 veg. caps	44.00	33.00	30.00			
01884	**SILYMARIN** • 100 mg, 90 veg. caps	14.00	10.50	9.50			
01249	**SINUS CLEANSER** • 4 oz. bottle	25.00	18.75				
01596	**SKIN RESTORING PHYTOCERAMIDES w/LIPOWHEAT®** 30 liquid veg. caps	25.00	18.75	17.25			
00961	**SODZYME® w/GLISODIN® & WOLFBERRY** • 90 veg. caps	28.00	21.00	18.00			
00657	**SOLARSHIELD® SUNGLASSES** • Smoke color	12.99	9.74	8.63			
01097	**SOY EXTRACT** (Ultra) • 150 veg. caps	87.00	65.25	58.50			
00432	**STEVIA™** (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	**STEVIA™ ORGANIC LIQUID SWEETENER** (Better) • 2 oz	11.00	8.25				
01476	**STRONTIUM** • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01649	**SUPER ABSORBABLE SOY ISOFLAVONES** • 60 veg. caps	28.00	21.00	18.75			
01778	**SUPER SELENIUM COMPLEX** • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
	T						
01723	**TART CHERRY EXTRACT W/STANDARDIZED CHERRYPURE®** 60 veg. caps	22.00	16.50	15.00			
01827	**TAURINE** • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
01918	**TEAR SUPPORT w/MAQUIBRIGHT®** • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	**L-TAURINE POWDER** • 300 grams	20.00	15.00	12.66			
*13685	**TEN MUSHROOM FORMULA®** • 120 veg. caps	39.95	33.96				
01304	**THEAFLAVIN STANDARDIZED EXTRACT** • 30 veg. caps	18.00	13.50	12.00			
01683	**(L) THEANINE** • 100 mg, 60 veg. caps	24.00	18.00	15.38			
***01038	**THERALAC® PROBIOTICS** • 30 caps	47.95	35.96				
00668	**THYROID FORMULA** (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	**TMG POWDER** • 50 grams	14.00	10.50	8.25			
01859	**TMG** • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	**TOCOTRIENOLS** (Super-absorbable) • 60 softgels	30.00	22.50	21.00			
01278	**TOOTHPASTE** • 4 oz (Mint) tube	9.50	7.13	6.50			
01917	**TRANQUIL TRACT™** • 60 veg. caps	52.00	39.00	34.50			
01468	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT** 60 veg. caps	24.00	18.00	16.50			
01469	**TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL** • 60 veg. caps	32.00	24.00	22.20			
02003	**TRIPLE ACTION THYROID** • 60 veg. caps	36.00	27.00	24.00			
01803	**TRI SUGAR SHIELD®** • 60 veg. caps	36.00	27.00	24.00			
01386	**TRUFIBER™** • 180 grams	32.95	24.71				
01389	**TRUFLORA® PROBIOTICS** • 32 veg. caps	42.95	32.21				
01722	**L-TRYPTOPHAN** • 500 mg, 90 veg. caps	33.00	24.75	22.50			
01721	**TRYPTOPHAN PLUS** (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02016	**TWO-PER-DAY** • 60 tablets	10.50	7.88	7.13			
02015	**TWO-PER-DAY** • 120 tablets	20.00	15.00	13.50			
02014	**TWO-PER-DAY** • 120 caps	22.00	16.50	15.00			
00326	**L-TYROSINE** • 500 mg, 100 tablets	12.98	9.74				

