

**HORRIFIC CONDITIONS INSIDE DRUG FACTORIES**

[www.lef.org](http://www.lef.org)

# LifeExtension®

The ULTIMATE Source For New Health And Medical Findings From Around The World

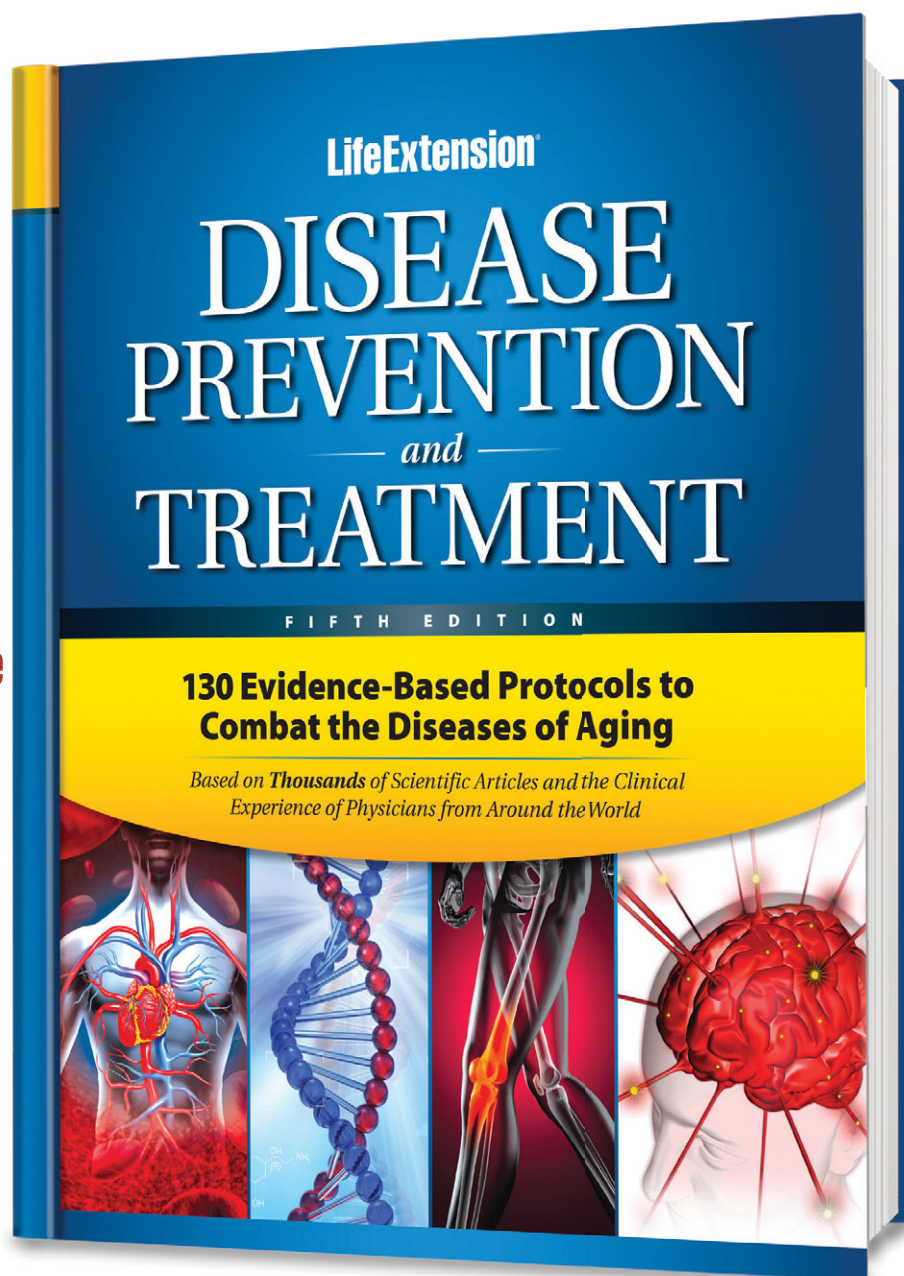
September 2013

## ***Don't Be a Victim of Medical Ignorance***

**Exclusive Conference  
Report on Aging  
Reversal Research**

**Brain-Preserving  
Impact of Melatonin**

**Newly Discovered  
Benefits of Whey**



**Brand New 2014 Edition of  
*Disease Prevention and Treatment***

# Worried About High Homocysteine?

Take Action with Low-cost

# TMG

**PROVEN** to support healthy  
homocysteine levels

Life Extension® has long warned members about the risks of high homocysteine levels.

Maintaining healthy levels of homocysteine is an important—and often overlooked—way to support healthy **endothelial function** in arteries throughout the body.

Research has shown that a unique nutrient called **TMG** (trimethylglycine) supports homocysteine levels already in normal range.<sup>1-9</sup>

## TMG For Heart Health

TMG is essential for heart and brain health. Study after study has demonstrated that TMG is one of the most effective nutrients for promoting healthy levels of homocysteine measured within normal range.<sup>1-9</sup>

TMG does much more than help maintain healthy levels of homocysteine. It literally *transforms* homocysteine into an amino acid that converts to a powerful compound called **s-adenosylmethionine (SAME)**.<sup>10</sup>



Item# 01559



It does this through a process called **methylation**, which means it provides methyl groups to quickly convert homocysteine back into the precursor to **SAMe**.<sup>10</sup>

**TMG** is a remarkably affordable way to maintain healthier homocysteine and SAME levels. The retail price for a box of **60 500 mg** vegetarian tablets of **TMG** is \$11. If a member buys four boxes, the price is reduced to **\$7.50** a box.

To order TMG, call 1-800-544-4440, or visit [www.LifeExtension.com](http://www.LifeExtension.com)

### References

1. *J Nutr.* 2003 Dec;133(12):4135-8.
2. *J Nutr.* 2003 May;133(5):1291-5.
3. *Am J Clin Nutr.* 2002 Nov;76(5):961-7.
4. *Br J Clin Pharmacol.* 2002 Aug;54(2):140-6.
5. *Kidney Int.* 2002 Mar;61(3):1040-6.
6. *An Esp Pediatr.* 1993 Jul;39(1):37-41.
7. *Metabolism.* 1985 Dec;34(12):1115-21.
8. *N Engl J Med.* 1983 Aug 25;309(8):448-53.
9. *J Nutr.* 2006 Jan;136(1):34-8.
10. *Altern Med Rev.* 2003 Feb;8(1):7-19.

## REPORTS



## 40 MELATONIN: HORMONAL BRAIN PROTECTION

Leading researchers have discovered how melatonin guards against brain degeneration brought on by aging and environmental factors. New studies uncover melatonin's ability to protect against common age-related neurological disorders including Alzheimer's and Parkinson's.



## 52 WHEY PROTEIN'S NEW LONGEVITY BENEFITS

Though popular with athletes for its ability to help build muscle mass, new studies have shown that whey protein has impressive longevity benefits that can mimic those of calorie restriction. Whey has the ability to optimize immunity factors as well as maximize glutathione.



## 68 CONFERENCE REPORT: AGING AND DISEASES OF AGING

At *The Aging and Diseases of Aging* conference in Tokyo, scientists reported on their investigations into the mechanisms underlying the diseases of aging. Presentations included findings on reduced adiponectin leading to obesity and insulin resistance, how amyloid protein leads to cardiovascular disease, and how specific sirtuins protect against obesity. Other topics included the role of autophagy in neurodegenerative disease, understanding cell senescence, and using young blood to restore health in older organisms.



## 78 UNSURPASSED QUALITY-CONTROL STANDARDS

Unlike many drug manufacturers whose plants have been found to be contaminated, *Life Extension* has in place stringent safeguards to ensure purity, active ingredient status, and overall integrity of the nutrients we use each day. These quality control standards exceed FDA mandates in order to ensure consumers the purest supplements in the industry.



## AVOID TODAY'S LEADING CAUSE OF DEATH

The leading cause of death in the modern world is **medical ignorance**.

To combat this epidemic, *Life Extension* researchers have spent the past ten years accumulating a wealth of new lifesaving knowledge that has been compiled into the **2014** edition of *Disease Prevention and Treatment*. This **5th** edition book contains over **1,400** pages of information about innovative approaches to disease management that is overlooked by most practicing physicians. *Disease Prevention and Treatment* delivers innovative recommendations extracted from the published scientific literature about diet, nutrients, hormones, and drugs to address **130** common health concerns.

## DEPARTMENTS

7 AS WE SEE IT:  
HORRIFIC DRUG FACTORY CONDITIONS

The **FDA** pretends to protect the public against contaminated drugs. The sordid facts reveal an agency incapable of acting in a rational manner. Such is the case of a company that made contaminated injectable drugs that sickened 745 Americans with 58 associated deaths. The FDA knew about this company's substandard manufacturing practices, yet it did nothing to stop it. See past this charade as you read how a **drug factory** operated under filthy conditions while FDA looked the other way.

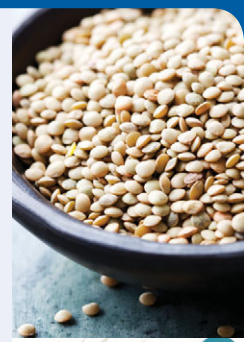


## 23 IN THE NEWS

Metformin cuts colorectal cancer mortality by **56%**; low vitamin D levels related to hypertension; supplements and exercise reduce risk of coronary artery disease; lower DHEA levels associated with higher stroke risk in women; and more.

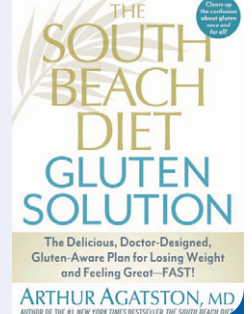
## 85 SUPERFOODS

Lentils are richly packed with phytochemicals, vitamins, and nutrients—especially folate, minerals, and dietary fiber. Research demonstrates that lentils powerfully protect against cancer, diabetes, and the deadly metabolic syndrome.



## 93 AUTHOR INTERVIEW

Dr. Arthur Agatston, author of the best-selling *The South Beach Diet* explains in his new book, *The South Beach Diet Gluten Solution*, how the growing presence of gluten in the American diet can lead to brain fog, reduced vitamin D absorption, and even rheumatoid arthritis. Dr. Agatston provides an easy-to-follow program for repairing the damage done by gluten.





**PUBLISHER • LE Publications, Inc.**

## CONNECT WITH LIFE EXTENSION ON THE WEB!



**Facebook.com/LifeExtension**

For instant access to special offers and promotions, product news, and exclusive health and wellness information.



**Twitter.com/LifeExtension**

For up-to-the-minute health tips, breaking industry news, and the latest updates in medical research.

Join us on the Life Extension forums:  
**ask.lef.org**

Post your questions, add your comments, and access useful information on health, nutrition, prevention, anti-aging, and more.

## Visit the Life Extension Nutrition Center Store

- The Most Complete Line of Life Extension Supplements
- Blood Testing and Analysis
- Personal Consultation with Life Extension Product/Health Advisors



**Nutrition Center of Florida, Inc.**  
5990 North Federal Highway,  
Fort Lauderdale, FL 33308-2633 • 954-766-8144

Monday-Friday 9 am-8 pm,  
Saturday 9 am-6 pm, Sunday 11 am-5 pm

## EDITORIAL

**Editor-in-Chief • Philip Smith**  
**Executive Managing Editor • Renee Price**  
**Senior Copy Editor • Laurie Mathena**  
**Medical Editor • Andrea Pryce, ND**  
**Senior Staff Writer • Michael Downey**  
**Department Editor • Jon Finkel**  
**Creative Director • Robert Vergara**  
**Art Director • Alexandra Maldonado**

## CHIEF MEDICAL OFFICER

Steven Joyal, MD

## SCIENTIFIC ADVISORY BOARD

Örn Adalsteinsson, PhD • John Boik, PhD • Aubrey de Grey, PhD  
Frank Eichorn, MD • Deborah F. Harding, MD • Steven B. Harris, MD  
Stanley W. Jacob, MD • Richard Kratz, MD, DSci  
Peter H. Langsjoen, MD, FACC • Ralph W. Moss, PhD  
Michael D. Ozner, MD, FACC • Robert Pastore, PhD, CNS  
Jonathan V. Wright, MD

## CONTRIBUTORS

Dr. Arthur Agatston • Ben Best • Will Brink • Ryan Carrigan • D. Dye  
William Faloon • Stephen Fredericks • William Gamonski • M. Richmond

## ADVERTISING

**Vice President of Marketing • Rey Searles • rsearles@lifeextension.com**  
**National Advertising Manager • Eric Brown • 404-347-8992**

## VICE PRESIDENT OF SALES AND BUSINESS DEVELOPMENT

Ron Antriasian • rantriasian@lifeextension.com • 781-271-0089

## CIRCULATION & DISTRIBUTION

Life Extension • 3600 West Commercial Blvd., Fort Lauderdale, FL 33309  
Editorial offices: 954-766-8433 • fax: 954-491-5306

**Customer Service: 800-678-8989 • email: customerservice@lef.org**  
Advisors: 800-226-2370 • Advisory email: advisory@lef.org

**At Life Extension Magazine® we value your opinion and welcome feedback.**

Please mail your comments to *Life Extension Magazine®*,  
Attn: Letters to the Editor, PO Box 407198, Fort Lauderdale, FL 33340  
or email us: [LEmagazine@lef.org](mailto:LEmagazine@lef.org)

**LIFE EXTENSION (ISSN 1524-198X) Vol. 19, No.9 ©2013** is published monthly except semi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. **LE Publications, Inc. All rights reserved.** Published 13 times a year. Subscription rate: \$40 per year in the United States. US \$47 in Canada. US \$60 in other countries. Subscription included as part of Life Extension Foundation membership. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. **POSTMASTER:** Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Printed in USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional. **LEGAL NOTICE:** Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA approved qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. Life Extension® does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in Life Extension magazine® except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.

# Magnesium and Brain Health

Profound loss of connections between nerve cells in the brain is one of the major hallmarks associated with **neurodegeneration** and memory impairment. Previous research has shown that **magnesium** is a critical factor in controlling **synaptic density**.<sup>1</sup>

To combat this, an innovative form of magnesium called **Neuro-Mag™** has been developed. The *magnesium-L-threonate* contained in **Neuro-Mag™** has been shown to specifically target multiple areas of the aging brain. In fact, pre-clinical models show that the *magnesium-L-threonate* contained in **Neuro-Mag™** boosted levels of magnesium in spinal fluid by **15%** versus no increase from conventional magnesium.<sup>2</sup>

## New Cognitive Benefits Revealed!

Although research into the role of magnesium in the brain dates back 70 years, scientists continue to uncover its comprehensive benefits for cognitive function.<sup>1,3</sup> Studies using **magnesium-L-threonate** show this unique form of magnesium maintains the quantity of synaptic connections between brain cells and inhibits the dysregulation of signaling pathways.<sup>1</sup>

## Capsules or Powder...Value Priced

The suggested daily dose of three **Neuro-Mag™ Magnesium-L-Threonate Capsules** provides **2,000 mg** of **Magnesium-L-Threonate**. While supplying a modest **144 mg** of elemental magnesium, its superior absorption into the bloodstream and nervous system make it a preferred choice for maturing individuals to supplement with.

This same brain-health supporting magnesium is also available in a natural lemon flavor called **Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder**. In addition to its fresh lemon flavor, the one-scoop per day serving supplies the same amount of magnesium as the capsules plus **500 mg** of highly soluble calcium and **1,000 IU** of vitamin D3.

A bottle containing 90 vegetarian capsules of **Neuro-Mag™ Magnesium-L-Threonate** or a jar containing **30** scoops of **Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder** retails for \$40. If a member buys 4 units, the price is reduced to **\$27** per unit.

### References

1. *J Neurosci*. 2013 May 8;33(19):8423-41.
2. *Neuron*. 2010 Jan 28;65(2):165-77.
3. *Yale J Biol Med*. 1933 Jul;5(6):545-53.

To order **Neuro-Mag™ Magnesium L-Threonate Capsules** or Powder call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Magtein™ is a registered trademark of Magceutics, Inc, distributed exclusively by AIDP, Inc. Magtein™ is covered by registered and pending US patents. Neuro-Mag™ Magnesium-L-Threonate- Item #01603 Neuro-Mag™ Magnesium-L-Threonate with Calcium and Vitamin D3 Powder Item #01602



Item # 01602



Item # 01603

**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.

**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 bio-identical 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](http://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, New Jersey, 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. Dzigan, MD, PhD**, was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzigan'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 hemopoietic 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, DDC, DO**, is a licensed osteopathic physician and chiropractor. He completed a NIH Fellowship in nutrition at UAB. Board certified in family medicine with a CNS in nutrition, he is currently the medical director at Leon County Jail. He is responsible for 1,100–1,200 inmates' medical needs.

**Prof. Francesco Marotta, MD, PhD**, gastroenterologist and nutrigenomics expert with extensive international university experience. Consulting Professor, WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy. Hon. Res. Professor, Human Nutrition Dept, TWU, USA. 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.

**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**, practices internal medicine at the Integrative Longevity Institute of Virginia in Virginia Beach, VA.

**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 staffs 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 staffs 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.

**Carol Ann Ryser, MD, FAAP**, is medical director of Health Centers of America in Kansas City, MO, and focuses on pediatrics and mental health.

**Michael D. Seidman, MD**, is the regional coordinator 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. Board certified in Anti-Aging medicine.

**Herbert R. Slavin, MD**, is medical director of the Institute of Advanced Medicine in Lauderhill, FL, specializing in anti-aging medicine, disease prevention, chelation therapy, and natural hormone replacement therapy.

**Stephen L. Smith, MD**, Richland, WA, focuses on treating allergies and is a member of the American Society for Lasers in Medicine and Surgery.

**Stephen Strum, MD**, is a medical oncologist who has specialized in prostate cancer treatment since 1983. He is co-founder and past medical director of the Prostate Cancer Research Institute. Currently, he directs a practice for prostate cancer patients in Ashland, OR.

**Javier Torres, MD**, is a member of the American Academy of Physical Medicine and Rehabilitation and is on the medical staffs of Sunrise Hospital, Desert Springs Hospital, Valley Hospital, and Mountain View Hospital, all in Las Vegas, NV.

**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.

**Charles E. Williamson, MD**, Boca Raton, FL, focuses on anti-aging, longevity, and pain management.

**Jonathan V. Wright, MD**, is medical director of the Tahoma Clinic in Renton, 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 11 books and publishes *Nutrition and Healing*, a monthly newsletter with a worldwide circulation of more than 100,000.

# SCIENTIFIC ADVISORY BOARD



**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*.



**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.



**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 anticancer 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.



**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 is working together with an international network of experts to improve treatment outcomes for prostate cancer patients with a special focus on natural and translational medicine.



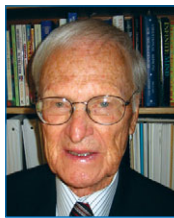
**Deborah F. Harding, MD**, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the Cenegeics certification in age management medicine. She is a faculty member of the new University of Central Florida Medical School.



**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.



**Stanley W. Jacob, MD**, is Gerlinger Distinguished Professor, Department of Surgery, Oregon Health and Science University. He has authored 175 scientific articles and 15 books and holds 3 patents, including the initial patent on the therapeutic implications of dimethyl sulfoxide (DMSO).



**Richard Kratz, MD, DSci**, is clinical professor of ophthalmology at the University of California, Irvine, and the University of Southern California (Los Angeles). Dr. Kratz pioneered the cataract-removal technique called phacoemulsification and developed intraocular lenses to replace the crystalline lens. He is currently involved in projects relating to glaucoma, cataract extraction, and facilitating eyesight for the totally blind.



**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.



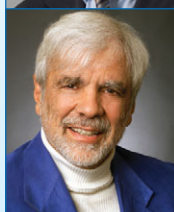
**Ralph W. Moss, PhD**, is the author of books such as *Antioxidants Against Cancer*, *Cancer Therapy*, *Questioning Chemotherapy*, and *The Cancer Industry*, as well as the award-winning PBS documentary "The Cancer War." Dr. Moss has independently evaluated the claims of various cancer treatments and 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* and *The Miami Mediterranean Diet* (2008, Benbella Books). For more information visit [www.drozner.com](http://www.drozner.com).



**Robert Pastore, PhD, CNS**, is a clinical nutritionist practicing in New York City. Due to his thorough nature and focus on organic chemistry and biochemistry, his colleagues have termed his practice forensic nutrition. He is a member of Harvard Medical School Postgraduate Association, the American College of Nutrition, New York Academy of Sciences, and the American Association of Pharmaceutical Scientists.



**Jonathan V. Wright, MD**, is medical director of the Tahoma Clinic in Renton, 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 11 books and publishes *Nutrition and Healing*, a monthly newsletter with a worldwide circulation of more than 100,000.

# WHAT IS THE IDEAL **GARLIC** SUPPLEMENT?

Numerous garlic products can be found in health food stores. Each garlic manufacturer claims that its products are of the best quality and provide optimal health benefits. Garlic supplements, however, are not that simple.

When garlic is aged, its harsh and highly odorous compounds are converted into more beneficial and much less odorous compounds. Numerous studies have suggested that supplementing one's diet with **aged garlic extract** may be beneficial. Published data about aged garlic extract shows that it:

1. Helps maintain healthy endothelial function and structure.\*<sup>1,2</sup>
2. Helps maintain healthy immune function.\*<sup>3,4</sup>
3. Helps maintain healthy cellular DNA structure.\*<sup>5,6</sup>

## Why Life Extension Recommends **Kyolic® Aged Garlic Extract™**

The Life Extension Foundation recommends dietary supplements based on the published, peer-reviewed scientific literature. There are more published studies substantiating the multiple benefits of **Kyolic® Aged Garlic Extract™** than any other brand.

While some other garlic preparations may work as well as **Kyolic®**, we do not want our members risking their precious health on a supplement that has not been specifically documented to work. We therefore recommend **Kyolic®** over all other brands.

## Easy-To-Swallow Kyolic® Garlic Capsules

Each easy-to-swallow capsule of **Kyolic® Reserve** provides **600-mg** of standardized aged garlic extract. The suggested dose for healthy people is two capsules per day with meals.

The retail price for a bottle containing 120 600-mg capsules of **Kyolic® Reserve** is \$27.95. If a member buys four bottles, the price is reduced to only **\$18.75** per bottle.

**To order Kyolic® Reserve 600-mg capsules,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**



### References

1. *Planta Med.* 1989 Dec;55(6):506-8.
2. *Zasshi.* 1997 Oct;110 Suppl 1:138P-41P.
3. *Cancer Immunol Immunother.* 1993 Oct;37(5):316-22.
4. *Mol Biother.* 1991 Jun;3(2):103-7.
5. *Carcinogenesis.* 1993 Aug;14(8):1627-31.
6. *Carcinogenesis.* 1992 Oct;13(10):1847-51.



Item # 00789

# Horrific Conditions Inside Drug Factories



BY WILLIAM FALOON



I've never understood why people traffic **heroin** or **cocaine** when **higher** profit margins are available manufacturing **prescription drugs**.

In my early days I assumed that with their enormous price markups, at least minimum **quality-control** standards would exist at drug makers. How uninformed I was!

As history has taught us, **pharmaceutical companies** don't care about their customer's health. It's not a part of their business model whether their drugs heal or harm. Their overriding concern is to make **money**.

**Dietary supplement** companies do not enjoy the gargantuan profit margins of **regulated** drug makers. Yet never have I seen such **reckless disregard** for consumer protection as has been exposed in the field of **prescription drug** manufacturing.

The **FDA** pretends to protect the public against contaminated drugs. The sordid facts reveal an agency incapable of acting in a rational manner, and when the FDA does something "after the fact," they often create worse problems.

Such is the case of a company that made contaminated injectable drugs that sickened 745 Americans with 58 associated deaths at the time of this writing.<sup>1</sup>

The FDA identified problems with this manufacturer as early as **2002**, but dropped the ball into a state pharmacy board's lap that failed to act. FDA again identified dangerous problems in **2006**, but once more failed to take actions other than send a "warning letter." The FDA now says it needs more power and money to do its job.

What the FDA does not want the public to know is that the reason this shady manufacturer was able to take over such a significant part of the market is that FDA actions caused other companies to stop making certain injectable drugs.

The media was initially confused by this tragedy and blamed it on lack of **regulatory authority**.

In this article, you'll see past this charade as you'll read how a **drug factory pretended** to be a **compounding pharmacy**. Particularly appalling is the FDA's inability to recognize that making as many as **17,000 vials** of a drug all at once under **filthy** conditions was a far cry from custom making one drug at a time per individual prescription in a **sterile** environment.

The contamination problem, however, is not isolated to one bad drug maker. It turns out that these kinds of **safety violations** were routine at drug factories that the FDA had certified as being safe.

### US Drug Factories in 'Terrible Shape'

Here's how the *New York Times* described conditions inside **FDA-registered** drug factories:

*"Weevils floating in vials of heparin. Morphine cartridges containing up to twice the labeled dose. Manufacturing plants with rusty tools, mold in production areas and—in one memorable case—a barrel of urine."*<sup>2</sup>

The *New York Times* emphasized that these were not reports about the injectable drug maker that was linked to 745 cases of infection and 58 American deaths.<sup>1</sup> These quality lapses were found at **large drug companies** whose names are familiar to many Americans.<sup>2</sup>

When these problems were discovered, the FDA sent out "warnings" to these companies. Instead of fixing the problems, many of these drug makers decided it was cheaper to simply discontinue making the drug(s). The result was severe shortages of the drugs cited by the FDA.<sup>2</sup> This opened up the

market for disreputable companies to make these same drugs, who did so under the same kind of abysmal conditions the FDA found at large drug factories.

The FDA would like to take credit for stopping these problems, but in certain cases, it was people working at the drug factories that came forward to complain about unsanitary manufacturing conditions, or people dying from contaminated drugs, that prompted FDA action.

The sad fact is that some drug companies are so greedy they will not stop their highly profitable assembly lines to perform even the most rudimentary sterilizing procedures.

### Contaminated Injectable Drugs

**Fungal meningitis** causes inflammation of the lining of the brain and spinal cord that results in dreadful sickness and sometimes death.<sup>3</sup>

A drug factory made large quantities of a steroid (*methylprednisone*) that was injected into the

joints and spines of aging humans in chronic pain. It provided temporary relief.

The problem was this drug was contaminated with a **black fungus** that infected those who were injected with it.<sup>4</sup> Since injectable drugs bypass the natural barriers afforded by an intact digestive/immune system, they have to be manufactured and maintained in a sterile environment to avoid killing patients.

FDA inspections in **2002** and **2006** revealed injectable drugs being made under substandard (non-sterile) conditions at a drug factory. It was not until hundreds fell ill and scores died that the FDA took meaningful action.<sup>5,6</sup>

### How the FDA Bungled the Investigation

The name of the company that made the fungus-laced injectable drug is **New England Compounding Center (NECC)**.<sup>4,5</sup> It **pretended** to be a compounding pharmacy, but instead functioned as a **drug factory**.

The FDA claims that it lacks adequate regulatory authority over compounding pharmacies, but FDA's inspection of NECC in the year **2002** revealed problems with sterility and other issues.<sup>7</sup> That same year, the FDA informed the Massachusetts State Board of Pharmacy of an adverse reaction to *methylprednisone*, which is the same drug that in **2012** caused the fungal-meningitis outbreak.<sup>8</sup>

Had the FDA done their job back in **2002**, they would have forced NECC to register as a drug manufacturer and subjected NECC to stricter regulatory oversight, although that may still not have prevented the problems since FDA-registered drug makers were later





found to have similar unsanitary facilities.<sup>9</sup>

The FDA and Massachusetts state pharmacy board's most blatant failure, however, was to uncover horrific conditions inside NECC and take no practical steps to enforce safety compliance or shut down NECC before tragedy struck.<sup>10</sup>

### Good Manufacturing Practices Overlooked

According to Massachusetts state regulators, the NECC drug factory failed to sterilize injectable drugs, something that is mandatory for a substance that is going to be injected into the body.<sup>11</sup>

The regulators said that NECC didn't keep manufacturing equipment clean, operated a leaky boiler near the "clean room" where injectable drugs were packaged, and shipped products before receiving test results showing the products were sterile, which violates good manufacturing guidelines.<sup>12,13</sup>

In addition, NECC did not test the manufacturing equipment used to sterilize injectable drugs on a timely basis according to regulators.<sup>13</sup>

The result of these multitudes of quality lapses were injectable vials that contained black matter inside, which turned out to be the **fungus** that has been linked to 58 deaths so far.<sup>1,10</sup>

### FDA Inspects After Catastrophe

After hundreds had fallen ill from fungal meningitis, the FDA conducted a thorough inspection of NECC's drug factory.<sup>14</sup>

The FDA's report cited greenish-yellowish discoloration on sterilization equipment and non-sterile raw ingredients. The FDA found that **25%** of supposedly sterile vials were contaminated with greenish-black foreign matter and that **100%** of these vials sent for analysis contained fungus.<sup>14</sup>

The FDA noted that NECC was unable to provide documentation that its steam autoclave devices were capable of achieving product sterility, a critical factor when making injectable drugs.<sup>10,13</sup> In fact, FDA inspectors found greenish-yellow discoloration inside the one cleaning autoclave and a tarnished discoloration inside another.<sup>13,15</sup>

NECC turned off its air conditioning in "clean rooms" from 8:00 pm to 5:30 am, which is improper because failing to keep clean rooms at low temperature and low humidity provides a fertile environment for fungal growth.<sup>14,15</sup>

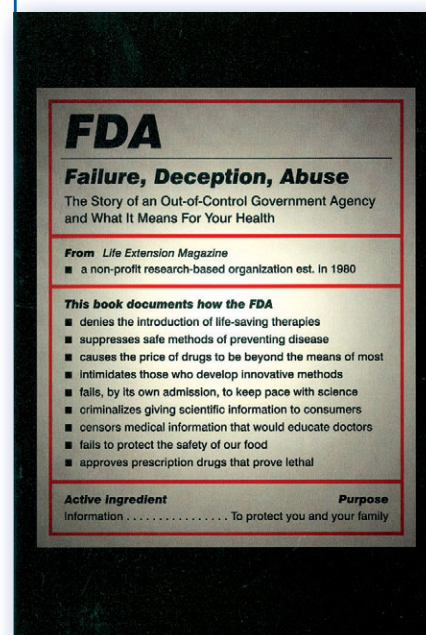
Particularly troubling in the FDA report was documentation that NECC had found microbial contamination, but did not enact cleanliness procedures to neutralize this lethal threat.<sup>14</sup>

Furthermore, "clean rooms" used to make injectable drugs had been identified by NECC's own staff as detecting bacteria and molds, but the FDA could find no evidence that the company acted to fix these lethal problems.<sup>14</sup>

The FDA's belated inspection of NECC did nothing to prevent the suffering and death of hundreds of victims who contracted fungal infections from contaminated vials of **methylprednisone** injected into their spines and joints.<sup>10</sup>

### FDA: Failure, Deception and Abuse

My book titled **FDA: Failure, Deception and Abuse** was published in early **2010**, but no one in Congress listened, and scores of Americans are dead because of the FDA's egregious ineptitude in the NECC fiasco.



#### FDA

#### Failure, Deception, Abuse

The Story of an Out-of-Control Government Agency and What It Means For Your Health

From Life Extension Magazine

■ a non-profit research-based organization est. in 1960

#### This book documents how the FDA

- denies the introduction of life-saving therapies
- suppresses safe methods of preventing disease
- causes the price of drugs to be beyond the means of most
- intimidates those who develop innovative methods
- fails, by its own admission, to keep pace with science
- criminalizes giving scientific information to consumers
- censors medical information that would educate doctors
- fails to protect the safety of our food
- approves prescription drugs that prove lethal

#### Active Ingredient

Information . . . . . To protect you and your family

#### Purpose

Information . . . . . To protect you and your family



## Congress Cites FDA Failure

The House and Senate held several hearings in **November 2012** on the NECC tragedy.

Congress wanted to know why the FDA didn't do more to prevent the production and sale of these tainted steroids.

As anticipated, the FDA claimed that it didn't have enough **authority** to regulate pharmacies that compound drugs. FDA Commissioner (Margaret Hamburg, MD) warned that if Congress didn't strengthen legislation, another similar tragedy is inevitable. Dr. Hamburg stated before the House committee:<sup>16-18</sup>

*"If we fail to act, this type of incident will happen again. It is a matter of when, not if."*

What Dr. Hamburg may not have expected was documentation that the FDA and the Massachusetts pharmacy board both repeatedly visited NECC and found problems, but the strongest action the FDA took was the issuance of a warning letter in **2006**.

In response to Dr. Hamburg claiming the FDA needed more "authority," one Representative responded:

*"We're just not buying it, doctor... You lack the authority to do anything, yet you send a letter like this?"*

(In reference to FDA 2006 Warning Letter).

This **warning letter** documented numerous violations of existing rules the FDA found in **2006**, yet the FDA **failed** to take action until citizens started dying.

House members repeatedly berated **regulators** who failed to prevent the fungal meningitis outbreak, stating the **FDA** and **Massachusetts state regulators** both knew as far back as **2002** that there were problems at the pharmacy, which distributed more than **17,000 doses** from contaminated lots of steroids.

Dr. Hamburg was lambasted by House Committee members who stated:<sup>18</sup>

*"This is a complete and utter failure on the part of your agency."*

*"This is one of the worst public health disasters ever caused by a contaminated drug in this country."*

*"After a tragedy like this the first question we all ask is 'Could this have been prevented?' After an examination of documents produced by the Massachusetts Board of Pharmacy and the US Food and Drug Administration, the answer here appears to be, 'Yes.'"*

Other House members came to Dr. Hamburg's defense, arguing that a solution needed to be found instead of seeking to "**prosecute the Food and Drug Administration**."

## Senate Harshly Criticizes the FDA

The day after the November 2012 House hearing, where the FDA asked for more authority, a bipartisan staff of the Senate Health, Education, Labor, and Pensions Committee issued a report detailing how federal and state regulators knew nearly a **decade** before of serious safety concerns with the pharmacy (NECC) tied to hundreds of meningitis cases, but **failed** to act decisively. The report concluded that "**bureaucratic inertia appears to be what allowed a bad actor to repeatedly risk public health**."<sup>19,20</sup>

While acknowledging the lack of clarity in what the FDA's role should be in regulating **compounding pharmacies**, the Senate cited plenty of evidence that the FDA should have taken action against NECC, which clearly was functioning as a **drug factory**.

The Senate investigators wrote, "**Both federal and state regulators were well aware that NECC and its owners posed a risk to the public health**" and "**repeatedly failed to demonstrate that the company could safely compound sterile products**."<sup>19</sup>





### FDA Says It Lacks Authority...

But FDA does have the authority. And it did in **2006**, when FDA inspected and sent a **warning letter** in effect telling **NECC** to stop manufacturing certain drugs or face legal action.<sup>19</sup>

In **2006**, the warning came because NECC (pretending to be a compounding pharmacy) was found, among other things, to have failed to verify if supposedly sterile drugs met safety standards.<sup>19</sup>

Move forward to **2012** and NECC was not only still operating, but was selling tainted drugs manufactured under horrifically unsanitary conditions.<sup>19</sup> Where was the FDA? Why did they wait for Americans to die before doing their job?

The Senate report uncovered an internal FDA memo in **2003** that concluded there was *“potential for serious public health consequences if NECC’s compounding practices, in particular those relating to specific sterile products, are not improved.”*<sup>19</sup>

The Senate confirmed that methylprednisolone produced by NECC *“had previously been a suspected cause of at least two cases with bacterial meningitis-like symptoms”* in **2002**, leading to an **FDA inspection**...with no meaningful action taken.<sup>19</sup>

Most Senators expressed skepticism the FDA could effectively use widened authority under any new law, one stating *“the FDA has failed to use its existing authority...”* with another stating, *“This has been going on since 2002...It took all this time, and nobody did anything.”*<sup>20</sup>

Regrettably, some Senators still believe that giving the FDA more tax dollars will solve these issues of bureaucratic incompetence and mismanagement.

At the Senate hearing, FDA Commissioner Margaret A. Hamburg conceded:

*“Perhaps we should have been more aggressive,”* referring to the FDA’s failure to inspect NECC and follow up on the **2006** warning letter. *“There was a lot of debate within the agency about whether to proceed.”*<sup>20</sup>

Senators repeatedly questioned the FDA’s sending NECC a warning letter in **2006** and a letter in **2008** saying that it planned to inspect, but not following through until after the fungal meningitis outbreak occurred in late **2012**.<sup>19,21</sup>

### CBS News Enables FDA to Temporarily Deceive Public

On **March 10, 2013**, CBS News’ **60 Minutes** aired an emotional broadcast about the NECC tragedy that included interviewing victims who suffered horrific illnesses, along with family members of those who died.<sup>22</sup>

**60 Minutes** accurately told this story about NECC-contaminated drugs that caused **58 deaths** and over 700 serious illnesses.<sup>1</sup>

What **60 Minutes** omitted was the fact that the **FDA knew** about this disaster-waiting-to-happen,

but failed to stop it until Americans started dying in **2012**.

**FDA** officials were given free rein on **60 Minutes** to blame this catastrophe on a lack of **regulatory authority**. As you’re learning here, the fault instead lies with **bureaucratic ineptitude** at the hands of the FDA and the state pharmacy board that permitted these lethal deviations in good manufacturing practices to occur.

Instead of blaming the FDA for **ignoring** this lethal problem, **CBS News** let FDA officials blame Congress for not giving the FDA more regulatory power.

What the FDA does not want the public to know is that the reason this shady manufacturer was able to take over such a significant part of the market is that FDA actions caused *other* companies to stop making certain injectable drugs.

**CBS News** overlooked the **House** and **Senate** investigations that documented FDA's egregious failings in the NECC matter.

## **Congress Strikes Back at the FDA**

On April 16, 2013, the **FDA** was subpoenaed to appear before Congress to account for why more wasn't done to protect the public against contaminated drugs made at NECC.<sup>13,23</sup>

Congress wanted the FDA Commissioner to explain why she was not more forthcoming about the FDA failures during the House and Senate hearings held in **November 2012**.

According to the House Committee report on the NECC debacle:

- "The investigation revealed what FDA Commissioner Margaret Hamburg did not disclose during the November 2012 hearing: FDA received a litany of complaints about NECC and its sister company, Ameridose, right up until the 2012 outbreak."<sup>13</sup>

- "These complaints were related to the safety and potency of NECC and Ameridose products, issues that the FDA failed to routinely, if ever, inform the state about."<sup>13</sup>

- "After reviewing more than 27,000 documents, we found a dramatically different picture than the one painted by the FDA during our initial hearing in November. We now know that doctors, patients, providers, and whistleblowers tried to warn FDA for years that NECC and Ameridose were operating

as manufacturers and marketing their products nationwide without patient prescriptions."<sup>13</sup>

- "The FDA was also warned about sterility and safety issues with the companies' products. Rather than do its job and protect the patients who were taking NECC and Ameridose drugs, FDA chose not to act."<sup>13</sup>

The box on the bottom of this page contains highlights from the House Committee report showing that FDA failures contributed to the NECC disaster and how the FDA tried to cover up their own ineptitudes.

## **What Congress Overlooked**

What was not discussed in Congressional hearings was the

## **Highlights from House Committee Report On FDA's Cover Up and Failings**

On April 16, 2013, the House Committee on Energy and Oversight issued a report titled:<sup>23</sup>

### **FDA'S OVERSIGHT OF NECC AND AMERIDOSE: A HISTORY OF MISSED OPPORTUNITIES?"**

*Here are some highlights from the Committee's report:*

"Since the (November 2012) hearing, the Committee has pressed FDA to produce all of its documents relating to NECC and Ameridose in order to obtain a full picture of FDA's inspectional history, oversight, and decision-making with respect to these firms. Only after being threatened with the possibility of a subpoena in a February 1, 2013, letter to Commissioner Hamburg, did FDA finally complete its production on March 21, 2013.

After reviewing these documents, Majority Committee staff believes there is a strong basis for Members to pursue answers from FDA on whether this tragedy

was preventable had the agency taken action under its existing authorities to address the steady stream of complaints it had received about NECC and its sister company, Ameridose, since issuing a Warning Letter to NECC in December 2006.

One of FDA's fundamental reasons for existence is to protect the public health by assuring the safety of our nation's drug supply. With respect to NECC and Ameridose, documents produced to the Committee raise serious questions about whether FDA repeatedly failed in its core mission.

The agency's inaction in the face of years of complaints and red flags associated with the safety of both companies' products and underlying practices had a tragic ending."

This entire document can be accessed at:  
**[www.lef.org/necc](http://www.lef.org/necc)**

FDA's history of **abusing** and **mis-using** whatever **authority** Congress gave it.

For example, when the FDA first discovered problems at NECC (in **2002**), it chose to direct its resources to prosecuting a man named **Jay Kimball**, who sold a drug (liquid deprenyl) that harmed no one. Jay Kimball remains in prison.<sup>24</sup>

In **2006**, while the FDA did not think it needed to stop NECC's lethal manufacturing practices, it somehow found the time to censor claims by **cherry growers** that cited scientific studies on their website showing cherries conferred health benefits.<sup>25</sup>

What few understand is how the FDA has historically **abused** its authority in a **discriminatory** manner. The new "authority" the FDA is seeking would enable the agency to pick out small, well-run pharmaceutical firms and regulate them out of business using minor technical arguments that have no bearing on safety.

### GLAXO Pays \$750 Million Fine for Quality Lapses

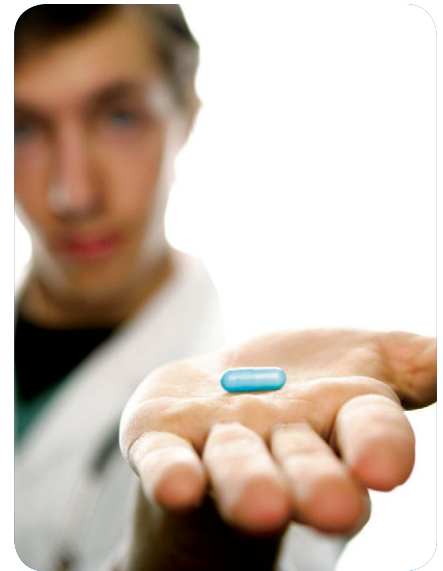
GlaxoSmithKline is the world's 4th largest drug maker, with annual sales of nearly \$46 billion and profits of almost \$9 billion.<sup>26</sup>

In **July 2002**, the FDA sent a **warning letter** about quality problems uncovered at one of GLAXO's subsidiary manufacturers. The egregious problems, however, were not corrected despite additional FDA inspections that continued to turn up severe problems, including failure to safeguard against microbial contamination.<sup>27</sup>

The FDA initiated a seizure action in **2005** to remove adulterated and improperly made drugs.<sup>28</sup>

Horrendous problems persisted, however, until the **Justice Department** filed a **criminal complaint** against GlaxoSmithKline and stopped what could have been a human catastrophe.<sup>29</sup>

In **October 2010**, Glaxo-SmithKline agreed to plead guilty



and pay a **\$750 million** fine to resolve criminal and civil liability regarding the manufacturing deficiencies.<sup>29</sup>

### Glaxo's Defective Drugs

The defective drugs, manufactured between 2001 and 2005, were Kytril, Bactroban, Paxil CR, and Avandamet.<sup>29</sup>

**Kytril** is a sterile injectable anti-nausea medication used by cancer patients receiving chemotherapy or radiation. **Bactroban** is a topical anti-infection ointment used to treat skin infections. **Paxil CR** is the controlled-release formulation of the popular anti-depressant drug Paxil, and **Avandamet** is a combination of Avandia and metformin.

Avandia has since essentially disappeared from the market because of increased **heart attack** risks, though an FDA advisory panel recently recommended it be allowed to be prescribed to certain diabetic patients.<sup>30</sup>

Years after FDA approval, Glaxo sent out a black box warning about increased **suicide** risks in users of Paxil.<sup>31</sup>



With the realization that cardiovascular disease is the leading cause of death amongst diabetics, and suicide a huge risk in depressed patients, the notion that the FDA approved drugs with these kinds of side effects borders on absurdity.<sup>32,33</sup> These lethal side effect issues, however, are irrelevant to the manufacturing lapses that occurred.

According to an employee who filed a lawsuit against Glaxo over these uncorrected defects, the water system was contaminated, the air system allowed for cross-contamination between products, the warehouse was so overcrowded that rented vans were used for storage, the plant could not ensure the sterility of intravenous drugs, and pills of differing strengths were sometimes mixed in the same bottles.<sup>34</sup> Although FDA inspectors had spotted some problems, most were missed.

Glaxo paid the **\$750 million** fine and admitted that its subsidiary failed to ensure that Kytril and Bactroban finished products were free of contamination from microorganisms. It also admitted that its manufacturing process caused



Paxil CR two-layer tablets to split, which the company itself called a “critical defect,” because potential distribution of tablets would not have any therapeutic effect and no controlled release mechanism.<sup>35</sup>

Glaxo admitted that Avandamet tablets did not always have the proper mix of active ingredients and, as a result, potentially contained too much or too little of the ingredient with the therapeutic effect.<sup>29</sup>

### *Potential Lethal Impact of Glaxo's Abhorrent Lack of Quality Control*

One can only imagine the problems that would occur if a depressed individual took a powerful anti-diabetic drug like Avandia, which could inflict acute hypoglycemia. A former employee identified nine instances where the wrong pills were sold, including Avandia® mixed in packages of over-the-counter antacids like Tagamet®.<sup>36</sup>

For chemotherapy patients who are immune compromised, they could have easily succumbed to an infection without their oncologists ever suspecting it was linked to the anti-nausea drug Kytril, which was not tested to ensure it was free of microbial contamination.

### *No Jail Time for Glaxo Executives*

Glaxo denies that any patients were ever harmed by the adulterated drugs they distributed in the United States and also denied that these kinds of problems occurred at its other drug factories.

No one from Glaxo faced criminal charges. I again remind readers that **Jay Kimball**, who sold a



clean product that harmed no one, remains in federal prison. One difference is that Jay Kimball had no money for an attorney and had to represent himself in court (or render himself insolvent defending against FDA's prejudicial accusations). Pharmaceutical behemoths like Glaxo, on the other hand, spend virtually unlimited money on lobbyists and lawyers and have not faced personal criminal liability for the misdeeds they allowed.

### *Reputation in Lieu of Regulation*

One reason why horrific quality issues occur at pharmaceutical companies is that few consumers know who makes their prescription drugs.

When your doctor writes a prescription, you take it to your pharmacy and usually get a brown-colored bottle with pills inside. Seldom is the manufacturer's name stated on the bottle.

Drug companies can thus run their manufacturing facilities with reckless abandon with little reputational risk.

Dietary supplement companies, on the other hand, prominently state their name on the labels of their products.

In a more sensibly-regulated environment, better-operated pharmaceutical companies would prosper as their reputation for quality control became known. Unfortunately, today's Orwellian regulatory structure has created utter chaos, with retail pharmacies not knowing which generic manufacturer is going to make which generic drug at any given time.

Since we established the **Life Extension Pharmacy™** six years ago, we have learned how dangerous the prescription drug marketplace has become, with counterfeiting, shortages, and quality problems more rampant than reported by the media.

We would prefer that pharmaceutical companies place a higher value on their **reputation** and instill better quality standards.

Instead, regulatory burdens are so cumbersome that quality con-

trol takes a back seat to pleasing bureaucrats who wield **unbridled power**, but lack the **competency** to recognize catastrophic problems as occurred with the contaminated steroids made by NECC.

### ***How Much More FDA Failure Will Americans Tolerate?***

In **1906**, a book called ***The Jungle*** was published that described appalling conditions inside America's meat packing industry. The revelations in this book resulted in the establishment of federal laws that mandated standards of strength, purity, and quality of foods and drugs.

Conditions inside some of America's drug factories are eerily similar to those described in *The Jungle*, yet the FDA has been around for more than 100 years! How much longer is the public expected to wait before the FDA effectively spends its **\$4 billion** annual budget on real consumer

protection, as opposed to threatening walnut and cherry growers for claiming health benefits of their foods?

No matter how many times the FDA fails to protect consumers against contaminated drugs, there are no calls for meaningful reform.

Instead of recognizing FDA ineptitude, cries ring out to give the FDA more money and power... as Americans perish from contaminated drugs the FDA had the authority to stop!

### ***No Free Market!***

What the public doesn't yet understand is that contaminated drugs are the result of draconian **regulations** that limit **free market** competition. By restricting drug making to **only** those controlled by incompetent bureaucrats, the inevitable result will be shortages, poor quality, and high prices.

As I write this article, one of the challenges in dealing with the



NECC catastrophe is that there may be new shortages of injectable drugs because there are not enough drug factories in the US to meet patient demand. Shortages create opportunities for unsavory companies to dump even greater amounts of overpriced and contaminated drugs into the bodies of unsuspecting victims.

This kind of problem would not continue in a **free market**, but ever-increasing **regulations** are exacerbating the problems of drug shortages, deadly manufacturing practices, and obscenely high prices.

You'll read in this month's issue about the quality-control standards we at **Life Extension** insist on. Unlike those involved in pharmaceutical manufacturing, I and most everyone else at **Life Extension** consume these nutrients ourselves and would never tolerate the deplorable conditions that exist in certain American drug factories today.

For longer life,



William Faloon

## References

1. Available at: <http://www.cdc.gov/hai/outbreaks/meningitis-map-large.html>. Accessed June 25, 2013.
2. Available at: <https://www.nytimes.com/2012/10/18/business/drug-makers-stalled-in-a-cycle-of-quality-lapses-and-shortages.html?pagewanted=all>. Accessed June 13, 2013.
3. Available at: <http://www.cdc.gov/meningitis/fungal.html>. Accessed June 20, 2013.
4. Available at: [http://www.nejm.org/doi/full/10.1056/NEJMra1212617?query=featured\\_meningitis](http://www.nejm.org/doi/full/10.1056/NEJMra1212617?query=featured_meningitis). Accessed June 13, 2013.
5. Available at: [http://www.upi.com/Health\\_News/2012/11/13/Meningitis-pharmacy-had-many-violations/UPI-28381352863651/](http://www.upi.com/Health_News/2012/11/13/Meningitis-pharmacy-had-many-violations/UPI-28381352863651/). Accessed June 13, 2013.
6. Available at: [http://www.washingtonpost.com/national/health-science/previous-fungal-meningitis-outbreak-a-decade-ago-resulted-in-no-oversight-changes/2012/11/05/8417d84e-1fa8-11e2-9cd5-b55c38388962\\_story.html](http://www.washingtonpost.com/national/health-science/previous-fungal-meningitis-outbreak-a-decade-ago-resulted-in-no-oversight-changes/2012/11/05/8417d84e-1fa8-11e2-9cd5-b55c38388962_story.html). Accessed June 13, 2013.
7. Available at: <http://finance.yahoo.com/news/fda-seeks-more-authority-amid-meningitis-outbreak-225136817--finance.html>. Accessed June 13, 2013.
8. Available at: <http://www.reuters.com/article/2012/10/23/us-usa-health-meningitis-congress-idUSBRE89M00820121023>. Accessed June 20, 2013.
9. Available at: <http://www.nytimes.com/2012/10/18/business/drug-makers-stalled-in-a-cycle-of-quality-lapses-and-shortages.html?pagewanted=all>. Accessed June 13, 2013.
10. Available at: <http://online.wsj.com/article/SB10001424052970203406404578075092760806164.html>. Accessed June 13, 2013.
11. Available at: <http://www.mass.gov/eohhs/docs/dph/quality/boards/necc/necc-preliminary-report-10-23-2012.pdf>. Accessed June 27, 2013.
12. Available at: <http://foodpoisoningbulletin.com/2012/necc-methylprednisolone-acetate-linked-to-meningitis-outbreak-evidence-drug-made-under-insanitary-conditions/>. Accessed June 20, 2013.
13. Available at: <http://energycommerce.house.gov/press-release/committee-report-meningitis-outbreak-chronicles-fdas-missed-opportunities-to-protect-public-health>. Accessed June 21, 2013.
14. Available at: <http://www.fda.gov/downloads/AboutFDA/CentersOffices/OfficeofGlobalRegulatoryOperationsandPolicy/ORA/ORAElectronicReadingRoom/UCM325980.pdf>. Accessed June 13, 2013.
15. Available at: <http://www.nytimes.com/2012/10/27/health/fda-finds-unsanitary-conditions-at-new-england-compounding-center.html?pagewanted=all>. Accessed June 14, 2013.
16. Available at: <http://www.reuters.com/article/2012/11/14/us-usa-health-meningitis-widow-idUSBRE8AD13020121114>. Accessed June 14, 2013.
17. Available at: [http://www.nytimes.com/2012/11/15/health/fda-asking-for-more-control-over-drug-compounding.html?\\_r=0](http://www.nytimes.com/2012/11/15/health/fda-asking-for-more-control-over-drug-compounding.html?_r=0). Accessed June 14, 2013.
18. Available at: <http://www.nbcnews.com/health/pharmacy-owner-refuses-testify-about-fungal-outbreak-1C7055774?franchiseSlug=healthmain>. Accessed June 14, 2013.
19. Available at: [http://www.help.senate.gov/imo/media/doc/11\\_15\\_12%20HELP%20Staff%20Report%20on%20Meningitis%20Outbreak.pdf](http://www.help.senate.gov/imo/media/doc/11_15_12%20HELP%20Staff%20Report%20on%20Meningitis%20Outbreak.pdf). Accessed June 14, 2013.
20. Available at: <http://stream.wsj.com/story/latest-headlines/SS-2-63399/SS-2-102550/>. Accessed June 14, 2013.
21. Available at: <http://www.fda.gov/ICECI/EnforcementActions/WarningLetters/2006/ucm076196.htm>. Accessed June 14, 2013.
22. Available at: [http://www.cbsnews.com/8301-18560\\_162-57573175/meningitis-whistleblower-on-60-minutes/](http://www.cbsnews.com/8301-18560_162-57573175/meningitis-whistleblower-on-60-minutes/). Accessed June 14, 2013.
23. Available at: <http://energycommerce.house.gov/sites/republicans.energycommerce.house.gov/files/analysis/20130416Meningitis.pdf>. Accessed June 17, 2013.
24. Available at: [http://www.lef.org/magazine/mag2004/aug2004\\_report\\_prisons\\_03.htm?source=search&key=Jay%20Kimball](http://www.lef.org/magazine/mag2004/aug2004_report_prisons_03.htm?source=search&key=Jay%20Kimball). Accessed June 17, 2013.
25. Available at: [http://usatoday30.usatoday.com/news/health/2006-03-19-cherry-warnings\\_x.htm?csp=34](http://usatoday30.usatoday.com/news/health/2006-03-19-cherry-warnings_x.htm?csp=34). Accessed June 17, 2013.
26. Available at: [http://www.forbes.com/lists/2010/18/global-2000-10\\_The-Global-2000\\_Sales\\_2.html](http://www.forbes.com/lists/2010/18/global-2000-10_The-Global-2000_Sales_2.html). Accessed June 21, 2013.
27. Available at: <http://www.fda.gov/downloads/iceci/enforcementactions/enforcementstory/enforcementstoryarchive/ucm091066.pdf>. Accessed June 17, 2013.
28. Available at: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2005/ucm108418.htm>. Accessed June 17, 2013.
29. Available at: <http://www.justice.gov/opa/pr/2010/October/10-civ-1205.html>. Accessed June 17, 2013.
30. Available at: [http://www.findavandiahelp.com/avandia\\_fda](http://www.findavandiahelp.com/avandia_fda). Accessed June 17, 2013.
31. Available at: <http://www.justice.gov/opa/pr/2012/July/12-civ-842.html>. Accessed June 18, 2013.
32. Available at: <http://www.world-heart-federation.org/cardiovascular-health/cardiovascular-disease-risk-factors/diabetes/>. Accessed June 15, 2013.
33. Available at: <http://www.webmd.com/depression/guide/depression-recognizing-signs-of-suicide>. Accessed June 18, 2013.
34. Available at: <http://www.nytimes.com/2010/10/27/business/27drug.html?pagewanted=all>. Accessed June 18, 2013.
35. Available at: [http://chiefofficers.net/888333888/cms/index.php/news/industries/health\\_care\\_pharma/pharmaceuticals/health\\_gsk\\_pays\\_usd750\\_million\\_fine\\_and\\_penalties\\_in\\_usa](http://chiefofficers.net/888333888/cms/index.php/news/industries/health_care_pharma/pharmaceuticals/health_gsk_pays_usd750_million_fine_and_penalties_in_usa). Accessed June 15, 2013.
36. Available at: [http://www.cbsnews.com/8301-18560\\_162-7195247.html](http://www.cbsnews.com/8301-18560_162-7195247.html). Accessed June 18, 2013.

## Senate Bill Seeks to Restrict Consumer Access to Better Drugs!

A battle is raging in the US Senate over whether you will be able to continue to obtain medications that are often more effective and less expensive than what large pharmaceutical companies offer.

On April 16, 2013, the FDA was subpoenaed to appear before Congress to account for the contaminated drugs made at New England Compounding Pharmacy (NECC).

According to the Congressional investigative reports, this unscrupulous manufacturer was allowed to inflict this carnage because the FDA failed to do its job.

Instead of punishing the FDA for its appalling dereliction of duty, the Senate has introduced a bill giving the FDA more power to take away bioidentical hormones and other drugs that are safely being made at compounding pharmacies.

Large pharmaceutical companies are using the NECC fiasco as a ruse to give the FDA more power to stamp out lower-cost competition.

You can easily contact your Senators by logging on to Life Extension's legislative action website [lef.org/lac](http://lef.org/lac) and sending them a prepared email instructing them to oppose S.959. The provisions contained in S.959 give the FDA the authority to restrict and eliminate the bioidentical hormones upon which millions of women and men depend.

FDA failures have resulted in unprecedented numbers of contaminated drugs poisoning Americans. The absolute worst response to these catastrophes is to give the FDA more power when it utterly botched its job with the draconian authority it already has.

Please send an email alerting your members of Congress to vote NO on Senate bill 959 (S.959).

You can also phone your Senators at 1-877-762-8762 to let your voice be heard.



# SUPPORT FOR THE IMMUNE SYSTEM

**Reishi mushroom** has been traditionally used to boost immune system vitality. Its broad-spectrum benefits have been demonstrated in thousands of studies.<sup>1</sup>

An advanced extraction technology has resulted in a new **Reishi extract** that make its active compounds even more bio-available.

## REISHI SUPPORTS A HEALTHY IMMUNE SYSTEM

An abundance of evidence demonstrates that **Reishi** constituents enhance the protective activity of the body's **hematopoietic stem cells**, **T-cells**, and other crucial immune factors.<sup>2-9</sup>

**Reishi's** immune-supporting compounds include an array of unique *polysaccharides*, *triterpenes*, and other constituents,<sup>10,11</sup> many of which assist activation of the cell surface receptors that modulate normal immunity.<sup>12</sup>

The **Reishi** mushroom also supports the body's production of endogenous antioxidant enzymes—such as **superoxide dismutase (SOD)**, **catalase**, and **glutathione**—which, in turn, support the body's natural immune defenses against free radical damage!<sup>13,14</sup>

## ADVANCED EXTRACTION TECHNOLOGY

**Reishi Extract Mushroom Complex** delivers powerful compounds and represents the **next generation** of natural immune support. Reishi extracts standardized to polysaccharides have been available for years, but most do not standardize for triterpenes and include the spores. This full-spectrum extract has multiple components that have shown to support healthy immune function and enhanced longevity in a natural experimental aging model.<sup>15</sup>



Item# 01708

The suggested 2 capsules a day of  
**Reishi Extract Mushroom Complex** provide:

<b>Reishi mushroom</b> ( <i>Ganoderma lucidium</i> ) extract ( <b>Fruit body</b> )	<b>980 mg</b>
[standardized to 13.5% polysaccharides (132.3mg) and 6% triterpenes (58.8mg)]	
<b>Shell-broken Reishi mushroom</b> ( <i>Ganoderma lucidium</i> ) spore	<b>150 mg</b>

A bottle containing 60 vegetarian capsules of **Reishi Extract Mushroom Complex** retails for \$30. If a member buys four bottles, the price reduced to **\$20.25**.

## References

1. *Front Pharmacol.* 2012;3:51.
2. *Bioorg Med Chem.* 2010 Dec 15;18(24):8583-91.
3. *Br J Pharmacol.* 2003 May;139(2):289-98.
4. *Int J Med Mushrooms.* 2011;13(5):441-8.
5. *Biosci Biotechnol Biochem.* 2009 Dec;73(12):2589-94.
6. *Front Pharmacol.* 2012;3:135.
7. *Mol Pharmacol.* 2006 Aug;70(2):637-44.
8. *Chem Pharm Bull (Tokyo).* 2002 May;50(5):623-9.
9. *Acta Pharmacol Sin.* 2003 Apr;24(4):321-6.
10. *Curr Pharm Biotechnol.* 2009 Dec;10(8):717-42.
11. *Am J Chin Med.* 2011;39(1):15-27.
12. *J Biol Chem.* 2009 Dec 11;284(50):34479-89.
13. *J Basic Clin Physiol Pharmacol.* 2009;20(4):289-307.
14. *Clin Nutr.* 2010 Jun;29(3):406-12.
15. *FASEB.* 2012;26;373.2.

To order Reishi Extract Mushroom Complex, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com).

# LIMIT THE RELEASE OF GLUCOSE FROM STARCHY FOODS

Hundreds of studies document the importance of protecting against blood **glucose** surges.<sup>1</sup>

What the public doesn't realize is that a huge source of **blood sugar** emanates from dietary **starch**.<sup>2,3</sup> This includes bread, pasta, potatoes, and rice. But even so-called healthy carbohydrates such as whole-grain bread and brown rice can induce undesirable glucose spikes.<sup>4</sup>

In a breakthrough development, scientists have shown that an enzyme called **transglucosidase** converts **starches** into prebiotic **fiber**—*within your own digestive tract!*<sup>5,6</sup> Taking this enzyme with starchy meals helps avoid the flood of **glucose** into the bloodstream that results from eating carbohydrates.

## COMPELLING HUMAN RESEARCH DATA

Published studies show that **transglucosidase** limits the amount of **SUGAR** released from **STARCH**, especially in the critical **after-meal** period. It does this by converting dietary starch into a beneficial indigestible prebiotic **fiber**.<sup>5,6</sup>

**Transglucosidase** has been demonstrated in humans to reduce the level of **rapidly digested** starch in a carbohydrate food item by **31%**.<sup>7</sup> This helps maintain healthy blood glucose, cholesterol, and insulin levels for those whose levels are already in the normal range.<sup>8-11</sup>

## SHIELD AGAINST AFTER-MEAL GLUCOSE SURGES

Each vegetarian capsule of the new **GlycemicPro™ Transglucosidase** contains a full **450,000 TG** (transglucosidase activity units) of **trans-glucosidase**.

Just one capsule taken with starch-containing meals helps limit the release of sugar from starch. Those who consume a low-starch diet may need to take only one **GlycemicPro™ Transglucosidase** capsule daily with their starch-containing meal.

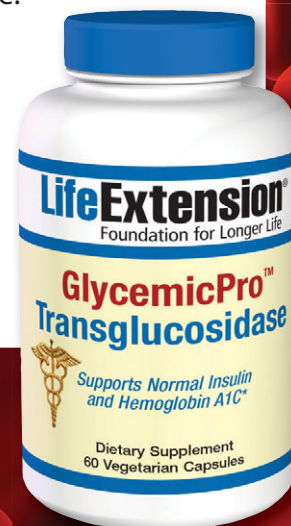
A bottle of 60 vegetarian capsules of **GlycemicPro™ Transglucosidase** retails for \$54. If a member buys four bottles, the price is reduced to **\$37.50** per bottle.

### References

1. Available at: [www.myhealthnewsdaily.com/3759-soda-type-2-diabetes-risk.html](http://www.myhealthnewsdaily.com/3759-soda-type-2-diabetes-risk.html). Accessed April 30, 2013.
2. *Am J Clin Nutr*. 1998 Jun;67(6):1186-96.
3. *Am J Clin Nutr*. 2001 Feb;73(2):177-89.
4. *Am J Clin Nutr*. 1997 Nov;66(5):1264-76.
5. *J Clin Biochem Nutr*. 2007 Nov;41(3):191-6.
6. *Vet Res Commun*. 2010 Feb;34(2):161-72.
7. *J Agric Food Chem*. 2007 May 30;55(11):4540-7.
8. *Clin Microbiol Infect*. 2012 Jul;18 Suppl 4:50-3.
9. *Acta Cir Bras*. 2012 Mar;27(3):279-82.
10. *Indian J Endocrinol Metab*. 2012 Jan;16(1):20-7.
11. *Gastroenterol Clin North Am*. 2012 Dec;41(4):843-54.

Contains soybeans. Contains tree nuts (coconut).

CAUTION: If you are taking blood glucose lowering medication, consult your healthcare provider before taking this product.



ITEM # 01731

**GlycemicPro™ Transglucosidase**,  
call 1-800-544-4440  
or visit [www.LifeExtension.com](http://www.LifeExtension.com)

# NEXT-GENERATION VITAMIN C

ITEM# 01717



*Backed by controlled human trials, FAST-C®  
COMBINES FASTER-ABSORBING ASCORBIC ACID-MINERAL  
BLEND with vitamin C “recycling” power.*

Vitamin C efficacy can be limited because it is quickly utilized and excreted by the body.<sup>1</sup>

A **novel** formula sets a **new** standard for **rapid absorption**, enhancing the time that vitamin C is delivered to the cells.

In **two** human trials at a distinguished research center, **FAST-C®** was compared head-to-head with a leading premium brand of “enhanced absorption” vitamin C.<sup>2,3</sup>

Their findings validate that **FAST-C®** has faster absorption—and without greater excretion!

## Rapid Vitamin C Delivery

Vitamin C neutralizes free radicals,<sup>4,7</sup> supports biosynthesis of certain neurotransmitters,<sup>8,9</sup> and promotes production of vital tissue (collagen) that supports arterial walls, skin, and bones.<sup>7,9</sup> Vitamin C promotes immunity,<sup>7,10</sup> boosts lymphocyte glutathione levels,<sup>11</sup> and helps regenerate other antioxidants, including vitamin E.<sup>12</sup>

But because it leaves the body quickly,<sup>1</sup> capturing vitamin C’s optimal benefits has required taking supplements several times daily, *hoping* they’ll be effective without posing a risk for acid-sensitive stomachs.

The scientific community has long sought faster-absorbing vitamin C formulas.

**FAST-C® with Dihydroquercetin** is the *only* vitamin C product to incorporate:

1. A **proprietary** blend of alkalizing **minerals** that yields an almost completely acid-neutralized—which is better than “buffered”—vitamin C for sensitive stomachs.
2. **Piperine (Bioperine®)**, a multi-patented, black pepper alkaloid that significantly accelerates vitamin C absorption, shortening the time to peak plasma concentration.<sup>3</sup>
3. **Dihydroquercetin**, a grape leaf derived flavonoid that donates electrons back to vitamin C molecules that have spent their electrons neutralizing free radicals—*regenerating vitamin C to work again!*<sup>13</sup>

**Each vegetarian tablet of FAST-C® with Dihydroquercetin provides:**

<b>Vitamin C</b> (as ascorbic acid)	<b>500 mg</b>
<b>Calcium</b> (as calcium carbonate)	<b>79 mg</b>
<b>Magnesium</b> (as magnesium hydroxide)	<b>8 mg</b>
<b>Bioperine® piperine</b> [from black pepper ( <i>Piper nigrum</i> ) extract (fruit)]	<b>3 mg</b>
<b>Total Dihydroquercetins</b> [from grape ( <i>Vitis vinifera</i> ) extract (leaf)]	<b>25 mg</b>

A bottle of 120 vegetarian tablets of **FAST-C® with Dihydroquercetin** retails for **\$26**. If a member buys four bottles, the price is reduced to just **\$18** per bottle.

Take one (1) tablet once or twice daily. Do not take more than 15 mg per day of Bioperine®.

FAST-C® is a registered trademark of Scientific Food Solutions, LLC.  
Bioperine® is a registered trademark of Sabinsa Corporation.

## References

1. *PLoS Med.* 2005 Sep;2(9):e307.
2. *FASEB J.* April 2008;22 Meeting Abstract Supp:689.
3. American College of Nutrition. Annual Meeting, October, 2009.
4. *Ann N Y Acad Sci.* 1992 Sep 30;669:7-20.
5. *Am J Clin Nutr.* 1996 Jun;63(6):985S-905S.
6. *FASEB J.* 1995 Apr;9(7):526-33.
7. *Altern Med Rev.* 2003 Nov;8(4):359-77.
8. *J Nutr.* 2007;137:2171-84.
9. *Am J Clin Nutr.* 1999;69:1086-107.
10. *Curr Drug Targets.* 2012 Dec 1;13(14):1757-71.
11. *Am J Clin Nutr.* 2003 Jan;77(1):189-95.
12. *Lipids.* 2012 Dec;47(12):1193-207.
13. *Free Radic Biol Med.* 1995 Jul;19(1):45-52.



**To order FAST-C® with Dihydroquercetin, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

ITEM # 01707

# REMARKABLE WEIGHT REDUCTION WITH **CoffeeGenic®** **Green Coffee Bean Extract (GCA™)**



In a placebo-controlled human study, subjects took **350 mg** of **green coffee extract** three times daily (before meals).

Study subjects were not asked to change their calorie intake or exercise level, but people participating in weight loss trials often do make lifestyle changes in order to increase their odds of shedding body fat.

The impressive findings, published in January 2012, noted that men and women lost an average of **17.6 pounds**—over **10%** of body weight—after **12 weeks** of **green coffee extract** supplementation! There was also an average **4.44%** reduction in body fat percentage!<sup>1</sup>

The conclusion is that **green coffee extract** supports the ability to lose weight.<sup>1</sup> The form of **green coffee bean extract** used in this successful weight loss study is **CoffeeGenic® Green Coffee Extract (GCA™)**.

## How CoffeeGenic® Works

The active ingredient in **green coffee bean extract** is **chlorogenic acid**.

Published studies on **chlorogenic acid** demonstrate a wide range of supportive properties related to insulin sensitivity<sup>2</sup> and to glucose formation<sup>3,4</sup> and absorption.<sup>5</sup>

Clinical research has shown that **chlorogenic acid** helps limit after-meal glucose surges, supporting healthy blood sugar levels for those already within the normal range.<sup>6</sup>

**CoffeeGenic® Green Coffee Extract (GCA™)** provides a standardized dose of **chlorogenic acid** extracted from **green coffee beans**.

Based on the latest research, **CoffeeGenic® Weight Management™ with Green Coffee Extract (GCA™)** has been formulated to provide in each capsule:

<b>CoffeeGenic® Green Coffee Bean Extract</b> [Standardized to 50% <i>chlorogenic acid</i> ]	<b>350 mg</b>
<b>Integra-Lean® African Mango</b> <i>(Irvingia gabonensis)</i> <b>proprietary extract</b> (seed)	<b>100 mg</b>
<b>Chromium</b> [as Crominex® 3+ chromium stabilized with Capros® <i>(Phyllanthus emblica)</i> extract (fruit) and PrimaVie® Shilajit]	<b>150 mcg</b>
<b>Iodine</b> (as potassium iodide)	<b>100 mcg</b>
<b>Green Tea decaffeinated extract</b> [98% polyphenols, 45% EGCG]	<b>50 mg</b>

The suggested dose is just one capsule before each meal. A bottle of **90 vegetarian capsules** of **CoffeeGenic® Weight Management™ with Green Coffee Extract (GCA™)** retails for \$48. If a member buys four bottles, the price is reduced to **\$31.50 per bottle**.

## References

1. *Diabetes Metab Syndr Obes.* 2012;5:21-7.
2. *J Nutr Biochem.* 2006 Jan;17(1):63-71.
3. *J Agric Food Chem.* 2010 Apr 14;58(7):4141-4.
4. *Ethnopharmacol.* 2010 Jul 6;130(1):93-7.
5. *J Nutr Sci Vitaminol (Tokyo).* 2007 Apr;53(2):166-73.

**This supplement should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.**

**Caution:** If you are taking blood glucose lowering medication, consult your healthcare provider before taking this product.

6. Nagendran MV. Effect of Green Coffee Bean Extract (GCE), High in Chlorogenic Acids, on Glucose Metabolism. Poster presentation number: 45-LB-P. Obesity 2011, the 29th Annual Scientific Meeting of the Obesity Society. Orlando, Florida. October 1-5, 2011.

Integra-Lean® *Irvingia* is protected by U.S. Patent No. 7,537,790. Other patents pending. IG08-131® proprietary extract is a registered trademark of Gateway Health Alliances, Inc. CoffeeGenic® contains GCA™ which is a registered trademark of Applied Food Sciences, Inc.

**To order CoffeeGenic® Weight Management™ with Green Coffee Extract (GCA™),  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

# BONE RESTORE

NOW WITH VITAMIN K2

and highly *absorbable*  
Magnesium Citrate!



**Bone Restore** combines critical **bone boosting** nutrients into one **superior formula**.

**Bone Restore** includes highly *absorbable* forms of **calcium** and **boron**, along with **vitamin D3**, **magnesium**, **zinc**, **manganese**, and **silicon**. **Bone Restore** is now available with or without **vitamin K2** (MK-7).

**Bone Restore** contains **magnesium citrate**, which is one of the most absorbable forms of magnesium.

The retail price for 150 capsules of **Bone Restore** is \$26.

If a member buys four bottles, the price is reduced to **\$17.25** per bottle. (Item# 01711)

The same **Bone Restore** formula without vitamin K2 (MK-7) is available as well. The retail price for 150 capsules is \$22.50. If a member buys four bottles, the price is reduced to **\$14.63** per bottle. (Item# 01611)

**Note:** Those who take **Super Booster** or **Super K** usually do not need additional vitamin K2. They should order **Bone Restore** without vitamin K2. Those taking the anti-coagulant drug **Coumadin**® (warfarin) should use **BONE RESTORE** without vitamin K2.

#### Just five capsules of Bone Restore provide:

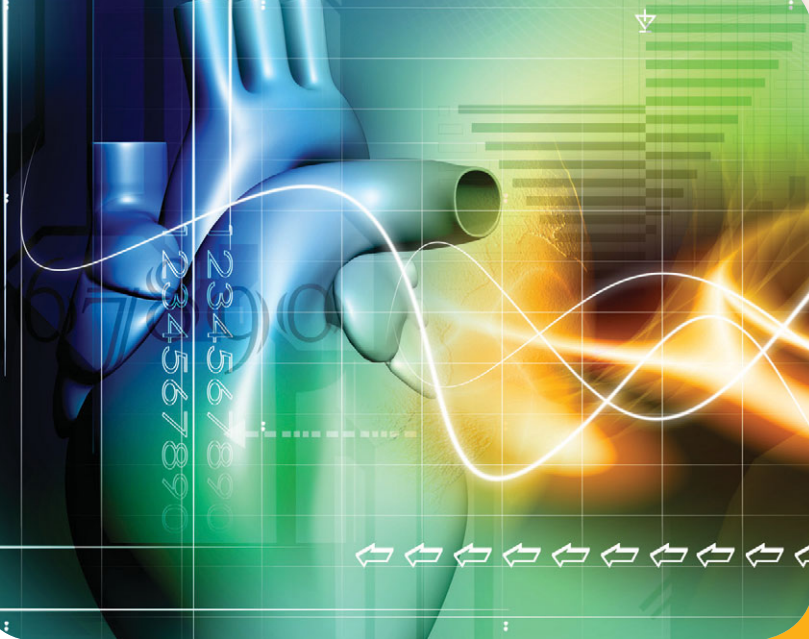
<b>Highly Absorbable Calcium</b> (as DimaCal® dicalcium malate, TRAACS® calcium glycinate chelate, calcium fructoborate)	<b>1,200 mg</b>
<b>Vitamin D3</b>	<b>1,000 IU</b>
<b>Vitamin K2</b> (as menaquinone-7)	<b>200 mcg</b>
<b>Magnesium</b> (as magnesium citrate)	<b>100 mg</b>
<b>Boron</b> (calcium fructoborate as patented FruiteX B® OsteoBoron®)	<b>3 mg</b>
<b>Zinc</b> (as TRAACS® zinc glycinate chelate)	<b>2 mg</b>
<b>Manganese</b>	<b>1 mg</b>
<b>Silicon</b>	<b>5 mg</b>

FruiteX B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049.

DimaCal® and TRAACS® are registered trademarks of Albion Laboratories, Inc. Malate is covered by U.S. Patent 6,706,904 and patents pending.

**To order Bone Restore, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.



## IN THE NEWS

### Dietary Supplements and Exercise Associated with Lower Heart Disease Risk in Women

In the *Journal of Clinical Nursing*, researchers from Taiwan report a reduction in the incidence of coronary artery disease (CAD) in middle-aged women who engaged in exercise or used dietary supplements.\*

The study included 65 women whose age averaged 56.2 years. Cardiac catheterization revealed the presence of coronary artery disease in 31 subjects. Questionnaire responses provided data concerning activity levels and the intake of dietary supplements over the preceding year and others.

Blood samples were analyzed for fasting glucose, lipids, and additional factors.

Adjusted analysis of the data uncovered a **72% lower** risk of coronary artery disease in supplement users compared to nonusers, and an **84% lower** risk of CAD among those who engaged in physical activity in comparison with inactive women.

**Editor's Note:** Authors C. C. Tsai and colleagues remark that by reducing lipid peroxidation and free radical damage, vitamins C and E, and other antioxidants help protect the heart's blood vessels. In addition, studies have found a reduction in low-density lipoprotein cholesterol and triglycerides in association with increased vitamin C intake. Furthermore, B vitamins can help prevent increases in serum homocysteine, which damages the lining of the vessels, lowers nitric oxide levels, and alters platelet activity.

—D. Dye

\* *J Clin Nursing*. 2013 Jun 7.

### Increased Breast Cancer Risk Associated with Deficient Vitamin D Levels in Saudi Women

The *American Journal of Clinical Nutrition* recently published the findings of researchers from Saudi Arabia and the University of Arizona of a greater risk of breast cancer among women with deficient levels of serum vitamin D.\*

Fatimah M. Yousef and her associates compared 120 Saudi women with invasive breast cancer with 120 age-matched controls. Dietary questionnaires completed by the participants provided information concerning vitamin D intake. Blood samples were analyzed for serum 25-hydroxyvitamin D levels.

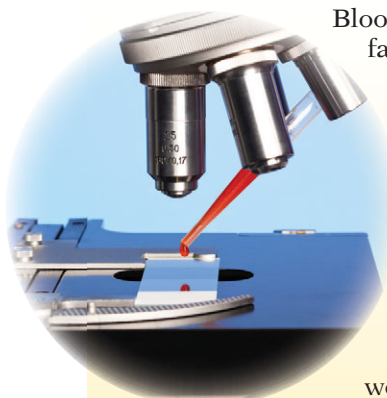
Dietary intake of vitamin D among the participants was low. Average serum 25-hydroxyvitamin D levels were **9.4 ng/mL** among subjects with breast cancer in comparison with **15.4 ng/mL** in the control group. While **38.3%** of the control group had deficient vitamin D levels of less than **10 ng/mL**, this percentage rose to **60.8%** of the breast cancer group.

Optimal **25-hydroxyvitamin D** blood levels are between **50-80 ng/mL**. Religious laws in Saudi Arabia prohibit women from exposing their skin in public. Lack of sunlight and lack of supplements results in very low vitamin D levels and subsequent increases in breast cancer rates.

**Editor's Note:** When women whose vitamin D levels were less than **10 ng/mL** were compared with those whose levels were greater than **20 ng/mL**, the risk of breast cancer was more than **six times higher** in the lower vitamin D level group.

—D. Dye

\* *Am J Clin Nutr*. 2013 Jul; 98(1)105-10.





## Increased Vegetable Fat Intake Linked with Lower Risk of Premature Death in Prostate Cancer Patients

In *JAMA Internal Medicine*, researchers from the University of California and Harvard report an association between greater consumption of vegetable fat intake and a lower risk of dying over an 8.4 year median among men with prostate cancer.\*

The investigation included 4,577 men who were diagnosed with nonmetastatic prostate cancer between 1986 and 2010. Questionnaires completed at the beginning of the study and every four years thereafter provided data on fat intake.

Events of lethal prostate cancer, defined as the occurrence of distant metastases or death from the disease, occurred in 315 subjects. The adjusted risk of events of lethal prostate cancer was **16%** higher among those whose animal fat intake was among the top **20%** in comparison with those whose intake was among the lowest **20%**. In contrast, an intake of vegetable fat that was among the top **20%** was associated with a **36%** lower risk.

**Editor's Note:** When death from any cause was examined, those whose animal fat intake was highest had a **19%** greater risk of dying over follow-up in comparison with the lowest group, and those whose vegetable fat intake was highest had a **35%** lower risk.

—D. Dye

\* *JAMA Int Med.* 2013 Jun 10.

## Decreased DHEA Sulfate Levels Linked to Greater Stroke Risk in Women

In an article published in the American Heart Association journal *Stroke*, researchers from Brigham Women's Hospital and Harvard School of Public Health report an association between lower levels of the hormone dehydroepiandrosterone sulfate (DHEAS) and a greater risk of stroke in older women.\*

The study included women who had no history of stroke upon enrollment in the Nurses' Health Study in 1976. Stored blood samples obtained between 1989 and 1990 were analyzed for DHEA sulfate levels. Four hundred sixty-one participants in whom stroke had occurred over follow-up were matched for age, race, menopausal status, and other factors with 461 control subjects.

Among women whose DHEAS levels were among the lowest **25%** of participants in the current study, the adjusted risk of experiencing an ischemic stroke was **33%** higher than that of women whose levels were among the top **25%**.

**Editor's Note:** Authors Kathryn M. Rexrode MD, MPH, and colleagues note that DHEA could influence the development of cardiovascular disease and stroke through mechanisms that include inhibition of the migration and proliferation of vascular wall cells, and stimulation of vascular smooth muscle cell apoptosis, which reduces vascular remodeling subsequent to injury.

—D. Dye

\* *Stroke.* 2013 May 23.

## Higher Dose Metformin Associated with Improved Survival Among Colorectal Cancer Patients

*Cancer Epidemiology, Biomarkers & Prevention* published an article that reports a positive effect for the antidiabetic drug metformin in colorectal cancer survival among men and women with stage I-III colorectal cancer diagnosed between 2001 and 2006. Participants included 207 diabetics who had been prescribed metformin, 108 diabetics who did not use the drug, and 3,501 nondiabetics.\* The subjects were followed through 2010, during which 196 deaths occurred among those with diabetes and 1,897 occurred among the nondiabetics.

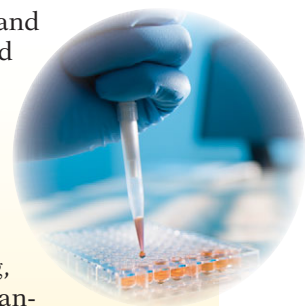
When subjects treated with metformin were compared to diabetics who were not treated with the drug, a reduction in the risk of death due to colorectal cancer that "approached significance" was observed. However, those whose use of metformin was categorized as high intensity had a **56%** lower risk of dying of the disease than diabetics not treated with metformin.

Intensity of metformin use was calculated as high or low based the number of days that metformin was presumably taken in the year prior to a cancer diagnosis. The average dose of metformin used by study participants was **1,148 mg** daily.

**Editor's Note:** Metformin use was additionally associated with a **31%** lower adjusted risk of dying from any cause among diabetic subjects over follow-up.

—D. Dye

\* *Cancer Epidemiol Biomark Prev.* 2013 Jun 10.



## Research Supports Causative Role for Reduced Vitamin D Levels in High Blood Pressure

At the annual conference of the European Society of Human Genetics, Dr. Karani S. Vimalaswaran presented the finding of a causative role for vitamin D in the development of hypertension.\*

Dr. Vimalaswaran reported the findings of the D-CarDia collaboration that included over 35 studies involving up to 108,173 participants, which associated higher serum 25-hydroxyvitamin D levels with lower blood pressure. To validate causation, a team of researchers examined the association of four vitamin D-related genetic variants known as single nucleotide polymorphisms (SNPs) with 25-hydroxyvitamin D levels and with hypertension.

An association with serum 25-hydroxyvitamin D levels was confirmed for all SNPs. The researchers also uncovered an association between one SNP (CYP2R1) and diastolic blood pressure and hypertension. Following further analysis, it was concluded that reduced vitamin D levels have a modest causal association with hypertension.

**Editor's Note:** A decrease in diastolic blood pressure of **0.24 mmHg** and a **7%** decrease in the risk of hypertension were associated with each **10%** increase in serum 25-hydroxyvitamin D.

—D. Dye

\* Annual Conference of the European Society of Human Genetics. 2013 June 11.



## Higher Plasma Vitamin D Levels Associated with Lower Biomarkers of Cardiometabolic Disease

The *United States Centers for Disease Control and Prevention* (CDC) reports a reduction in risk factors for cardiometabolic disease among men and women with higher plasma vitamin D levels.\*

Canadian researchers evaluated data from 1,928 men and women between the ages of 6 and 79 years who participated in the Canadian Health Measures Survey. Blood samples obtained during physical examinations were analyzed for glucose, fasting insulin, C-reactive protein, fibrinogen, homocysteine, triglycerides, total cholesterol, high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), apolipoprotein A1, apolipoprotein B, and 25-hydroxyvitamin D [25(OH)D].

Vitamin D levels varied according to the month during which plasma levels were sampled. Subjects who had higher levels of **vitamin D** had reductions in insulin, insulin resistance, triglycerides, total cholesterol, LDL cholesterol, and ratio of total to HDL cholesterol.

**Editor's Note:** Cardiometabolic disease, also known as metabolic syndrome, is characterized by dyslipidemia, dysglycemia, abdominal obesity, and hypertension, which greatly increase the risk of cardiovascular disease and diabetes.

—D. Dye

\* *Prev Chronic Dis.* 2013 Jun 6;10:E91.



## Cinnamon Compounds May Protect Against Tau Protein Aggregation in Alzheimer's Disease

The *Journal of Alzheimer's Disease* published an article by Donald J. Graves and his associates at the University of California, Santa Barbara which describes how compounds in cinnamon reduce the aggregation of tau protein that occurs, along with amyloid-beta aggregation, in the brains of men and women with Alzheimer's disease.\*

Tau protein is responsible for the assembly of microtubules within the cell that form its structure. When tau does not effectively bind to the microtubules, it clumps together, forming tangled fibers. Previous research conducted by Dr. Graves' team uncovered an ability of cinnamon extract to inhibit tau aggregation and dissociate tangles in brain tissue derived from Alzheimer's disease patients.

The current study revealed that the compounds cinnamaldehyde and the oxidized form of epicatechin derived from cinnamon extract inhibited tau aggregation in vitro by protecting the protein from oxidative stress.

**Editor's Note:** Lead author Roshni C. George noted that, "Cell membranes that are oxidized also produce reactive derivatives, such as Acrolein, that can damage the cysteines. Epicatechin also sequesters those byproducts."

—D. Dye

\* *J Alz Dis.* 2013 Jun;36(1)21-40.



## Preventing Vitamin D Deficiency May Help Delay Early Puberty

A presentation at The Endocrine Society's 95<sup>th</sup> Annual Meeting held in San Francisco this year revealed a greater risk of precocious puberty in girls with deficient levels of vitamin D in comparison with girls who entered puberty at a normal age.\*

The research included 110 girls aged 7 to 10 years, among whom 35 were categorized as having experienced precocious puberty according to the Tanner Scale. Blood samples collected from the subjects were analyzed for serum 25-hydroxyvitamin D levels and other factors.

Vitamin D levels were lower on average among girls with early puberty in comparison with girls who entered puberty at a normal age. Forty-four percent of the girls who underwent precocious puberty had serum 25-hydroxyvitamin D levels that were classified as severely deficient at less than **10 ng/mL** in comparison with **21%** of the normal group.

**Editor's Note:** In additional experimentation, the researchers found that the administration of vitamin D suppressed the ability of N-methyl-D-aspartate (NMDA) to release gonadotropin-releasing hormone (GnRH, which triggers the ovulation process) from neurons.

—D. Dye

\* The Endocrine Society's 95th Annual Meeting, San Francisco. 2013 Jun 17.



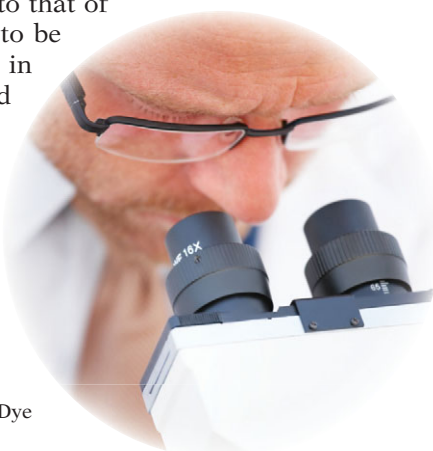
## Life-Extending Mechanism of Rhodiola Explored

The journal *PLOS ONE* published an article that reports a benefit for *Rhodiola rosea* in extending the life span of fruit flies.\* The herb does not appear to promote longevity via mechanisms involved in calorie restriction, which is a well-known method of extending life span in experimental models.

Previous studies revealed that Rhodiola can extend the lives of flies, yeast, and worms. In order to determine whether Rhodiola utilized the same mechanisms as calorie restriction, Mahtab Jafari and colleagues at the University of California, Irvine gave Rhodiola to fruit flies provided with diets containing reduced amounts of yeast. If Rhodiola extended life span in a manner similar to that of dietary restriction, it was not expected to be associated with longer life in animals in which the molecular pathways associated with dietary restriction were already affected, but Dr. Jafari's team observed an increase in life span in male and female flies that received Rhodiola.

**Editor's Note:** In fruit flies in which the known molecular pathways associated with calorie restriction (including silent information regulator 2 (SIR2) proteins, insulin, and insulin-like growth factor signaling and target of rapamycin pathways) were perturbed, Rhodiola still elicited an extension of life span.

—D. Dye



\* *PLOS ONE*. 2013 May 21.