SUBTOTAL OF COLUMN 10

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
	U, V						
01921	**URIC ACID CONTROL** • 60 veg. caps	24.00	18.00	16.50			
00213	**VANADYL SULFATE** • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
00408	**VENOTONE** • 60 caps	18.95	14.21	12.00			
01327	**VINPOCETINE** • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	**VITAMIN B3 NIACIN** • 500 mg, 100 caps	7.65	5.74	4.99			
00098	**VITAMIN B5** • 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88	7.04			
01535	**VITAMIN B6** • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	**VITAMIN B12** • 500 mcg, 100 lozenges	8.75	6.56	5.44			
01634	**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
00927	**VITAMIN C w/DIHYDROQUERCETIN** 1,000 mg, 250 veg. tablets	25.50	19.13	17.44			
00084	**VITAMIN C POWDER** (BUFFERED) • 454 grams	23.95	17.96	16.50			
01736	**VITAMIN C-MAGNESIUM CRYSTALS** (EFFERVESCENT) 180 grams	20.00	15.00	13.50			
01732	**VITAMIN D3** • 2,000 IU, 1 fl. oz, Mint flavor	28.00	21.00	18.75			
01753	**VITAMIN D3** • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	**VITAMIN D3** • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	**VITAMIN D3** • 5,000 IU, 60 softgels	10.00	7.50	6.50			
01718	**VITAMIN D3** • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	**VITAMIN D3 W/SEA-IODINE™** • 5,000 IU, 60 caps	14.00	10.50	9.38			
00864	**VITAMIN D3 LIQUID EMULSION** • 2,000 IU, 1 fl. oz	28.00	21.00	18.75			
01840	**VITAMINS D AND K W/SEA-IODINE™** • 60 caps	24.00	18.00	16.50			
01863	**VITAMIN E** (Natural) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00		
01936	**VITAMIN K2** (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
	W						
01902	**WAIST-LINE CONTROL™** • 120 veg. caps	42.00	31.50	28.50			
	X, Y						
01919	**X-R SHIELD** • 90 veg. caps	15.00	11.25	9.75			
00409	**XYLIWHITE™ MOUTHWASH** • 16 oz	10.00	7.50				
	Z						
01813	**ZINC HIGH POTENCY** • 50 mg, 90 veg. caps	7.95	5.96	5.25			
01561	**ZINC LOZENGES** • 60 veg. lozenges	9.00	6.75	6.00			
01961	**ZINC LOZENGES** (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00			
**01051	**ZYFLAMEND® WHOLE BODY** • 120 liquid veg. caps	72.95	54.71				
	BOOKS						
33999	**THE MENOPAUSE CURE** by Jill D. Davey & Sergey Dzugan, MD • 2016	17.32	12.99				
33998	**THE RIGHT TO TRY** by Darcy Olsen • 2016	26.99	20.24				
33840	**THE CRWAY® TO GREAT GLUCOSE CONTROL CD** by Paul McGlothin and Meredith Averill • 2016	189.00	189.00				
33890	**FORTIFY YOUR LIFE** by Tieraona Low Dog, MD • 2016	28.89	21.67				
33885	**THE BLUE ZONES SOLUTION** by Dan Buettner • 2015	26.00	19.50				
33880	**OUTSTANDING HEALTH:** THE 6 ESSENTIAL KEYS TO MAXIMIZE YOUR ENERGY AND WELL BEING by Michael Galitzer, MD & Larry Trivieri Jr. • 2015	24.95	18.71				
33878	**TESTOSTERONE REPLACEMENT THERAPY** by Dr. John Crisler • 2015	19.99	14.99				
	SUBTOTAL OF COLUMN 11						

ITEM No.	PRODUCT	Retail Each $	YOUR PRICE 1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
33877	**THE TRUTH ABOUT MEN AND SEX** by Abraham Morgentaler, MD, FACS • 2015	16.99	12.74				
33876	***TOX*-SICK** • by Suzanne Somers • 2015	26.00	19.50				
33875	**DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN** • by Sandeep Jauhar • 2015	26.00	19.50				
33874	**MISSING MICROBES** • by Martin J. Blaser, MD • 2014	28.00	21.00				
33873	**EATING ON THE WILD SIDE** • by Jo Robinson • 2014	16.00	12.00				
33872	**GET SERIOUS** • by Brett Osborn, MD • 2014	24.95	18.71				
33868	**TOXIN TOXOUT:** GETTING HARMFUL CHEMICALS OUT OF OUR BODIES AND OUR WORLD • by Bruce Lourie and Rick Smith • 2014	25.99	19.49				
33867	**THE COMPLETE MEDITERRANEAN DIET** by Michael Ozner, MD • 2014	19.95	14.96				
33869	**UNLEASH THE POWER OF THE FEMALE BRAIN** by Daniel Amen, MD • 2014	16.00	12.00				
33870	**MAGNIFICENT MAGNESIUM** by Dennis Goodman, MD • 2014	14.95	11.21				
DPT05	**DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION** (Hardcover) • 2014	69.95	39.95	36.00			
33865	**THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS]** by Sergey A. Dzugan, MD, PhD • 2014	29.95	22.46				
33862	**I'M TOO YOUNG FOR THIS** • by Suzanne Somers • 2013	26.00	19.50				
33835	**PHARMOCRACY** • by William Faloon • 2011	24.00	9.60	8.00			
33958	**THE VITAMIN D SOLUTION** by Michael F. Holick, PhD, MD (Paperback) • 2013	16.00	12.00				
33838	**YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY** by Gary Goldfaden, MD • 2012	26.00	15.00				
33815	**KNOCKOUT** • by Suzanne Somers • 2009	25.99	17.00				
33809	**TESTOSTERONE FOR LIFE** by Abraham Morgentaler, MD • 2008	16.95	11.87				
33696	**LIFE EXTENSION REVOLUTION** by Philip Lee Miller, MD (Paperback)	16.00	12.00				
33805	**MIAMI MEDITERRANEAN DIET WITH 300 RECIPES** by Michael D. Ozner, MD, FACC, FAHA (Hardcover) • 2008	24.95	16.25				
33906	**THE MIGRAINE CURE** • by Sergey Dzugan, MD, PhD • 2006	24.00	15.60				
33803	**WHAT YOUR DOCTOR MAY NOT TELL YOU ABOUT DIABETES** by Steven V. Joyal, MD • 2008	14.99	10.49				
	SUBTOTAL OF COLUMN 12						

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References

1. *Pharmacol Biochem Behav.* 2012;103(2):245-52.
2. *J Physiol Anthropol.* 2012;31:28.
3. *J Herb Pharmacother.* 2006;6(2):21-30.
4. *ScientificWorldJournal.* 2014;2014:419032.

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