## Diabetes Risk Linked to Red Meat Consumption

Red meat consumption has been consistently associated with an increased risk of type II diabetes mellitus. However, whether changes in red meat intake are related to subsequent type II diabetes risk remains unknown.\* A study published in the *Journal of the American Medical Association* set out to examine this association.

The study followed up with 26,357 men in the Health Professionals Follow-up Study (1986-2006), 48,709 women in the Nurses' Health Study (1986-2006), and 74,077 women in the Nurses' Health Study II (1991-2007). Diet was assessed by validated food frequency questionnaires and updated every four years. Time-dependent models were used to calculate the effects of age, family history, race, marital status, initial red meat consumption, smoking status, and changes in other lifestyle factors (physical activity, alcohol intake, total energy intake, and diet quality).

The study concluded that increasing red meat consumption over time is associated with an elevated subsequent risk of type II diabetes, and the association is partly mediated by body weight. Their results add further evidence that limiting red meat consumption over time confers benefits for type II diabetes prevention.

—M. Richmond

\* Available at: <http://archinte.jamanetwork.com/article.aspx?articleid=1697785>. Accessed June 21, 2013.

NEW

# ASTAXANTHIN Formula with *Increased* Bio-availability

**Astaxanthin** is a fat-soluble carotenoid compound. The challenge to deriving maximum benefits is its normally limited absorption—as low as about **50%.**<sup>1,2</sup> Assimilation of astaxanthin is impeded by limited uptake and intestinal degradation.

A new **Astaxanthin 4 mg with Phospholipids** combines **4 milligrams** of natural astaxanthin with a *proprietary blend* of **phospholipids**.

By incorporating phospholipids, scientific study shows that carotenoid **absorption** may be enhanced **several-fold.**<sup>3</sup>

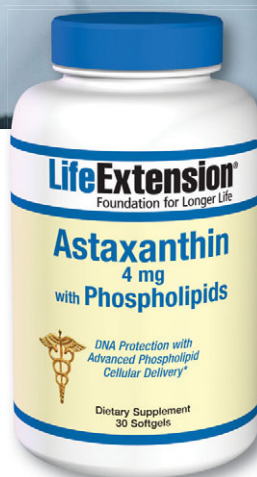
The new **Astaxanthin 4 mg with Phospholipids** uses four different phospholipids to facilitate maximum absorption of **astaxanthin** into the bloodstream, where it is transported to cells throughout the body.

## ASTAXANTHIN

Each softgel of the new **Astaxanthin with Phospholipids** provides **4 mg** of natural astaxanthin along with **80 mg** of proprietary phospholipid blend. Just one softgel a day provides tremendous systemic cellular support!



A bottle of 30 softgels of **Astaxanthin 4 mg with Phospholipids** retails for \$16. If a member buys four bottles, the price is reduced to **\$10.50** per bottle. **Contains soybeans.**



Item #01720

### References

1. *Mol Nutr Food Res.* 2012 Sep;56(9):1385-97.
2. *Eur J Pharm Sci.* 2003 Jul; 19(4):299-304.
3. *Int J Pharm.* 2011 Jun 30; 412(1-2):99-105.

To order **Astaxanthin 4 mg with Phospholipids**,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



# CoQ10, Shilajit, and PQQ *Triple-Action Mitochondrial Support!*

**Life Extension®** continues to develop increasingly potent mitochondria-boosting formulations.<sup>1-4</sup>

The new **Super Ubiquinol CoQ10 With BioPQQ®** contains **shilajit** (which studies have shown doubles CoQ10 levels in the mitochondria), **plus** the breakthrough compound **PQQ** (shown to support the **spontaneous generation of new mitochondria** in aging cells). This represents a **three-way** strategy for enhanced mitochondrial support!

## 1. SUPER UBIQUINOL COQ10

CoQ10 is required to convert the energy from fats and sugars you eat into usable cellular energy. More people are supplementing with CoQ10 than ever before. A key reason is increased awareness that the body's production of CoQ10 declines significantly with advancing age.<sup>5</sup> "Statin" drugs also deplete CoQ10 levels in the blood, and possibly, tissues.<sup>6,7</sup> For example, statin drugs reduce plasma CoQ10 by almost **40%**—but the aging process *itself* reduces CoQ10 levels in the heart muscle wall by **72%**!<sup>8</sup>

Scientific studies show that **absorption** of the **ubiquinol** form of CoQ10 is far greater than the conventional

ubiquinone form. In middle-aged mice, **ubiquinol** was shown to be **40% more effective** in slowing measurements of aging, compared to ubiquinone.<sup>9</sup> **Life Extension®** offers this highly bioavailable ubiquinol form of patented CoQ10 in an advanced delivery system, providing an unparalleled absorption level.<sup>10</sup>

## 2. ENHANCED SUPPORT WITH SHILAJIT

**PrimaVie® shilajit** has been shown to **double** levels of **CoQ10** in mitochondria!<sup>11</sup> Combining CoQ10 and shilajit produced a **56% increase** in energy production in the brain—**40% better** than CoQ10 alone. And in muscle, there was a **144% increase** in energy production—**27% better** than CoQ10 alone.<sup>12</sup>

Shilajit boosts CoQ10's beneficial effects by stabilizing CoQ10 in the superior **ubiquinol** form.<sup>13,14</sup> Additionally, shilajit facilitates more efficient delivery of CoQ10 into the mitochondria, which results in greater cellular energy production.<sup>15-18</sup> Shilajit itself is rich in essential compounds that help the mitochondria convert fats and sugars into **ATP** (adenosine triphosphate), the body's main source of energy.<sup>16</sup>



ITEM # 01733

### 3. PQQ PROMOTES GROWTH OF NEW MITOCHONDRIA!

Supporting mitochondria is one thing. But until recently, the only options for aging individuals to promote replenishment of the declining numbers of mitochondria in their bodies were long-term calorie restriction or exhaustive physical activity—difficult or impractical for most aging people.

Now **PQQ** offers a viable alternative: **PQQ** (*pyrroloquinoline quinone*) promotes **spontaneous production of new mitochondria!**<sup>19</sup>

In fact, **PQQ** promotes youthful cellular function in **three** distinct ways:

- **Promotes mitochondrial biogenesis.** PQQ activates genes that promote the formation of *fresh mitochondria!*<sup>19</sup> It also beneficially interacts with genes directly involved in mitochondrial health. These same genes support *healthy body weight, normal fat and sugar metabolism, and youthful cellular proliferation.*<sup>20</sup>
- **Mitochondrial defense.** Mitochondria possess their *own* DNA, distinct from those contained in the cell nucleus. Unfortunately, compared to nuclear DNA, mitochondrial DNA are relatively unprotected—and yet situated at the *source* of both energy and free-radical production! PQQ's antioxidant potency and favorable gene-expression profile powerfully boost mitochondrial defense.
- **Antioxidant power.** PQQ is a potent antioxidant. Its extraordinary molecular stability enables it to facilitate thousands of antioxidant reactions in the mitochondria—*without breaking down*—for maximum antioxidant and bioenergetic support.<sup>21</sup>

**PQQ** is an **essential nutrient**, meaning that your body cannot make it on its own. A wealth of research demonstrates that—alone and especially in combination with CoQ10—its unique nutritional profile supports heart health and brain function.<sup>22-24</sup> This should be no surprise, given how much energy these vital organs need.

**Life Extension®** has identified a purified, highly potent form of PQQ from Japan that is produced through a unique fermentation process. The result is some of the highest quality PQQ available today.

### BREAKTHROUGH WEAPON IN THE BATTLE AGAINST AGING!

**Super Ubiquinol CoQ10 With BioPQQ®** combines:

- **CoQ10** in a super-absorbable *ubiquinol* form.
- **Shilajit** to synergistically boost mitochondrial CoQ10 levels and youthful cellular energy.
- **PQQ** to support spontaneous generation of new mitochondria in aging people.

The suggested dosage of one (1) softgel daily of **Super Ubiquinol CoQ10 With BioPQQ®** provides:

<b>Ubiquinol (as Kaneka QH® Ubiquinol)</b>	<b>100 mg</b>
<b>PrimaVie® Shilajit fulvic acid complex</b>	<b>100 mg</b>
<b>BioPQQ® Pyrroloquinoline quinone disodium salt</b>	<b>10 mg</b>

A bottle of 30 softgels of **Super Ubiquinol CoQ10 With BioPQQ®** retails for \$54. If a member buys four bottles, the price is reduced to **\$37.50** per bottle.

The optimal dose of **PQQ** is **20 mg** each day. Members taking **Mitochondrial Energy Optimizer, Mitochondrial Basics, or PQQ 10 mg caps** obtain this optimal PQQ dose when taking the new **Super Ubiquinol CoQ10 with PQQ**.

### References

1. *Curr Alzheimer Res.* 2011 Dec;8(8):868-75.
2. *Dev Disabil Res Rev.* 2010 Jun;16(2):183-8
3. *N Z Med J.* 2009 Oct 30;122(1305):74-9.
4. *Mol Genet Metab.* 2004 Apr;81(4):263-72.
5. *Mech Ageing Dev.* 2010 Apr;131(4):225-35.
6. *Mitochondrion.* 2007 Jun;7 Suppl:S168-74.
7. *Cardiol Rev.* 2005 Mar-Apr;13(2):76-9.
8. *Biofactors.* 1999;9(2-4):291-9.
9. *Exp Gerontol.* 2006 Feb;41(2):130-40.
10. *Regul Toxicol Pharmacol.* 2007 Feb;47(1):19-28.
11. Systemic CoQ level in animals: Part II. Unpublished study. Natreon, Inc.;2007.12.
12. *Pharmacologyonline.* 2009;1:817-25.
13. *Pharmacologyonline.* 2009;2:690-8.
14. *Electron J Biotechn.* 2008 Jul 15;11(3).
15. *Environ Sci Technol.* 2002 Jul 15;36(14):3170-5.
16. *Environ Sci Technol.* 2009 Feb 1;43(3):878-83.
17. *Environ Sci Technol.* 2002 May 1;36(9):1939-46.
18. Ghosal S. Shilajit in Perspective. Alpha Science International Limited; 2006.
19. *J Biol Chem.* 2010 Jan 1;285:142-52.
20. Available at: <http://www.ncbi.nlm.nih.gov/gene/10891>. Accessed May 21, 2013.
21. *Alt Med Rev.* 2009; 14(3):268-77.
22. *Cardiovasc Drugs Ther.* 2004 Nov;18(6):421-31.
23. *J Cardiovasc Pharmacol Ther.* 2006 Jun;11(2):119-28.
24. *FOOD Style.* 2009;21:13(7)50-3.

Kaneka QH® is a registered trademark of Kaneka Corporation. PrimaVie® is a registered trademark of Natreon, Inc. BioPQQ® is a registered trademark of MGC (Japan).

**To order Super Ubiquinol  
CoQ10 With BioPQQ®, call 1-800-544-4440  
or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

# *CIRCUMVENT Today's Leading Cause of Death*

**John Snow, MD**, is the genius who created the modern science of epidemiology.<sup>1</sup>

Dr. Snow demonstrated that **feces-laden water** consumed by the people of **London** in the **mid-1800s** was causing **cholera** and other epidemic diseases.<sup>1</sup>

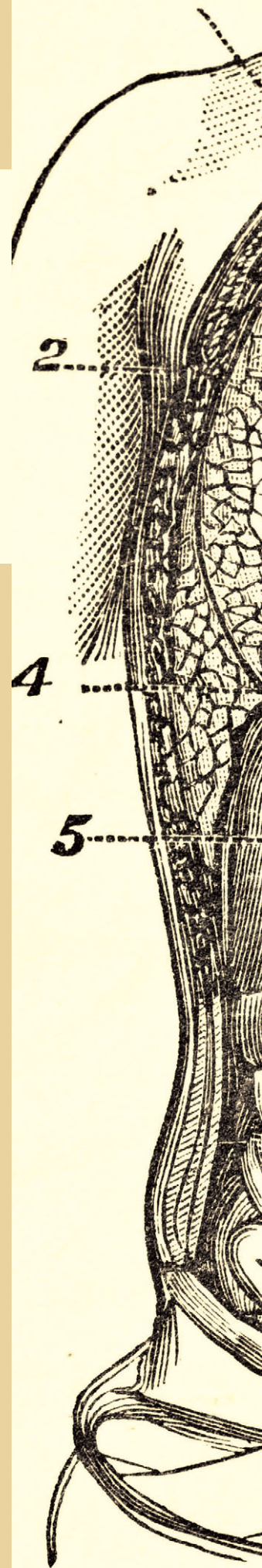
Dr. Snow had no idea that microscopic **bacteria** were behind cholera. Doctors at that time had not yet recognized the “**germ theory**” of disease. He nonetheless concluded that contaminated water was the source of a self-replicating poison that was killing thousands of London residents.

Few people of the day followed Dr. Snow's admonition to boil drinking water and avoid fluids that emanated from the bowels of cholera patients.

It might not surprise you that the **medical establishment** did not agree with Dr. Snow. Physicians in **1854** attributed cholera and other enteric diseases to the foul smelling gasses produced by piles of rotting garbage and raw sewage that characterized London at that time.<sup>1</sup>

Rational decision making by the **medical establishment** has not improved much on a relative basis since Dr. Snow's time.

Mainstream medicine continues to overlook **proven** methods to prevent, mitigate, or eradicate chronic disorders. The result is that too many Americans needlessly suffer and die.





One of today's great misconceptions is how people die. Most believe **disease** is the leading cause of death. Nothing could be further from the truth.

While data is regularly published showing what diseases people die with, missing is what caused the disease to manifest in the first place.

The number one **cause of death** throughout the world is **medical ignorance**. Not just the Western world, but the entire world. This fact can be demonstrated by looking at the degree of **ignorance** in developing countries today.

In parts of Africa, for example, AIDS is not considered to be a viral disease.<sup>2</sup> Instead, the belief is that one contracts AIDS by "thinking" they may contract AIDS. Therefore, according to this backward logic, to even "think" that practicing safe sex will prevent AIDS causes one to contract the disease. The result of this fallacy is that HIV infection has spread at epidemic proportions in Africa, as people freely engage in dangerous sex practices and intentionally pretend that there is no such thing as HIV-AIDS.<sup>3,4</sup>

One reason that new viral diseases keep emanating from China is that sanitary conditions are very bad in many parts of the country. Some rural Chinese farmers live under the same roof as their livestock, increasing the likelihood of transmitting animal viruses to humans. Apartment buildings constructed during the communist regime have such improperly installed plumbing that it is not unusual for the toilet contents of those living upstairs to wind up in their downstairs neighbor's sinks. Rampant infectious disease involving the same organism has been known to strike virtually everyone living in these decrepit apartment buildings.



More than **1.8 million** humans die annually from water-borne bacterial diarrhea including **cholera**.<sup>5</sup> While many Third World populations have little choice, it's not the cholera bacterium that is their enemy. The preventable culprit is their **ignorance** about the dangers of **drinking** contaminated water.<sup>1,5,6</sup>

### It's Nearly as Bad in the Western World

Arrogant doctors in the Western world pretend that they have somehow lifted themselves out of the sea of oblivion that caused so many needless deaths in the past.

The unfortunate fact is that **medical ignorance** in the Western world is also the leading cause of death; it just consumes its victims in other ways. Doctors who would ridicule the stupidity of disease causation in developing nations don't understand that their own oversight is also easy to criticize.

For example, hospitalized patients continue to die needlessly due to **malnutrition** even in industrialized countries.<sup>7</sup> Despite numerous studies documenting the negative effects of hospitalization on nutritional status, very little is being done to correct this problem.<sup>8-11</sup> The result is that hospitalized Americans continue to perish from **malnutrition**, just as those in the Third World continue contracting **water-borne infections** at epidemic proportions—two diseases with the same underlying cause...**medical ignorance**!

If doctors can't get it right in hospitals when it comes to something as easy as measuring the calorie intake of patients, then can we really expect them to optimally treat complex disease states? The answer is a resounding no!

In the brand new **2014** edition of the book **Disease Prevention and Treatment**, you will find out how **medical ignorance** in the so-called modern world deprives patients of life-saving treatments and contributes to unnecessary suffering and death.

### Needless Cancer Deaths

Despite proclamations of progress, cancer continues to inflict an epidemic of disability and death on the aging American population.

When a primary tumor is surgically removed, the body produces **growth factors** to heal the surgical wound. The problem is that these same growth factors also promote the proliferation of cancer cells that may have already spread (metastasized) to other parts of the body.<sup>12,13</sup> If drugs that suppressed these growth factors were administered *prior* to cancer surgery, many lives could be spared. The sad fact is that most oncologists do not even consider prescribing



drugs and nutrients before surgery that not only suppress growth factors, but also markedly reduce the metastatic potential of the primary tumor. In the **2014** edition of ***Disease Prevention and Treatment***, we discuss new approaches to treating cancer both before and after surgery that could result in many more successful long-term outcomes.

Cancer cells are uniquely able to adapt to toxic environments, which is why chemotherapy drugs have such a high failure rate. Researchers have identified survival mechanisms that cancer cells employ to avoid obliteration by chemotherapy drugs and other conventional therapies, yet few practicing oncologists incorporate these synergistic strategies into clinical practice. The 2014 edition of ***Disease Prevention and Treatment*** identifies therapies that may complement cancer treatments to improve patient outcomes.

Radiation has been used to kill cancer cells for over 100 years, but doctors continue to overlook novel methods to enable this therapy to better treat the disease. The 2014 edition of ***Disease Prevention and Treatment*** contains voluminous data on how cancer patients may achieve better results when having to undergo radiation therapy.

### Don't Let Viruses Get You

Each year, tens of millions of Americans suffer acute *viral* outbreaks that result in debilitating cold-flu sicknesses, herpes, and shingles recurrences, and lethal episodes of influenza.

While effective therapies exist to combat these diseases, the *delay* in initiating treatment too often results in failure to contain the virus. The 2014 edition of ***Disease Prevention and Treatment*** identifies novel drug-nutrient-hormone cocktails that can quickly suppress or destroy a broad array of common viruses.

The most important recommendation, however, is to encourage patients to initiate these comprehensive therapies at the very first symptom of a viral infection. Few doctors understand that treatment delay past 48 hours renders even the most advanced anti-viral approaches virtually useless.

Victims of HIV and hepatitis know how difficult it is to kill a virus once it gains a foothold inside the cells of the body. For those afflicted with chronic viral infections, the 2014 edition of ***Disease Prevention and Treatment*** provides a plethora of immune-boosting strategies designed to contain difficult-to-manage viruses.

### Control High Blood Pressure

High blood pressure is a silent epidemic that *threatens* the lives of one in every three American adults.<sup>14</sup> Of those taking blood pressure medications, optimal control rates are typically less than half.<sup>14,15</sup> This means that the majority of those diagnosed with hypertension spend most of their day with blood pressure levels that are dangerously elevated.

Since increased blood pressure is a major risk factor for *heart disease, stroke, congestive heart failure, and kidney disease*, it acts as an accomplice in *millions* of deaths each year.<sup>16</sup>

Mainstream medicine has *fallen fatally short* of relieving high blood pressure. A major problem is that conventional medicine's definition of what constitutes acceptable blood pressure levels is far too high. In the 2014 edition of ***Disease Prevention & Treatment***, readers will learn about a dangerous assumption made by doctors regarding anti-hypertensive drugs, optimal blood pressure targets, and ways to better manage blood pressure.

### Avoid the Dangers of Chronic Stress

Chronic and unremitting stress can increase our risk of suffering from a barrage of anxiety- and pressure-related diseases ranging from high blood pressure to dementia to depression.

Regrettably, while chronic stress produces significant adverse health effects, conventional medicine often relies upon psychoactive drugs to mask stressed patients' symptoms. At the same time, mainstream stress management strategies often fail to address

biochemical abnormalities, such as imbalanced **adrenal hormone levels**, that contribute to the detrimental health effects of chronic stress.<sup>17-19</sup>

At the core of chronic stress is deregulation of the **hypothalamic-pituitary-adrenal (HPA) axis**, an interconnected network of physiologic command terminals that governs the production of stress hormones like *cortisol*, *epinephrine*, and *norepinephrine*. Chronic stress leads to *desynchronization* of the HPA axis and subsequent imbalances in stress hormone levels, a critical feature of stress-related illness.

The 2014 edition of ***Disease Prevention and Treatment*** describes the dangers of chronic stress, how it contributes to various diseases, and how one can optimize their stress response by combining healthy lifestyle habits with scientifically studied natural therapies.

### Overlooked Multiple Sclerosis Therapy

More than three decades ago a **natural intervention** was hypothesized to be an environmental determinant of multiple sclerosis incidence.<sup>20,21</sup>

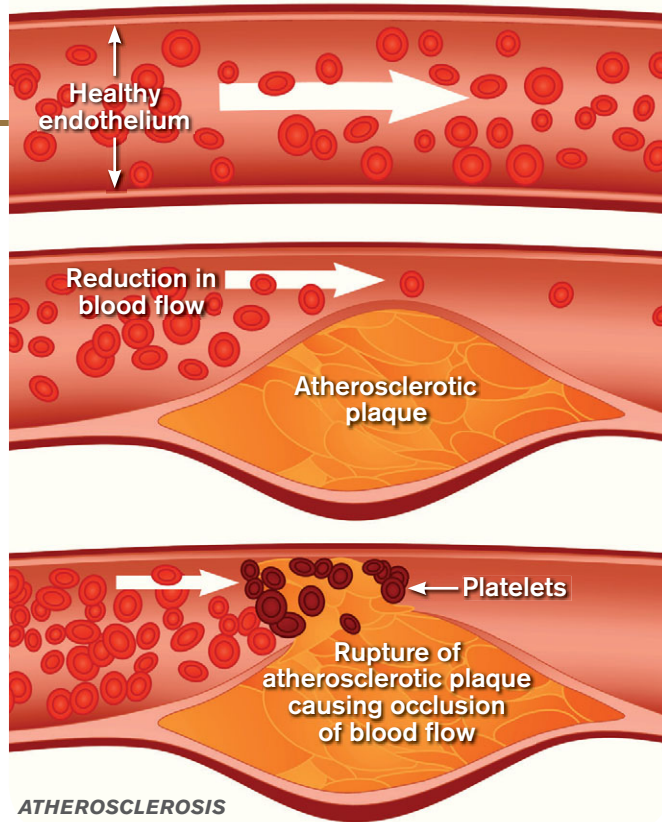
Since then, numerous scientific studies have shown that this common natural compound can dramatically *modulate* the cascade of autoimmunity and inflammation that claims the lives of so many multiple sclerosis patients.<sup>22,23</sup> Moreover, evidence shows many multiple sclerosis patients have very **low levels** of the natural substance in their blood.<sup>24</sup>

Despite robust findings suggesting this inexpensive natural therapy should be an integral part of every multiple sclerosis patient's treatment plan, conventional medicine still **fails** to recommend it. In the 2014 edition of ***Disease Prevention and Treatment***, you will learn about this underappreciated multiple sclerosis therapy as well as a multitude of other innovative disease treatments that conventional medicine continues to overlook.

### Keeping the Blood Flowing

Atherosclerosis is the most deadly disease in the United States, yet most doctors still do not understand how it develops. While most people think of their arteries becoming clogged like a pipe, the fact is that the aging process damages the inner linings of blood vessels, even when conventional risk factors such as cholesterol and blood pressure are within normal ranges.<sup>25</sup>

While high cholesterol levels contribute to atherosclerosis, the mechanism by which it most damages the arterial wall is quite different than what drug companies promote. When levels of cholesterol (and other



atherogenic risk factors) are too high, there is a corresponding reduction in the amount of **nitric oxide** available to the endothelial lining of the arteries.<sup>26</sup>

**Nitric oxide** is a critically needed substance that enables the arteries to expand and relax with youthful elasticity.<sup>27</sup> The encouraging news is that novel approaches are available that have been shown to safely increase nitric oxide and reverse atherosclerosis markers in humans and animals.<sup>28-33</sup>

In the 2014 edition of ***Disease Prevention and Treatment***, readers will learn how to circumvent the many overlooked factors that make aging humans so vulnerable to artery disease and subsequent stroke and heart attack.

### Protect Healthy Tissues Against Lethal Radiation Damage

Even if cancer is completely cured by radiation therapy, there is sometimes severe peripheral damage to healthy tissues known as *radiation fibrosis*.<sup>34</sup> Life Extension long ago advised those undergoing radiation to use a drug-nutrient combination that was shown to promote healing time and reduce pain following radiation damage.

A more dangerous form of radiation damage, however, occurs when treating cancers involving the brain. The high levels of radiation used to treat tumors in the brain can result in a lethal side effect called *radiation necrosis* that manifests long after the therapy is discontinued.<sup>35-37</sup>

The swelling of the brain caused by radiation necrosis can lead to dementia or death.<sup>38,39</sup> Doctors treat the brain swelling by administering anti-inflammatory steroid drugs. At some point, steroid drug therapy fails. Years ago, one expert complained that no matter how many brain tumors are cured with radiation therapy, the patients eventually died from radiation necrosis.

What conventional doctors overlook is that even when brain swelling is temporarily controlled, the radiation necrosis process itself continues to stimulate inflammatory cytokines. The result is a vicious cycle where damaged brain tissues keep provoking inflammatory cytokines that cause even more necrotic damage, which then promotes even more inflammatory cytokine production (and more necrotic damage).

In the 2014 edition of ***Disease Prevention and Treatment***, a breakthrough drug-nutrient cocktail is introduced to suppress the chronic inflammatory-cytokine cascade and gain long-term control over radiation necrosis.

### Why You'll Want This Book in Your Library or on Your Coffee Table

For the **past 33 years**, Life Extension has published life-saving information a decade or more ahead of conventional medicine. A case-in-point is Life Extension's advice to take low-dose **aspirin** to prevent heart attacks. While mainstream hospitals like Johns Hopkins now advocate aspirin to prevent heart attacks, the Life Extension Foundation® published evidence about aspirin's benefits back in **1983**. The Life Extension Foundation® then spent 15 years battling the FDA to force the agency to recognize the cardioprotective effects of low-dose aspirin.

When a serious medical disorder develops, most people have no one to turn to other than their doctor. The problem is that physicians are often too busy to keep up with the latest research findings. As a result, many patients suffer and die even though advanced therapies already exist that could cure them.

For example, in 2005 "**Tamiflu®**" became a household word as fears of an avian flu epidemic caused a shortage of this anti-viral drug. Those who purchased the year **2003 edition** of ***Disease Prevention and Treatment***, however, learned about Tamiflu before the public and were advised about the benefits of having it available to prevent a flu virus infection.

A stark illustration of the failure of doctors to recognize the value of **life-saving medical breakthroughs** was a study showing that the drug **cimetidine** improved survival odds in a group of **colon cancer** patients.<sup>40</sup> In this landmark study, patients with an aggressive form of colon cancer took **800 mg**

of **cimetidine** for one year after surgery. After ten years, there was nearly a **60% improvement** in survival in the group that took **cimetidine**.

As early as **1985**, the Life Extension Foundation recommended **cimetidine** as an **adjuvant cancer therapy**. If you had been a Life Extension member and contracted colon cancer, your odds of dying could have been reduced dramatically.

Many colon cancer patients learned about the enormous value of cimetidine in the year **2003 edition** of ***Disease Prevention and Treatment***. The brand new **2014 edition** of ***Disease Prevention and Treatment*** provides even more novel therapies for colon cancer patients to consider.

For those afflicted with chronic illnesses, the new information contained in the **2014 edition** of ***Disease Prevention and Treatment*** could result in a liberating experience. When a medical concern arises, you don't want to be left in the darkness of scientific ignorance.

By keeping the latest edition of ***Disease Prevention and Treatment*** close by, you will quickly be able to use the expanded index to educate yourself about novel therapies that have shown efficacy in peer-reviewed studies, but have not yet made it into conventional medical practice.

### Save Over 60% on Disease Prevention and Treatment

Life Extension has spent millions of dollars in researching, writing, and editing the 130 chapters that comprise the **2014 edition** of ***Disease Prevention and Treatment***. We expect to recoup some of this expenditure when we release it to book stores in **January 2014**.



We want every one of our members to have this updated reference book in their homes today. To encourage this, we are offering the book to members at a **64% discount** off the cover price of ***Disease Prevention and Treatment*** until **January 31, 2014**.

This beautiful hardbound book retails for **\$69.95**...a far lower price than what medical textbooks like this normally cost. Until January 31, 2014, you can obtain the **2014 edition** of ***Disease Prevention and Treatment*** for only **\$24.95**.

To order your personal copy of the new ***Disease Prevention and Treatment*** reference book, call **1-800-544-4440** today.

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

## References

- Available at: <http://jama.jamanetwork.com/article.aspx?articleid=1667095>. Accessed May 17, 2013.
- Available at: <http://www.plosmedicine.org/article/info:doi/10.1371/journal.pmed.0040256>. Accessed May 9, 2013.
- Available at: <http://www.yale.edu/macmillan/apartheid/nattrassp2.pdf>. Accessed May 9, 2013.
- Available at: [http://www.africa.upenn.edu/Articles\\_Gen/aids\\_afr.html](http://www.africa.upenn.edu/Articles_Gen/aids_afr.html). Accessed June 6, 2013.
- Available at: [http://www.who.int/water\\_sanitation\\_health/publications/factsfigures04/en/](http://www.who.int/water_sanitation_health/publications/factsfigures04/en/). Accessed May 17, 2013.
- Available at: <http://www.webmd.com/a-to-z-guides/cholera-faq>. Accessed May 9, 2013.
- Middleton MH, Nazarenko G, Nivison-Smith I, Smerdely P. Prevalence of malnutrition and 12-month incidence of mortality in two Sydney teaching hospitals. *Intern Med J*. 2001 Nov;31(8):455-61.
- Barker LA, Gout BS, Crowe TC. Hospital malnutrition: prevalence, identification and impact on patients and the healthcare system. *Int J Environ Res Public Health*. 2011 Feb;8(2):514-27.
- Kyle UG, Genton L, Pichard C. Hospital length of stay and nutritional status. *Curr Opin Clin Nutr Metab Care*. 2005 Jul;8(4):397-402.
- Available at: <http://www.nature.com/ejcn/journal/v57/n7/full/1601616a.html>. Accessed May 9, 2013.
- Holyday M, Daniells S, Bare M, Caplan GA, Petocz P, Bolin T. Malnutrition screening and early nutrition intervention in hospitalised patients in acute aged care: a randomised controlled trial. *J Nutr Health Aging*. 2012;16(6):562-8.
- Michalek RD, Rathmell JC. The metabolic life and times of a T-cell. *Immunol Rev*. 2010 Jul;236:190-202.
- Fritz V, Fajas L. Metabolism and proliferation share common regulatory pathways in cancer cells. *Oncogene*. 2010 Aug 5;29(31):4369-77.
- Lloyd-Jones et al. Heart disease and stroke statistics—2010 Update. *Circulation*. 2010 Feb 23;121(7):e46-e215.
- Lloyd-jones et al. Hypertension in adults across the age spectrum. *JAMA*. 2005 Jul 27;294(4):466-72.
- Roger VL. Heart disease and stroke statistics—2011 update: a report from the American Heart Association. *Circulation*. 2011 Feb 1;123(4):e18-e209.
- Jeckel CM, Lopes RP, Berleze MC, et al. Neuroendocrine and immunological correlates of chronic stress in 'strictly healthy' populations. *Neuroimmunomodulation*. 2010;17(1):9-18.
- Wolkowitz OM, Reus VI, Keebler A, et al. Double-blind treatment of major depression with dehydroepiandrosterone. *Am J Psychiatry*. 1999 Apr;156(4):646-9.
- Wolkowitz OM, Reus VI, Manfredi F, et al. Dehydroepiandrosterone (DHEA) treatment of depression. *Biol Psychiatry*. 1997 Feb 1;41(3):311-8.
- Craielius W. comparative epidemiology of multiple sclerosis and dental caries. *J Epidemiol Community Health*. 1978 Sep;32(3):155-65.
- Goldberg P. Multiple Sclerosis: vitamin D and calcium as environmental determinants of prevalence (a viewpoint). Part 1: sunlight, dietary factors and epidemiology. *Intern J Environ Stud*. 1974, 6: 19-27.
- Burton JM, Kimball S, Vieth R, et al. A phase I/II dose-escalation trial of vitamin D3 and calcium in multiple sclerosis. *Neurology*. 2010 Jun 8;74(23):1852-9.
- Adorini L, Penna G. Control of autoimmune diseases by the vitamin D endocrine system. *Nat Clin Pract Rheumatol*. 2008 Aug;4(8):404-12.
- Soilu-Hänninen M, Laaksonen M, Laitinen I, Erälinna JP, Lilius EM, Mononen I. A longitudinal study of serum 25-hydroxyvitamin D and intact parathyroid hormone levels indicate the importance of vitamin D and calcium homeostasis regulation in multiple sclerosis. *J Neurol Neurosurg Psychiatry*. 2008 Feb;79(2):152-7.
- Available at: <http://www.nia.nih.gov/health/publication/aging-hearts-and-arteries-scientific-quest/chapter-4-blood-vessels-and-aging-rest>. Accessed May 9, 2013.
- Gattullo D, Pagliaro P, Marsh NA, Losano G. New insights into nitric oxide and coronary circulation. *Life Sci*. 1999;65(21):2167-74.
- Sugawara J, Komine H, Hayashi K, et al. Effect of systemic nitric oxide synthase inhibition on arterial stiffness in humans. *Hypertens Res*. 2007 May;30(5):411-5.
- Cloarec M, Caillard P, Provost JC, Dever JM, Elbeze Y, Zamaria N. GliSODin, a vegetal sod with gliadin, as preventative agent vs. atherosclerosis, as confirmed with carotid ultrasound-B imaging. *Allerg Immunol (Paris)*. 2007 Feb;39(2):45-50.
- de Nigris F, Williams-Ignarro S, Lerman LO, et al. Beneficial effects of pomegranate juice on oxidation-sensitive genes and endothelial nitric oxide synthase activity at sites of perturbed shear stress. *Proc Natl Acad Sci USA*. 2005 Mar 29;102(13):4896-901.
- Sies H, Schewe T, Heiss C, et al. Cocoa polyphenols and inflammatory mediators. *Am J Clin Nutr*. 2005a Jan;81(1 Suppl):304S-312S.
- Grassi D, Lippi C, Necozione S, Desideri G, Ferri C. Short-term administration of dark chocolate is followed by a significant increase in insulin sensitivity and a decrease in blood pressure in healthy persons. *Am J Clin Nutr*. 2005 Mar;81(3):611-4.
- Aviram M, Rosenblat M, Gaitini D, et al. Pomegranate juice consumption for 3 years by patients with carotid artery stenosis reduces common carotid intima-media thickness, blood pressure and LDL oxidation. *Clin Nutr*. 2004 Jun;23(3):423-33.
- Kaplan M, Hayek T, Raz A, et al. Pomegranate juice supplementation to atherosclerotic mice reduces macrophage lipid peroxidation, cellular cholesterol accumulation and development of atherosclerosis. *J Nutr*. 2001 Aug;131(8):2082-9.
- Burger A, Löffler H, Bamberg M, Rodemann HP. Molecular and cellular basis of radiation fibrosis. *Int J Radiat Biol*. 1998 73(4):401-8.
- Available at: <http://emedicine.medscape.com/article/1157533-overview>. Accessed May 9, 2013.
- Plimpton SR, Stence N, Hemenway M, Hankinson TC, Foreman N, Liu AK. Cerebral Radiation Necrosis in Pediatric Patients. *Pediatr Hematol Oncol*. 2013 May 7. [Epub ahead of print]
- DeAngelis LM, Delattre JY, Posner JB. Radiation-induced dementia in patients cured of brain metastases. *Neurology*. 1989 Jun;39(6):789-96.
- Crossen JR, Garwood D, Glatstein E, Neuwelt EA. Neurobehavioral sequelae of cranial irradiation in adults: a review of radiation-induced encephalopathy. *J Clin Oncol*. 1994 Mar;12(3):627-42.
- Johannessen TB, Lien HH, Hole KH, Lote K. Radiological and clinical assessment of long-term brain tumour survivors after radiotherapy. *Radiother Oncol*. 2003 Nov;69(2):169-76.
- Matsumoto S, Imaeda Y, Umemoto S, Kobayashi K, Suzuki H, Okamoto T. Cimetidine increases survival of colorectal cancer patients with high levels of sialyl Lewis-X and sialyl Lewis-A epitope expression on tumour cells. *Br J Cancer*. 2002 Jan 21;86(2):161-7.

# THE BOOK OF LIFE

Obtain  
it **NOW**  
for only  
**\$24.95**

## *DISEASE PREVENTION and TREATMENT*

*The most expensively-produced  
book you will ever read!*

The 2014 edition of *Disease Prevention and Treatment* could help you or someone you know overcome a chronic medical condition, or better yet, prevent it from developing in the first place.

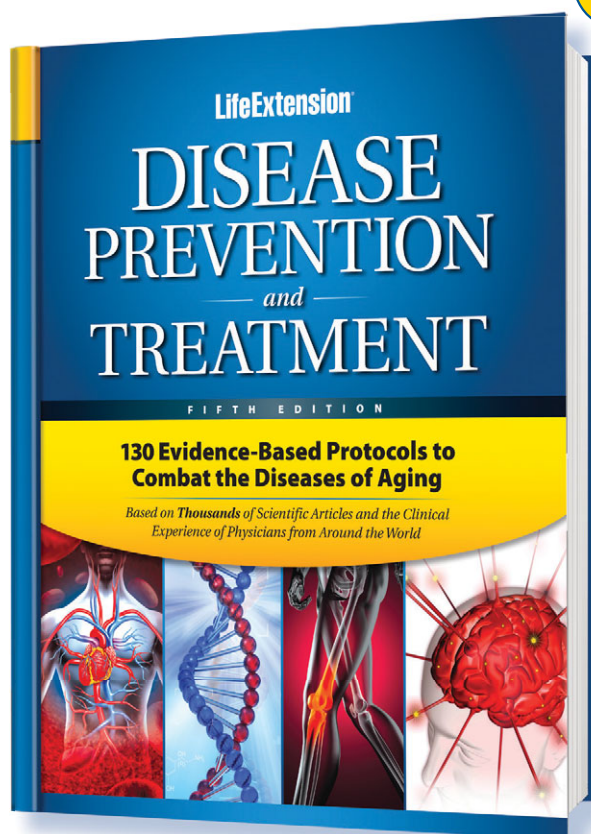
The 2014 edition of *Disease Prevention and Treatment* provides over 1,400 pages of concise data about therapies that are documented in scientific literature, but not routinely incorporated into clinical medical practice. Gaining access to this knowledge enables one with a medical disorder to take advantage of these advanced modalities immediately, rather than waiting years for conventional medicine to catch on.

It is a well-known fact that people suffer and die even though effective treatments may already exist for their diseases. Don't let this happen. *Disease Prevention and Treatment* helps break down barriers of **ignorance** that censor life-saving knowledge.

If you know someone who is concerned about staying healthy, or in need of better treatment for cancer, heart disease, hepatitis, etc., the 2014 edition of *Disease Prevention and Treatment* is a must for their library.

*Disease Prevention and Treatment* is fully indexed so that a person can easily learn more about their medical problems. Each chapter provides specific recommendations for the novel use of diet, nutrients, hormones, and drugs to address 130 different health concerns.

**Life Extension** has spent **millions of dollars** over the past 10 years updating *Disease Prevention and Treatment*. This one-of-a-kind **beautiful hardbound book** serves as a handy household reference that may be used for years to come.



*Disease Prevention and Treatment* is the only book that makes specific recommendations about combining mainstream therapies with natural approaches and novel medications to provide the best chance of preventing or gaining control over serious medical disorders. This is not a nutrition book. Rather, *Disease Prevention and Treatment* provides guidelines about how to safely use FDA-approved drugs, along with innovative therapies, in order to implement logical treatment regimens to address the multiple pathological processes involved in degenerative disease.

The protocols discussed in this book are documented by thousands of published studies from internationally recognized scientific journals. Despite this bountiful evidence, the **medical establishment** largely ignores many of the therapies recommended in this book.

The leading cause of death and disability today is **ignorance** about scientific approaches to prevent and treat degenerative disease. The novel information contained in *Disease Prevention and Treatment* could literally save the life of someone you care for.

The cover price of the 2014 edition of *Disease Prevention and Treatment* is **\$69.95**. Until January 31, 2014, members can obtain this book for only **\$24.95**.

To order the 2014 edition of *Disease Prevention and Treatment* for only \$24.95, call **1-800-544-4440** or log on to [www.LifeExtension.com](http://www.LifeExtension.com)

# PROTECT SKIN AGAINST DAMAGE FROM INSIDE OF YOUR BODY

Scientists have discovered that an extract of the fern *Polypodium leucotomos* helps inhibit cellular changes in the skin that can lead to premature aging due to sun exposure.<sup>1</sup>

Taken orally, **Enhanced FernBlock® with Red Orange Complex** provides an **additional** layer of support for the body's ultraviolet-light defenses.

Best of all, *Polypodium leucotomos* offers this protection from the inside out. The result is an oral photoprotective agent that provides uniform, systemic, total-body surface protection (including the eyes, lips, and the scalp), without the problems associated with sunscreen.<sup>2,3</sup>

## Oral Sun Defense

**FernBlock®** has shown remarkable effectiveness in promoting skin defenses against harmful solar radiation.<sup>1,4-7</sup>

**FernBlock®** in this **oral** formulation works by promoting the body's ability to inhibit absorption of ultraviolet rays and to quench the free radicals that this type of radiation can generate.<sup>4,5</sup> In one clinical study, *Polypodium leucotomos* offered significant protection against the sun's rays, even for those taking medication that causes increased sun sensitivity.<sup>8</sup> The study subjects experienced an almost **three-fold** increase in the amount of time they spent in the sun.

## Enhanced FernBlock® Formula

This product has been upgraded to contain **Red Orange Complex**, a standardized extract that is obtained from three **red orange** varieties—*Citrus sinensis* var. Moro, Tarocco, and Sanguinello.

The main active **phenolic** compounds include **anthocyanins**, **flavanones**, and **hydroxycinnamic acids**. It also includes vitamin C,<sup>9</sup> which works together to support the body's natural photoprotection against ultraviolet radiation,<sup>10,11</sup> by helping to balance the body's normal inflammation response,<sup>12</sup> free-radical defense mechanism, and healthy apoptotic (cell death) activity.<sup>13</sup>

In a controlled human trial, 15 days of **oral** supplementation with **Red Orange Complex** was demonstrated to **measurably** support natural skin defenses against ultraviolet radiation.<sup>11</sup>

FernBlock® is a registered trademark of Industrial Farmaceutica Cantabria, S.A.

Note: This product is not a sunscreen.

### References

1. *J Dermatol Sci.* 2003 Jun;32(1):1-9.
2. *Br J Dermatol.* 2011 Aug;165(2):255-62.
3. Available at: <http://www.ewg.org/2012/sunscreen/sunscreen-exposed/nanomaterials-and-hormone-disruptors-in-sunscreens/>. Accessed April 8, 2013.
4. Available at: <http://www.cdc.gov/excite/skincancer/mod10.htm>. Accessed April 8, 2013.
5. *Drugs Today (Barc).* 2007 Jul;43(7):475-85.
6. *Photochem Photobiol Sci.* 2010 Apr;9(4):559-63.
7. *J Am Acad Dermatol.* 2004 Dec;51(6):910-8.
8. *Photodermatol Photoimmunol Photomed.* 1997 Feb;13(1-2):50-60.
9. *Phytother Res.* 2010;24:414-8.
10. *Int J Cosmetic Sci.* 1998;20:331-42.
11. *Bionap Report.* Santa Venerina, CT, Italy, 2008.
12. *Nat Prod Res.* 2010 September 20;24(15):1469-80.
13. *BioFactors.* 2007;30:129-38.

## More Comprehensive Sun Protection

**Enhanced FernBlock® with Red Orange Complex** is designed to complement topical sunscreens for sun exposure. Taken orally, **FernBlock®** supplements the effectiveness of topical sunscreens by protecting the **entire skin surface** and has an obvious advantage in that it **cannot be removed by perspiring or bathing**.

If taken daily, just one capsule should provide everyday protection. Each vegetarian capsule of **Enhanced FernBlock® with Red Orange Complex** provides:

<b>FernBlock®</b> <i>Polypodium leucotomos</i> extract (leaf)	<b>240 mg</b>
<b>Red Orange Complex</b> (Sicilian red oranges – <i>Citrus sinensis</i> var. Moro, Sanguinello, and Tarocco) extract (fruit and peel)	<b>100 mg</b>
<b>Vitamin C</b> (as ascorbic acid from Red Orange Complex)	<b>5.5 mg</b>



Item #01728

A bottle of 30 vegetarian capsules of **Enhanced FernBlock® with Red Orange Complex** retails for \$42. If a member buys four bottles, the price is reduced to **\$28.50** per bottle.

**To order Enhanced FernBlock® with Red Orange Complex, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**



These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

# Comprehensive Brain Support!

# COGNITEX®

Brain decline affects all aging humans. Scientific studies demonstrate more **youthful** cognition and memory in response to the proper nutrients. **Cognitex®** provides the following **brain boosting** ingredients in one advanced formula:



**Alpha-glycerol phosphoryl choline** boosts levels of **acetylcholine**, a neurotransmitter that enables brain cells to communicate and is intimately involved in memory and learning. Acetylcholine levels markedly decline as humans age past 30.

**Vinpocetine** enhances circulation, oxygenation, and electrical conductivity of brain cells.

**Uridine-5'-monophosphate** is a compound naturally found in the milk of nursing mothers and is essential to humans when brains are the youngest. UMP also supports superior cognitive function in aging adults.

**Wild blueberry extract** has been shown to inhibit oxidative and inflammatory changes in brain cells believed to be involved in memory decline.



ITEM # 01697

**Hops** and **rosemary** have all been shown to help suppress inflammatory cytokines.

**DHA** combines with **phosphatidylserine** to form cell membrane structure. The ability of **phosphatidylserine** to improve cognitive skills has been extensively studied. **Sharp PS® Gold** is a patented compound of **phosphatidylserine** and **DHA** to support normal neuronal cell membrane function and structure.

**Ashwagandha** inhibits an enzyme (**acetylcholinesterase**) that breaks down acetylcholine in the brain.

**Phospholipid grape seed extract** improves blood vessel tone and elasticity, thus boosting cerebral oxygen flow.

**Pregnenolone** is a hormone involved in synchronization of brain cells that declines in normal aging brains.

## MOST ADVANCED NEUROLOGICAL FORMULA AT NEW LOWER PRICES

The ingredients in **Cognitex®** sell for a small fortune in **Europe**, where they are commonly prescribed. You can obtain them all at a fraction of this cost in the comprehensive **Cognitex®** nutrient formula for the brain.

The retail price for 90 softgels of **Cognitex® with NeuroProtection Complex** (with or without pregnenolone) is \$74 (Item # 01697) and \$72 (Item # 01696), respectively. If a member buys eight bottles of either version, the price per bottle is **\$44.17** and **\$42.72**, respectively.

References for most can be found at:  
[http://www.lef.org/magazine/mag2007/feb2007\\_report\\_cognitex\\_03.htm](http://www.lef.org/magazine/mag2007/feb2007_report_cognitex_03.htm)

Sharp-PS® GOLD is a trademark of Enzymotec Ltd. US Patent No. 7,935,365. Sensoril® is protected under US Patents Nos. 6,153,198 and 6,713,092 and is a registered trademark of Natreon, Inc. Perluxan® is used with permission.

## Just three softgels of Cognitex® provide the following nutrients:

Alpha-Glycerol Phosphoryl Choline (A-GPC)	600 mg
Phosphatidylserine-DHA (PS-DHA)	100 mg
[Sharp-PS® GOLD Conjugated Phosphatidylserine-DHA]	
Pregnenolone	50 mg
Vinpocetine	20 mg
Phospholipid-Grape Seed Extract	150 mg
Wild Blueberry Extract	150 mg
(Vaccinium angustifolium)	
Sensoril® Ashwagandha Extract	125 mg
(Withania somnifera)	
Uridine-5'-Monophosphate (disodium)	50 mg
Proprietary NeuroProtection Complex Blend	125 mg
Perluxan® Hops Extract (Humulus lupulus)	
Rosemary (Rosmarinus officinalis) Extract	

Contains fish (wild herring, blue whiting) and soybeans.

To order **Cognitex® with NeuroProtection Complex**, call **1-800-544-4440** or visit **www.LifeExtension.com**

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

BY STEPHEN FREDERICKS

# MELATONIN: The *Brain* Hormone

**Melatonin** was introduced to the United States in **1992** as a “**sleep hormone**.”

While some find melatonin helps restore restful sleep, scientists are finding far more consistent applications for melatonin in the area of **brain protection**.

New discoveries are validating melatonin's ability to guard the brain from oxidative stress and the neurodegeneration that occurs as a result of aging and environmental factors.<sup>1</sup> With this research, melatonin deserves the title of “brain hormone.”

Scientists are increasingly finding that the age-related decline in melatonin levels may be one factor for the age-related increase in neurodegenerative diseases.<sup>2-4</sup> In fact, some symptoms of melatonin deficiency are seen in patients with Alzheimer's, such as disruption of day/night patterns, mood changes, and delirium.<sup>5</sup>

Fortunately, supplementing with melatonin in middle age and beyond has been shown to protect against Alzheimer's as well as reduce the risk of Parkinson's disease, shrink the size of the infarct area involved in a stroke, and minimize the brain swelling and dysfunction following a head injury.<sup>2,6-13</sup>

As if this were not enough, research is also finding that in lab studies melatonin can play a role in longevity by increasing the “longevity protein” SIRT1.<sup>14,15</sup> Clearly, melatonin's beneficial properties extend far beyond sleep. >





### **Melatonin's Role in Neurodegenerative Diseases**

Some scientists think the increase in neurodegenerative diseases as we age may be directly related to the age-related decline in melatonin levels.<sup>2-4</sup> Fortunately, oral melatonin supplements are available, which may combat this decline by increasing blood and brain levels of melatonin.<sup>6,7</sup>

Supplementation with low-cost melatonin thus offers an opportunity to restore the brain's natural antioxidant protection and potentially prevent age-related changes to the brain.<sup>2,4,6,16,17</sup> In fact, melatonin's effects are so powerful that it's been designated a drug by the European Medicines Agency (EMA).<sup>17</sup>

With the onset of menopause, animals (like humans) experience a marked increase in oxidative damage, leading to brain cell dysfunction.<sup>18</sup> Studies show that in such animals, melatonin supplementation reverses those harmful effects in a similar manner to hormone replacement—but without the associated risks.<sup>18</sup>

## Melatonin Deficiency Linked to Alzheimer's Disease

Melatonin deficiency and Alzheimer's disease are closely linked; profound reductions in melatonin levels have been found in Alzheimer's disease patients. Melatonin, which is maintained at high levels in the brain and spinal fluid throughout youth and middle age, begins to decline sharply with advancing age—in a fashion that closely parallels the rise of Alzheimer's incidence.<sup>2,19,20</sup>

One impressive study found that melatonin levels in the spinal fluid of adults older than 80 were just half those of younger, healthy individuals.<sup>21</sup> But older adults who had Alzheimer's had dramatically lower levels yet—roughly one-fifth of those in healthy young people.

This connection is often overlooked, but vitally important—especially because some of the symptoms that arise as a result of melatonin deficiency are detected long before other more obvious cognitive Alzheimer's symptoms present themselves.<sup>22</sup> This makes melatonin deficiency one of the earliest indicators of Alzheimer's disease.

Most notably, these include symptoms such as insomnia and *sundowning*. Sundowning is a “circadian” (daily rhythm) disturbance in which agitation and activity increase, rather than slow down, as the day wanes.<sup>23,24</sup> Sleep disorders (such as insomnia, restlessness, and poor sleep quality) generally increase with age and are a sign of declining melatonin production. Such disorders occur in about **45%** of those with Alzheimer's.

Fortunately, clinical research has demonstrated the value of melatonin supplementation in reversing these and other changes associated with Alzheimer's, particularly when implemented early in the course of the disease.<sup>24,25</sup>

## Melatonin Fights Brain Changes in Alzheimer's Disease

In animals given the drug haloperidol (Haldol®), which impairs melatonin synthesis, memory deficits and brain protein changes resembling Alzheimer's disease arise.<sup>26,27</sup> However, when the animals are then supplemented with melatonin, the changes disappear, indicating a critical role for melatonin in protecting neurons.

In addition, melatonin has been found to help combat Alzheimer's disease by reducing the damage caused by two harmful proteins: *amyloid beta proteins* and *tau proteins*.<sup>6,20,26,28,29</sup> High levels of these two proteins contribute to the death of brain cells and have been linked to Alzheimer's disease.

Melatonin also helps fight Alzheimer's disease by guarding against the harmful effects of aluminum, which is known to produce Alzheimer's-like oxidative changes in brain cells.<sup>28</sup>

Together, these biochemical effects help to explain why melatonin supplementation has been found to reduce learning and memory deficits in animal models of Alzheimer's disease.<sup>7,30</sup>

## Why It's Important to Start Melatonin Early

Researchers agree that it's best to start taking melatonin before symptoms arise and before physical changes in brain cells have occurred.

One particular animal study demonstrated just how dramatic melatonin's preventive properties really are. For the study, scientists used mice that had human genes predisposed to Alzheimer's disease (these are called transgenic mice).<sup>7</sup>



By late-middle age, the unsupplemented mice proceeded to develop the behavioral and cognitive deficits typical of the disease. In fact, *even before signs of disease were visible*, the animals' brains already manifested the typical increased oxidation and decreased intracellular antioxidant defenses seen in Alzheimer's.<sup>7</sup> Soon their brain cells began to die off.

However, mice that were supplemented with melatonin before any disease was evident showed none of those pathological changes—and they performed normally on cognitive and behavioral tests.

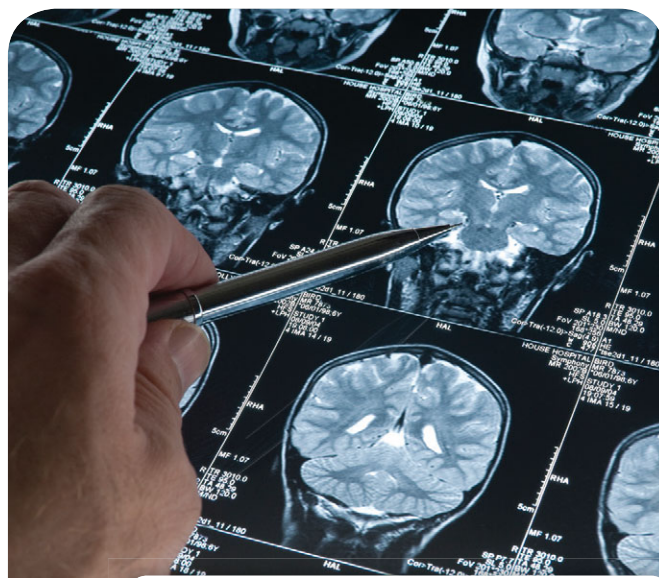
This shows just how powerfully melatonin works as a preventive agent. Unfortunately, it's been difficult to prove these preventive benefits in people because human trials of interventions for Alzheimer's tend to start only after the disease has become apparent—and well after the window of opportunity for intervention has closed. Nonetheless, very encouraging findings come from studies showing that Alzheimer's patients taking melatonin experience improved sleep patterns, less sundowning, and slower progression of cognitive impairment.<sup>23,24</sup>

Still more evidence that it's best to start melatonin supplements as early as possible comes from several recent studies of *mild cognitive impairment*, a condition defined as impairment that precedes actual dementia.<sup>31</sup> About **12%** of people with mild cognitive impairment proceed to develop dementia each year. In a series of studies, researchers have now shown that people taking between **3 and 24 mg** of a fast-acting formulation of melatonin daily for 15 to 60 months performed significantly better on a host of cognitive assessment scales and tests of memory.<sup>23,31,32</sup>

### Melatonin Fights Parkinson's at the Earliest Stages

Animal studies demonstrate that melatonin supplementation can prevent—and to some extent, even *reverse*—the changes in behavior and motor function induced by Parkinson's disease.<sup>33-35</sup> Parkinson's disease robs its victims of normal movement, slowing them down, making their walk erratic, and blocking normal facial expressions.<sup>35</sup> All of this occurs through the loss of neurons that produce the neurotransmitter *dopamine*.<sup>33</sup>

Parkinson's has a number of similarities to Alzheimer's. Both can lead to dementia. Both are the result of out-of-control oxidation (in the case of Parkinson's focused on brain regions that control movement and balance).<sup>20,35</sup> And in both diseases, brain cell death and dysfunction is brought on by an abnormal, oxidizing, and inflammatory protein accumulation. In Parkinson's, that protein is called *alpha-synuclein*.<sup>36,37</sup>



### What You Need to Know

#### Melatonin: The Brain Hormone

- Melatonin, a hormone produced in the pineal gland of the brain, is well known as a sleep aid; it is registered as a drug for that purpose in Europe.
- Melatonin also has incredible neuroprotective effects.
- Studies now reveal that melatonin levels begin to decline at just the time when neurodegenerative diseases begin to rise, and there's good scientific evidence for a strong connection between these phenomena.
- Supplemental melatonin restores normal, youthful levels of the hormone, and provides powerful antioxidant protection for the brain.
- Laboratory and early clinical studies show that melatonin supplementation can protect against the age-induced brain changes leading to Alzheimer's and Parkinson's diseases, to increased stroke risk, and to susceptibility to brain trauma.
- To achieve the most benefit from melatonin, begin supplementation as early as possible.



### The Hidden Dangers of Sleep Drugs

Because of the high prevalence of sleep disorders in older adults—even those without dementia—use of benzodiazepine drugs is widespread.<sup>64</sup> But these drugs, which include alprazolam (Xanax<sup>®</sup>), diazepam (Valium<sup>®</sup>), and Lorazepam (Ativan<sup>®</sup>), and others, have a nasty but little-known side effect—they suppress melatonin levels.

In studies going back 25 years, benzodiazepines have been proven to suppress melatonin levels.<sup>65</sup> In fact, a single dose (**2 mg**) of alprazolam at 9:00 p.m. was shown to significantly suppress blood melatonin levels at 11:00 p.m., midnight, 1:00 a.m., 6:00 a.m., and 7:00 a.m.<sup>66</sup>

That's troubling because this drug, so often taken for sleep, is in fact depleting the body of its own most potent sleep-inducing hormone. It's even more troubling because regular benzodiazepine use is now recognized as a risk factor for dementia.<sup>64</sup>

Research showed that people who used benzodiazepines at any time in their life were at approximately a **50%** greater risk for developing dementia than non-users.<sup>67</sup> And for those with benzodiazepine dependence, the risk of probable cognitive impairment *more than quintupled!*<sup>68</sup>

Given what we know about melatonin's powerful neuroprotective properties, the conclusion is inescapable that these melatonin-depleting drugs are triggering dementia in people who use them regularly.

If you are using one of these drugs, it would be wise to begin regular melatonin supplementation to restore your levels to the safe range. And if you are using the drugs purely for sleep, consider replacing them (gradually) with melatonin at bedtime.

Working with various laboratory models of Parkinson's disease, scientists have demonstrated that melatonin can attack Parkinson's disease at each of its critical junctures:

- It prevents the production of *alpha-synuclein* in brain cells, at the same time attacking existing molecules of the toxic protein and making them available for cellular cleanup.<sup>36,37</sup>
- It reverses the inflammatory changes seen in the brains of people with Parkinson's disease.<sup>38</sup>
- It restores normal activity of a key enzyme involved in dopamine production.<sup>8,24</sup>

Melatonin's ability to prevent—and *reverse*—the changes in behavior and motor function induced by the disease is the result of enhanced survival of the dopamine-producing cells that become damaged or destroyed in Parkinson's disease.<sup>8-10</sup>

### Melatonin Cuts Stroke Risk

As you age, waning melatonin levels place your brain at risk for both immediate and long-term neurological damage. In particular, decreased melatonin levels have been associated with a greater presence of stroke, with the odds appearing to rise more than **2%** for each **1 pg/mL** decline in melatonin.<sup>39</sup> In people whose pineal gland (the source of melatonin) has become calcified and non-functional, the risk of stroke is increased by **35%**.<sup>40</sup>

Plenty of biochemical evidence is available to explain this increased risk. Much of the damage done in either type of stroke—ischemic (insufficient blood flow) or hemorrhagic (bleeding into the brain)—is the result of free radical production. In an animal model of ischemic stroke, melatonin improved cognition by scavenging and neutralizing free radicals.<sup>41</sup>

It also reduces *indirect* risk factors for stroke, such as elevated cholesterol and blood pressure. It has been shown to suppress cholesterol formation by **38%**, reduce LDL-cholesterol accumulation by **42%**, and reduce blood pressure into the normal range.<sup>42</sup>

### Melatonin Limits Stroke Damage

Once a stroke has begun to develop, melatonin can prevent the death of neurons in the stroke area—limiting the damage done by the stroke.<sup>11</sup> Researchers conducted an experiment in which they removed the pineal glands of rats to make them deficient in

melatonin. They found that these rats experienced significantly greater brain damage after a stroke or seizure than the rats that still had sufficient melatonin levels.<sup>43</sup>

Repeated animal studies have demonstrated that animals supplemented with melatonin prior to a stroke experienced a decrease in the volume of brain tissue affected by an ischemic stroke (the most common kind).<sup>11,44-47</sup> This results in improved neurological and behavioral outcomes, and faster recovery from the stroke.<sup>11,47,48</sup>

One of the most important determinants of a good recovery from a stroke is the degree of “plasticity” in the surviving neurons.<sup>49</sup> Plasticity involves how well the surviving neurons are able to shift their function and take on some of the activities of damaged or destroyed brain cells.<sup>49</sup> Melatonin has been found to increase the plasticity of the neurons on both sides of the brain (the affected side and the opposite side)—an effect that hastens recovery.<sup>50</sup>

Another way melatonin helps reduce the damage caused by a stroke is by reducing the activation of destructive “protein-melting” enzymes.<sup>47,51</sup> An ischemic stroke triggers an increase in “protein-melting” enzymes, which impair the integrity of the normal blood-brain barrier, leading to brain swelling, increased pressure, and occasionally transformation into a hemorrhagic (bleeding) stroke.<sup>52</sup> However, in experimental models of ischemic stroke, when melatonin is administered during or after ischemia, it reduces the activation of those destructive enzymes, tightens the blood-brain barrier, reduces tissue swelling, and prevents hemorrhagic transformation.<sup>11,47,51,53</sup>

## Melatonin Shields Your Brain from Traumatic Injuries

Melatonin has also been found to help protect your brain in the event of a traumatic brain injury (such as head trauma experienced in an automobile accident). Traumatic brain injury is a leading cause of death and disability in younger Americans (but not unheard of in older adults).<sup>54,55</sup>

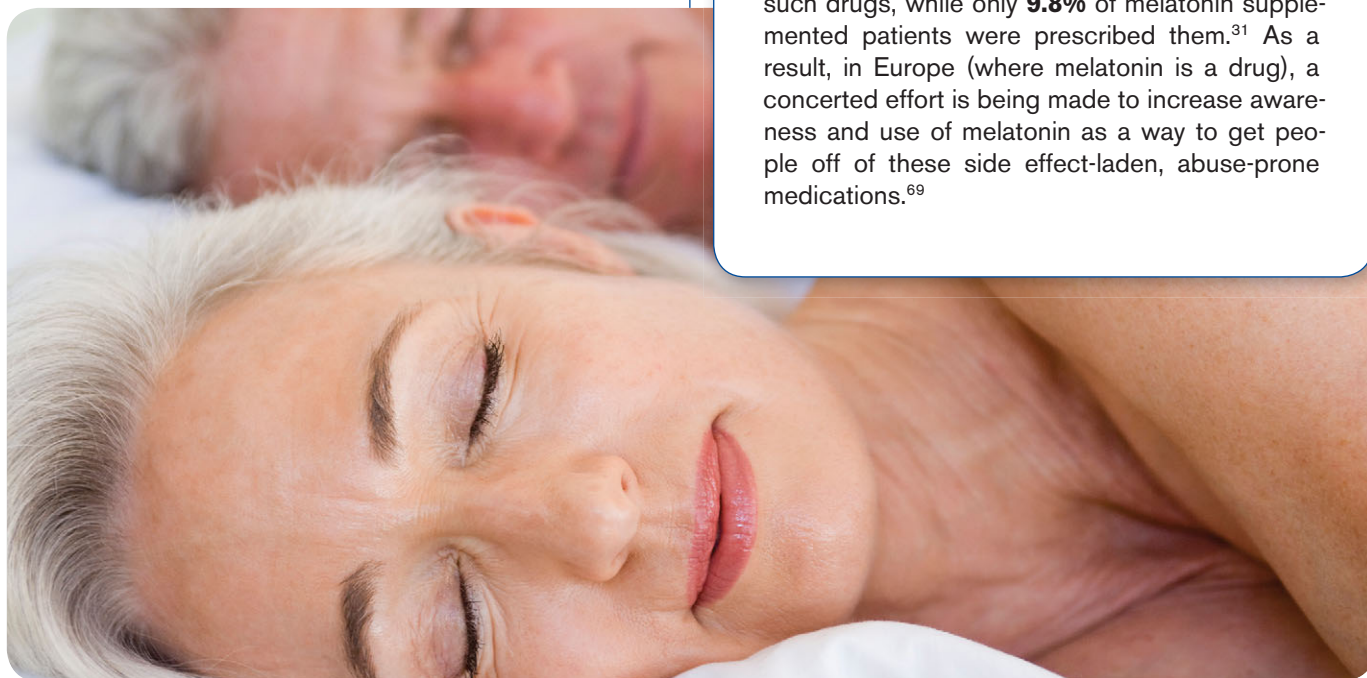
Just as in a stroke, oxidative damage to brain cells is the leading culprit in traumatic brain injuries. Also as in a stroke, promoting brain cell plasticity (the ability of surviving neurons to take on some of the activities of damaged brain cells and to promote re-growth of damaged tissue) is a mainstay of treatment.<sup>56</sup>

Animal studies show that administration of melatonin after such an injury maintains integrity of the blood-brain barrier, prevents dangerous brain swelling in the hours and days following the injury, and shrinks the size of the bruised and injured tissue.<sup>55</sup> It has also been found to reduce the mortality rate after a burst aneurysm.<sup>12,13</sup>

Most of these effects are related to melatonin’s direct antioxidant effects, along with its ability to induce otherwise dormant cellular antioxidant systems.<sup>13</sup>

## A Safer Alternative to Prescription Sleep Drugs

Supplementing with melatonin may reduce the use of prescription sleep medications in the benzodiazepine family (Xanax®, Valium®, and others). In one study, **62.8%** of control subjects received such drugs, while only **9.8%** of melatonin supplemented patients were prescribed them.<sup>31</sup> As a result, in Europe (where melatonin is a drug), a concerted effort is being made to increase awareness and use of melatonin as a way to get people off of these side effect-laden, abuse-prone medications.<sup>69</sup>



## What Is Melatonin?

Melatonin is a hormone that is primarily secreted in the pineal gland, a minute, pea-sized organ located in the center of the brain between the two hemispheres.<sup>16,17,22</sup> Shaped like a tiny pine cone (hence the name), the pineal gland is filled with nerve cells that respond to light or darkness (some biologists refer to the pineal as the “third eye” for this reason).<sup>22,70</sup>

Through its secretion of melatonin, the pineal gland acts as the body's central clock, telling the brain and other organs when it's time to be active and when it's time to rest.<sup>2,16,17,19,22</sup> That's why melatonin is typically thought of as the “sleep hormone.”<sup>17</sup>

But in addition to its hormonal actions, melatonin is one of the body's most powerful intrinsic **antioxidants**.<sup>2,18,28</sup> Melatonin has several antioxidant mechanisms: it directly scavenges free radicals of both oxygen and nitrogen, neutralizes a host of other radi-

cals, and stimulates gene expression of powerful intracellular antioxidant systems.<sup>2,3,28</sup> But melatonin has an additional action that sets it apart from other antioxidants: It readily crosses the blood-brain barrier and enters brain cells and their organelles.<sup>3</sup>

Unfortunately, the pineal gland's production of melatonin declines rapidly after middle age.<sup>2,6,16</sup> Since the brain lacks other oxidative defense mechanisms, the decline in melatonin production leaves brain cells increasingly vulnerable to oxidative damage, resulting in dysfunction at the level of molecules and cells.<sup>3</sup>

We see the effects of that dysfunction in the various diseases of the aging brain, such as Alzheimer's, Parkinson's, Huntington's, and others.<sup>2,3</sup> Oxidative damage also produces the disastrous effects of a stroke or a traumatic brain injury, effects which may be attenuated by melatonin.<sup>2,3,42</sup>

## Can Melatonin Extend Your Life?

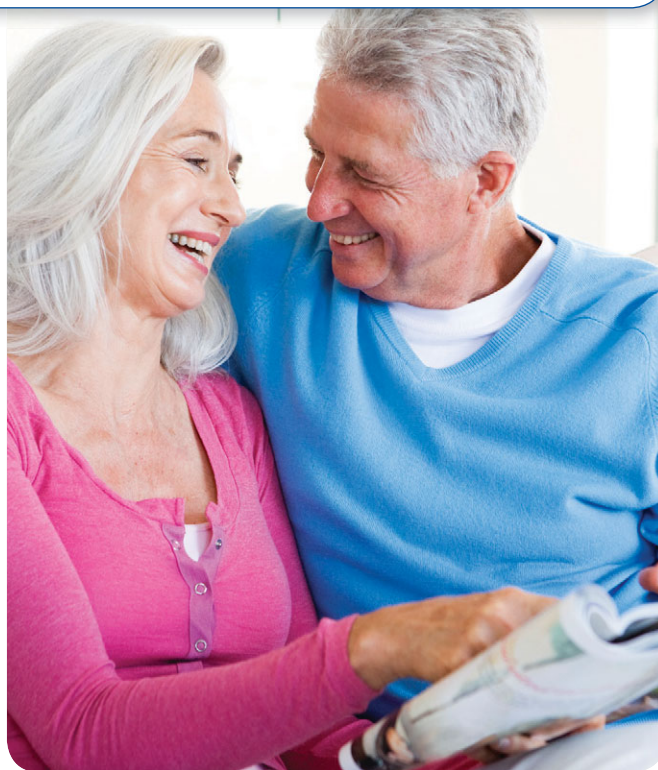
There's no question that melatonin exerts powerful protective effects on brain tissue. We've seen how it can mitigate oxidative damage that contributes to neurodegenerative diseases, stroke, and head trauma.

But melatonin is a potent antioxidant that's also found in the blood, making it accessible to other tissues throughout the body.<sup>57</sup> Could melatonin, then, offer true life extension by preventing damage not just to the brain, but to the entire body?

It's too early to say definitively, of course. Humans live so long that it's challenging to conduct an ethical, randomized, placebo-controlled study of most interventions. But studies in other animals yield considerable reason for hope.

In the single-celled organism *Paramecium tetraurelia*, melatonin treatment increased both the mean and the maximal life span by up to **24%** over control animals.<sup>58</sup> In fruit flies (*Drosophila melanogaster*), melatonin-fed flies had a **33%** increase in maximum life span and a nearly **14%** increase in median life span.<sup>59</sup>

In higher organisms such as mice and rats, data are promising but incomplete. Melatonin increases expression of the “longevity protein” SIRT1, which triggers the expression of a host of self-healing genes (SIRT1 is activated by calorie restriction).<sup>14</sup> One study in mice found no increase in mean life span, but an increase in the life span of the last surviving **10%** of the population.<sup>60</sup> Another study did show increases in longevity in mice engineered to age rapidly.<sup>61</sup>



Research also shows that animals undergoing calorie restriction—a documented means of extending life span—substantially increase their production of melatonin.<sup>19</sup> And melatonin activates (and synergizes with) some of the same brain-protective mechanisms activated by resveratrol, another life-extending supplement.<sup>15,62,63</sup>

## Summary

Melatonin has been ignored or trivialized as simply a “sleep aid” ever since *Life Extension* introduced it to the world in 1992. But a burst of new studies now reveals that melatonin can protect your brain from many of the ravages of aging.

When we're young, melatonin protects our brains from free radical attack. But after middle age, melatonin levels drop precipitously, leaving our brains increasingly susceptible to the growing impact of oxidative damage. Such damage leads to increased risk of neurodegenerative diseases and stroke, and increased vulnerability to the effects of head trauma.

Studies now show that melatonin supplementation can normalize oxidative damage in brain tissue. It can protect against the pathological changes seen in Alzheimer's and Parkinson's diseases, can shrink the size of the brain area involved in a stroke and can minimize brain swelling and dysfunction following a head injury.

But, like all preventive measures, brain protection with melatonin requires early action. You likely won't get much benefit from melatonin if you wait until after onset of symptoms of neurodegeneration or until after a stroke or head injury claims some of your brain cells.

In order to keep your brain functioning in top condition, you need to support your dwindling supplies of brain-protective melatonin now. ●

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

## References

- Gutierrez-Cuesta J, Sureda FX, Romeu M, et al. Chronic administration of melatonin reduces cerebral injury biomarkers in SAMP8. *J Pineal Res.* 2007 Apr;42(4):394-402.
- Pandi-Perumal SR, BaHammam AS, Brown GM, et al. Melatonin antioxidative defense: therapeutical implications for aging and neurodegenerative processes. *Neurotox Res.* 2013 Apr;23(3):267-300.
- Gupta YK, Gupta M, Kohli K. Neuroprotective role of melatonin in oxidative stress vulnerable brain. *Indian J Physiol Pharmacol.* 2003 Oct;47(4):373-86.
- Bondy SC, Lahiri DK, Perreau VM, et al. Retardation of brain aging by chronic treatment with melatonin. *Ann N Y Acad Sci.* 2004 Dec;1035:197-215.
- De Rooij SE. Melatonin deficiency hypothesis in delirium. A synthesis of current evidence. *Rejuvenation Res.* 2013 Apr 19. [Epub ahead of print]
- Lahiri DK, Chen DM, Lahiri P, Bondy S, Greig NH. Amyloid, cholinesterase, melatonin, and metals and their roles in aging and neurodegenerative diseases. *Ann N Y Acad Sci.* 2005 Nov;1056:430-49.
- Feng Z, Qin C, Chang Y, Zhang JT. Early melatonin supplementation alleviates oxidative stress in a transgenic mouse model of Alzheimer's disease. *Free Radic Biol Med.* 2006 Jan 1;40(1):101-9.
- Niranjan R, Nath C, Shukla R. The mechanism of action of MPTP-induced neuroinflammation and its modulation by melatonin in rat astrocytoma cells, C6. *Free Radic Res.* 2010 Nov;44(11):1304-16.
- Ma J, Shaw VE, Mitrofanis J. Does melatonin help save dopaminergic cells in MPTP-treated mice? *Parkinsonism Relat Disord.* 2009 May;15(4):307-14.
- Borah A, Mohanakumar KP. Melatonin inhibits 6-hydroxydopamine production in the brain to protect against experimental parkinsonism in rodents. *J Pineal Res.* 2009 Nov;47(4):293-300.
- Reiter RJ, Sainz RM, Lopez-Burillo S, Mayo JC, Manchester LC, Tan DX. Melatonin ameliorates neurologic damage and neurophysiologic deficits in experimental models of stroke. *Ann N Y Acad Sci.* 2003 May;993:35-47; discussion 48-53.
- Ayer RE, Sugawara T, Zhang JH. Effects of melatonin in early brain injury following subarachnoid hemorrhage. *Acta Neurochir Suppl.* 2008;102:327-30.
- Wang Z, Ma C, Meng CJ, et al. Melatonin activates the Nrf2-ARE pathway when it protects against early brain injury in a subarachnoid hemorrhage model. *J Pineal Res.* 2012 Sep;53(2):129-37.
- Chang HM, Wu UI, Lan CT. Melatonin preserves longevity protein (sirtuin 1) expression in the hippocampus of total sleep-deprived rats. *J Pineal Res.* 2009 Oct;47(3):211-20.
- Cristofol R, Porquet D, Corpas R, et al. Neurons from senescence-accelerated SAMP8 mice are protected against frailty by the sirtuin 1 promoting agents melatonin and resveratrol. *J Pineal Res.* 2012 Apr;52(3):271-81.
- Lahiri DK, Chen D, Lahiri P, Rogers JT, Greig NH, Bondy S. Melatonin, metals, and gene expression: implications in aging and neurodegenerative disorders. *Ann N Y Acad Sci.* 2004 Dec;1035:216-30.
- Fernandez-Tresguerres Hernandez JA. Melatonina: old molecule, new medicament. *An R Acad Nac Med (Madr).* 2008;125(4):681-96.



18. Feng Z, Zhang JT. Long-term melatonin or 17-beta-estradiol supplementation alleviates oxidative stress in ovariectomized adult rats. *Free Radic Biol Med*. 2005 Jul 15;39(2):195-204.
19. Bubenik GA, Konturek SJ. Melatonin and aging: prospects for human treatment. *J Physiol Pharmacol*. 2011 Feb;62(1):13-9.
20. Wang JZ, Wang ZF. Role of melatonin in Alzheimer-like neurodegeneration. *Acta Pharmacol Sin*. 2006 Jan;27(1):41-9.
21. Liu RY, Zhou JN, van Heerikhuizen J, Hofman MA, Swaab DF. Decreased melatonin levels in postmortem cerebrospinal fluid in relation to aging, Alzheimer's disease, and apolipoprotein E-epsilon4/4 genotype. *J Clin Endocrinol Metab*. 1999 Jan;84(1):323-7.
22. Wu YH, Swaab DF. The human pineal gland and melatonin in aging and Alzheimer's disease. *J Pineal Res*. 2005 Apr;38(3):145-52.
23. Cardinali DP, Furio AM, Brusco LI. Clinical aspects of melatonin intervention in Alzheimer's disease progression. *Curr Neuropsychopharmacol*. 2010 Sep;8(3):218-27.
24. Cardinali DP, Brusco LI, Liberczuk C, Furio AM. The use of melatonin in Alzheimer's disease. *Neuro Endocrinol Lett*. 2002 Apr;23 Suppl 1:20-3.
25. Cardinali DP, Furio AM, Brusco LI. The use of chronobiotics in the resynchronization of the sleep/wake cycle. Therapeutic application in the early phases of Alzheimer's disease. *Recent Pat Endocr Metab Immune Drug Discov*. 2011 May;5(2):80-90.
26. Zhu LQ, Wang SH, Ling ZQ, Wang DL, Wang JZ. Effect of inhibiting melatonin biosynthesis on spatial memory retention and tau phosphorylation in rat. *J Pineal Res*. 2004 Sep;37(2):71-7.
27. Wang S, Zhu L, Shi H, et al. Inhibition of melatonin biosynthesis induces neurofilament hyperphosphorylation with activation of cyclin-dependent kinase 5. *Neurochem Res*. 2007 Aug;32(8):1329-35.
28. Daniels WM, van Rensburg SJ, van Zyl JM, Taljaard JJ. Melatonin prevents beta-amyloid-induced lipid peroxidation. *J Pineal Res*. 1998 Mar;24(2):78-82.
29. Lahiri DK, Chen D, Ge YW, Bondy SC, Sharman EH. Dietary supplementation with melatonin reduces levels of amyloid beta-peptides in the murine cerebral cortex. *J Pineal Res*. 2004 May;36(4):224-31.
30. Feng Z, Chang Y, Cheng Y, et al. Melatonin alleviates behavioral deficits associated with apoptosis and cholinergic system dysfunction in the APP 695 transgenic mouse model of Alzheimer's disease. *J Pineal Res*. 2004 Sep;37(2):129-36.
31. Cardinali DP, Vigo DE, Olivar N, Vidal MF, Furio AM, Brusco LI. Therapeutic application of melatonin in mild cognitive impairment. *Am J Neurodegener Dis*. 2012;1(3):280-91.
32. Furio AM, Brusco LI, Cardinali DP. Possible therapeutic value of melatonin in mild cognitive impairment: a retrospective study. *J Pineal Res*. 2007 Nov;43(4):404-9.
33. Capitelli C, Sereniki A, Lima MM, Reksidler AB, Tufik S, Vital MA. Melatonin attenuates tyrosine hydroxylase loss and hypolocomotion in MPTP-lesioned rats. *Eur J Pharmacol*. 2008 Oct 10;594(1-3):101-8.
34. Gutierrez-Valdez AL, Anaya-Martinez V, Ordonez-Librado JL, et al. Effect of chronic L-dopa or melatonin treatments after dopamine deafferentation in rats: dyskinesia, motor performance, and cytological analysis. *ISRN Neurol*. 2012;2012:360379.
35. Patki G, Lau YS. Melatonin protects against neurobehavioral and mitochondrial deficits in a chronic mouse model of Parkinson's disease. *Pharmacol Biochem Behav*. 2011 Oct;99(4):704-11.
36. Ono K, Mochizuki H, Ikeda T, et al. Effect of melatonin on alpha-synuclein self-assembly and cytotoxicity. *Neurobiol Aging*. 2012 Sep;33(9):2172-85.
37. Sae-Ung K, Ueda K, Govitrapong P, Phansuwan-Pujito P. Melatonin reduces the expression of alpha-synuclein in the dopamine containing neuronal regions of amphetamine-treated postnatal rats. *J Pineal Res*. 2012 Jan;52(1):128-37.
38. Brito-Armas JM, Baekelandt V, Castro-Hernandez JR, Gonzalez-Hernandez T, Rodriguez M, Castro R. Melatonin prevents dopaminergic cell loss induced by lentiviral vectors expressing A30P mutant alpha-synuclein. *Histol Histopathol*. 2013 Feb 27.
39. Atanassova PA, Terzieva DD, Dimitrov BD. Impaired nocturnal melatonin in acute phase of ischaemic stroke: cross-sectional matched case-control analysis. *J Neuroendocrinol*. 2009 Jul;21(7):657-63.



40. Kitkhuandee A, Sawanyawisuth K, Johns NP, Kanpittaya J, Johns J. Pineal Calcification is Associated with Symptomatic Cerebral Infarction. *J Stroke Cerebrovasc Dis*. 2013 Feb 20.
41. Deykun K, Pometlova M, Schutova B, Mares J. Modulations of behavioral consequences of minor cortical ischemic lesion by application of free radicals scavengers. *Gen Physiol Biophys*. 2011 Sep;30(3):263-70.
42. Sewerynek E. Melatonin and the cardiovascular system. *Neuro Endocrinol Lett*. 2002 Apr;23 Suppl 1:79-83.
43. Manev H, Uz T, Kharlamov A, Joo JY. Increased brain damage after stroke or excitotoxic seizures in melatonin-deficient rats. *FASEB J*. 1996 Nov;10(13):1546-51.
44. Shinozuka K, Staples M, Borlongan CV. Melatonin-based therapeutics for neuroprotection in stroke. *Int J Mol Sci*. 2013 Apr 25;14(5):8924-47.
45. Pei Z, Ho HT, Cheung RT. Pre-treatment with melatonin reduces volume of cerebral infarction in a permanent middle cerebral artery occlusion stroke model in the rat. *Neurosci Lett*. 2002 Feb 1;318(3):141-4.
46. Pei Z, Pang SF, Cheung RT. Pretreatment with melatonin reduces volume of cerebral infarction in a rat middle cerebral artery occlusion stroke model. *J Pineal Res*. 2002 Apr;32(3):168-72.
47. Hung YC, Chen TY, Lee EJ, et al. Melatonin decreases matrix metalloproteinase-9 activation and expression and attenuates reperfusion-induced hemorrhage following transient focal cerebral ischemia in rats. *J Pineal Res*. 2008 Nov;45(4):459-67.
48. de Courten Myers GM, Kleinholtz M, Wagner KR, Myers RE. Stroke assessment: morphometric infarct size versus neurologic deficit. *J Neurosci Methods*. 1998 Sep 1;83(2):151-7.
49. Dietrichs E. Brain plasticity after stroke--implications for post-stroke rehabilitation. *Tidsskr Nor Lægeforen*. 2007 May 3;127(9):1228-31.
50. Chen HY, Hung YC, Chen TY, et al. Melatonin improves presynaptic protein, SNAP-25, expression and dendritic spine density and enhances functional and electrophysiological recovery following transient focal cerebral ischemia in rats. *J Pineal Res*. 2009 Oct;47(3):260-70.
51. Jang JW, Lee JK, Lee MC, Piao MS, Kim SH, Kim HS. Melatonin reduced the elevated matrix metalloproteinase-9 level in a rat photothrombotic stroke model. *J Neurol Sci*. 2012 Dec 15;323(1-2):221-7.
52. Dong X, Song YN, Liu WG, Guo XL. Mmp-9, a potential target for cerebral ischemic treatment. *Curr Neuropharmacol*. 2009 Dec;7(4):269-75.
53. Reiter RJ, Tan DX, Leon J, Kilic U, Kilic E. When melatonin gets on your nerves: its beneficial actions in experimental models of stroke. *Exp Biol Med (Maywood)*. 2005 Feb;230(2):104-17.
54. Tsai MC, Chen WJ, Tsai MS, Ching CH, Chuang JI. Melatonin attenuates brain contusion-induced oxidative insult, inactivation of signal transducers and activators of transcription 1, and up-regulation of suppressor of cytokine signaling-3 in rats. *J Pineal Res*. 2011 Sep;51(2):233-45.
55. Ismailoglu O, Atilla P, Palaoglu S, et al. The therapeutic effects of melatonin and nimodipine in rats after cerebral cortical injury. *Turk Neurosurg*. 2012;22(6):740-6.
56. Flanagan SR, Cantor JB, Ashman TA. Traumatic brain injury: future assessment tools and treatment prospects. *Neuropsychiatr Dis Treat*. 2008 Oct;4(5):877-92.
57. Sae-Teaw M, Johns J, Johns NP, Subongkot S. Serum melatonin levels and antioxidant capacities after consumption of pineapple, orange, or banana by healthy male volunteers. *J Pineal Res*. 2012 Oct 5.
58. Thomas JN, Smith-Sonneborn J. Supplemental melatonin increases clonal lifespan in the protozoan *Paramecium tetraurelia*. *J Pineal Res*. 1997 Oct;23(3):123-30.
59. Bonilla E, Medina-Leendertz S, Diaz S. Extension of life span and stress resistance of *Drosophila melanogaster* by long-term supplementation with melatonin. *Exp Gerontol*. 2002 May;37(5):629-38.
60. Anisimov VN, Alimova IN, Baturin DA, et al. Dose-dependent effect of melatonin on life span and spontaneous tumor incidence in female SHR mice. *Exp Gerontol*. 2003 Apr;38(4):449-61.
61. Rodriguez MI, Escames G, Lopez LC, et al. Improved mitochondrial function and increased life span after chronic melatonin treatment in senescent prone mice. *Exp Gerontol*. 2008 Aug;43(8):749-56.
62. Kwon KJ, Kim JN, Kim MK, et al. Melatonin synergistically increases resveratrol-induced heme oxygenase-1 expression through the inhibition of ubiquitin-dependent proteasome pathway: a possible role in neuroprotection. *J Pineal Res*. 2011 Mar;50(2):110-23.
63. Kwon KJ, Kim HJ, Shin CY, Han SH. Melatonin Potentiates the Neuroprotective Properties of Resveratrol Against Beta-Amyloid-Induced Neurodegeneration by Modulating AMP-Activated Protein Kinase Pathways. *J Clin Neurol*. 2010 Sep;6(3):127-37.
64. Gallacher J, Elwood P, Pickering J, Bayer A, Fish M, Ben-Shlomo Y. Benzodiazepine use and risk of dementia: evidence from the Caerphilly Prospective Study (CaPS). *J Epidemiol Community Health*. 2012 Oct;66(10):869-73.
65. McIntyre IM, Burrows GD, Norman TR. Suppression of plasma melatonin by a single dose of the benzodiazepine alprazolam in humans. *Biol Psychiatry*. 1988 May;24(1):108-12.
66. McIntyre IM, Norman TR, Burrows GD, Armstrong SM. Alterations to plasma melatonin and cortisol after evening alprazolam administration in humans. *Chronobiol Int*. 1993 Jun;10(3):205-13.
67. Billioti de Gage S, Begaud B, Bazin F, et al. Benzodiazepine use and risk of dementia: prospective population based study. *BMJ*. 2012;345:e6231.
68. Potvin O, Hudon C, Forget H, et al. Prevalence of psychiatric disorders in community-dwelling older men and women with cognitive impairment no dementia: results from the ESA study. *Aging Ment Health*. 2012;16(2):218-27.
69. Clay E, Falissard B, Moore N, Toumi M. Contribution of prolonged-release melatonin and anti-benzodiazepine campaigns to the reduction of benzodiazepine and z-drugs consumption in nine European countries. *Eur J Clin Pharmacol*. 2013 Apr;69(4):1-10.
70. Mano H, Fukada Y. A median third eye: pineal gland retraces evolution of vertebrate photoreceptive organs. *Photochem Photobiol*. 2007 Jan-Feb;83(1):11-8.



# ULTIMATE PROSTATE PROTECTION



Item# 01695

**Ultra Natural Prostate** combines cutting-edge ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.\*

**AprèsFlex®** is an extract of *Boswellia serrata* that has **two times the bioavailability** of the leading boswellia extract. AprèsFlex® inhibits the enzyme *5-lipoxygenase*. **Boron** is included because of studies showing it may help slow elevation of prostate-specific antigen (PSA).

The formula provides **saw palmetto extract** and **Graminex® Flower Pollen Extract™** to interfere with DHT activity and help regulate inflammatory reactions in the prostate.\* **Lycopene** is a carotenoid that is included in the formula to help maintain healthy DNA gene function in prostate cells.

In order to boost its anti-estrogen capabilities, **Ultra Natural Prostate** incorporates **HMRlignan™**, derived from Norway spruce, **flax lignans**, and **nettle root extract**.

Since normal aging can lead to potentially unsafe levels of prostaglandins in the prostate, **Pygeum africanum** extract is included to help suppress prostaglandins and thereby promote prostate comfort.\* **Beta-sitosterol** has been added because it is the most biologically active component of *Pygeum* and enhances its protective effects.

The retail price for one bottle of **Ultra Natural Prostate with AprèsFlex® and Standardized Lignans** is \$38. If a member buys four bottles, the price is reduced to **\$26.25** per bottle. If a member buys 12 bottles, the price is reduced to **\$24** per bottle.

AprèsFlex® is a registered trademark of Laila Nutraceuticals exclusively licensed to PL Thomas—Laila Nutra LLC. International patents pending. ActiFlax™ is a trademark of Pharma Science Nutrients, Inc., all rights reserved. HMRlignan™ is a trademark used under sublicense from Linnea S.A. USPlus® and DeepExtract™ are trademarks of Valensa International and are used under license. US Patents 6,319,524 & 6,669,968. Not available for export.

The daily dose of two softgels of **Ultra Natural Prostate with AprèsFlex® and Standardized Lignans Formula** provides:

<b>USPlus® Saw Palmetto</b> (CO <sub>2</sub> DeepExtract™) (std to 85%-95% total fatty acids and sterols)	<b>320 mg</b>
<b>Graminex® Flower Pollen Extract™</b>	<b>252 mg</b>
<b>AprèsFlex® (<i>Boswellia serrata</i>) extract</b>	<b>70 mg</b>
<b>Pumpkin seed oil (<i>Cucurbita pepo</i>) extract</b> (standardized to 85% total fatty acids)	<b>200 mg</b>
<b>Stinging and Dwarf nettle root extracts</b> ( <i>Urtica dioica</i> )	<b>240 mg</b>
<b>Pygeum extract</b>	<b>100 mg</b>
<b>Lycopene</b>	<b>10 mg</b>
<b>Phytosterol complex</b> (standardized to 26.6% free beta-sitosterol)	<b>678 mg</b>
<b>Proprietary blend of HMRlignan™</b> Norway Spruce and <b>ActiFlax™</b> Flax Lignan extracts	<b>20.15 mg</b>
<b>Boron</b>	<b>3 mg</b>

Contains soybeans.

To order **Ultra Natural Prostate with AprèsFlex® and Standardized Lignans**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

**NEW!**

**Fast-acting  
and Quickly Absorbed...  
for a  
Restful Night's Sleep**

# LIQUID MELATONIN

The consequences of **sleep deprivation** go far beyond fatigue and diminished performance. Sleep deprivation can impact the immune system, the nervous system, memory and cognitive impairment, mood, and more.<sup>1</sup>

Ultimately, lack of sleep leads to an overall poor quality of life.

If you're one of the more than **20 million** Americans who suffer from occasional sleep problems,<sup>2</sup> you don't have to settle for frustrating nights of tossing and turning.

A new, fast-acting **LIQUID melatonin** may enable you to...

## TAKE BACK CONTROL OF YOUR SLEEP!

Melatonin is well known for its ability to regulate your body's internal clock. However, as you grow older, the secretion of melatonin declines significantly as the pineal gland becomes calcified.<sup>3,4</sup>

Fortunately, melatonin has been studied and shown to be effective for managing disturbances in circadian rhythms.<sup>5,6</sup>

A meta-analysis of 17 studies concluded that melatonin supplementation **decreases the time it takes to fall asleep** while **increasing sleep efficiency** and **total sleep duration**.<sup>7</sup>

In fact, melatonin has been shown to increase the speed of falling asleep—and the quality of sleep—in **about 60% of people who use it**.<sup>8,9</sup>

## NEW MELATONIN LIQUID DROPS!

Not all people benefit from melatonin when it's in the form of a capsule or tablet. However, some report that by applying melatonin *liquid* drops under their tongue at bedtime for immediate absorption, they are able to sleep better. While any kind of liquid melatonin has been reported to work, Life Extension has developed melatonin liquid drops that are completely free of **sugars**.

This new soothing **Fast-Acting Liquid Melatonin** has a great tasting natural citrus vanilla flavor and is quickly absorbed for a restful night's sleep.

An increase in age doesn't have to mean an increase in sleep problems. Consider making **Liquid Melatonin** a part of your **healthy sleep program**.

The retail price for 1 bottle of **Fast Acting Liquid Melatonin** is \$12. If a member buys 4 bottles, the price is reduced to **\$8.25** a bottle. Seven drops provide about **1 mg** of melatonin and there are approximately **1,180** drops in each bottle. Most people place one to two full eyedroppers under their tongues at night which provides **3 to 6 mg** of melatonin.



ITEM# 01734

## WHY WE NEED SLEEP

Decades of clinical research document that a good night's rest supports nearly all systems of the body, including:

- Skin health and youthful appearance<sup>10,11</sup>
- Healthy collagen formation<sup>12</sup>
- Insulin levels already within normal range<sup>13,14</sup>
- Healthy body weight<sup>15,16</sup>
- Glucose levels already within normal range<sup>17,18</sup>
- Blood pressure already within normal range<sup>13,19</sup>
- Healthy cell division<sup>20</sup>
- Cardiovascular health<sup>21,22</sup>
- A good mood<sup>23</sup>

## References

1. Available at: <http://www.webmd.com/sleep-disorders/features/important-sleep-habits>
2. Available at: <http://www.nlm.nih.gov/medlineplus/tutorials/sleepdisorders/nr249104.pdf>
3. *Exp Gerontol.* 2001 Jul;36(7):1083-100.
4. *J Pineal Res.* 1994 May;16(4):178-83.
5. *Neuroimmunomodulation.* 2006;13(3):133-44.
6. *Travel Med Infect Dis.* 2008 Jan;6(1-2):17-28.
7. *Sleep Med Rev.* 2005;9(1):41-50.
8. *Clin Pharmacol Ther.* 1995 May;57(5):552-8.
9. *Actas Esp Psiquiatr.* 2000 Sep-Oct;28(5):325-9.
10. *J Invest Dermatol.* 2001 Aug;117(2):309-17.
11. *Bioengineering of the Skin: Skin Surface Imaging and Analysis.* Boca Raton, FL: CRC Press LLC; 1997:337.
12. *Med Hypotheses.* 2010 Dec;75(6):535-7.
13. *Obes Rev.* 2009 Nov;10 Suppl 2:37-45.
14. *Science.* 2010 Dec 3;330(6009):1349-54.
15. *J Clin Sleep Med.* 2007 Dec 15;3(7):681-8.
16. *Obesity (Silver Spring).* 2009 Apr;17(4):767-71.
17. *Horm Res.* 2007;67 Suppl 1:2-9.
18. *Ann NY Acad Sci.* 2008;1129:287-304.
19. *Am J Hypertens.* 2010 Dec;23(12):1286-91.
20. *Chronobiol Int.* 2011 Feb;28(1):76-80.
21. *Prog Cardiovasc Dis.* 2009 Jan-Feb;51(4):294-302.
22. *Sleep.* 2010 Aug 1;33(8):1037-42.
23. *Psychiatry Clin Neurosci.* 2003 Jun;57(3):265-70.

**TO ORDER FAST ACTING LIQUID  
MELATONIN, CALL 1-800-544-4440  
OR VISIT WWW.LIFEEXTENSION.COM**

BY WILL BRINK

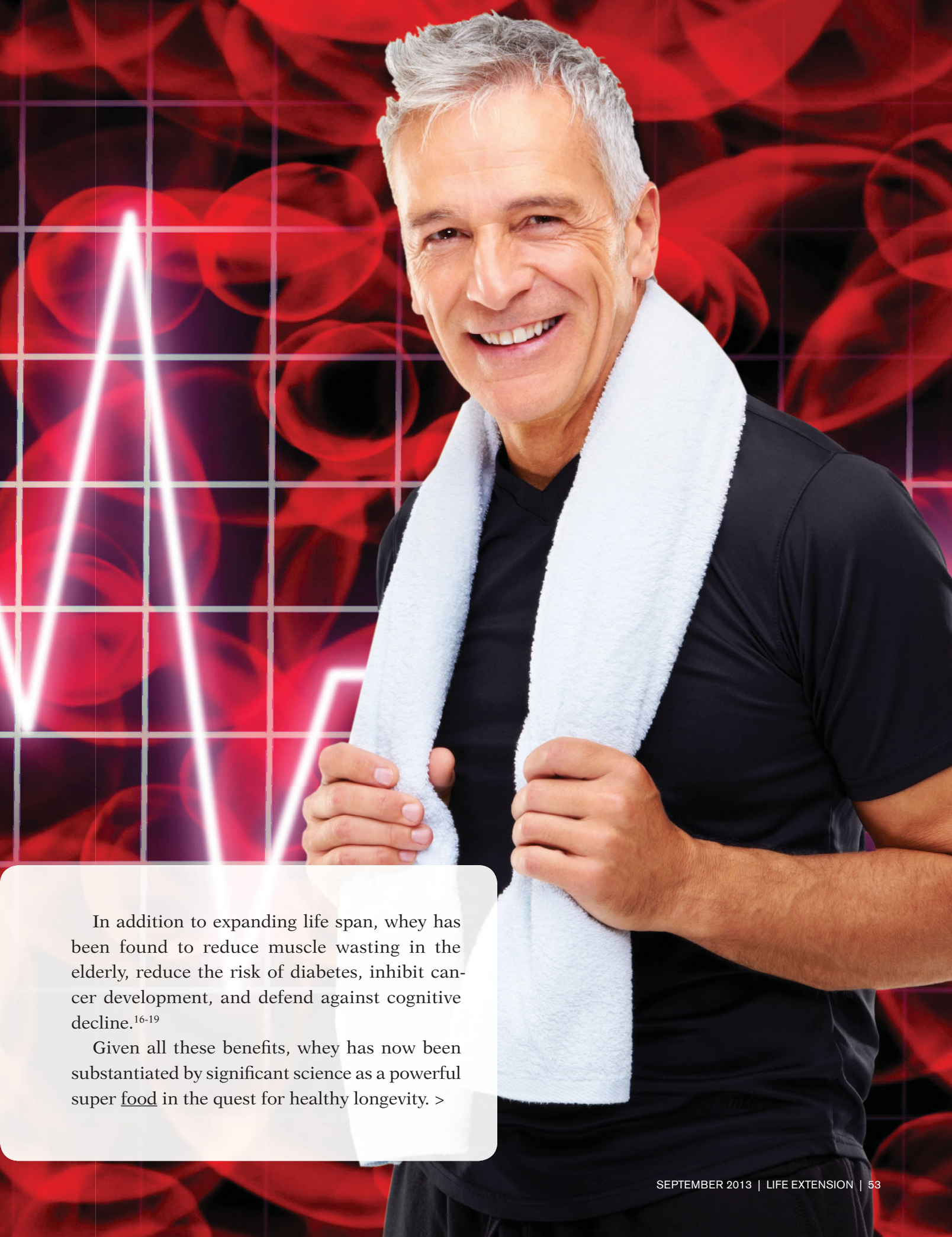
WHEY PROTEIN

# NEW *Longevity Benefits* of **WHEY PROTEIN**

Many people think of **whey protein** as a supplement only used by athletes wanting to increase their muscle mass. But evolving research suggests the **branched-chain amino acids** (BCAAs) leucine, isoleucine, and valine and other fractions found in whey can **mimic** the longevity benefits of **calorie restriction (CR)**!

Searching for CR-mimetics, scientists recently investigated the life span effects of a balanced amino acid mixture high in the branched chain amino acids found in whey.<sup>1,2</sup> In keeping with earlier studies on other organisms,<sup>3,4</sup> they found branched chain amino acids significantly **increased life span** in mice.<sup>2</sup>

This “superfood” provides all 18 amino acids, naturally occurring bioactive components such as immunoglobulins and lactoferrin, and a *cysteine* concentration over **4-fold higher** than other proteins—all in a highly absorbable form.<sup>5-8</sup> And whey is one of the greatest foods for maximizing *glutathione*,<sup>9,10</sup> the endogenous antioxidant that quenches oxidative stress<sup>11,12</sup> to inhibit **diseases of aging**.<sup>10,13-15</sup>



In addition to expanding life span, whey has been found to reduce muscle wasting in the elderly, reduce the risk of diabetes, inhibit cancer development, and defend against cognitive decline.<sup>16-19</sup>

Given all these benefits, whey has now been substantiated by significant science as a powerful super food in the quest for healthy longevity. >

## Calorie Restriction Benefits—Without Starving!

It is surprising to learn that about **45%** of older individuals in the general population—and **84% to 100%** in residential care facilities—are not adequately nourished.<sup>1,20</sup> This results from reduced appetite and food intake, impaired nutrient absorption, and age-related medical and social changes.<sup>20,21</sup>

In particular, an insufficient intake of quality **protein** can lead to loss of muscle mass, reduced strength, decreased bone mass, low immunity, cognitive impairment, and delayed wound and surgery recovery. Low protein intake is a strong independent predictor of mortality in aging people.<sup>1,22</sup> This problem leads to the functional decline known as *frailty*, a recognized geriatric syndrome.<sup>23</sup>

A second unfortunate factor is that, although calorie restriction (CR) has been shown to have beneficial, health-and-longevity effects, long-term adherence requires a major commitment of will power—and its potential risks for the elderly have yet to be determined.<sup>24,25</sup>

These two factors together—reduced protein intake among the aging, and the unlikelihood that people will follow a CR regime—bring us to whey's CR-mimetic effects. Providing the benefits of CR without a reduction in food intake has now become a hot area of investigation within gerontology.<sup>25,26</sup>



Whey is a potential solution. First, whey represents a high-quality protein supplement for aging persons—with a rich source of BCAAs to stimulate protein synthesis and inhibit protein breakdown.<sup>27,28</sup>

Second, whey delivers CR benefits—playing pivotal roles in *hormone secretion* and action, *intracellular signaling*, and regulation of *gene transcription* and translation.<sup>1,2,29</sup> Let's review some of these longevity studies.

## CR Mimetic: Whey Can Add the Equivalent of Nearly 10 Human Years

Scientists investigating **calorie restriction** mimetic compounds discovered that increasing the availability of the branched chain amino acids abundantly found in whey—*leucine*, *isoleucine*, and *valine*—increased life span in yeast (*Saccharomyces cerevisiae*).<sup>1,3</sup>

Similarly, it was found that the most striking distinction common only to long-lived mutant varieties of *Caenorhabditis elegans* worms was their increased up-regulation of these same branched chain amino acids.<sup>1</sup>

Then in a breakthrough study, scientists supplemented the diet of mice with a *branched chain amino acids-enriched* mixture of amino acids, similar to the composition of whey. The test mice received the mixture daily beginning at nine months of age, which is middle-aged for mice. There was no significant change in *maximum* life span for any of the mice in the study. However, the **median** life span was **774 days** for the untreated controls, and **869 days** for the whey supplemented mice—an increase of more than **12%** after starting the protocol only in middle age!<sup>2</sup>

In human terms, based on today's life expectancy of **78.7** years,<sup>30</sup> this median increase—even beginning supplementation only at midlife—translates to an **additional 9.4 years of life!**

## Whey Can Prevent Type II Diabetes—A Major Aging Disease!

Scientists demonstrated that whey can reduce the risk of developing *type II diabetes*.<sup>16</sup> Normally, a high-fat diet produces excessive weight gain, adiposity, and metabolic complications associated with higher risk for type II diabetes and fatty liver disease. Scientists placed mice on a high-fat diet for **eleven weeks** and gave one group **100 grams** of whey protein **per liter** of drinking water (equivalent to approximately **12 grams** for an average 165 pound human).

With no other intervention, the whey-protein mice improved *both* their glucose tolerance and insulin sensitivity. They also maintained lower weight and greater percentage of lean body mass, compared to control mice consuming the same daily calories but

without the added whey. The team concluded that whey protein boosted metabolic rate in the test group and may be beneficial in preventing the development of *type II diabetes*.<sup>16</sup>

Another team found that whey remarkably decreases blood sugar *without* increasing insulin secretion. For non-diabetic individuals, taking protein along with oral glucose would normally decrease the usual rise in blood sugar. Researchers wondered whether whey protein could still lower blood glucose in humans diagnosed with *insulin-resistant prediabetes*—or whether, instead, their insulin resistance would blunt the hypoglycemic effect.<sup>31</sup>

They divided the human subjects into three groups according to level of insulin resistance. For eleven mornings, they gave **0, 5, or 30 grams** of protein (from whey protein concentrate) and canola oil to all participants along with doses of **50 grams** of oral glucose.<sup>31</sup>

Whey significantly reduced blood glucose levels in all three categories of insulin resistance—yet the rate of insulin secretion was not affected. They concluded that, despite very high levels of insulin resistance in some of the individuals, whey was still able to decrease blood sugar levels.<sup>31</sup>

### Whey Maintains Youthful Weight and Lean Body Mass

In 2013, scientists reviewed many previous studies and concluded that the evidence supports the use of whey as a therapeutic treatment for obesity.<sup>32</sup> Specifically, the study team concluded that:

*“Whey protein, via bioactive peptides and amino acids generated during gastrointestinal digestion, enhances the release of several hormones...that lead to reduced food intake and increased satiety.”<sup>32</sup>*

In a host of studies—all with similar conclusions—scientists have investigated pathways through which the proteins, peptides, and minerals in whey boost satiety, influence glucose homeostasis, and optimize lean body mass.<sup>33-37</sup>

The branched chain amino acids play an essential role in supporting *lean* muscle mass, especially among older adults.<sup>13,38</sup> One trial compared diets high in *leucine*—abundant in whey—to calorie-equivalent diets high in carbohydrate. After 16 weeks, the leucine group lost **6.8 pounds more** in total body weight, **7 pounds more** in body fat—but lost **1.5 pounds less** in lean body mass!<sup>39</sup>



### What You Need to Know

#### Whey: The New CR Powerhouse

- Although whey is often viewed simply as a protein source, emerging evidence indicates that the *branched-chain amino acids (BCAAs)* and other fractions found in whey act as a **calorie restriction-mimetic**.
- Studies on middle-aged animals demonstrate that supplementing with the branched chain amino acids and other components in whey increase median life span by up to the equivalent of **9.6 years** in human terms!
- This effect is modulated along typical CR pathways—boosting mitochondrial biogenesis, reactive oxygen species (ROS) defense, cell signaling, and expression of *sirtuin 1 (SIRT1)*—the mammalian longevity gene CR.
- Whey constituents increase median, but not maximum, life span—indicating disease prevention at work. And whey's protection against age-related diseases has been separately confirmed.
- Whey offers an ideal supplement to secure calorie restriction's life extension benefits—without the rigors of a low calorie regime.



### What is a Calorie Restriction Mimetic?

A wealth of scientific data spanning more than seven decades shows that **calorie restriction (CR)**, the reduction of caloric intake without malnutrition, has power to boost longevity in nearly all forms of life—as much as **100%** in some species.<sup>84,85</sup>

However, most people cannot submit to a sufficiently restrictive dietary regimen to obtain the benefits. And the effects and risks for elderly individuals have not been well investigated.

The good news is that pioneering researchers have brought to light a novel class of nutrients called **calorie restriction mimetics (CR-mimetics)**. The administration of a CR-mimetic results in some of the same physiological changes seen in CR itself. One way these substances work is by influencing specific genes that ultimately affect either cell repair or cell death.

A handful of natural compounds have been shown to safely *simulate* some of the beneficial effects of calorie restriction—**without the need for stringent dietary measures**.

### Block Age-Related Muscle Loss and Muscle Wasting

Approximately **30%** of people aged 60 or over have sarcopenia, *age-related* muscle-wasting that increases the risk of falls and disability.<sup>40</sup> By sparing and synthesizing muscle, whey blocks this process.<sup>41,42</sup> (This *mimics* the proven sarcopenia-delaying effects of calorie restriction.<sup>43</sup>)

The most metabolically active branched chain amino acid in whey is leucine, which promotes muscle synthesis by activating a signaling pathway in muscle that modulates the body's anabolic drive.<sup>44-48</sup> Aging muscle becomes resistant to leucine stimulation, but taking leucine with meals (or in leucine-rich whey) can overcome this aging deficit, stimulating muscle synthesis.<sup>46-50</sup>

Cachexia is a clinical wasting syndrome characterized by progressive loss of weight, muscle, and strength.<sup>51</sup> Increased calorie intake doesn't help.<sup>51</sup> Cachexia can occur with cancer, AIDS, rheumatoid arthritis, and various chronic or malignant diseases—and is a major cause of death.

Each of the following CR-mimetics operates in a multi-targeted and complementary fashion—allowing you the opportunity to activate your **longevity** genes without hunger.<sup>99-104</sup>

**Resveratrol**, the most widely known of the CR mimetics, is a polyphenol found most abundantly in red wine grape skins, as well as in many other darkly colored fruits.

**Fisetin** is a relatively rare flavonoid found only in minute quantities in the plant kingdom that augments the effects of resveratrol.

**Pterostilbene** is a polyphenol closely related to resveratrol, but with unique attributes.

**Grape Seed Extract** is a derivative of whole grape seeds; resveratrol is a polyphenol contained in grape seeds.

**Quercetin** is a plant-derived flavonoid found in fruits, vegetables, leaves, and grains.

**Black Tea**, a type of tea that is more oxidized than oolong, green, and white teas, contains polyphenols and other constituents.

**Whey** has newly emerged as a CR mimetic and is gaining acceptance as the first **whole food** CR-mimetic.

Because whey has among the highest biological values—meaning absorption, use, and retention—of any other protein source, it attenuates catabolic wasting by boosting muscle mass.<sup>5-7,52,53</sup>

One study involving HIV-positive men given whey found dramatic increases in glutathione, with most subjects reaching ideal body weight.<sup>54</sup>

Aging individuals may also benefit from whey's ability to promote bone formation and suppress bone resorption.<sup>55</sup>

### **Whey Protein Inhibits Development of Cancer Cells**

Animal studies have demonstrated that whey is superior to other dietary proteins for suppression of cancer development.<sup>56-58</sup>

This benefit is attributed to whey's high content of *cystine/cysteine* and *gamma-glutamylcysteine dipeptides*—used for synthesis of glutathione—giving whey its *rare* ability to raise levels of glutathione.<sup>9,10</sup> Glutathione is well-known to destroy reactive oxygen species—but it *also* detoxifies carcinogens and ensures a competent immune system!<sup>56</sup>

Studies show that whey's tumor prevention is accompanied by enhanced glutathione levels, spleen lymphocyte proliferation, phagocytosis, and activity of natural killer, T helper, and *cytotoxic* T cells.<sup>56</sup>

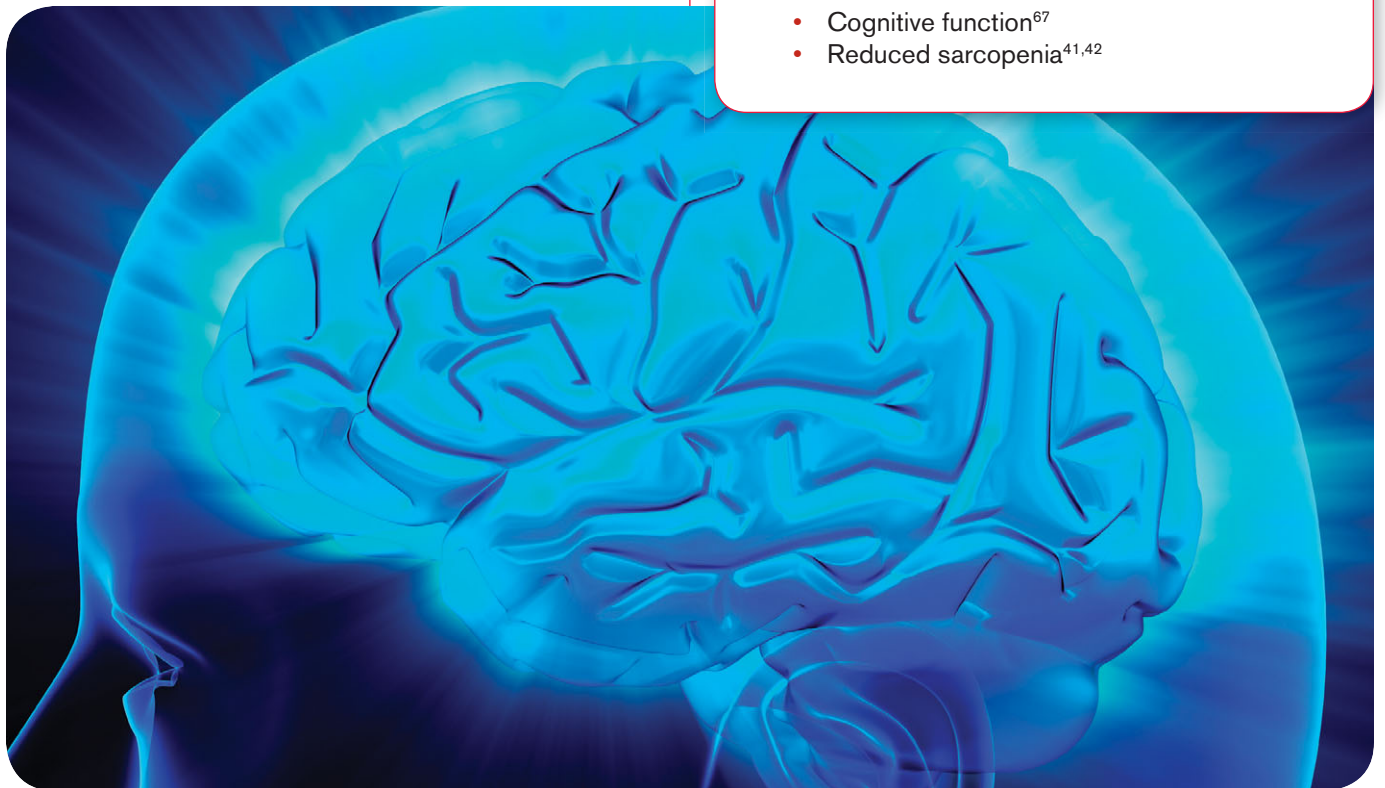
And the whey component lactoferrin powerfully inhibits tumors by various pathways, including inducing apoptosis, blocking angiogenesis, modulating carcinogen-metabolizing enzymes, and possibly by scavenging iron.<sup>56</sup>

### **Whey's Multiple Anti-Aging Benefits**

This highest-quality of all protein sources delivers the wide spectrum of *anti-aging* effects provided by a calorie restriction (CR) diet, without the need for the willpower of long-term starvation. (See figure 2 on page 60.)

Among the many *anti-aging* benefits of whey are:

- Mitochondrial biogenesis<sup>2</sup>
- Bone growth<sup>55</sup>
- Muscle support<sup>13,38</sup>
- Hypoglycemic effect<sup>16,31</sup>
- Anticancer defense<sup>56-58</sup>
- Antioxidant enhancement<sup>10</sup>
- Anti-inflammatory protection<sup>69</sup>
- Anti-hypertensive effect<sup>60</sup>
- Anti-microbial activity<sup>8</sup>
- Cholesterol reduction<sup>60</sup>
- Mood balance<sup>66</sup>
- Cognitive function<sup>67</sup>
- Reduced sarcopenia<sup>41,42</sup>



### Whey Component Uniquely Modulates Iron for Broad Health Benefits

**Lactoferrin** is a minor fraction of whey (see figure 1 on page 59). Its unique ability to **modulate iron**—up or down as needed—in different tissues provides a remarkably broad range of health benefits that contribute to whey's life extension effects.

Extensive scientific research demonstrates that, through its wide network of modulatory effects, lactoferrin:

- Kills dangerous microbes<sup>86,87</sup>
- Nurtures beneficial bacteria<sup>88</sup>
- Binds iron to prevent free radicals<sup>89,90</sup>
- Optimizes blood-iron levels<sup>86,91</sup>
- Inhibits cancer cells<sup>86,92</sup>
- Enhances intestinal absorptive cells<sup>93</sup> and maturation of dendritic cells<sup>94</sup>
- Boosts immunity<sup>94</sup>
- Enhances gene transcription<sup>95,96</sup>
- Reduces inflammation<sup>86,97</sup>
- Combats obesity<sup>98</sup>

It's no wonder scientists have described the whey protein lactoferrin as "**multifunctional!**"<sup>86</sup>

### Unique Protein Subfractions Modulate the Origins of Cardiovascular Disease

Cardiovascular disease is the leading cause of mortality in Western society, and the two main contributing factors are *hypertension* (high blood pressure) and *dyslipidemia* (elevated LDL/reduced HDL).<sup>59</sup>

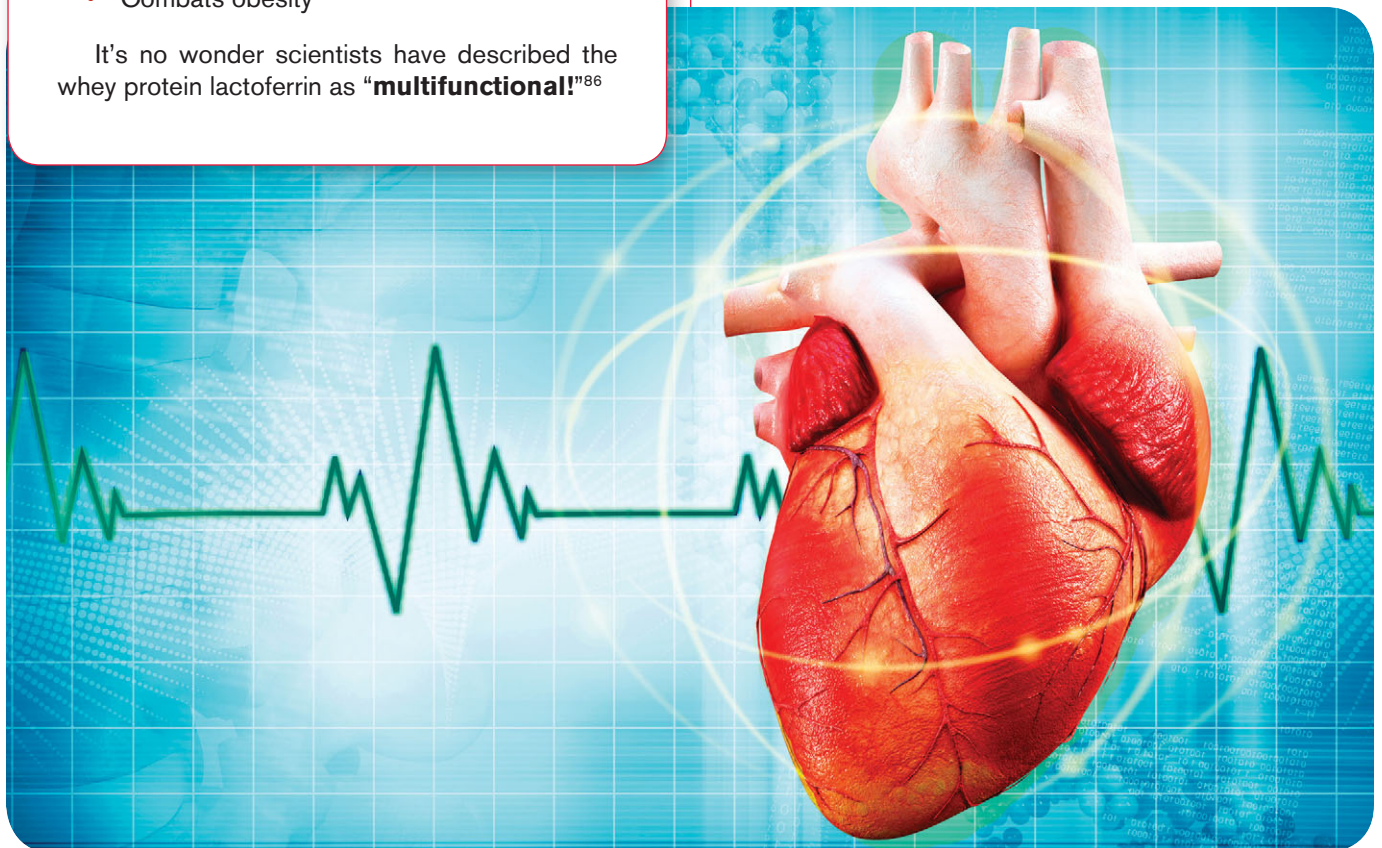
Recent research demonstrates that whey-based peptides reduce both of these risk factors through various pathways.<sup>60,61</sup> And food-derived peptides are considered far safer than anti-hypertension drugs.

Several whey peptides—including *alpha-lactalbumin* and *beta-lactoglobulin*—exhibit opioid-like activity. Endogenous opioid peptides have shown promise as blood-pressure modulators.<sup>60</sup>

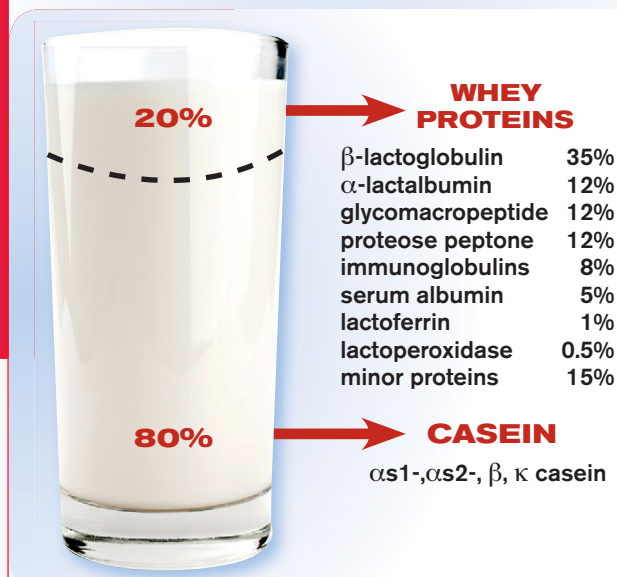
And limited evidence suggests whey's *lactoferrin* helps modulate platelet binding.<sup>60</sup>

Casein protein *raises* cholesterol—but whey protein shows the opposite effect!<sup>60,61</sup> Two-generation feeding of rats with *sphingolipids*—a type of phospholipid found in whey—decreased blood cholesterol levels by about **30%**!<sup>60</sup> How? Scientists speculate whey inhibits synthesis of cholesterol in the liver.<sup>61</sup>

Research also demonstrated a marked lowering of LDL cholesterol in rats given whey, which may be mediated through a decrease in *VLDL* (very low-density lipoprotein) fractions.<sup>60</sup>



**Figure 1: Whey Proteins are the Healthy Constituent of Milk**



The protein component of milk is composed of **20%** whey and **80%** casein. The whey fraction is made up of various protein components that each have their own unique benefits.<sup>6</sup>

Extremely interesting was the fact that reduction of LDL-cholesterol was *not* seen in animals fed amino acid mixtures that were *identical* in profile to whey protein—showing the benefits of whey are specific to its *unique* protein subfractions as opposed to its amino acid profile alone.<sup>61</sup>

Clearly, compounds in whey have cardioprotective effects that go beyond those of its amino acid profile!

### Whey Defends Against Neurocognitive Decline During Aging

Serotonin levels in the body can decline with age.<sup>62,63</sup> The rate of the brain's serotonin synthesis normally depends on its concentration of *tryptophan*, serotonin's essential amino acid precursor.<sup>64,65</sup> Reinforcing this, dietary intake of tryptophan has been found to *relieve* depression and stress.<sup>66</sup>

A double-blind, placebo-controlled study indicated that whey's *alpha-lactalbumin* increases the plasma ratio of tryptophan. And in subjects assessed as highly vulnerable to stress, this whey fraction *raised* brain serotonin activity and coping ability and improved mood under stress.<sup>66</sup>

Memory performance can decline under chronic stress, believed to result partially from reduced brain

serotonin. In a double-blind, placebo-controlled study, whey significantly improved memory-test performance in stress-vulnerable subjects.<sup>67</sup>

Also, because it boosts *glutathione* levels,<sup>9,10</sup> whey may protect against various age-related diseases—including neurocognitive disorders.<sup>13-19, 66-68</sup>

A 2012 review suggested that the *peptides* and *alpha-lactalbumin* found in whey may help protect against age-related cognitive decline and dementia during aging.<sup>68</sup>

### Whey Components Protect Gastrointestinal Tissue and Boost Beneficial Bacteria

Because whey raises *glutathione* levels, it protects tissue against damage caused by inflammation.<sup>69,70</sup> Lower levels of antioxidants—including glutathione—are associated with inflammatory bowel disease (IBD).<sup>71</sup>

Also, glutamine is a preferred fuel source for support of epithelial cells lining the small intestine. It is rapidly utilized by tissues during catabolic states, such as gastrointestinal dysfunction among children.<sup>72</sup>

Dietary components that act as prebiotics can improve balance and persistence of beneficial colonic bacteria by providing *substrates* (growth surfaces). Whey lactose can be converted to *galactooligosaccharides*—indigestible ingredients that create a substrate that *specifically* enhances growth of bifidobacteria.<sup>73</sup> These and other bacteria protect the intestine by secreting antimicrobial substances, modulating immune response, and influencing metabolic activities.<sup>74,75</sup>

In rats, the whey component *alpha-lactalbumin* showed dose-dependent protection against gastric injury caused by alcohol or stress.<sup>76</sup> Researchers concluded that whey may help prevent gastric mucosal injury, ulcers, and other gastrointestinal pathologies—avoiding the need for antiulcer drugs, *and their risks*.<sup>76</sup>

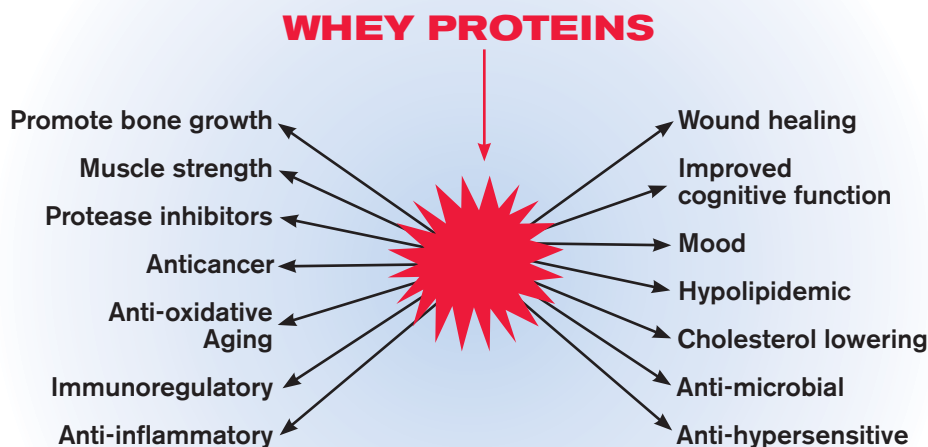
### Whey Proteins Rejuvenate and Optimize Immune Function!

Whey uniquely *fortifies* the overall immune system—so broadly that it's remarkable!<sup>8</sup>

Major and minor whey fractions are established immune-enhancing constituents that modulate a full range of immune functions, including *destruction* of pathogens and elimination of toxins.<sup>8,77,78</sup>

Whey supplementation significantly improves primary and secondary antibody responses to a variety of vaccines.<sup>79</sup>

A key immunity pillar is the cell-mediated, adaptive immune system, which—through *clonal expansion*

**Figure 2: Functional Properties of Whey**

Whey proteins provide a diverse array of functional properties that produce beneficial effects on many different biological processes and organ systems.<sup>6</sup>

(proliferation)—builds up a pool of *antigen-reactive bodies*.<sup>8,77</sup> Whey was found in an array of studies to be superior to other commercially available protein sources in improving adaptive immune reactivity.<sup>14,80-82</sup>

Mice supplemented with whey produced higher levels of *white blood cells*, *lymphocytes*, and *cytokines*—resulting in greater immune responsiveness and reduced infection severity.<sup>8,82</sup>

The antibody-mediated, humoral immune system needs to quickly produce antibodies in response to foreign microorganisms. Several studies found that, compared to other protein sources—soy, casein, wheat, corn, egg white, fish, beef, or spirulina maxima—whey proteins much more substantially boost production of both humoral immune response and antibodies.<sup>14,82,83</sup> In fact, in some instances, *the response was nearly five times greater than with other protein sources*.<sup>14</sup>

**Glutathione** is the centerpiece of immune protection against endogenously created oxidative stress as well as that from exogenous sources such as pollution, toxins, exercise, and ultraviolet light exposure.<sup>11</sup> And as mentioned, whey can greatly increase glutathione levels.<sup>9,10</sup>

An example of a condition characterized by glutathione deficiency—and greater oxidative stress—is *HIV infection*. Fortunately, whey supplements have been shown to dramatically increase glutathione levels in those with HIV.<sup>154</sup>

## Summary

Whey is often viewed simply as a high-quality protein source for athletes. However, emerging evidence indicates that the *branched-chain amino acids (BCAAs)* and other fractions found in whey **mimic** many of the longevity benefits of **calorie restriction (CR)**.

Studies on various organisms, including middle-aged mice, demonstrate that supplementing with the BCAAs and other components in whey can increase median life span by up to the equivalent of **9.6 years** in human terms!

This effect was modulated along typical CR pathways, including increases in mitochondrial biogenesis, reactive oxygen species (ROS) defense, cell signaling, and

expression of *sirtuin 1 (SIRT1)*—the mammalian **longevity gene** induced by CR!

Whey offers a method to secure some of the **anti-aging** effects of **calorie restriction** without extreme food deprivation. ●

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

## References

1. Valerio A, D'Antona G, Nisoli E. Branched-chain amino acids, mitochondrial biogenesis, and healthspan: an evolutionary perspective. *Aging (Albany NY)*. 2011 May;3(5):464-78.
2. D'Antona G, Ragni M, Cardile A, et al. Branched-chain amino acid supplementation promotes survival and supports cardiac and skeletal muscle mitochondrial biogenesis in middle-aged mice. *Cell Metab*. 2010 October;12(4):362-72.
3. Alvers AL, Fishwick LK, Wood MS, Hu D, Chung HS, Dunn WA, and Aris JP. Autophagy and amino acid homeostasis are required for chronological longevity in *Saccharomyces cerevisiae*. *Aging Cell*. 2009;8:353-69.
4. Fuchs S, Bundy JG, Davies SK, Viney JM, Swire JS, and Leroi AM. A metabolic signature of long life in *Caenorhabditis elegans*. *BMC Biol*. 2010;8:14.
5. Yalçın AS. Emerging therapeutic potential of whey proteins and peptides. *Curr Pharm Des*. 2006;12(13):1637-43.
6. Krissansen GW. Emerging health properties of whey proteins and their clinical implications. *J Am Coll Nutr*. Dec. 2007;26(6):713S-23S.

7. Vegarud GE, Langsrud T, Svenning C. Mineral-binding milk proteins and peptides; occurrence, biochemical and technological characteristics. *Br J Nutr*. 2000;84(Suppl 1):S91-8.
8. Available at: [http://www.innovatewithdairy.com/SiteCollectionDocuments/Mono\\_Immunity\\_0304.pdf](http://www.innovatewithdairy.com/SiteCollectionDocuments/Mono_Immunity_0304.pdf). Accessed June 12, 2013.
9. Kent KD, Harper WJ, Bomser JA. Effect of whey protein isolate on intracellular glutathione and oxidant-induced cell death in human prostate epithelial cells. *Toxicol In Vitro*. 2003 Feb;17(1):27-33.
10. Bounous G, Gervais F, Amer V, Batist G, Gold P. The influence of dietary whey protein on tissue glutathione and the diseases of aging. *Clin Invest Med*. 1989;12:343-9.
11. Townsend DM, Tew KD, Tapiero H. The importance of glutathione in human disease. *Biomed Pharmacother*. 2003 May-Jun;57(3-4):145-55.
12. Wu G, Fang YZ, Yang S, Lupton JR, Turner ND. Glutathione metabolism and its implications for health. *J Nutr*. 2004 Mar;134(3):489-92.
13. Katsanos CS, Chinkes DL, Paddon-Jones D, Zhang XJ, Aarsland A, Wolfe RR. Whey protein ingestion in elderly persons results in greater muscle protein accrual than ingestion of its constituent essential amino acid content. *Nutr Res*. 2008 Oct;28(10):651-8.
14. Bounous G, Batist G, Gold P. Immunoenhancing property of dietary whey protein in mice: role of glutathione. *Clin Invest Med*. 1989 Jun;12(3):154-61.
15. Currais A, Maher P. Functional consequences of age-dependent changes in glutathione status in the brain. *Antioxid Redox Signal*. 2013 Feb 5. [Epub ahead of print]
16. Shertzer HG, Woods SE, Krishan M, Genter MB, Pearson KJ. Dietary whey protein lowers the risk for metabolic disease in mice fed a high-fat diet. *J Nutr*. 2011 Apr 1;141(4):582-7.
17. Paddon-Jones D, Short KR, Campbell WW, Volpi E, Wolfe RR. Role of dietary protein in the sarcopenia of aging. *Am J Clin Nutr*. 2008 May;87(5):1562S-6S.
18. Pepe G, Tenore GC, Mastrocinque R, Stusio P, Campiglia P. Potential anticarcinogenic peptides from bovine milk. *J Amino Acids*. 2013;2013:939804.
19. Markus CR, Olivier B, de Haan EH. Whey protein rich in alpha-lactalbumin increases the ratio of plasma tryptophan to the sum of the other large neutral amino acids and improves cognitive performance in stress-vulnerable subjects. *Am J Clin Nutr*. 2002 Jun;75(6):1051-6.
20. Visvanathan R, and Chapman IM. Undernutrition and anorexia in the older person. *Gastroenterol Clin North Am*. 2009;38:393-409.
21. Ahmed T, and Haboubi N. Assessment and management of nutrition in older people and its importance to health. *Clin Interv Aging*. 2010;5:207-16.
22. Chapman IM. Nutritional disorders in the elderly. *Med Clin North Am*. 2006;90:887-907.
23. Ahmed N, Mandel R, and Fain MJ. Frailty: An emerging geriatric syndrome. *Am J Med*. 2007;120:748-53.
24. Heilbronn LK, de Jonge L, Frisard MI, et al. Effect of 6-month calorie restriction on biomarkers of longevity, metabolic adaptation, and oxidative stress in overweight individuals: A randomized controlled trial. *JAMA*. 2006;295:1539-48.
25. Ingram DK, Roth GS. Glycolytic inhibition as a strategy for developing calorie restriction mimetics. *Exp Gerontol*. 2011;46:148-54.
26. Ingram DK, Zhu M, Mamczarz J, et al. Calorie restriction mimetics: an emerging research field. *Aging Cell*. 2006 Apr;5(2):97-108.
27. Solerte SB, Gazzaruso C, Bonacasa R, et al. Nutritional supplements with oral amino acid mixtures increases whole-body lean mass and insulin sensitivity in elderly subjects with sarcopenia. *Am J Cardiol*. 2008;101:69E-77E.
28. Available at: <http://www.encognitive.com/files/Potential%20benefits%20of%20improved%20protein%20intake%20in%20older%20people.pdf>. Accessed June 12, 2013.
29. Nair KS, Short KR. Hormonal and signaling role of branched-chain amino acids. *J Nutr*. 2005 Jun;135(6 Suppl):1547S-52S.
30. Available at: <http://www.cdc.gov/nchs/fastats/lifexp.htm>. Accessed June 12, 2013.
31. Lan-Pidhainy X, Wolever TM. The hypoglycemic effect of fat and protein is not attenuated by insulin resistance. *Am J Clin Nutr*. 2010 Jan;91(1):98-105.
32. Jakubowicz D, Froy O. Biochemical and metabolic mechanisms \ by which dietary whey protein may combat obesity and type 2 diabetes. *J Nutr Biochem*. 2013 Jan;24(1):1-5.
33. Hall WL, Millward DJ, Long SJ, Morgan LM. Casein and whey exert different effects on plasma amino acid profiles, gastrointestinal hormone secretion and appetite. *Br J Nutr*. 2003;89:239-48.
34. Pal S, Ellis V. The acute effects of four protein meals on insulin, glucose, appetite and energy intake in lean men. *Br J Nutr*. 2010;104:1241-8.



35. Veldhorst MA, Nieuwenhuizen AG, Hochstenbach-Waelen A, et al. Dose-dependent satiating effect of whey relative to casein or soy. *Physiol Behav.* 2009;96:675-82.
36. Bowen J, Noakes M, Trenerry C, Clifton PM. Energy intake, ghrelin, and cholecystokinin after different carbohydrate and protein preloads in overweight men. *J Clin Endocrinol Metab.* 2006;91:1477-83.
37. Baer DJ, Stote KS, Paul DR, Harris GK, Rumpler WV, Clevidence BA. Whey protein but not soy protein supplementation alters body weight and composition in free-living overweight and obese adults. *J Nutr.* 2011;141:1489-94.
38. Dangin M, Boirie Y, Guillet C, Beaufre B. Influence of the protein digestion rate on protein turnover in young and elderly subjects. *J Nutr.* 2002 Oct;132(10):3228S-33S.
39. Available at: [http://www.usdec.org/files/PDFs/2008Monographs/WeighWeightManagement\\_English.pdf](http://www.usdec.org/files/PDFs/2008Monographs/WeighWeightManagement_English.pdf). Accessed June 13, 2013.
40. Doherty TJ. Invited review: Aging and sarcopenia. *J Appl Physiol.* 2003. 95(4):1717-27.
41. Graf S, Egert S, Heer M. Effects of whey protein supplements on metabolism: evidence from human intervention studies. *Curr Opin Clin Nutr Metab Care.* 2011 Nov;14(6):569-80.
42. Paddon-Jones D, Sheffield-Moore M, Katsanos CS, Zhang XJ, Wolfe RR. Differential stimulation of muscle protein synthesis in elderly humans following isocaloric ingestion of amino acids or whey protein. *Exp Gerontol.* 2006 Feb;41(2):215-9.
43. McKiernan SH, Colman RJ, Lopez M, et al. Caloric restriction delays aging-induced cellular phenotypes in rhesus monkey skeletal muscle. *Exp Gerontol.* 2011 January;46(1):23-9.
44. Paddon-Jones D, Short KR, Campbell WW, Volpi E, Wolfe RR. Role of dietary protein in the sarcopenia of aging. *Am J Clin Nutr.* 2008 May;87(5):1562S-6S.
45. Koopman R, Verdijk L, Manders RJ, et al. Co-ingestion of protein and leucine stimulates muscle protein synthesis rates to the same extent in young and elderly lean men. *Am J Clin Nutr.* 2006 Sep;84(3):623-32.
46. Dardevet D, Sornet C, Balage M, Grizard J. Stimulation of in vitro rat muscle protein synthesis by leucine decreases with age. *J Nutr.* 2000 Nov;130(11):2630-5.
47. Katsanos CS, Kobayashi H, Sheffield-Moore M, Aarsland A, Wolfe RR. A high proportion of leucine is required for optimal stimulation of the rate of muscle protein synthesis by essential amino acids in the elderly. *Am J Physiol Endocrinol Metab.* 2006 Aug;291(2):E381-7.
48. Fujita S, Dreyer HC, Drummond MJ, et al. Nutrient signalling in the regulation of human muscle protein synthesis. *J Physiol.* 2007 Jul 15;582(Pt 2):813-23.
49. Dreyer HC, Drummond MJ, Pennings B, et al. Leucine-enriched essential amino acid and carbohydrate ingestion following resistance exercise enhances mTOR signaling and protein synthesis in human muscle. *Am J Physiol Endocrinol Metab.* 2008 Feb;294(2):E392-400.
50. Fujita S, Volpi E. Amino acids and muscle loss with aging. *J Nutr.* 2006 Jan;136(1 Suppl):277S-80S.
51. Morley JE, Thomas DR, Wilson MM. Cachexia: pathophysiology and clinical relevance. *Am J Clin Nutr.* 2006 Apr;83(4):735-43.
52. Hack V, Schmid D, Breikreutz R, et al. Cystine levels, cystine flux, and protein catabolism in cancer cachexia, HIV/SIV infection, and senescence. *FASEB J.* 1997 Jan;11(1):84-92.
53. Dillon EL, Basra G, Horstman AM, et al. Cancer cachexia and anabolic interventions: a case report. *J Cachexia Sarcopenia Muscle.* 2012 Dec;3(4):253-63.
54. Bounous G, Baruchel S, Falutz J, Gold P. Whey proteins as a food supplement in HIV-seropositive individuals. *Clin Invest Med.* 1993 Jun;16(3):204-9.
55. Aoe S, Toba Y, Yamamura J, et al. Controlled trial of the effects of milk basic protein (MBP) supplementation on bone metabolism in healthy adult women. *Biosci Biotechnol Biochem.* 2001;65: 913-8.
56. Parodi PW. A role for milk proteins and their peptides in cancer prevention. *Curr Pharm Des.* 2007;13(8):813-28.
57. McIntosh GH, Regester GO, Le Leu RK, Royle PJ, Smithers GW. Dairy proteins protect against dimethylhydrazine-induced intestinal cancers in rats. *J Nutr.* 1995 Apr;125(4):809-16.
58. Tsuda H, Sekine K, Ushida Y, et al. Milk and dairy products in cancer prevention: focus on bovine lactoferrin. *Mutat Res.* 2000 Apr;462(2-3):227-33.
59. Available at: <http://www.cdc.gov/features/vitalsigns/cardiovascular-disease/>. Accessed June 14, 2013.
60. Available at: [http://usdec.files.cms-plus.com/Publications/CardioHealth\\_English.pdf](http://usdec.files.cms-plus.com/Publications/CardioHealth_English.pdf). Accessed June 14, 2013.
61. Zhang X, Beynen AC. Lowering effect of dietary milk-whey protein v. casein on plasma and liver cholesterol concentrations in rats. *Br J Nutr.* 1993 Jul;70(1):139-46.



62. Meltzer CC, Smith G, DeKosky ST, et al. Serotonin in aging, late-life depression, and Alzheimer's disease: the emerging role of functional imaging. *Neuropsychopharmacology*. 1998 Jun;18(6):407-30.
63. Meltzer CC, Price JC, Mathis CA, et al. Serotonin 1A receptor binding and treatment response in late-life depression. *Neuropsychopharmacology*. 2004 Dec;29(12):2258-65.
64. Fernstrom JD, Wurtman RJ. Brain serotonin content: physiological dependence on plasma tryptophan levels. *Science*. 1971;173:149-52.
65. Fernstrom JD, Wurtman RJ. Brain serotonin content: physiological regulation by plasma neutral amino acids. *Science*. 1972;178:414-6.
66. Markus CR, Olivier B, Panhuysen GE, et al. The bovine protein alpha-lactalbumin increases the plasma ratio of tryptophan to the other large neutral amino acids, and in vulnerable subjects raises brain serotonin activity, reduces cortisol concentration, and improves mood under stress. *Am J Clin Nutr*. 2000 Jun;71(6):1536-44.
67. Markus CR, Olivier B, de Haan EH. Whey protein rich in alpha-lactalbumin increases the ratio of plasma tryptophan to the sum of the other large neutral amino acids and improves cognitive performance in stress-vulnerable subjects. *Am J Clin Nutr*. 2002 Jun;75(6):1051-6.
68. Camfield DA, Owen L, Scholey AB, Pipingas A, Stough C. Dairy constituents and neurocognitive health in ageing. *Br J Nutr*. 2011 Jul;106(2):159-74.
69. Chatterton DE, Nguyen DN, Bering SB, Sangild PT. Anti-inflammatory mechanisms of bioactive milk proteins in the intestine of newborns. *Int J Biochem Cell Biol*. 2013 May 6.
70. Rahman I, MacNee W. Oxidative stress and regulation of glutathione in lung inflammation. *Eur Respir J*. 2000 Sep;16(3):534-54.
71. Buffinton GD, Doe WF. Depleted mucosal antioxidant defences in inflammatory bowel disease. *Free Radic Biol Med*. 1995;19:911-8.
72. Duggan C, Stark AR, Auestad N, et al. S. Collier. 2004. Glutamine supplementation in infants with gastrointestinal disease: a randomized, placebo-controlled pilot trial. *Nutrition*.2004;20:752-6.
73. Walzem RL, Dillard CJ, German JB. Whey components: millennia of evolution create functionalities for mammalian nutrition: What we know and what we may be overlooking. *Crit Rev Food Sci Nutr*. 2002;42:353-75.
74. Fioramonti J, Theodorou V, Bueno L. Probiotics: what are they? What are their effects on gut physiology? *Best Pract Res Clin Gastroenterol*. 2003;17:711-24.
75. Teitelbaum JE, Walker WA. Nutritional impact of pre- and probiotics as protective gastrointestinal organisms. *Annu Rev Nutr*. 2002;22:107-38.
76. Matsumoto H, Shimokawa Y, Ushida Y, Toida T, Hayasawa H. New biological function of bovine alpha-lactalbumin: Protective effect against ethanol- and stress-induced gastric mucosal injury in rats. *Biosci Biotechnol Biochem*. 2001 May;65(5):1104-11.
77. Cross M L, Gill HS. Immunomodulatory properties of milk. *Brit J Nutr*. 2000;84:S81-9.
78. Clare DA, Swaisgood HE. Bioactive milk peptides: A prospectus. *J Dairy Sci*. 2000;83:1187-95.
79. Low PPL, Rutherford KJ, Gill HS, Cross ML. Effect of dietary whey protein concentrate on primary and secondary antibody responses in immunized BALB/C mice. *Int Immunopharmacol*. 2003;3:393-401.
80. Bounous G, Kongshavn PA, Gold P. The immunoenhancing property of dietary whey protein concentrate. *Clin Invest Med*. 1988 August;11(4):271-8.
81. Bounous G, Papenburg R, Kongshavn PA, Gold P, Fleiszer D. Dietary whey protein inhibits the development of dimethylhydrazine induced malignancy. *Clin Invest Med*. 1988;11(3):213-7.
82. Ford JT, Wong CW, Colditz IG. Effects of dietary protein types on immune responses and levels of infection with *Eimeria vermiformis* in mice. *Immunol Cell Biol* 2001;79(1):23-8.
83. Bounous G, Kongshavn PA. Differential effect of dietary protein type on the B-cell and T-cell immune responses in mice. *J Nutr*. 1985;115(11):1403-8.
84. McCay CM, Crowel MF. Prolonging the life span. *Scientific Monthly*. 1934 Nov;39(5):405-14.
85. McCay CM, Crowell MF, Maynard LA. The effect of retarded growth upon the length of life span and upon the ultimate body size. *Nutrition*. 1935;5:155-71.
86. Ward PP, Paz E, Conneely OM. Multifunctional roles of lactoferrin: a critical overview. *Cell Molecul Life Sci*. 2005;62:2540-8.
87. Wakabayashi H, Yamauchi K, Takase M. Inhibitory effects of bovine lactoferrin and lactoferricin B on *Enterobacter sakazakii*. *Biocontrol Sci*. 2008;13:29-32.
88. Liepke C, Adermann K, Raida M, et al. Human milk provides peptides highly stimulating the growth of bifidobacteria. *Eur J Biochem*. 2002;269:712-8.
89. Okazaki Y, Kono I, Kuriki TJ, et al. Bovine lactoferrin ameliorates ferric nitrilotriacetate-induced renal oxidative damage in rats. *Clin Biochem Nutr*. 2012 Sep;51(2):84-90.
90. Raghuvver TS, McGuire EM, Martin SM, et al. Lactoferrin in the preterm infants' diet attenuates iron-induced oxidation products. *Pediatr Res*. 2002;52:964-72.
91. Shoji H, Oguchi S, Shinohara K, et al. Effects of iron-unsaturated human lactoferrin on hydrogen peroxide-induced oxidative damage in intestinal epithelial cells. *Pediatr Res*. 2007;61:89-92.
92. Iigo M, Shimamura M, Matsuda E, et al. Orally administered bovine lactoferrin induces caspase-1 and interleukin-18 in the mouse intestinal mucosa: a possible explanation for inhibition of carcinogenesis and metastasis. *Cytokine*. 2004;25:36-44.
93. Oguchi S, Walker WA, Sanderson IR. Iron saturation alters the effect of lactoferrin on the proliferation and differentiation of human enterocytes (Caco-2 cells). *Biol Neonate*. 1995;67:330-9.
94. Spadaro M, Caorsi C, Ceruti P, et al. Lactoferrin, a major defense protein of innate immunity, is a novel maturation factor for human dendritic cells. *FASEB J*. 2008;22:2747-57.
95. Ashida K, Sasaki H, Suzuki YA, Lonnardal B. Cellular internalization of lactoferrin in intestinal epithelial cells. *Biometals*. 2004;17:311-5.
96. Garre C, Bianchi-Scarra G, Sirito M, et al. Lactoferrin binding sites and nuclear localization in K562(S) cells. *J Cell Physiol*. 1992;153:477-82.
97. Tung YT, Chen HL, Yen CC, et al. Bovine lactoferrin inhibits lung cancer growth through suppression of both inflammation and expression of vascular endothelial growth factor. *J Dairy Sci*. 2013 Apr;96(4):2095-106.
98. Ono T, Murakoshi M, Suzuki N, et al. Potent anti-obesity effect of enteric-coated lactoferrin: decrease in visceral fat accumulation in Japanese men and women with abdominal obesity after 8-week administration of enteric-coated lactoferrin tablets. *Br J Nutr*. 2010 Dec;104(11):1688-95.
99. Maher P. Modulation of multiple pathways involved in the maintenance of neuronal function during aging by fisetin. *Genes Nutr*. 2009 Sep 10.
100. Sadruddin S, Arora R. Resveratrol: biologic and therapeutic implications. *J Cardiometa Syndr*. 2009 Spring;4(2):102-6.
101. Joseph JA, Fisher DR, Cheng V, Rimando AM, Shukitt-Hale B. Cellular and behavioral effects of stilbene resveratrol analogues: implications for reducing the deleterious effects of aging. *J Agric Food Chem*. 2008 Nov 26;56(22):10544-51.
102. Salas A, Subirada F, Perez-Enciso M, et al. Plant polyphenol intake alters gene expression in canine leukocytes. *J Nutrigenet Nutrigenomics*. 2009;2(1):43-52.
103. Ruiz PA, Braune A, Holzwimmer G, Quintanilla-Fend L, Haller D. Quercetin inhibits TNF-induced NF-kappaB transcription factor recruitment to proinflammatory gene promoters in murine intestinal epithelial cells. *J Nutr*. 2007 May;137(5):1208-15.
104. Widlansky ME, Duffy SJ, Hamburg NM, et al. Effects of black tea consumption on plasma catechins and markers of oxidative stress and inflammation in patients with coronary artery disease. *Free Radic Biol Med*. 2005 Feb 15;38(4):499-506.

# THE OPTIMAL TRYPTOPHAN FORMULA!



**Serotonin** is a neurotransmitter made in the brain from **tryptophan**. Serotonin has been associated with positive moods and restful sleep.<sup>1-4</sup>

To produce and maintain optimum serotonin levels, your body requires **tryptophan**, an essential amino acid, which means that your body cannot produce it.<sup>1</sup>

In the body, tryptophan has been shown to:

- Improve sleep<sup>3,4</sup>
- Enhance mood<sup>1,2,4</sup>
- Modulate stress<sup>5</sup>

**Life Extension®** offers **Optimized Tryptophan Plus** to broadly and powerfully support tryptophan levels already within the normal range.

In addition to delivering an optimum intake of tryptophan *itself*—the **Optimized Tryptophan Plus** formula also provides a unique, balanced supply of other nutrients found to help maintain tryptophan activity in the body.<sup>6-8</sup>

## Multi-Pathway Tryptophan Support

The **Optimized Tryptophan Plus** blends lysine, niacinamide, and extracts of hops and rosemary to provide nutritive support for the body's production of serotonin.

## Purity and Safety

**Life Extension® Optimized Tryptophan Plus** contains premium L-tryptophan which has undergone significantly more rigorous manufacturing processes than regular tryptophan material to assure the highest purity and safety.

The suggested daily dose of 3 vegetarian capsules of **Optimized Tryptophan Plus** provides:

<b>L-Tryptophan</b>	<b>1,000 mg</b>
<b>L-Lysine</b> (as L-Lysine HCl)	<b>250 mg</b>
<b>Proprietary Tryptophan Plus Blend</b> Perluxan® Hops Standardized Extract ( <i>Humulus lupulus</i> )(cones), and Ursole™ Rosemary Standardized Extract ( <i>Rosmarinus officinalis</i> )(leaves)	<b>285 mg</b>
<b>Niacin</b> (as Niacinamide)	<b>66 mg</b>

A bottle of 90 vegetarian capsules of **Optimized Tryptophan Plus** retails for \$32. If a member buys four bottles, the price is reduced to **\$21.75** per bottle.

## References

1. *Int J Neurosci*. 1992 Nov-Dec;67(1-4):127-44.
2. *Curr Opin Neurobiol*. 2013 Feb 2. pii: S0959-4388(13)00027-5.
3. *Prog Neurobiol*. 2000 Jan;60(1):13-35.
4. *J Nutr*. 2012 Dec;142(12):2236S-2244S.
5. *J Exp Biol*. 2002 Dec;205(Pt 23):3679-87.
6. Available at: <http://www.tamu.edu/faculty/bmiles/lectures/amcat.pdf>. Accessed February 14, 2013.
7. *Amino Acids*. 2012 June 8.
8. *J Clin Invest*. 1999 April 15;103(8):1169-78.

Perluxan® is used by permission. Ursole™ is a trademark of Vitiva d. d., Slovenia.

For those who prefer capsules containing pure Tryptophan alone, **Life Extension®** also offers **L-Tryptophan**.

Each capsule provides **500 milligrams** of **L-Tryptophan**.

A bottle of 90 vegetarian capsules of **L-Tryptophan** retails for \$33. If a member buys four bottles, the price is reduced to **\$22.50** per bottle.



**To order Optimized Tryptophan Plus and L-Tryptophan,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

# A SUPERIOR WHEY PROTEIN

*from Grass-Fed, Free Range Cows not treated with Growth Hormone (rBST).*

As people age, they become more susceptible to muscle deterioration and a declining immune system.<sup>1,2</sup> Fortunately, **whey protein** can have a positive impact on muscle construction and immunity due to its *branched-chain amino acid profile* (BCAAs) and naturally occurring *lactoferrin* and *immunoglobins*.<sup>3-5\*</sup>

Unlike many commercial brands on the market, **New Zealand Whey Protein Concentrate** is uniquely derived from **grass-fed, free range cows** living healthy lives in New Zealand and not treated with Growth Hormone (rBST).

Life Extension's New Zealand Whey Protein Concentrate offers the following:

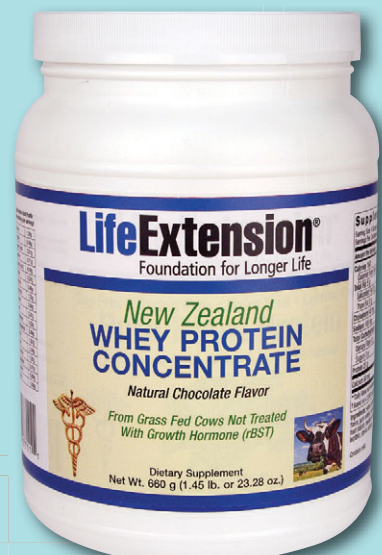
- **Non-GMO Whey Protein Concentrate!**
- **Naturally high levels of essential branched-chain amino acids!**
- **High-quality muscle building protein!**
- **Easily mixes into water or milk!**
- **Great Taste!** – Available in both **natural chocolate** and **natural vanilla** flavors.

The retail price for an 18.34 ounce container of **New Zealand Vanilla Flavored Whey Protein Concentrate** (Item # 01770) or for a 23.28 ounce container of **New Zealand Chocolate Flavored Whey Protein Concentrate** (Item # 01771) is \$30. If a member purchases four bottles, the price is reduced to **\$19.95** per bottle. Contains milk.

**To order New Zealand Whey Protein Concentrate, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**



Item # 01770



Item # 01771

#### References

1. *J Appl Physiol*. 2003; 95(4):1717-27.
2. *Curr Genomics*. 2012 Dec;13(8):589-602.
3. Available at: <http://www.innovatewithdairy.com/>
4. *Curr Opin Clin Nutr Metab Care*. 2011 Nov;14(6):569-80.
5. *J Nutr*. 2006 Jan;136(1 Suppl):277S-80S.

SiteCollectionDocuments/Mono\_Immunity\_0304.pdf.  
Accessed June 12, 2013.

\*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

# THE UPGRADED LIFE EXTENSION MIX™

Scientists have identified multiple mechanisms by which **green tea** extract helps protect against LDL oxidation, neuronal oxidation, and a host of other structural and functional age-related changes. LIFE EXTENSION MIX™ provides more green tea extract than found in commercial formulations.

**Broccoli** is one of the vegetables best documented to protect healthy DNA. The broccoli concentrate in LIFE EXTENSION MIX™ is standardized to provide **sulforaphane** and other **glucosinolates**, compounds responsible for broccoli's protective benefits.

**Olive polyphenols** help protect against LDL oxidation, quench free radicals, and stabilize cell membranes. LIFE EXTENSION MIX™ contains an olive extract standardized to provide the best-documented polyphenol called **hydroxytyrosol**.

**Luteolin** is a flavonoid found in **parsley, artichoke, basil, celery**, and other foods. It has shown the ability to help protect against DNA oxidative damage. When measured against 27 other citrus flavonoids, **luteolin** proved one of the most beneficial at maintaining healthy DNA. **Luteolin** also suppresses excess levels of **interleukin-6** and **interleukin-1b**. LIFE EXTENSION MIX™ contains a standardized dose of **8 mg** of luteolin.

**Lycopene** is the red carotenoid in **tomatoes** that supports a healthy prostate and helps promote healthy lipid profiles for those already within a normal range.

**Lutein** is found in **spinach** and **collard greens** and has been shown to help maintain **eye macula pigment** structure.

**D-glucarate** is found in **grapefruit, apples, oranges, broccoli**, and **Brussels sprouts**. D-glucarate supports a detoxification process that helps to remove DNA toxins.

**Pomegranate** may be the most effective plant to help maintain optimal endothelial function. This pomegranate extract is standardized to provide the punicalagins and other polyphenols found in up to 2.6 ounces of pomegranate juice.

**Sesame lignans** increase tissue levels of **vitamin E**, including **gamma tocopherol**, and inhibit the formation of an inflammatory precursor called arachidonic acid.

**Wild blueberry extract**, standardized to help maintain optimal neuronal function.

**Pterostilbene** is a compound naturally found in blueberries and grapes that has been shown to have beneficial, anti-aging effects on gene expression and to promote healthy cognitive function.

**Cyanidin-3-Glucoside** is a berry compound that promotes healthy function of the retina to help support night vision.

**Pyridoxal 5'-phosphate** helps protect against glycation reactions, a toxic process in which sugars bind to lipids and proteins to form non-functional structures in the body.



315 tablets  
Item #01755



490 capsules  
Item #01754



14.81 oz powder  
Item #01756

**9 tablets, 14 capsules, or three scoops of powder provide:**

## Vegetable-Fruit Complex

Green tea extract (decaf.) (45% EGCG)	325 mg
Broccoli sprout concentrate (providing sulforaphane, glucosinolates, D-3T, and PEITC)	525 mg
Olive juice extract (providing polyphenols, hydroxytyrosol, oleuropein)	12.5 mg
Grapeseed proanthocyanidin extract (Leucoselect®)	25 mg
Grape ( <i>vitis vinifera</i> ) extract (BioVin®)	25 mg
Luteolin (Pureolin™ and SMART™)	8 mg
Lycopene (natural tomato extract) (Tomat-O-Red®)	3 mg
Lutein (marigold extract) (465 mcg trans-zeaxanthin)	15 mg
Maqui Berry ( <i>Aristotelia chilensis</i> ) anthocyanin extract	100 mg
Milk thistle extract (85% silymarin)	100 mg
Bromelain (from pineapple)	15 mg
Calcium D-Glucarate	200 mg
Citrus Bioflavonoids (50% hesperidin)	200 mg
Acerola extract 4:1	300 mg
Bilberry extract (MirtoSelect®)	30 mg
Pomegranate extract (30% punicalagins) (POMELLA®)	85 mg
Sesame seed lignan extract	10 mg
Berry-fruit blend (HiActives®) (blackberry, blueberry, cranberry, elderberry, persimmon, prune, and cherry)	200 mg
Wild Blueberry ( <i>Vaccinium angustifolium</i> ) anthocyanin extract (fruit)	150 mg
trans-Pterostilbene (from pTeroPure™)	0.5 mg
Cyanidin-3-Glucoside (C3G) (from blackcurrant extract)	1.25 mg
Tart Cherry ( <i>Prunus cerasus</i> ) proanthocyanidin extract	85 mg

## Water-Soluble Vitamins and Enzymatic Activators

Vitamin C	2000 mg
as: ascorbic acid, calcium, magnesium & niacinamide ascorbates, ascorbyl palmitate, acerola extract	
Natural Folate (from lemon extract)	400 mcg
Biotin	3,000 mcg
Trimethylglycine (TMG) (from sugar beets)	100 mg
Vitamin B1 (thiamine HCl)	125 mg
Vitamin B2 (riboflavin)	50 mg
Supplying: Riboflavin 5'-phosphate	2 mg
Vitamin B3 (niacinamide and niacinamide ascorbate)	117 mg
Vitamin B3 (niacin)	73 mg
Vitamin B5 (D-calcium pantothenate)	600 mg
Pantethine	5 mg
Vitamin B6 (pyridoxine HCl)	5 mg
Pyridoxal 5'-phosphate (vitamin B6)	100 mg
Vitamin B12 (hydroxocobalamin acetate)	600 mcg

# The Most Complete Multivitamin Available Today

Published scientific studies document that people who eat the **most fruits and vegetables** have much lower incidences of health problems. Few people, however, consistently eat enough plant foods to protect against common age-related decline,<sup>1,3</sup> and commercial multivitamins do not provide all of the vital plant components needed to maintain good health.

**Life Extension Mix** provides a broad array of **vegetable/fruit extracts**.

**Life Extension Mix™** now contains the **sodium selenite** form of selenium in addition to **L-selenomethionine** and **Se-methyl-L-selenocysteine**.

## Fat-Soluble Vitamins

Vitamin A (90% Betatene® beta-carotene + 10% acetate)	5,000 IU
Vitamin D3 (cholecalciferol)	2,000 IU
Vitamin C (as calcium ascorbate, ascorbic acid, ascorbyl palmitate, magnesium ascorbate, niacinamide ascorbate, acerola extract)	2,000 mg
Ascorbyl palmitate (fat-soluble vitamin C)	250 mg
Vitamin E (natural D-alpha tocopheryl succinate and D-alpha tocopherol)	100 IU
Natural mixed tocopherols (providing gamma, delta, alpha, and beta tocopherols)	60 mg

## Amino Acid Complex

N-acetyl-L-cysteine	600 mg
Taurine	200 mg

## Mineral Complex

Selenium (from Se-methyl L-selenocysteine)	100 mcg
Selenium (from L-selenomethionine—SelenoPure™)	50 mcg
Selenium (from sodium selenite)	50 mcg
Zinc (monomethionine) (OptiZinc®)	20 mg
Zinc (succinate)	15 mg
Boron (as boron citrate/aspartate/glycinate)	3 mg
Calcium	218 mg
Copper (as copper glycinate chelate TRAACS®)	1 mg
Chromium (as Chrominex® 3+ chromium stabilized with Capros® and PrimaVie® Shilajit)	500 mcg
Potassium chloride (37.4 mg elemental)	71.3 mg
Molybdenum (sodium molybdate)	125 mcg
Manganese (gluconate)	1 mg
Iodine (potassium iodide)	150 mcg
Magnesium oxide (335.96 mg elemental)	560 mg
Magnesium citrate (35.28 mg elemental)	261.3 mg
Magnesium glycinate (11.74 mg elemental)	100 mg
Magnesium taurinate (7.83 mg elemental)	100 mg
Magnesium arginate (5.87 mg elemental)	100 mg
Magnesium ascorbate (3.40 mg elemental)	58.1 mg

## Cholinergic Complex

Choline (from bitartrate)	120 mg
Phosphatidylcholine (from soy)	150 mg
Inositol	250 mg

Each one of these selenium compounds provides unique biological benefits. The **new Life Extension Mix™** also provides a small amount of **gamma tocopherol** (40 mg) as a part of **natural mixed tocopherols** which includes natural vitamin E. Most members take an additional **200 mg** of **gamma tocopherol** in other supplements. The full daily dose of Life Extension Mix™ can be obtained for as little as **\$1.49** per day.

**Vitamin D3** helps maintain healthy bone density and DNA. There is five times more vitamin D in LIFE EXTENSION MIX™ compared to conventional multivitamins.

The **new Life Extension Mix™** utilizes **natural mixed tocopherols** that provide natural vitamin E from alpha tocopherol and a small amount of gamma tocopherol (40 mg). Compared to synthetic vitamin E, the natural form is far more **bioavailable** to the body.

**N-acetyl-L-cysteine** suppresses free radicals inside the cell and maintains healthy glutathione levels. **Taurine** may protect against free radicals between cells and supports eye health.

**Life Extension Mix™** contains the **sodium selenite**, **selenomethionine**, and **Se-methyl L-selenocysteine** forms of selenium. Some scientific evidence suggests that consumption of **selenium** may reduce the risk of certain forms of cancer; however, the FDA has determined that this evidence is limited and not conclusive.

**Zinc** is often poorly absorbed, but LIFE EXTENSION MIX™ provides two of the most bioavailable forms of zinc.

**Boron** is not only needed to maintain healthy bone density but may also help promote healthy prostate cell function.

LIFE EXTENSION MIX™ provides a high amount of an optimal form of **chromium** to help maintain arterial wall structure and already normal glucose levels.

**Magnesium** helps protect arteries and heart valves, and supports heart and brain cells. LIFE EXTENSION MIX™ provides high potencies of six different forms of magnesium to fully saturate the body with this life-saving mineral.

Maintaining high levels of **acetylcholine** in the brain helps support cognitive function and memory.

Contains soybeans.

1) Betatene® is a registered trademark of Cognis Nutrition and Health. 2) The use of Calcium D-Glucarate is licensed from Applied Food Sciences, LLC under U.S. Patent No. 5,561,160. 3) OptiZinc® is a registered trademark of InterHealth Nutritionals, Inc. 4) SelenoPure™ is a trademark of Nutrition 21. 5) Chrominex® 3+, Capros® and PrimaVie® are registered trademarks of Natreen, Inc. 6) Leucosellect® is a registered trademark of Indena S.p.A. 7) BioVin® is a registered trademark of Cyvex Nutrition. 8) Purelin™ and SMART™ are trademarks of Pharma Science Nutrients, Inc., and is used here under license. All rights reserved worldwide. 9) Tomat-O-Red® is a registered trademark of Lycopodium LTD. 10) POMELLA® Extract is covered under U.S. Patent 7,638,640 and POMELLA® is a registered trademark of Verdure Sciences, Inc. 11) pTeroPure™ is a trademark of ChromaDex, Inc. 12) MitoSelect® is a registered trademark of Indena, S.p.A., Milan, Italy. 13) HiActives® is a registered trademark of VDF FutureCeuticals, Inc. 14) TRAACS® is a registered trademark of Albion Laboratories, Inc.

**CAUTION:** Some people choose a high-niacin version of Life Extension Mix that provides 862 mg in the daily dose, of which 345 mg is the form of niacin that can cause temporary flushing, itching or gastric disturbances. Liver function testing is recommended when niacin is taken in excess of 500 mg daily. Those with gout or liver diseases should avoid taking high doses of niacin. Consult with your doctor before using this product if you are taking anticoagulant medications. Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxyvitamin D measurement. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

## References

1. Stroke. 2004 Sep;35(9):2014-9.
2. Mutant Res. 1999 Jul 16;428(1-2):329-38.
3. J Am Diet Assoc. 1996 Oct;96(10):1027-39.

To order call toll-free  
1-800-544-4440 or visit  
[www.LifeExtension.com](http://www.LifeExtension.com)

# Aging & Diseases of Aging

## CONFERENCE

### in Tokyo, Japan

If you could go back in time, you'd want to have a pint of your blood removed and frozen every few years so that it would be available to be reintroduced into your aging body.

One reason is that your young blood does not have the inflammatory proteins that are found in old blood. These inflammatory factors have been found to inhibit stem cell function. Young blood also contains more youthful immune system cells (T-lymphocytes and B-lymphocytes). Cells in the immune system become less functional with age.

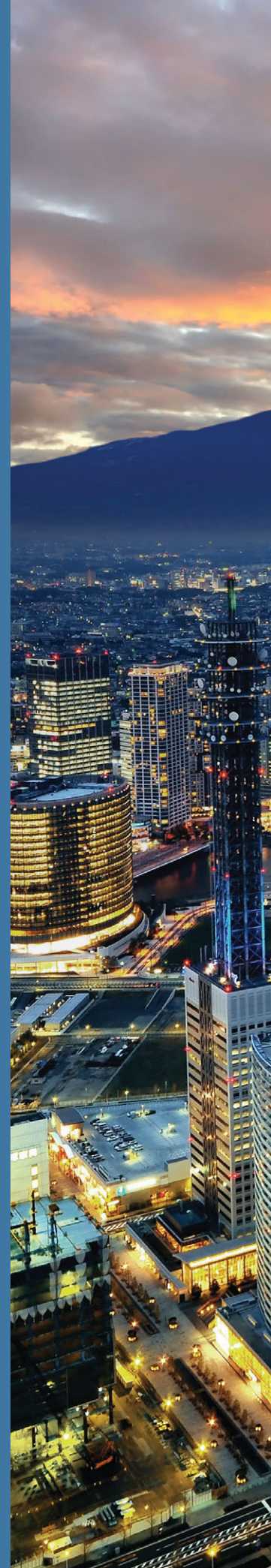
Another benefit of having your youthful blood available is that it contains more youthful **stem cells** that can provide a systemic rejuvenating effect.

Progressive medical facilities in the United States now offer a service where they temporarily stimulate stem cells in healthy people to boost their white blood cell production (using **granulocyte-colony-stimulating factor**). After a week's time, the doctors withdraw your blood and freeze it until a time in the future when you need it to save your life. There is no time limit for how long your blood can remain frozen.

The time and expense involved in this procedure precludes most people from doing it.

Over forty years ago scientists demonstrated that linking the blood circulation of old rats to young rats could extend the life span of old rats by about **20%**.<sup>1</sup> The rat experiments worked because the rats were genetically identical, despite being different ages. Elderly humans cannot accept the blood of younger people because of immune rejection of the stem cells unless they are a full tissue match.

Only in the last ten years have scientists begun to discover the reason behind the life-extending benefits for old rats sharing blood circulation with young rats. This was one of the many topics covered in the "Aging and Diseases of Aging" conference held in Tokyo, Japan, on October 22-27, 2012.





### Research in Tissue Aging

As described by Thomas Rando, PhD, (Professor of Neurology & Neurological Sciences at Stanford University) the technique of shared blood circulation between rodents of different ages was not used again for decades until 2005 when his graduate student, Irina Conboy, showed that the procedure restored the regenerative capacity of muscle stem cells in the older mice.<sup>2</sup> It was also demonstrated that the stem cells in the liver, brain, and bone of an old animal could regain regenerative potential by being exposed to the circulating blood of a young animal.<sup>2</sup> Later studies have confirmed that molecules in the blood of old animals depress muscle stem cell activity in both young and old animals.<sup>3</sup>

More recently, Dr. Rando's laboratory used shared circulation in mice to discover the chemical **CCL11** in the blood of old mice responsible for inhibiting stem cells in the brain.<sup>4</sup> CCL11 injected into young mice reduced brain stem cell activity, while impairing learning and memory.<sup>4</sup> Excessive inflammatory factors in the blood of old animals, notably **TGF-1**, are responsible for the inhibition of stem cells in muscle.<sup>5</sup>

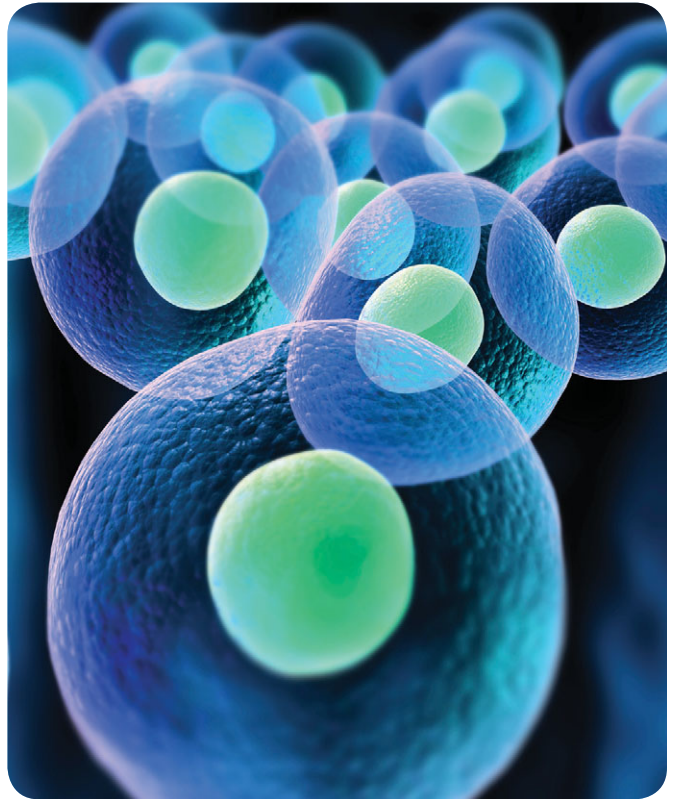
Dr. Rando believes that a major cause of tissue aging is the decline in regenerative capacity of the stem cells of those tissues as a result of blood-borne molecules that increase with age and that inhibit stem cells. He has been investigating the mechanisms by which chemicals in the blood reduce stem cell activity, concluding that DNA expression is being altered.<sup>6</sup> Every tissue in the body of an animal is different, but all cells making up these tissues have the same DNA code serving as a blueprint for cell function. What makes a liver cell, skin cell, and brain cell different from one another is that different portions of DNA are being expressed for each cell type.

Amy Wagers, PhD (Associate Professor, Harvard Medical School Department of Stem Cell and Regenerative Biology), was a contributor to the 2005 study of shared blood circulation between rodents of different ages. She was also present at this conference, where she reported that shared circulation could stimulate stem cells in old mouse brains to produce new myelin sheaths for neuronal fibers, a technique that could benefit patients suffering from multiple sclerosis.<sup>7</sup> Wagers is also researching the use of stem cells from fat tissue to regenerate heart muscle in patients who have suffered from heart failure or heart attack.<sup>8</sup>

### Understanding Senescent Cells

Judith Campisi, PhD (Professor at the Buck Institute for Research on Aging), is interested in the senescent cells that increase with age as a proportion of the total cells in tissues. Cells, like people, can become senescent, and the increasing number of senescent cells contributes to the senescence of people. For cells, senescence means that they stop dividing, usually because their telomeres have become too short, or because of irreparable DNA damage. Cellular senescence is nature's way of preventing cells from becoming cancerous, but (ironically) cells that have become senescent begin secreting growth factors, proteins, and inflammatory agents that can cause *other* cells to become cancerous.<sup>9,10</sup>

Dr. Campisi's group has identified **IL-6** (Interleukin-6) and **IL-8** (Interleukin-8) as inflammatory molecules known as *cytokines* being produced by senescent cells.<sup>11</sup> More recently, her group showed



that senescent cells resulting from DNA damage are induced to produce pro-inflammatory cytokines by increased activity of the NF- $\kappa$ B pathway.<sup>12</sup> Senescent cells are thus in large part responsible for the chronic inflammation of old age that causes so many age-related diseases such as cancer and atherosclerosis. Dr. Campisi noted a discovery made in 2011 of the rejuvenating effects of eliminating senescent cells in mice.<sup>13</sup>

Dr. Campisi has wondered whether there is any benefit that results from the secretory products of senescent cells. Her conclusion is that in the presence of senescent cells, wound-healing is less fibrous than it would be otherwise due to the presence of protein-digesting enzymes secreted by the senescent cells (along with the other inflammatory molecules).

### Reducing Methylation

Juleen Zierath, PhD (Head of the Section of Integrative Physiology, Department of Molecular Medicine and Surgery, Karolinska Institute, Stockholm, Sweden), like Dr. Rando, is interested in control of DNA expression (*epigenetics*, as distinct from genetics, which studies the effects of DNA differences). Dr. Zierath is specifically investigating the relationship between gene expression and type II (formerly called adult-onset) diabetes.

An important mechanism of epigenetics is addition of methyl molecules (*methylation*) or removal of methyl molecules (*demethylation*) to regulatory areas of DNA.<sup>14,15</sup> Methylation of biomolecules is an essential biochemical reaction required for maintaining the integrity of biological membranes,<sup>16</sup> synthesis of neurotransmitters,<sup>16</sup> visual acuity,<sup>17</sup> increasing glutathione synthesis in the brain to protect against oxidative stress,<sup>18</sup> and protection against depression<sup>19</sup> among many other vital functions. Methylation and demethylation of DNA is a means by which control is exerted over which genes are expressed and which genes are not. If DNA were completely methylated, no genes would be expressed, whereas if there were no DNA methylation there would be chaotic overexpression of too many genes. Both excessive and inadequate DNA methylation have been associated with cancer.<sup>20</sup>

Dr. Zierath has been studying DNA methylation effects in type II diabetes. As background, Dr. Zierath described twin studies. Identical twins are genetically identical because they have the same DNA and continue to have the same DNA throughout their lifetimes. Identical twins are epigenetically identical at birth, but become increasingly epigenetically distinct as they become subject to different environmental influences.<sup>21</sup> She cited a study which showed that epigenetic effects due to smoking and dietary behavior can be inherited.<sup>22</sup>

In 2009 Dr. Zierath's laboratory published a study showing that fatty material in the bloodstream causes methylation of DNA regulatory areas that results in a reduction of mitochondria (and resultant reduction of cellular energy).<sup>23</sup> This study was an advance in providing a molecular mechanism that would explain why patients with type II diabetes have fewer mitochondria in their cells. The following year, her team published research indicating that exercise induces epigenetic changes that induce mitochondria function and fat utilization.<sup>24</sup>

Dr. Zierath has called exercise "the first line of defense against the development of insulin resistance in type II diabetes." Vigorous exercise at

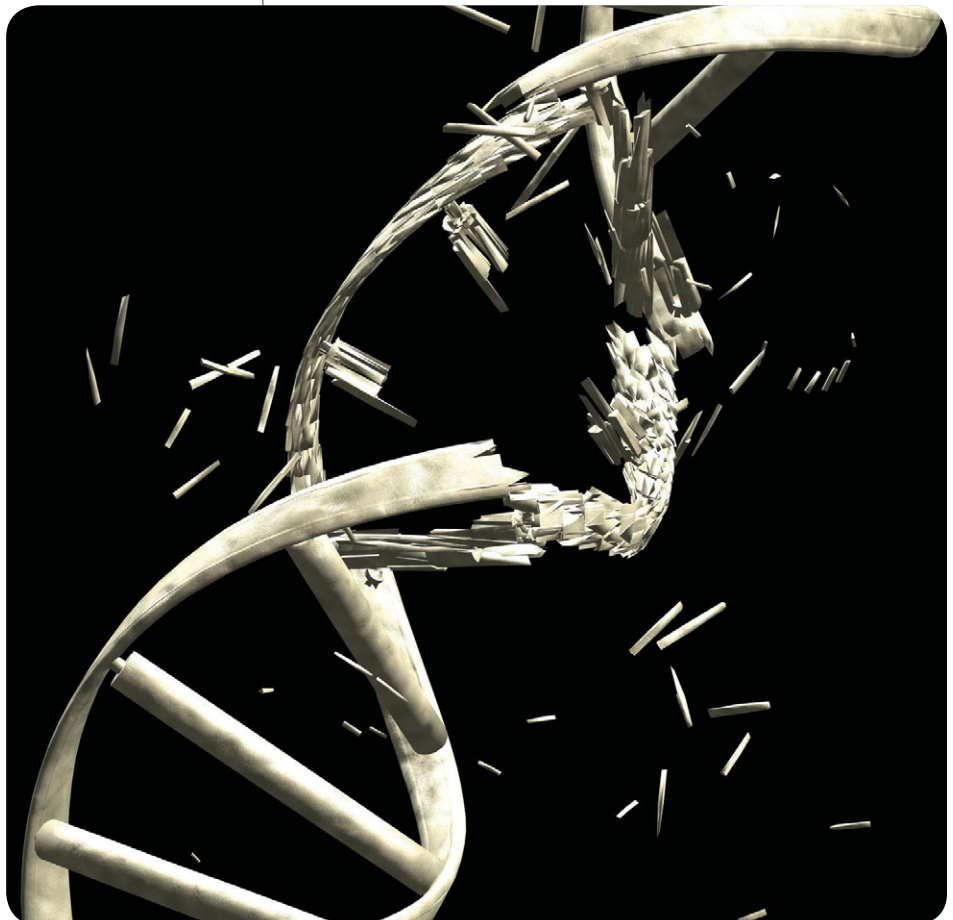
least once per week has been shown to reduce the risk of type II diabetes by **33%**.<sup>25</sup> Most recently Dr. Zierath's group published a study showing that exercise increases gene expression of sections of DNA that induce mitochondrial formation.<sup>26</sup>

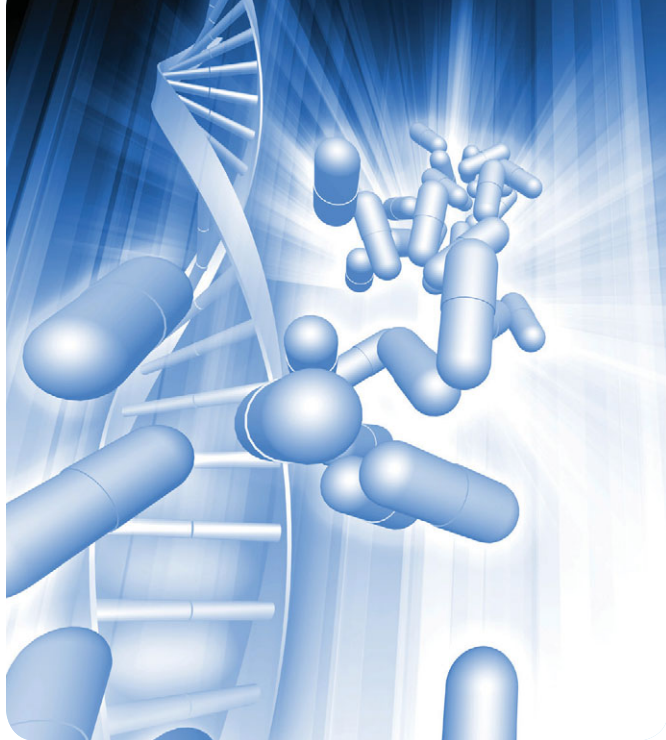
Dr. Zierath takes her research personally. When I crossed her path in the hotel gym she asked me, "How's your methylation?" I did not see anyone else from the conference in the hotel gym.

## Stimulating SIRT3

Eric Verdin, MD (Senior Investigator at the Gladstone Institute of Virology and Immunology at the University of California, San Francisco), discovered in 2002 that the sirtuin SIRT3 is localized in the mitochondria (energy-producing portions of cells).<sup>27</sup>

**Sirtuins** are a family of enzymes that modify protein function by removing an acetyl molecule. The seven known sirtuins in mammals are identified by number: SIRT1, SIRT2...SIRT7. SIRT1 is the most famous because (unlike the others) it has been shown to extend the life span of worms and flies.<sup>28</sup> Resveratrol activates SIRT1 but not the other sirtuins.





SIRT1 acts primarily by removing acetyl molecules from the proteins surrounding DNA in the cell nucleus, thereby altering gene expression. DNA in the mitochondria is not surrounded by proteins, so Dr. Verdin has spent much of the last decade trying to determine the function of SIRT3. SIRT3 levels in the mitochondria have been shown to be increased in mice on calorie restriction,<sup>29</sup> a dietary alteration that extends the life span of rodents. By removing an acetyl group of the mitochondrial antioxidant enzyme SOD2, SIRT3 reduces free radical oxidation.<sup>30</sup>

A major breakthrough occurred when Dr. Verdin's research team demonstrated that mice lacking SIRT3 show accelerated obesity, insulin resistance, and other symptoms of the metabolic syndrome when fed a high fat diet.<sup>31</sup> A high fat diet normally has this effect on mice,<sup>32</sup> but the effect is much greater when SIRT3 is absent. Dr. Verdin's team also demonstrated that removing a single fat-processing enzyme that SIRT3 affects could rescue the mice from the effects of the high fat diet, even when SIRT3 was absent.<sup>31</sup> Dr. Verdin's team further demonstrated that a mutation in SIRT3 is associated with the metabolic syndrome in humans.<sup>31</sup> Dr. Verdin is hopeful that a molecule can be found that stimulates SIRT3 activity, just as resveratrol stimulates SIRT1 activity.

### Research on Adiponectin

Takashi Kadowaki, MD, PhD (Professor of Diabetes and Metabolic Diseases, University of Tokyo), has been doing research on *adiponectin* for over a decade. **Adiponectin** is a protein secreted exclusively by fat cells. Adiponectin sensitizes the body to insulin, thereby acting as an anti-diabetic agent.<sup>33</sup> **Insulin resistance** (a condition in which cells show reduced

insulin-mediated uptake of amino acids, fatty acids, and particularly glucose) precedes and predicts the development of type II diabetes.<sup>34</sup> Although adiponectin is produced by fat cells, adiponectin levels are typically low in people who are obese.<sup>33</sup> Reduced levels of adiponectin are associated with insulin resistance, lipid dysregulation, and atherosclerosis.<sup>33</sup>

The first published paper by Dr. Kadowaki on adiponectin reported that adiponectin, particularly when combined with another *adipokine* known as *leptin*, could reverse the insulin resistance that a high fat diet produced in mice.<sup>35</sup> Kadowaki's research team later demonstrated the key role of adiponectin receptors in mediating the effects of adiponectin suggesting that agents stimulating those receptors could be used to treat insulin resistance and type II diabetes linked to obesity.<sup>36</sup> His team has studied the molecular mechanisms behind the reduced mitochondria seen in type II diabetics, linking adiponectin effects to increased activity of the sirtuin SIRT1.<sup>37</sup> Mouse experiments suggest that a calorie restricted diet<sup>38</sup> or a EPA/DHA rich omega-3 diet<sup>39</sup> can increase blood levels of adiponectin.

### Screening Heart Drugs

Rolf Bodmer, PhD (Professor in the Development and Aging Program of the Sanford-Burnham Medical Institute in La Jolla, California), has been studying genetic and environmental influences on heart function. He has been doing this research primarily on fruit flies.

The heart of a fruit fly is basically a tube with an aorta at the upper end. But the muscular effects of fly heart aging are surprisingly similar to humans. As with humans, exercise-training in fruit flies reduces the age-related decline in heart function.<sup>40</sup> Dr. Bodmer's research team has demonstrated that, as with humans, fruit flies show a decrease in heart rate and an increase in heart arrhythmias (irregular heartbeats) as they age.<sup>41</sup> Dr. Bodmer illustrated these effects at the conference by showing a video of a heart operation in young and old fruit flies. Studying fruit flies has the advantages of short life span, ability to genetically manipulate, and ability to precisely quantify the effects.

Fruit flies fed a high fat diet become obese and display features of metabolic syndrome. Dr. Bodmer's research team demonstrated that the high fat diet affects the heart independently of atherosclerotic effects by directly impairing heart function.<sup>42</sup> Dr. Bodmer suggests that fruit flies could be used for primary screening of drugs to be used against cardiac arrhythmias.<sup>43</sup>

## Reducing Amyloid Formation

Edward Lakatta, MD (Chief of the Laboratory of Cardiovascular Science at the National Institute on Aging in Baltimore, Maryland), has been studying stiffening of arteries close to the heart with aging, a process that leads to an increase in blood pressure. He said that 8 out of 10 older adults develop high blood pressure. He noted that artery stiffness is strongly influenced by collagen, elastin, and other proteins in the artery walls.<sup>44</sup> Lakatta has been particularly interested in stiffening of the aorta and upper body by an *amyloid fibril protein*. Insofar as this form of amyloid is found in the aorta of virtually every Caucasian over the age of 50, this amyloid represents a potential overlooked cause of cardiovascular disease.<sup>45</sup> Dr. Lakatta would like to find ways to reduce amyloid formation in the central arteries as a way of reducing cardiovascular aging.

## The Role of Autophagy

Ana Maria Cuervo, MD, PhD (Co-Director of the Einstein Institute of Aging Research at the Albert Einstein College of Medicine in Bronx, New York), was introduced as “the Queen of Autophagy.” Her name appears on sixteen peer-reviewed journal articles about autophagy in 2012 alone.

**Autophagy** is the most important garbage-collection system used by cells to dispose of cellular waste. Autophagy is the process by which waste is taken to (or taken into) a cell’s lysosome (“incinerator”). From the point of view that the lysosome digests cellular material and recycles (reuses) the breakdown products, the lysosome could also be called the “stomach” of a cell.

More than a decade ago, Dr. Cuervo established that autophagy declines with aging.<sup>46</sup> In 2007 she established that age-related autophagy decline is primarily due to changes in the *lysosome membrane*.<sup>47</sup>

In her presentation Dr. Cuervo focused on the role that autophagy decline or malfunction plays in neurodegenerative disease. Her team has established that protein malformation in Parkinson’s disease blocks autophagy,<sup>48</sup> and that a similar problem occurs in Huntington’s disease<sup>49</sup> as well as Alzheimer’s disease.<sup>50</sup> They also showed that one of the enzymes that is defective in inherited cases of Alzheimer’s disease is required for effective lysosome function.<sup>51</sup> And most recently they showed that a high fat diet or a high cholesterol diet reduces autophagy due to incorporation of those fats into the lysosome membrane.<sup>52</sup> Decline in autophagy function could explain the increased risk of Alzheimer’s disease associated with obesity.<sup>53</sup>

## Summary

Overall, this conference seemed more concerned with diseases of aging than aging itself, except for the discussion of stem cell rejuvenation and senescent cell action. Nonetheless, chronic inflammation and the effects of **fat** in aging were recurrent themes. A deep inquiry into the particular conditions revealed the significant roles played by fat and **inflammation**. Fortunately, *Life Extension* members have been taking supplements that help suppress **chronic inflammation** like vitamin D, curcumin, luteolin, DHEA, and omega-3s. ●



## Collecting and Storing Your Healthy Adult Stem Cells

Commercial companies and research institutes around the country are offering to harvest your healthy adult stem cells and freeze them for future use. You can find locations near you by entering “storage of adult stem cells” into Google.

In South Florida, we use:

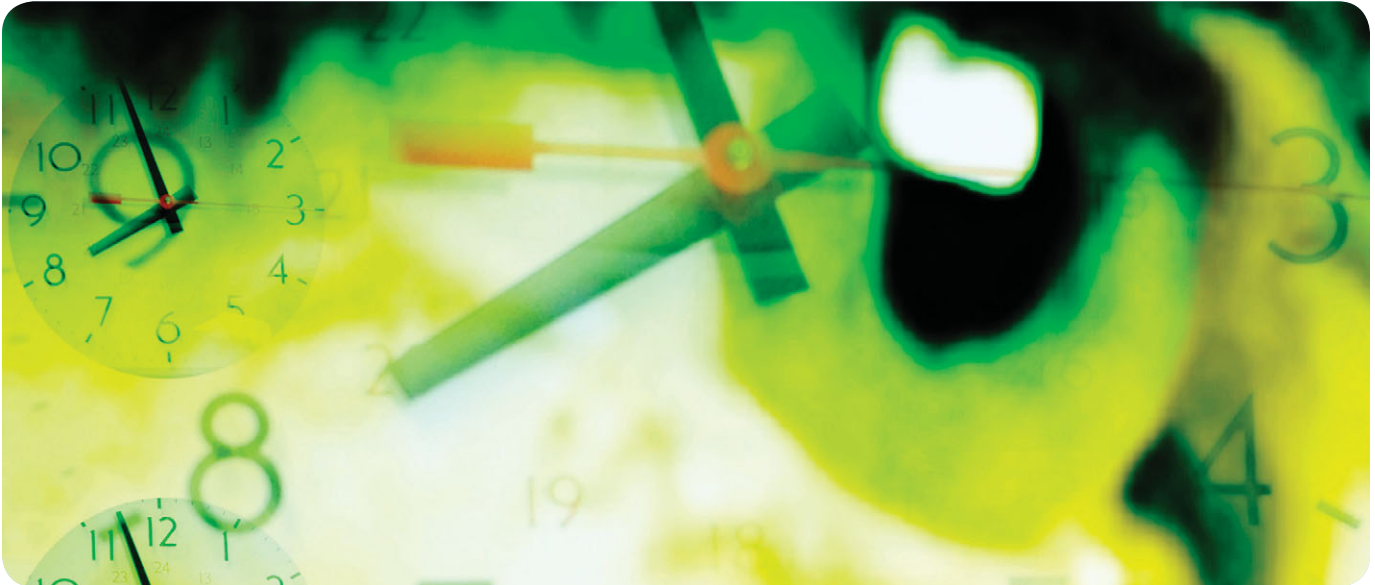
**South Florida Bone Marrow/  
Stem Cell Transplant Institute**  
10301 Hagen Ranch Road, Ste.600  
Boynton Beach, FL 33437  
1-866-235-5736  
Email: [info@bmscti.org](mailto:info@bmscti.org)

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

## References

- Ludwig FC, Elashoff RM. Mortality in syngeneic rat parabionts of different chronological age. *Trans N Y Acad Sci*. 1972 Nov;34(7):582-7.
- Conboy IM, Conboy MJ, Wagers AJ, Girma ER, Weissman IL, Rando TA. Rejuvenation of aged progenitor cells by exposure to a young systemic environment. *Nature*. 2005 Feb 17;433(7027):760-4.
- Brack AS, Conboy MJ, Roy S, Lee M, Kuo CJ, Keller C, Rando TA. Increased Wnt signaling during aging alters muscle stem cell fate and increases fibrosis. *Science*. 2007 Aug 10;317(5839):807-10.
- Villeda SA, Luo J, Mosher KI, et al. The ageing systemic milieu negatively regulates neurogenesis and cognitive function. *Nature*. 2011 Aug 31;477(7362):90-4.
- Carlson ME, Conboy MJ, Hsu M, et al. Relative roles of TGF-beta1 and Wnt in the systemic regulation and aging of satellite cell responses. *Aging Cell*. 2009 Dec;8(6):676-89.
- Rando TA, Chang HY. Aging, rejuvenation, and epigenetic reprogramming: resetting the aging clock. *Cell*. 2012 Jan 20;148(1-2):46-57.
- Ruckh JM, Zhao JW, Shadrach JL, et al. Rejuvenation of regeneration in the aging central nervous system. *Cell Stem Cell*. 2012 Jan 6;10(1):96-103.
- Bai X, Yan Y, Song YH, et al. Both cultured and freshly isolated adipose tissue-derived stem cells enhance cardiac function after acute myocardial infarction. *Eur Heart J*. 2010 Feb;31(4):489-501.
- Parrinello S, Coppe JP, Krtolica A, Campisi J. Stromal-epithelial interactions in aging and cancer: senescent fibroblasts alter epithelial cell differentiation. *J Cell Sci*. 2005 Feb 1;118(Pt 3):485-96.
- Rodier F, Coppé JP, Patil CK, et al. Persistent DNA damage signaling triggers senescence-associated inflammatory cytokine secretion. *Nat Cell Biol*. 2009 Aug;11(8):973-9.
- Coppé JP, Patil CK, Rodier F, et al. Senescence-associated secretory phenotypes reveal cell-nonautonomous functions of oncogenic RAS and the p53 tumor suppressor. *PLoS Biol*. 2008 Dec 2;6(12):2853-68.
- Freund A, Patil CK, Campisi J. p38MAPK is a novel DNA damage response-independent regulator of the senescence-associated secretory phenotype. *EMBO J*. 2011 Apr 20;30(8):1536-48.
- Baker DJ, Wijshake T, Tchkonja T, et al. Clearance of p16Ink4a-positive senescent cells delays ageing-associated disorders. *Nature*. 2011 Nov 2;479(7372):232-6.
- Jaenisch R, Bird A. Epigenetic regulation of gene expression: how the genome integrates intrinsic and environmental signals. *Nat Genet*. 2003 Mar;33 Suppl:245-54.
- Jones PA. Functions of DNA methylation: islands, start sites, gene bodies and beyond. *Nat Rev Genet*. 2012 May 29;13(7):484-92.
- Bottiglieri T. S-Adenosyl-L-methionine (SAME): from the bench to the bedside--molecular basis of a pleiotrophic molecule. *Am J Clin Nutr*. 2002 Nov;76(5):1151S-7S.
- Chiang PK, Gordon RK, Tal J, et al. S-denosylmethionine and methylation. *FASEB J*. 1996 Mar;10(4):471-80.
- De La Cruz JP, Pavia J, González-Correa JA, Ortiz P, Sánchez de la Cuesta F. Effects of chronic administration of S-adenosyl-L-methionine on brain oxidative stress in rats. *Naunyn Schmiedeberg Arch Pharmacol*. 2000 Jan;361(1):47-52.
- Papakostas GI, Mischoulon D, Shyu I, Alpert JE, Fava M. S-adenosyl methionine (SAME) augmentation of serotonin reuptake inhibitors for antidepressant nonresponders with major depressive disorder: a double-blind, randomized clinical trial. *Am J Psychiatry*. 2010 Aug;167(8):942-8.
- Patra SK, Patra A, Rizzi F, Ghosh TC, Bettuzzi S. Demethylation of (Cytosine-5-C-methyl) DNA and regulation of transcription in the epigenetic pathways of cancer development. *Cancer Metastasis Rev*. 2008 Jun;27(2):315-34.
- Fraga MF, Ballestar E, Paz MF, et al. Epigenetic differences arise during the lifetime of monozygotic twins. *Proc Natl Acad Sci U S A*. 2005 Jul 26;102(30):10604-9.
- Pembrey ME, Bygren LO, Kaati G, et al. Sex-specific, male-line transgenerational responses in humans. *Eur J Hum Genet*. 2006 Feb;14(2):159-66.
- Barrès R, Osler ME, Yan J, et al. Non-CpG methylation of the PGC-1alpha promoter through DNMT3B controls mitochondrial density. *Cell Metab*. 2009 Sep;10(3):189-98.
- Cantó C, Jiang LQ, Deshmukh AS, et al. Interdependence of AMPK and SIRT1 for metabolic adaptation to fasting and exercise in skeletal muscle. *Cell Metab*. 2010 Mar 3;11(3):213-9.





25. Manson JE, Rimm EB, Stampfer MJ, et al. Physical activity and incidence of non-insulin-dependent diabetes mellitus in women. *Lancet*. 1991 Sep 28;338(8770):774-8.
26. Barrès R, Yan J, Egan B, et al. Acute exercise remodels promoter methylation in human skeletal muscle. *Cell Metab*. 2012 Mar 7;15(3):405-11.
27. Schwer B, North BJ, Frye RA, Ott M, Verdin E. The human silent information regulator (Sir)2 homologue hSIRT3 is a mitochondrial nicotinamide adenine dinucleotide-dependent deacetylase. *J Cell Biol*. 2002 Aug 19;158(4):647-57.
28. Kenyon C. The plasticity of aging: insights from long-lived mutants. *Cell*. 2005 Feb 25;120(4):449-60.
29. Schwer B, Eckersdorff M, Li Y, Silva JC, Fermin D, Kurtev MV, Giallourakis C, Comb MJ, Alt FW, Lombard DB. Calorie restriction alters mitochondrial protein acetylation. *Aging Cell*. 2009 Sep;8(5):604-6.
30. Qiu X, Brown K, Hirschey MD, Verdin E, Chen D. Calorie restriction reduces oxidative stress by SIRT3-mediated SOD2 activation. *Cell Metab*. 2010 Dec 1;12(6):662-7.
31. Hirschey MD, Shimazu T, Jing E, et al. SIRT3 deficiency and mitochondrial protein hyperacetylation accelerate the development of the metabolic syndrome. *Mol Cell*. 2011 Oct 21;44(2):177-90.
32. Petro AE, Cotter J, Cooper DA, Peters JC, Surwit SJ, Surwit RS. Fat, carbohydrate, and calories in the development of diabetes and obesity in the C57BL/6J mouse. *Metabolism*. 2004 Apr;53(4):454-7.
33. Yadav A, Kataria MA, Saini V, Yadav A. Role of leptin and adiponectin in insulin resistance. *Clin Chim Acta*. 2012 Dec 21. [Epub ahead of print]
34. Eriksson J, Franssila-Kallunki A, Ekstrand A, et al. Early metabolic defects in persons at increased risk for non-insulin-dependent diabetes mellitus. *N Engl J Med*. 1989 Aug 10;321(6):337-43.
35. Yamauchi T, Kamon J, Waki H, et al. The fat-derived hormone adiponectin reverses insulin resistance associated with both lipoatrophy and obesity. *Nat Med*. 2001 Aug;7(8):941-6.
36. Yamauchi T, Nio Y, Maki T, et al. Targeted disruption of AdipoR1 and AdipoR2 causes abrogation of adiponectin binding and metabolic actions. *Nat Med*. 2007 Mar;13(3):332-9.
37. Iwabu M, Yamauchi T, Okada-Iwabu M, et al. Adiponectin and AdipoR1 regulate PGC-1 $\alpha$  and mitochondria by Ca<sup>2+</sup> and AMPK/SIRT1. *Nature*. 2010 Apr 29;464(7293):1313-9.
38. Nagasawa A, Fukui K, Funahashi T, et al. Effects of soy protein diet on the expression of adipose genes and plasma adiponectin. *Horm Metab Res*. 2002 Nov-Dec;34(11-12):635-9.
39. Flachs P, Mohamed-Ali V, Horakova O, et al. Polyunsaturated fatty acids of marine origin induce adiponectin in mice fed a high-fat diet. *Diabetologia*. 2006 Feb;49(2):394-7.
40. Piazza N, Gosangi B, Devilla S, Arking R, Wessells R. Exercise-training in young *Drosophila melanogaster* reduces age-related decline in mobility and cardiac performance. *PLoS One*. 2009 Jun 11;4(6):e5886.
41. Fink M, Callol-Massot C, Chu A, et al. A new method for detection and quantification of heartbeat parameters in *Drosophila*, zebrafish, and embryonic mouse hearts. *Biotechniques*. 2009 Feb;46(2):101-13.
42. Lim HY, Wang W, Wessells RJ, Ocorr K, Bodmer R. Phospholipid homeostasis regulates lipid metabolism and cardiac function through SREBP signaling in *Drosophila*. *Genes Dev*. 2011 Jan 15;25(2):189-200.
43. Nishimura M, Ocorr K, Bodmer R, Cartry J. *Drosophila* as a model to study cardiac aging. *Exp Gerontol*. 2011 May;46(5):326-30.
44. Clifford PS, Ella SR, Stupica AJ, et al. Spatial distribution and mechanical function of elastin in resistance arteries: a role in bearing longitudinal stress. *Arterioscler Thromb Vasc Biol*. 2011 Dec;31(12):2889-96.
45. Larsson A, Peng S, Persson H, et al. Lactadherin binds to elastin—a starting point for medin amyloid formation? *Amyloid*. 2006 Jun;13(2):78-85.
46. Cuervo AM, Dice JF. Age-related decline in chaperone-mediated autophagy. *J Biol Chem*. 2000 Oct 6;275(40):31505-13.
47. Kiffin R, Kaushik S, Zeng M, et al. Altered dynamics of the lysosomal receptor for chaperone-mediated autophagy with age. *J Cell Sci*. 2007 Mar 1;120(Pt 5):782-91.
48. Martinez-Vicente M, Tallozy Z, Kaushik S, et al. Dopamine-modified  $\alpha$ -synuclein blocks chaperone-mediated autophagy. *J Clin Invest*. 2008 Feb;118(2):777-88.
49. Martinez-Vicente M, Tallozy Z, Wong E, et al. Cargo recognition failure is responsible for inefficient autophagy in Huntington's disease. *Nat Neurosci*. 2010 May;13(5):567-76.
50. Wang Y, Martinez-Vicente M, Krüger U, et al. Tau fragmentation, aggregation and clearance: the dual role of lysosomal processing. *Hum Mol Genet*. 2009 Nov 1;18(21):4153-70.
51. Lee JH, Yu WH, Kumar A, et al. Lysosomal proteolysis and autophagy require presenilin 1 and are disrupted by Alzheimer-related PS1 mutations. *Cell*. 2010 Jun 25;141(7):1146-58.
52. Rodriguez-Navarro JA, Kaushik S, Koga H, et al. Inhibitory effect of dietary lipids on chaperone-mediated autophagy. *Proc Natl Acad Sci U S A*. 2012 Mar 20;109(12):E705-14.
53. Luchsinger JA, Gustafson DR. Adiposity and Alzheimer's disease. *Curr Opin Clin Nutr Metab Care*. 2009 Jan;12(1):15-21.

# Are You Travelling This Summer?

# DAILY **GRAB 'N GO** PACKS

Convenient  
Daily Individual  
Packs  
Containing  
Five Protective  
Formulas



For people on the go, it's easy to forget to take your supplements. Life Extension® has created daily **Comprehensive Nutrient Packs Advanced** with five protective formulas—in one convenient grab 'n go pack. Specially designed by Life Extension, the **Comprehensive Nutrient Packs Advanced** provides you with broad-spectrum nutrient protection—at no additional cost when compared to buying each product separately!

## Each pack contains the following supplements:

- **Two-Per-Day Multi-Nutrient Tablets** (2 tablets)
- **Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract** (2 softgels, yielding **700 mg** EPA and **500 mg** DHA)
- **Super Bio-Curcumin®** (1 capsule provides **400 mg** of Bio-Curcumin® that can provide blood levels equal to **2,500-2,800 mg** of commercial curcumin supplements)
- **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support** (1-100 mg softgel)
- **Super Booster Softgels with Advanced K2 Complex** (1 softgel)

## The Best Way to Manage Your Daily Supplement Regimen

These vital nutrients, bundled at no extra cost into a single packet, combine convenience with superior value when compared to buying each product separately.

A box containing a **30-day** supply of **Comprehensive Nutrient Packs Advanced** retails for \$90. If a member buys four boxes, the cost is just **\$61.50 per box. Item# 01796**

Kaneka QH® is a registered trademark of Kaneka Corporation. Tomat-O-Red® is a registered trademark of LycoRed LTD. SelenoPure™ is a trademark of Nutrition 21. OptiZinc® is a registered trademark of InterHealth Nutritionals, Inc. Biolut™ is a trademark of Biolut SA de CV. Crominex® 3+, Capros® and PrimaVie® are registered trademarks of Natreon, Inc. Albion® is a registered trademark of Albion Laboratories, Inc. Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas- Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.

Contains soybeans. Due to the source of kelp, this product may contain fish and shellfish.

To order Life Extension® Comprehensive Nutrient Packs Advanced, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

# COSMESIS RENEWING EYE CREAM

## TARGET AND REJUVENATE THE AGING SKIN AROUND YOUR EYES!

The thin, delicate skin area around your eyes is **extremely susceptible** to the visible impacts of aging, such as wrinkles, crow's feet, fine lines, and bags. Oxidative and environmental stress gradually breaks down the elastin and collagen, resulting in more fragile skin around the eye area.

Researchers have combined three natural ingredients into a formula to promote skin renewal and rejuvenation for the tender skin surrounding the **eye**.

## UNIQUE SCIENTIFIC FORMULATION

Specifically designed for the eye's delicate skin, **Renewing Eye Cream** combines several complementary compounds that have been generating interest among dermatologists for their beautifying effects.

**Renewing Eye Cream** contains:

- **Jujube seed extract**—a skin tonic rich in jujubosides, flavonoids, phenolics, and vitamin C.<sup>1,2</sup>
- **Olive leaf extract**—packed with potent compounds, notably **oleuropein**, to help with inflammation.<sup>3</sup>
- **Levan**—a polymer that attracts water molecules into the skin with powerful moisturizing effects.<sup>4</sup>

**Renewing Eye Cream** promotes **firmer** skin and helps maintain natural **hydration**. It also **smooths** and minimizes the appearance of fine lines and wrinkles.

In a controlled clinical study, twice-daily application of the active compounds contained in **Renewing Eye Cream** to the area around the eye was demonstrated to have softened the appearance of wrinkles by an average of **17%**.<sup>2</sup> This result was translated by the scientists to have provided the overall appearance of being **6 years** younger—**in just 28 days!**<sup>2</sup>

One 1/2-ounce jar of **Cosmesis Renewing Eye Cream** retails for \$65. If a member buys two jars, the price is reduced to **\$42.75**.

Item # 80150



To order **Cosmesis Renewing Eye Cream**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

## References

1. *Phcog Rev.* 2009;3(6):320-9.
2. Available at: <http://www.kinetiktech.com/brochures/pdf/rahn/PROTEOLEA-Leaflet.pdf>. Accessed April 29, 2013.
3. *Sci Pharm.* 2010 June;78(2):133-54.
4. Available at: [http://www.realbio.com/file\\_download.php?nfile=1\\_1266480435.pdf&ofile=Levan-Application+and+Perspectives.pdf&b\\_code=101](http://www.realbio.com/file_download.php?nfile=1_1266480435.pdf&ofile=Levan-Application+and+Perspectives.pdf&b_code=101). Accessed April 29, 2013.

A line of skin care products developed by  
renowned dermatologist Gary Goldfaden, MD



**COSMESIS**  
SKIN CARE

Developed Exclusively for Life Extension®



# Dietary Supplement Safety-Control Compared to FDA-regulated Drug Factories

*Can you imagine having a business where you charge customers  
\$200 each month for something that cost you only \$2.10!  
That's a markup of about 100 times and it's not for a patented product.*

In 2010, drug companies were charging around \$7 for each 500 mg tablet of a generic medicine called **valacyclovir**. The brand name **Valtrex**® was priced slightly higher. People with frequent oral or genital **herpes** outbreaks needed to take one valacyclovir tablet each day to reduce the number of outbreaks they'd suffer.

The annual cost to these consumers was \$2,400, yet drug companies paid only \$25.20 to produce it. (**Valacyclovir** is also used in higher doses to treat **shingles**.)

You would think that with these obscene profits, **drug factories** would bend over backward to ensure the **strictest** quality-control standards so as not to jeopardize this lucrative cash cow, much of it guaranteed by your **tax dollars**.

Instead, with quasi-monopoly status provided by **federal regulators** who stomp out competition, some pharmaceutical companies ran 24-hour-a-day assembly lines to make as many of these outrageously priced drugs as possible, knowing they had little downside risk by ignoring even rudimentary safety standards.

Over the past 33 years, **Life Extension**® has inspected hundreds of supplement makers. While some do not meet our exacting standards, we have never seen anything close to the deplorable conditions that have been uncovered inside some of America's largest drug factories.

One difference between supplement makers and drug factories is that owners of supplement companies often take their own products daily, whereas some pharmaceutical owners apparently live in a state of denial that they will ever need the polluted drugs they sell to others.

The **FDA** pretends to protect the public against contaminated drugs. The sordid facts reveal an agency incapable of acting in a consistent and logical manner.

Such is the case of a company that made contaminated injectable drugs that have killed and sickened many Americans. The FDA identified problems with this manufacturer as early as 2002, but dropped the ball into a state pharmacy board's lap that failed to act. The FDA again identified dangerous problems in 2006, but once more failed to take actions other than sending a "warning letter." The FDA now says it needs more power and money to do its job.

An increasing number of **supplement companies** are being bought out by **pharmaceutical companies**. These corporate behemoths have historically shown little regard for their customer's health and longevity, as demonstrated by the cover-ups of **deadly side effects** of drugs like **Vioxx**® that killed tens of thousands of Americans.

This article describes the quality-control mandates for products that carry the **Life Extension**® brand name.>

Since June 2007, there have been strict federal rules in outlining requirements for manufacturing, packaging, labeling and holding dietary supplement products in the United States.

Long before this, however, **Life Extension** insisted that its manufacturing and packaging partners follow these types of stringent quality control practices to ensure product purity and potency.

Life Extension stays ahead of government mandates by proactively defining and managing quality systems internally with an emphasis on qualification of materials and suppliers, mandating meticulous facility cleanliness, and insisting on rigorous finished goods specification/testing programs.

### FDA Inspections of Life Extension

In the year **2000**, an **FDA inspector** showed up at **Life Extension** and demanded samples of products for the FDA to assay.

The FDA agent was initially belligerent, perhaps expecting a legal challenge to his demand for product samples. Instead, Life Extension's quality control supervisor provided the FDA with all the requested samples, but let him know that the identical lot numbers would be sent out to two independent assay laboratories to verify any findings the FDA came back with.

During this initial inspection, the FDA agent repeatedly threatened to imprison Life Extension personnel if any problems were found. Life Extension responded that the products had already been assayed and, therefore, we had no concern about what the FDA would find.

Within ten days, the assays from the two independent labs came back on all the products. Upon submitting these assays to the FDA inspector, along with file cabinets full of quantitative analysis results, the FDA agent stated he was calling off the inspection because the quality control procedures employed, as he stated, are "analogous to those of drug companies." At the time, we took that as a compliment, until recent reports showed how poorly certain drug factories operate.

The FDA inspector indicated that he did not expect that a supplement maker would operate under high quality standards. When the FDA agent was asked if the samples taken ten days earlier met the FDA's standards, he indicated that they were not yet submitted for assay and would not be because the two independent testing labs had already documented that they met label potency.

The FDA inspected again in 2012. The inspection resulted in zero findings of non-compliance.

### NSF® International Registration

Life Extension's fulfillment facility recently earned cGMP (current Good Manufacturing Practices) registration from NSF International, an organization that

provides third party certification programs using state-of-the-art analytical laboratories and a highly skilled staff of chemists and microbiologists.



Life Extension is cGMP  
Registered by NSF.

NSF International registration was based on a demanding two-day audit conducted by NSF International which included an evaluation of Life Extension's Warehouse & Distribution center, including facility cleanliness and sanitation, as well as various quality systems such as complaint handling/investigations, product returns, training, deviation management and product recall handling. The NSF International registration is widely recognized as an objective "seal of approval" signifying the meeting or exceeding of cGMP requirements and industry standards/best practices for quality.

### ConsumerLab and International Fish Oil Standards

Life Extension continues to participate in the voluntary **ConsumerLab** testing program. The program includes an annual evaluation of various product families for potency and label claim verification. For example, over the past year products were submitted in a variety of categories including Multivitamins, Bone Health, Cancer, B-Vitamins, CoQ10/Ubiquinol and Memory. In 2012, all submitted products met all testing requirements.

ConsumerLab in late 2012 evaluated a wide range of green coffee bean extract supplements and found that 50% failed to meet their label claims. As usual, Life Extension **green coffee bean extract**, which contains the identical ingredient used in successful clinical studies, came out flawlessly.

Life Extension also continues to participate in the **International Fish Oil Standards (IFOS™)** testing program for fish oil products. In 2012, over 10 batches were submitted which met or exceeded the industry standards requirements for purity and potency. This is especially important for delicate **fish oils** that can oxidize and lose their EPA/DHA potency, and/or contain toxic levels of mercury and other heavy metals.

### Supplier Management/External Audit Program

Life Extension places high emphasis on the management and evaluation of outside providers ... including contract manufacturers and packagers, contract laboratories and raw material suppliers. The evaluation process consists of an assessment of completed regulatory questionnaires as well as an aggressive on-site audit program based on our stringent criteria for manufacturing, packaging, labeling and holding dietary supplement products in the United States. Items of special interest include: cleaning and sanitation procedures,

pest control, manufacturing and packaging controls, testing, training and documentation practices.

In 2011, we conducted 13 audits including on-site evaluations of Life Extension's top contract manufacturers, packagers and laboratories. Audit findings were documented and reported to the suppliers and corrective and preventive actions were requested from each supplier. In several instances, follow-up audits were performed to evaluate the effectiveness of corrective actions. In some cases, suppliers were disqualified for not meeting Life Extension's exacting quality standards.

In 2012, 26 audits were conducted. These audits include evaluations of new suppliers and/or existing supplier follow-up. This aggressive audit schedule will continue to ensure cGMP compliance and drive continuous improvement initiatives with our manufacturing partners.

Roughly 90% of Life Extension branded products are manufactured in NSF International cGMP registered facilities and the combination of NSF International registration along with Life Extension on-site inspections helps ensure that the products manufactured on our behalf have been produced in accordance with the highest standards.

### **Internal Audit Program**

To ensure compliance with applicable regulations, policies and procedures, the Life Extension Quality Unit maintains a documented system for self-inspections which includes internal audits conducted at the corporate location as well as the distribution center in Coram, NY. Although these internal audits are required annually, they are actually conducted more frequently by choice. Since late 2011, a total of four internal audits have been conducted at corporate and four have been conducted at the distribution center. The findings of these audits are captured under a documented quality-control program which ensures that processes and procedures are constantly being reviewed and evaluated as part of the company's continuous improvement initiatives.

### **Raw Material Qualification Program**

Before new Life Extension-purchased raw materials can be considered for use in branded products they must undergo an extensive, documented review process to ensure that they meet requirements for identity, potency and purity. These materials are tested at contract analytical laboratories which have been qualified by the Life Extension Quality Unit. Materials are typically assayed for potency via advanced analytical chemistry techniques like high performance liquid chromatography (HPLC) or gas chromatography (GC) and are screened for contaminants such as heavy metals via inductively coupled plasma-mass spectrometry (ICP-MS) and microbes utilizing advanced United States Pharmacopeia (USP) methodology.

Botanical ingredients undergo a higher level of scrutiny, with identity (genus/species) verified through comparison to reference standards utilizing high performance thin layer chromatography (HPTLC) and microscopy methods.

Botanical ingredients are also screened for pesticides as defined in USP <561>, *Articles of Botanical Origin*. In some cases residual solvents will also be evaluated to ensure that raw materials purchased by Life Extension meet appropriate requirements for safety, purity and efficacy. Based on these qualification activities, raw material specifications are developed for each ingredient which are reviewed and approved by the Quality Unit. Life Extension partners with contract manufacturers to ensure that all incoming test results on these materials meet Life Extension specifications and have been reviewed and approved by the Life Extension Quality Unit before use.

### **Finished Product Specifications/ Testing Requirements**

Requirements for the formulation, manufacturing, packaging and testing of all Life Extension branded finished goods are defined in each product's Finished Product Specification Packet (FPSP). This comprehensive document is developed, reviewed and approved by Life Extension's Product Development, Purchasing and Quality experts to ensure that Life Extension finished goods are manufactured, packaged and tested the same way every time. The process begins with the development of formulation and testing requirements by Product Development and Quality Control. These requirements are communicated to the contract manufacturer of choice and become the basis for what eventually becomes the Finished Product Specification Package. Contract manufacturers are required to acknowledge the approved specifications in writing and must notify Life Extension of any changes before implementation. Life Extension's specifications are reflected in the manufacturers' Master Manufacturing Records (MMRs) ensuring that the manufacturing, packaging and testing processes can be replicated on each run.

The finished product testing requirements are rigorous, including specifications for the testing of active ingredients (label claim) as well as potential contaminants including heavy metals and microbes. These tests are conducted using state of the art equipment such as HPLC, GC and ICP-MS at Life Extension's approved contract manufacturers and laboratories. Each lot of finished product received by Life Extension is held in quarantine pending a physical inspection of the goods along with a review of the product's Certificate of Analysis, which must accompany each shipment. The result of this incoming inspection is documented by Life Extension's Quality Control group. Any finished products not meeting these exacting

# Pharmaceutical cGMP Standards Not Always Adhered to by Drug Makers

The FDA's current Good Manufacturing Practices (cGMP) requirements are, in general, **stricter** for **pharmaceuticals** than either **food cGMP** or **dietary supplement cGMP** standards. Dietary supplement cGMP can be accurately characterized as a combination of food cGMP and pharmaceutical cGMP.

In **2003**, the FDA implied that food cGMP should be followed for dietary supplements. In fact, food cGMP focuses upon product safety and sanitation, not quality. In contrast, pharmaceutical cGMP focuses upon safety, sanitation, and quality.

In **2007**, the FDA passed **21 Code of Federal Regulations (CFR) Part 111** to ensure the identity, purity, quality, strength, and composition of dietary supplements. The FDA proceeded with enforcement under a "rolling" approach tiered for company employee number.

## Tragedy that could have been prevented

The public learned in late **2012** that not all pharmaceutical makers are following sanitary procedures and other mandated cGMP practices to make injectable prescription drugs. **Fungal meningitis** causes inflammation of the lining of



the brain and spinal cord that results in dreadful sickness and sometimes death.

A drug factory made large quantities of a steroid (*methylprednisone*) that was injected into the joints and spines of aging humans in chronic pain. It provided immediate but temporary relief.

The problem was that almost 800 Americans contracted fungal infections that caused severe meningitis. Use of the contaminated drug has been linked to 58 deaths.<sup>1</sup> The underlying culprit was a black mold that was allowed to grow in the supposedly sterile vials of injectable steroid (*methylprednisone*).<sup>2</sup> Since injectable drugs bypass the natural barriers afforded by an intact digestive/immune system, they have to be manufactured and maintained in a sterile environment to avoid killing patients.

FDA inspections in **2002** and **2006** revealed injectable drugs being made under substandard (non-sterile) conditions. It was not until hundreds fell ill and scores died that the FDA took meaningful action.

## How the FDA bungled the investigation

The name of the company that made the fungus-laced injectable drug is **New England Compounding Center (NECC)**. It **pretended** to be a compounding pharmacy, but instead functioned as a **large drug factory**.

The FDA claims that it lacks adequate regulatory authority over compounding pharmacies, but the FDA's inspection of NECC in year **2002** revealed problems with record keeping, sterility, and other issues. That same year the FDA informed the Massachusetts State Board of Pharmacy of an adverse reaction to **methylprednisone**, which is the same drug that in **2012** caused the fungal-meningitis outbreak.

Had the FDA done their job back in **2002**, they would have forced NECC to register as a drug manufacturer and subjected them to stricter regulatory oversight ... which may not have prevented the problems since FDA-registered drug-makers were later found to have similar unsanitary facilities.

The FDA and Massachusetts State Board of Pharmacy's most blatant failure, however, were to uncover horrific conditions inside NECC and then take no practical steps to enforce safety compliance or shut down its facilities before tragedy struck.

standards are rejected by the Quality Control group and are not released for distribution.

## Independent Assays

All of Life Extension's raw material qualification samples are sent out to independent labs for assay, heavy metals, micro and other contaminants during the qualification process. Likewise, a large percentage of finished product assay work and most finished product heavy metals testing is performed by qualified independent labs which are mandated and approved by Life Extension.

This independent testing, along with our participation in the **ConsumerLab** and **International Fish Oil Standards** programs, provides a very high level of confidence that Life Extension products meet all requirements for potency and purity.

## Deviation/Change Control Management

An important part of a robust Quality System is developing and managing a process for identifying, documenting, justifying and approving changes which could affect an approved process or system impacting a product's safety, purity and efficacy.

Life Extension has developed internal processes and procedures for documenting one-time occurrences (deviations) and permanent changes (change control). These systems cover changes to formulations, procedures, specifications, labels and any other cGMP-related system which could impact the quality of a finished product.

Life Extension's suppliers are required to notify Life Extension in writing of any proposed changes to formulations or processes and these changes cannot be implemented without the written approval of the Life Extension Quality Unit.

### **Current Good Manufacturing Practices/Standard Operating Procedures Training**

Life Extension maintains a documented internal cGMP (current Good Manufacturing Practices) training program for colleagues involved in the formulation, purchasing or holding of dietary supplements. This program includes a summary review of safety mandates and is presented to new hires in Quality Assurance and Quality Control, Product Development, Purchasing and Distribution Operations. Annual refresher training is provided to existing employees.

Life Extension's Quality Unit has also developed a training matrix per position defining Standard Operating Procedure (SOP) training requirements for these colleagues based on their job function and description. Relevant training is performed for new hires or when SOPs are issued or revised. These training efforts ensure that Life Extension colleagues are well-versed on cGMP requirements and have the training to effectively execute their specific job functions.

### **Complaint Handling/Continuous Improvement**

All dietary supplement companies in the United States are obligated to document and investigate customer complaints.

Life Extension's complaint management system far exceeds these requirements in that all complaints are tracked and trended to drive Continuous Improvement initiatives internally and at our contract manufacturers. These complaints are vigorously documented and investigated to ensure that products in the field meet or exceed high quality standards for our supplement customers.

As part of the complaint management system, quarterly reports are compiled and reviewed to spot trends in problematic products or suppliers. The reports are shared with Life Extension's contract manufacturers as a means to identify areas for improvement in products and processes. These "continuous improvement" efforts have been fruitful, with a robust 50% decrease in

quality customer complaints in 2012 compared to those received in 2011.

### **Member-Ready Certificates of Analysis (COA)**

Life Extension makes member-ready Certificates of Analysis (COAs) available to our customers upon request. These COAs are representations of the analytical reports received from the contract manufacturers and laboratories and contain all of the required tests as defined in the Finished Product Specification Packets (FPSP), including potency, heavy metals and micro. This transparency provides additional confidence that Life Extension's products meet high quality standards for purity and potency.

#### **Summary**

This report describes the step-by-step processes Life Extension has in place to ensure cleanliness, purity, active ingredient status and overall integrity of finished products. These quality control standards exceed FDA mandates in order to ensure consumers the highest quality finished products.

Life Extension has taken steps to produce nutritional supplements made under far safer conditions from a potency and purity standpoint than many expensive prescription drugs. ●

#### **References**

1. Available at: <http://www.cdc.gov/hai/outbreaks/meningitis-map-large.html>. Accessed July 1, 2013.
2. Available at: [http://www.nejm.org/doi/full/10.1056/NEJMr1212617?query=featured\\_meningitis](http://www.nejm.org/doi/full/10.1056/NEJMr1212617?query=featured_meningitis). Accessed June 13, 2013.

IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.



# ENHANCE HEART HEALTH

The reason for many circulatory problems is the breakdown of **endothelial function** and structure.

Today, there are nutrients that have been clinically shown to help maintain healthy endothelial function and arterial circulation. **Endothelial Defense™ with GliSODin®** provides potent nutrients to support endothelial health: **standardized pomegranate** and an orally active form of **superoxide dismutase**.

While both of these components have been clinically shown to help with blood flow and age-related changes in endothelial function, Life Extension® has made the best endothelial product even more powerful by adding **Full-Spectrum Pomegranate™**, which includes active constituents from the **seed** and **flower** in addition to the pomegranate **fruit**.<sup>1-7</sup>

#### The daily serving of 2 softgels of Endothelial Defense™ with Full-Spectrum Pomegranate™ contains:

<b>Superoxide Dismutase/Gliadin Complex</b> (GliSODin®) [SOD (Superoxide Dismutase) Enzyme Activity = 500 IU]	<b>500 mg</b>
<b>POMELLA® Pomegranate</b> ( <i>Punica granatum</i> ) <b>Extract</b> (fruit) [std. to 30% punicalagins (120 mg)]	<b>400 mg</b>
<b>Pomegranate</b> ( <i>Punica granatum</i> ) <b>5:1 Extract</b> (fruit)	<b>100 mg</b>
<b>Proprietary Pomegranate Blend</b> ( <i>Punica granatum</i> ) [flower extract and seed oil (standardized to 22% (30 mg) punicalic acid)]	<b>137.5 mg</b>

POMELLA® Extract is covered under U.S. Patent 7,638,640. POMELLA® Extract is a registered trademark of Verdure Sciences, Inc. IsoCell SA, France is the owner of US Patents Nos. 6,045,809 and 6,426,068B1 and the registered trademark of GliSODin®.

Contains soybeans and wheat.



Item # 01498

## Next-Generation Pomegranate Power

The unique blend of **pomegranate flower extract** and **seed oil** in **Endothelial Defense™ with Full-Spectrum Pomegranate™** contains potent polyphenols that provide support for youthful **lipid** and **glucose** metabolism, and help with **inflammatory factors**.<sup>8</sup>

A bottle containing 60 softgels of **Endothelial Defense™ with Full-Spectrum Pomegranate™** retails for \$56. If a member buys four bottles, the price is reduced to just **\$39** per bottle.

**To Order Endothelial Defense™ with Full-Spectrum Pomegranate™, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

#### References

1. *Clin Nutr.* 2004 Jun;23(3):423-33.
2. *Am J Cardiol.* 2005 Sep 15;96(6):810-4.
3. *Heart.* 2006 Jan;92(1):119-20.
4. *Phytother Res.* 2004 Dec;18(12):957-62.
5. *Intensive Care Med.* 2007 Apr;33(4):694-702.
6. *Allerg Immunol (Paris).* 2007 Feb;39(2):45-50.
7. *Free Radic Res.* 2004 Sep;38(9):927-32.
8. *Altern Med Rev.* 2008 Jun;13(2):128-44.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



## *SUPER* FOODS

BY WILLIAM GAMONSKI

# LENTILS

## The Elite Legume



Lentils (*Lens culinaris*) are indigenous to central Asia and one of the oldest cultivated legumes or pulses. Historians have found archeological evidence of lentil seeds in the Middle East dating back 8,000 years. Lentil seeds spread throughout Europe and Africa before being introduced to India, where they are frequently used in traditional cuisine. Lentils are available in a variety of colors including black, red, green, and brown, with the latter two the most common.<sup>1</sup>

### Cancer Protection

With their abundance of phytochemicals, vitamins, minerals, and dietary fiber, it's hardly surprising that numerous studies have reported a strong connection between greater intakes of lentils and a lowered risk of various cancers. In a study published in the *International Journal of Cancer*, researchers assessed the relationship between dietary flavonol intake and breast cancer risk in more than 90,000 premenopausal women, between the ages of 26 and 46, over an 8-year period.<sup>2</sup> Consuming at least two servings of lentils per week was associated with a **24%** reduced risk of breast cancer compared with those who ate lentils less than once a month.

In a separate study, Norwegian scientists analyzed legume intake in 3,539 cancer cases and 2,032 controls. They uncovered an association between lentil consumption and cancers of the upper digestive tract. Higher intakes of lentils decreased the risk of mouth/throat, esophagus, and larynx cancers by **51, 48, and 37%**, respectively.<sup>3</sup>

Other research shows that people who consumed more than two servings of lentils per week cut their risk of colon cancer by **47%**.<sup>4</sup> In the laboratory, scientists fed rats different types of lentils for five weeks before inducing them with the carcinogen azoxymethane, which leads to the formation of lesions known as aberrant crypt foci that precede colon cancer. Compared with the control group, the supplementation of raw split lentils and cooked whole lentils reduced the number of aberrant crypt foci by **36 and 42%** respectively.<sup>5</sup> Although the mechanisms are not yet clear, it may be related to lentils' high content of resistant starch.<sup>6</sup>



During a 6-year study of 14,000 men, researchers found that individuals who ate three or more servings of lentils per week had a **52%** lower risk of prostate cancer, according to research published in the journal *Cancer*.<sup>7</sup>

### Combating Metabolic Syndrome

Up to **34%** of Americans have metabolic syndrome, a collection of metabolic abnormalities that increase the risk for heart disease and type II diabetes.<sup>8</sup> Metabolic syndrome is defined as having at least three of the following components: central obesity (increased waist circumference); raised blood pressure; insulin resistance; elevated triglycerides; and lowered HDL cholesterol levels.<sup>9</sup> Epidemiological evidence pub-

lished in the *Archives of Iranian Medicine* indicates an association between the consumption of legumes like lentils and metabolic syndrome, as people with the highest intakes were **75%** less likely to develop the condition.<sup>10</sup>

This positive observational finding is supported by several compelling clinical studies showing that a diet rich in lentils can effectively combat the individual components that contribute to metabolic syndrome. For instance, English researchers found that overweight and obese people consuming two servings of pulses, such as lentils, per day for 18 months reduced their waistlines by **1.5 inches**, compared to **0.78 inches** in the control group.<sup>11</sup> In another study reported in the *European Journal of Nutrition*, four servings of lentils or other legumes per week as part of a reduced calorie diet for

8 weeks lowered obese subjects' mean systolic blood pressure reading (top number) by **9 mmHg** versus **4 mmHg** in the controls.<sup>12</sup>

To determine the effects of a pulse-dense diet on metabolic syndrome risk factors, scientists at the University of Toronto randomly assigned 40 overweight and obese adults to an ad libitum diet with five cups of pulses per week that included lentils, or a reduced calorie diet with dietary counseling. After 8 weeks, both groups exhibited improvements in several parameters of metabolic syndrome including insulin resistance and fasting glucose levels. However, the pulse group also increased HDL cholesterol by **4.5%**, compared with a decrease of **0.8%** in the control group.<sup>13</sup>

## Diabetes Management

In addition to decreasing the risk for metabolic syndrome, lentils show promise for improving blood glucose control in diabetics. In animal research published in the *Malaysian Journal of Nutrition*, diabetic rats fed cooked lentils daily for 6 weeks had lower blood glucose levels compared to a control group of rats.<sup>14</sup>

This favorable effect on blood sugar levels was also noted in a recent human study.<sup>15</sup> Researchers enrolled 121 type II diabetics and randomly selected them for a low-glycemic index diet with at least one cup of legumes daily or whole wheat products rich in insoluble fiber for 3 months. Hemoglobin A1c (HbA1c) levels, an indicator of blood glucose control over the last approximately three months, along with heart disease risk were the main outcomes studied. The

findings revealed that the legume group lowered HbA1c levels by **0.5%**, compared to **0.3%** in the wheat group.<sup>15</sup> Furthermore, the legume group decreased their risk of cardiovascular disease by **0.8%**, which was largely attributed to a reduction in systolic blood pressure by an average **4.5 mmHg**.<sup>15</sup>

## Summary

The ingestion of lentils in place of saturated fat, omega-6 fat, and high-glycemic carbohydrate foods can help ward off diabetes, cancer, and the deadly metabolic syndrome. ●



## Easy To Make Lentil Soup<sup>17</sup>

### Ingredients:

- 2 cups dry lentils
- 1 bay leaf
- 1 can crushed tomatoes (14.5 oz)
- 1 tsp dried basil
- 1 onion chopped
- 8 cups of water
- 1/4 cup olive oil
- 1/2 cup spinach, rinsed and thinly sliced
- 2 carrots diced
- 2 tbsp of vinegar
- 2 stalks of celery chopped
- salt and black pepper to taste
- 2 cloves garlic minced
- 1 tsp dried oregano

### Directions:

Put olive oil, carrots, onions, and celery in a large soup pot and place over medium heat. Once onion is tender, add in garlic, bay leaf, basil, and dried oregano. Allow this to cook for 2 minutes, add water and then fold in lentils and tomatoes. Bring this to boil and reduce heat. Let it simmer for one hour. Before it's ready to be served, add in spinach and cook until it wilts. Then add vinegar along with salt and pepper to taste. Makes 6 servings.

Per serving: calories 349, protein 18 g, fat 10 g, carbohydrates 48 g, cholesterol 0 mg, sodium 121 mg, fiber 22 g.



## Cooked Lentils Nutritional Facts, One Cup<sup>16</sup>

Nutrients	Amount	DV(%)
Folate	358 mcg	90%
Dietary Fiber	16 grams	63%
Manganese	1.0 mg	49%
Iron	6.6 mg	37%
Phosphorous	356 mg	36%
Copper	0.5 mg	25%
Thiamine	0.3 mg	22%
Potassium	731 mg	21%
Magnesium	71.3 mg	18%

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

## References

- Available at: <http://www.whfoods.com/genpage.php?name=foodspice&dbid=52>. Accessed November 1, 2012
- Adebamowo CA, Cho E, Sampson L, et al. Dietary flavonols and flavonol-rich foods intake and the risk of breast cancer. *Int J Cancer*. 2005;114:628-33.
- Aune D, De Stefani E, Ronco A, et al. Legume intake and risk of cancer: a multisite case-control study in Uruguay. *Cancer Causes Control*. 2009 Nov;20(9):1605-15.
- Singh PN, Fraser GE. Dietary risk factors for colon cancer in a low-risk population. *Am J Epidemiol*. 1998;148(8):761-74.
- Faris MA, Takruri HR, Shomaf MS, Bustanji YK. Chemopreventive effect of raw and cooked lentils (*Lens culinaris* L) and soybeans (*Glycine max*) against azoxymethane induced aberrant crypt foci. *Nutr Res*. 2009 May;29(5):355-62.
- Liu R, Xu G. Effects of resistant starch on colonic preneoplastic aberrant crypt foci in rats. *Food Chem Toxicol*. 2008;46:2672-9.
- Mills PK, Beeson WL, Phillips RL, Fraser GE. Cohort study of diet, lifestyle, and prostate cancer in Adventist men. *Cancer*. 1989;64:598-604.
- Mozumdar A, Liguori G. Persistent increase of prevalence of metabolic syndrome among US adults: NHANES III to NHANES 1999-2006. *Diabetes Care*. 2011 Jan;34(1):216-9.
- Grundy SM, Brewer HB Jr, Cleeman JI, et al. Definition of metabolic syndrome: Report of the National Heart, Lung, and Blood Institute/American Heart Association conference on scientific issues related to definition. *Circulation*. 2004 Jan 27;109(3):433-8.
- Hosseinpour-Niazi S, Mirmiran P, Amiri Z, Hosseini-Esfahani F, Shakeri N, Azizi F. Legume intake is inversely associated with metabolic syndrome in adults. *Arch Iran Med*. 2012 Sep;15(9):538-44.
- Venn BJ, Perry T, Green TJ, et al. The effect of increasing consumption of pulses and wholegrains in obese people: a randomized controlled trial. *J Am Coll Nutr*. 2010 Aug;29(4):365-72.
- Hermesdorff HM, Zulet MA, Abete I, Martinez JA. A legume-based hypocaloric diet reduced proinflammatory status and improves metabolic features in overweight/obese subjects. *Eur J Nutr*. 2011;50:61-9.
- Mollard RC, Luhovyy BL, Panahi S, Nunez M, Hanley A, Anderson GH. Regular consumption of pulses for 8 weeks reduces metabolic syndrome risk factors in overweight and obese adults. *Br J Nutr*. 2012 Aug;108:S111-22.
- Al-Tibi AM Jr, Takruri HR, Ahmad MN. Effect of dehulling and cooking of lentils (*Lens Culinaris*) on serum glucose and lipoprotein levels in streptozotocin-induced diabetic rats. *Malays J Nutr*. 2010 Dec;16(3):409-18.
- Jenkins DJ, Kendall CW, Augustin LS, et al. Effect of legumes as part of a low glycemic index diet on glycemic control and cardiovascular risk factors in type 2 diabetes mellitus: a randomized controlled trial. *Arch Intern Med*. 2012 Oct;182:1-8.
- Available at: <http://nutritiondata.self.com/facts/legumes-and-legume-products/4338/2> Accessed November 2, 2012.
- Available at: <http://allrecipes.com/recipe/lentil-soup/>. Accessed November 2, 2012.



# BLACK CUMIN SEED OIL



As we age, a *balanced immune* and *inflammatory* response becomes critical to guarding our health.<sup>1,5</sup>

Research has shown **Black Cumin Seed Oil** to be particularly effective.<sup>6,8</sup>

## UNIQUE MOLECULAR COMPLEX

Scientists have determined that **black cumin seeds** contain a *broad spectrum* of active compounds.<sup>6</sup> Combined, these compounds provide powerful and wide-ranging *immune* support and promote healthy *inflammatory* response.<sup>6,7</sup>

## DUAL IMMUNE SUPPORT

A number of biological factors contribute to the body's normal inflammatory activity, including cell-signaling chemicals and hormone-like messengers.<sup>8</sup> In a series of scientific studies, **Black Cumin Seed Oil** has been shown to support the normal effectiveness of these inflammatory factors.<sup>6,7</sup>

Also, an aging, healthy immune system needs to orchestrate the activity of macrophages and helper T-cells that work together to identify and destroy dangerous microbes and abnormal cells. **Black Cumin Seed Oil** was also shown to support the optimal function of these vitally important defensive activities.<sup>9-11</sup>

## A BALANCED INFLAMMATION RESPONSE

By acting on *both* immune factors *and* inflammatory factors, **Black Cumin Seed Oil** supports a healthy immune system—which is increasingly important as we age—and facilitates a **healthy inflammatory response!**

The suggested daily dosage of two softgels of Black Cumin Seed Oil provides:

Thymocid™ organic Black Cumin seed oil ( <i>Nigella sativa</i> )	1,000 mg
--	----------

A bottle containing 60 softgels of **Black Cumin Seed Oil** retails for \$16. If a member buys four bottles, the price is reduced to **\$10.50** per bottle. (Item# 01709)

Since **curcumin** possesses some of the properties of **black cumin seed oil**, some people might want to take both nutrients in the same capsule.

The suggested daily dose of two softgels of Black Cumin Seed with Bio-Curcumin® provides:

BCM-95® Bio-Curcumin® ( <i>Curcuma longa</i> ) extract	400 mg
--	--------

Thymocid™ organic Black Cumin Seed Oil ( <i>Nigella sativa</i> )	1,000 mg
--	----------

A bottle containing 60 softgels of **Black Cumin Seed Oil with Bio-Curcumin®** retails for \$32. If a member buys four bottles, the price is reduced to **\$22.50** per bottle. (Item# 01710)

To order Black Cumin Seed Oil or Black Cumin Seed Oil with Bio-Curcumin®, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**For Balanced  
Immune Support  
and Inflammation  
Control**



Item# 01709



Item# 01710

## References

1. Curr Alzheimer Res. 2007 Apr;4(2):117-22.
2. JAMA. 2004 Feb 11;291(6):704-10.
3. Nutr Rev. 2007 Dec;65(12 Pt 2):S173-6.
4. Biol Psychiatry. 2003 Sep 1;54(5):566-72.
5. Immunol Allergy Clin North Am. 2003 Feb;23(1):15-39.
6. Cancer Ther. 2008;6(b):495-510.
7. Int Immunopharmacol. 2005 Dec;5(13-14):1749-70.
8. Phys Sportsmed. 2008 Dec;36(1):11-7.
9. Int J Immunopharmacol. 2000 Sep;22(9):729-40.
10. Pulm Pharmacol Ther. 2009 Feb;22(1):37-43.
11. Crit Rev Food Sci Nutr. 2010 Aug;50(7):654-65.

Thymocid™ is a trademark of Verdure Sciences, Inc. Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patents Nos. 7,883,728, 7,736,679 and 7,879,373.



**Rich Rewards™**

**Lentil  
Vegetable  
Soup**

**One Smart Bowl of Soup™**

**A delicious vegetarian soup suitable for vegans**

# Only Healthy Ingredients

Processed food companies sell vegetable soups so cheaply because they load them with *high-glycemic* carbohydrates (rice, potatoes, pasta) that cost virtually nothing. They then add inexpensive ingredients like corn, sugar, and sometimes omega-6 fats (like cottonseed oil). So for less than \$2, you get a relatively high-carb-calorie soup that provides virtually no health benefits. **Life Extension®** has formulated a **lentil vegetable soup** suitable for vegans that contains only garden-fresh ingredients, including lentils, mushrooms, tomatoes, carrots, **extra-virgin olive oil**, and a host of other beneficial **plant foods**.

Each serving of **Rich Rewards Lentil Vegetable soup** contains only **120 calories** of the best-documented foods to maintain your precious health. You can consume the entire contents or use a smaller portion of the soup as part of a meal for you (or several people).

The entire container supplies about **3.5 servings** of these lentils, mushrooms, and vegetables—with none of the **glucose-spiking** fillers found in commercial soups.

**Rich Rewards Lentil Vegetable Soup** is packaged in a re-closable bottle free of **BPA**. While the **FDA** says the BPA lining in most cans is safe, we at Life Extension have always used BPA-free containers.

The retail price for a **3.5 serving bottle** of **Rich Rewards Lentil Vegetable soup** is \$13. The member price is **\$9.75**.



Item # 01705

## Lentil Vegetable Soup

### Nutrition Facts

Serving Size 1 cup (245g)  
Servings Per Container about 3.5

Amount Per Serving  
**Calories** 120    Calories from Fat 40

		% Daily Value *
<b>Total Fat</b>	4.5g	<b>7%</b>
Saturated Fat	0g	<b>0%</b>
Trans Fat	0g	
<b>Cholesterol</b>	0mg	<b>0%</b>
<b>Sodium</b>	35mg	<b>1%</b>
<b>Total Carbohydrate</b>	17g	<b>6%</b>
Dietary Fiber	5g	<b>20%</b>
Sugars	7g	
<b>Protein</b>	5g	

Vitamin A 40% • Vitamin C 40%  
Calcium 4% • Iron 15%

\*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

**Ingredients:** Water, Diced Tomatoes in Juice (tomatoes, tomato juice, citric acid, calcium chloride), Lentils, Tomato Paste, Celery, Onion, Mushroom, Carrot, Extra Virgin Olive Oil, Garlic, Parsley, Black Pepper, Sage, Basil, Thyme.

## Cruciferous Vegetable Soups

You can also order soups that contain vegetables like **broccoli**, **cauliflower**, and **asparagus** in **extra-virgin olive oil** with only **60-70 calories** per serving at the same price as the **Lentil Vegetable Soup**.

### Cruciferous Vegetable

Retail Price \$11.95

Member Price \$8.96

#01530

### Spicy Cruciferous Vegetable

Retail Price \$11.95

Member Price \$8.96

#01531



## Souper tasty. Souper Satisfying.

You know you don't eat enough veggies. So **Life Extension®** cooked up a convenient, tasty way to spoon-feed you these souper foods. Unlike many canned soups, **Rich Rewards™ Lentil Vegetable Soup** is contained in a convenient resealable package that is free of BPA.

This soup provides unique garden-fresh ingredients, such as lentils, mushrooms, tomatoes, carrots, and other beneficial plant foods plus heart-healthy extra virgin olive oil.

### One Smart Bowl of Soup

Contains about 3.5 servings of healthy lentils, mushrooms, and vegetables per bottle

Only 120 calories per serving

No added starches or sugars!

Excellent source of lentils, mushrooms, and fiber

Contains 4.5 grams of total fat per serving

0g trans fat. No saturated fat or cholesterol

To order your fresh supply of Rich Rewards Lentil Vegetable soup, call 1-800-544-4440 or visit [www.lef.org/soup](http://www.lef.org/soup)

Next-Generation Formula . . .

# ARTHROMAX™ ADVANCED

## WITH UC-II® AND APRÈSFLEX®



Item # 01618

### Dual-Action Support for Aging Joints!

As you grow older, age-related stiffness and discomfort in the joints becomes a fact of life. Activities once routine become a challenge as limited mobility hampers your every move.

You now have a more potent option to provide broad-spectrum support for aging joints.

**ArthroMax™ Advanced with UC-II® and AprèsFlex®** is a multi-nutrient formula based on scientific data on natural support for joint health. The ArthroMax™ formula provides more joint support than ever before, enhanced with two innovative, clinically validated ingredients: AprèsFlex® and UC-II®.

### Better Absorption for Optimum Benefit

**AprèsFlex®** represents a quantum leap forward in the delivery to aging joints of **boswellia**, long prized for its ability to help with inflammatory issues. It is a superior inhibitor of the enzyme **5-lipoxygenase** or **5-LOX**.

Excess activity of 5-LOX results in the accumulation of **leukotriene B4**, a pro-inflammatory compound that affects aging joints. **Boswellia** has been shown to bind directly to the 5-LOX enzyme in our bodies, blocking it from facilitating production of pro-inflammatory leukotrienes.<sup>1,2</sup>

**AprèsFlex®** boswellia *absorbs* into the blood **52%** **better** than previously available forms of boswellia, for superior effectiveness.

### ArthroMax™ Advanced with UC-II® and AprèsFlex®

In addition to AprèsFlex®, ArthroMax™ contains a novel form of undenatured chicken cartilage: UC-II®. Data show it helps with immune issues that can impact joint discomfort and ease of motion in aging individuals.

Two capsules of **ArthroMax™ Advanced with UC-II® and AprèsFlex®** provide the following nutrients in one convenient, joint-protecting formula:

<b>UC-II® standardized chicken cartilage</b>	<b>40 mg</b>
<b>Glucosamine sulfate 2KCl (from corn)</b>	<b>1500 mg</b>
<b>AprèsFlex® (Boswellia serrata) extract</b>	<b>100 mg</b>
<b>Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®)</b>	<b>1.5 mg</b>

The retail price of a bottle of 60 capsules of **ArthroMax™ Advanced with UC-II® and AprèsFlex®** is \$36. If a member buys four bottles, the price is reduced to **\$24** per bottle.

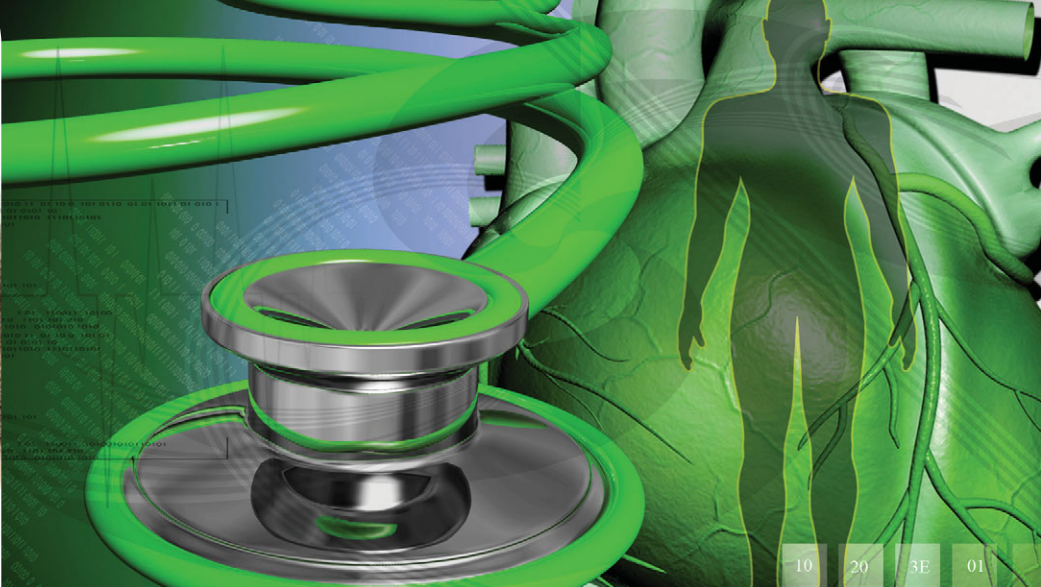
#### References

1. *Wien Med Wochenschr.* 2002;152(15-16):373-8.
2. *J Ethnopharmacol.* 2006 Sep 19;107(2):249-53.

AprèsFlex® is a registered trademark of Laila Nutraceuticals exclusively licensed to PL Thomas—Laila Nutra LLC. International patents pending. FruiteX B® and OsteoBoron® are registered trademarks of VDF FutureCeuticals, Inc. U.S. Patent No. 5,962,049. UC-II® is a registered trademark of InterHealth N.I. UC-II® brand undenatured type II collagen. U.S. Patents 5,645,851, 5,637,321, 5,529,786, 5,750,144, 7,083,820, EPO Patent EP1435906B1, U.S. and world-wide patents pending.

**To order ArthroMax™ Advanced with UC-II® and AprèsFlex®**  
**call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



## AUTHOR INTERVIEW

# The South Beach Diet Gluten Solution

*The Delicious, Doctor-Designed, Gluten-Aware  
Plan for Losing Weight and Feeling Great – FAST!*

Dr. Arthur Agatston is a leading preventive cardiologist and an associate professor of medicine at the University of Miami, Miller School of Medicine. A pioneer in the field of non-invasive cardiac imaging, Dr. Agatston's scientific work with Dr. Warren Janowitz, first reported in 1991, resulted in the Agatston Score, a method for screening for coronary calcium that is currently used throughout the world and considered by many experts to be an important predictor of heart disease. He is the author of the *New York Times* bestselling sensation, *The South Beach Diet*. His new book *The South Beach Diet Gluten Solution* is available now. In this exclusive interview, Dr. Agatston talks to *Life Extension*® about how his latest project can benefit readers.

**LE:** Let's start at the beginning. How serious of a problem is gluten in food products?

**AA:** For some people—about **1%** of the population—gluten can be a matter of life or death.<sup>1</sup> These people have a condition known as celiac disease. True celiacs, as they are called, are so sensitive to gluten

that even a small amount—really just a trace—can make them very sick. Until a decade ago, celiac disease was thought to be extremely rare, affecting **1 in 10,000** people in North America.<sup>2</sup> But in 2003, Dr. Alessio Fasano, one of the world's leading researchers in the field, reported a surprising finding: The rate was actually **1 in 133**.<sup>3</sup> That's 100 times more common than was previously believed.

**LE:** Celiac disease is the strongest form of gluten intolerance, but your book focuses largely on a more prevalent issue, which is something called gluten sensitivity. Can you explain that a little?

**AA:** Gluten sensitivity is a condition with symptoms often similar to celiac disease but that may not require giving up gluten entirely. With the significant increase in our gluten intake over the past 50 years due to the ubiquity and overconsumption of products made with highly refined wheat flour, we are just beginning to appreciate gluten's impact on our health. As a society, we are in a state of “gluten overload,” and millions of people of all ages and all walks of life are suffering as a result.

**LE:** What can people do to determine whether or not they have celiac disease?

**AA:** If you were to walk into my office tomorrow with abdominal pain, fatigue, foggy mind, joint pain, tingling in the extremities, or any of the other symptoms commonly associated with both celiac disease and gluten sensitivity, I would test you for celiac disease before suggesting that you try the Gluten Solution Program. This involves drawing blood to check for anti-tTG and other antibodies

that are produced when intestinal cells are damaged and for the genes linked to celiac disease (HLA-DQ2 and/or HLA-DQ8). Depending on the results, a confirming biopsy may also be necessary. At the same time, I also test for nutritional deficiencies common in people with celiac disease, namely iron, folic acid, vitamin B12, and vitamin D.\*

**LE:** In your experience, what are some of the symptoms that people may experience if they are sensitive to gluten?

**AA:** In my cardiology practice, I have been amazed at the number of patients who have gluten sensitivity and who have gone undiagnosed for many years. When they eat foods containing gluten, it triggers unpleasant symptoms—stomach pains, diarrhea, heartburn, body aches, headache, skin rashes, fatigue, brain fog, and depression—and sometimes leads to or exacerbates chronic illnesses such as rheumatoid arthritis and fibromyalgia. We now know that there is a relationship between this new epidemic of gluten sensitivity and the epidemics of obesity and diabetes, two related and reversible conditions that have been the principal focus of my earlier *South Beach Diet* books.

**LE:** Can you describe that insidious relationship?

**AA:** I have written a great deal about the epidemics of diabetes and obesity and their well-established relationship to heart disease and to most other chronic diseases. I have laid the blame squarely on our sedentary lifestyle and our poor diet filled with empty-calorie, low-fiber, non-nutritious foods—especially in the form of refined carbohydrates. Our addiction to



highly processed starches has led us to consume more gluten than ever before. The irony here is that the more of these junk foods we eat, the more we crave them and the more we continue to eat them. It is a vicious cycle that leaves millions of people struggling with their weight, feeling exhausted and depressed, and suffering from a variety of health problems that are diminishing their quality of life.

**LE:** In order to combat this problem, many people need to alter their diets to remove all gluten products. But what is the difference between being “gluten free” and being “gluten aware”?

**AA:** The generally accepted definition of gluten free means that a food must contain less than **20 parts per million (ppm)** of gluten,<sup>4</sup> though labeling laws are yet to be passed. That's the amount in about 1/48 of a slice of bread: just a tiny sliver. In addition, grain products—cereals, baked goods, and other products—are not truly

gluten free unless they are made in their own gluten-free facilities to prevent cross-contamination from wheat, rye, or barley products. For example, if an oatmeal cereal is made in a factory that makes cream of wheat, although the oatmeal is made from oats and nothing else, cross contamination with traces of wheat picked up from the same machines that processed the wheat can bring the oatmeal above the **20 ppm** threshold.

**LE:** An interesting section in your book describes how the overuse of pain relievers such as NSAIDs and antibiotics is exacerbating the gluten digestion problems many Americans face. How does this work?

**AA:** In recent decades, there has been an ever-increasing use of pain relievers, particularly non-steroidal anti-inflammatory medications (NSAIDs), both over the counter and prescribed.<sup>5,6</sup> These include aspirin (Bayer, Bufferin®), naproxen (Aleve®), and ibuprofen (Advil®, Motrin®). While most of us have heard that NSAIDs can damage our stomachs, what you may not know is that they are just as likely to damage your small intestine.<sup>5,7</sup> When you consider that more than **30 billion** doses of over-the-counter and prescription NSAIDs are taken in the United States each year,<sup>5</sup> the impact on our collective small intestines must be substantial. In the same manner that gastroenteritis allows incompletely digested gluten peptides to leak through the intestinal lining and cause symptoms, so can NSAID damage. As with NSAIDs, overuse and overprescription of antibiotics is rampant in the United States today, beginning in childhood. It is estimated

that doctors prescribe antibiotics to a child at one out of every five visits, often for viral respiratory ailments like bronchitis and flu that do not require them.<sup>8</sup>

**LE:** The science behind how your intestines take such a strong hit with this disease makes sense, but you even mention that gluten sensitivity can lead to osteoporosis. That's surprising.

**AA:** About **55%** of Americans over the age of 50 either have osteoporosis or are at high risk for developing it.<sup>9</sup> I have always wondered why osteoporosis is so common in the industrialized world, despite our intake of calcium, magnesium, vitamin D, and other nutrients important for bone formation and strength. Interestingly, osteoporosis has traditionally been treated with calcium supplements, but their impact on stopping or reversing this disease seems to be minimal and there is a reason for that. We know that with celiac disease, nutrient deficiencies resulting from a damaged small intestine stunt the growth of children and, indeed, prevent children from getting enough of these vital nutrients during their bone-building years. It seems likely that the osteoporosis that occurs later in life could be due to decades of poor absorption of the nutrients that were available from food but never got into the bloodstream and tissues.

**LE:** And gluten sensitivity can even affect vitamin D absorption, right?

**AA:** If you have been told that you have a low vitamin D level, you should be tested for celiac disease, since damaged villi cannot adequately absorb this fat-soluble vitamin. Even if the results are

negative, you should follow our Gluten Solution Program, monitor your response, and have your vitamin D rechecked after being off gluten. Conversely, if you find you are gluten sensitive after you've done our program, ask your doctor to test your vitamin D level and your levels of other nutrients as well. You may need supplementation under your doctor's guidance.

**LE:** Even if someone adopts a gluten free or gluten aware diet, there is still a lot of damage that has been done to the GI tract. What can people do to repair this damage?

**AA:** There's a promising area of microbiota research that is shedding new light on recolonizing the bacteria in our intestines with probiotics.<sup>10,11</sup> The word literally means "beneficial to life." You've likely heard of probiotics. These good bacteria, which already reside in our intestines, have populated or have been added to a vast number of products ranging from yogurt to green tea drinks and other supplements for years.



But despite some good rationale behind efficacy claims, we are still waiting for more evidence before probiotics can be established as an important component in achieving better health. That's in part because the various foods and supplements for oral delivery of probiotics don't necessarily spare these friendly bacteria from being destroyed by our stomach acid. One use of probiotics that has been found to be beneficial, however, is in the treatment of the bacterial overgrowth of *Clostridium difficile*, a decidedly unfriendly enemy that attacks our intestinal linings, causing inflammation, abdominal pain, and diarrhea.<sup>12,13</sup>

**LE:** How is the *South Beach Diet* similar to the *South Beach Diet Gluten Solution* program?

**AA:** The *South Beach Diet Gluten Solution* is simply an extension of our time-tested plan. The same principles of eating a varied diet consisting of nutrient- and fiber-rich vegetables, fruits, and whole grains, as well as lean protein and good fats, still hold true here. You'll just be giving up all gluten for a few weeks to determine if you have any gluten sensitivity. Today, wheat has been targeted as the enemy, and some people have gone a little overboard avoiding it. Just as people were wrongly fat phobic back in the 1990s, they're wrongly gluten phobic today. That's why I have created the *South Beach Diet Gluten Solution* to clear up the confusion about gluten, to help you figure out whether you need to be concerned about gluten at all, and then to help you make the best food choices for better health if it turns out you do have a gluten sensitivity. ●

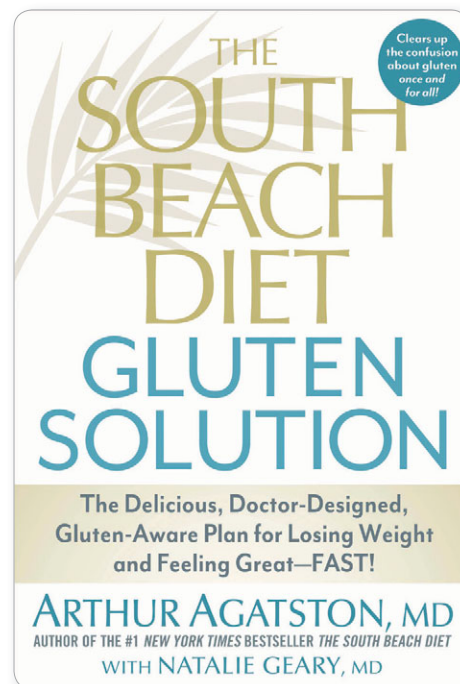
**\*Life Extension offers a Celiac Disease Antibody Screen as well as a Food Safe Allergy Screen which can determine gluten sensitivity. For more information on Celiac disease, gluten sensitivity, or to order a blood test, please contact a Life Extension® Health Advisor today at 1-866-864-3027.**

Arthur Agatston, MD, is a cardiologist and an associate professor of medicine at the University of Miami, Miller School of Medicine. He is the author of the best-selling book *The South Beach Diet*, which focuses on a food lifestyle including nutrient-dense, fiber-rich foods. Agatston admits that he didn't set out to create a popular diet plan—the plan came out of the need to get his heart patient's diets under control.

## References

1. Rubio-Tapia A, Ludvigsson JF, Brantner TL, Murray JA, Everhart JE. The prevalence of celiac disease in the United States. *Am J Gastroenterol*. 2012 Oct;107(10):1538-44.
2. Rossi TM, Albin CH, Kumar V. Incidence of celiac disease identified by the presence of serum endomysial antibodies in children with chronic diarrhea, short stature, or insulin-dependent diabetes mellitus. *J Pediatr*. 1993 Aug;123(2):262-4.
3. Fasano A, Berti I, Gerarduzzi T, et al. Prevalence of celiac disease in at-risk and not-at-risk groups in the United States: a large multicenter study. *Arch Intern Med*. 2003 Feb 10;163(3):286-92.
4. Available at: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm265838.htm>. Accessed April 9, 2013.
5. Available at: <http://www.ptjournal.com/ptJournal/fulltext/28/7/PTJ2807462.pdf>. Accessed April 9, 2013.
6. Kovac SH, Houston TK, Weinberger M. Inappropriate nonsteroidal anti-inflammatory drug use: prevalence and predictors. *J Patient Saf*. 2010 Jun;6(2):86-90.
7. Graham DY, Opekun AR, Willingham FF, Qureshi WA. Visible small-intestinal mucosal injury in chronic NSAID users. *Clin Gastroenterol Hepatol*. 2005 Jan;3(1):55-9.

8. Mangione-Smith R, McGlynn EA, Eliott MN, Krogstad P, Brook RH. The relationship between perceived parental expectations and pediatrician antimicrobial prescribing behavior. *Pediatrics*. 1999 Apr;103(4 Pt 1):711-8.
9. Available at: <http://www.nof.org/hcp/research/research-agenda>. Accessed April 9, 2013.
10. Lee BJ, Bak YT. Irritable bowel syndrome, gut microbiota and probiotics. *J Neurogastroenterol Motil*. 2011 Jul;17(3):252-66.
11. Saulnier DM, Ringel Y, Heyman MB, et al. The intestinal microbiome, probiotics and prebiotics in neurogastroenterology. *Gut Microbes*. 2013 Jan-Feb;4(1):17-27.
12. Lawley TD, Clare S, Walker AW, et al. Targeted restoration of the intestinal microbiota with a simple, defined bacteriotherapy resolves relapsing *Clostridium difficile* disease in mice. *PLoS Pathog*. 2012;8(10):e1002995.
13. Schoster A, Kokotovic B, Permin A, Pedersen PD, Bello FD, Guardabassi L. In vitro inhibition of *Clostridium difficile* and *Clostridium perfringens* by commercial probiotic strains. *Anaerobe*. 2013 Apr;20:36-41.



To order *The South Beach Diet Gluten Solution*, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Item# 33861  
Retail price \$25.99  
Member price \$19.49

# ARE YOU GETTING Curcumin's BENEFITS?



## How Much Curcumin Are You Absorbing?

**Curcumin** is the health-promoting trace compound derived from the Indian spice **turmeric**. But not all turmeric is alike.

The curcumin found in the vast majority of dietary supplements is derived from turmeric that is **nutritionally inferior**.

Why? Almost all growers harvest turmeric at the point when the turmeric root turns its signature yellow color, but *before* it has fully matured.

The turmeric root requires more time in the ground for highly beneficial phytonutrients called **curcuminoids** and **sesquiterpenoids** to attain peak concentrations.

**Life Extension®'s Super Bio-Curcumin®** derives from turmeric that is grown with organic practices, cultivated to maturity, then specially transported and processed to preserve and deliver the root's most complete nutritional profile.

In recent studies comparing the effects of standard curcumin against turmeric extracts comparable to **Super Bio-Curcumin®**, researchers observed:<sup>1,2</sup>

- Nearly twice the support for **immune** health.
- Approximately twice the support for **inflammatory** issues.
- Almost double the **antioxidant** support.

A separate study indicated that an antioxidant-rich curcumin extract<sup>3</sup> provided powerful support for heart health.

## Unrivalled Potency and Absorbability with BCM-95®

Curcumin is neither absorbed nor *retained* well in the blood, which is another challenge facing those who wish to maximize its benefits.

The highly popular **Super Bio-Curcumin®** uses **BCM-95®**, a patented, *bioenhanced* preparation of curcumin. It has been shown to reach up to **7 times higher concentration** in the blood than standard curcumin.<sup>4</sup>

The graphs on this page illustrate that one 400 mg vegetarian capsule per day of **Super Bio-Curcumin®** supplies the equivalent of **2,500 mg** of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of **Super Bio-Curcumin®** retails for \$38. If a member buys four bottles, the price is reduced to only **\$26.25** per bottle.



Item # 00407

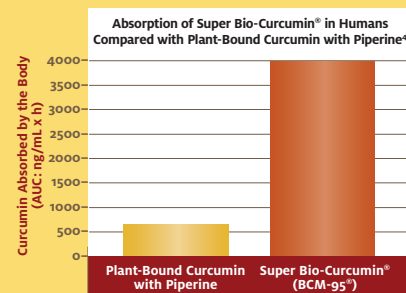
### References

1. *Int J Pharmacol.* 2009;5(6):333-45.
2. *J Food Nutr Res.* 2009;48(3):148-52.
3. *Arch Gerontol Geriatr.* 2002;34:37-46.
4. *Indian J Pharm Sci.* 2008 Jul-Aug;70(4):445-9.
5. Bioavailability study of BCM-95® in rats. Orcas International Inc. 2006.

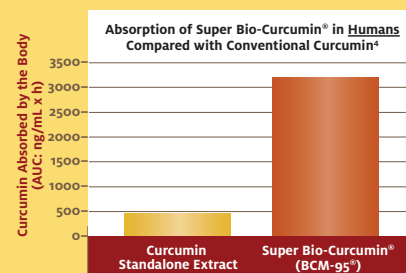
**CAUTION:** Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product.

**Bio-Curcumin®** and **BCM-95®** are registered trademarks of Dolcas-Biotech, LLC.

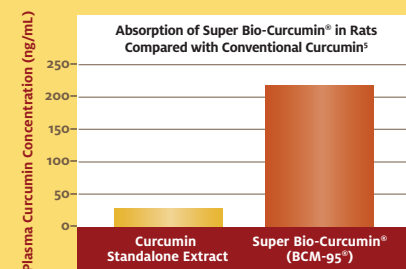
U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.



**Chart 1.** Super Bio-Curcumin® (BCM-95®) showed 6.3 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with plant-bound curcumin with piperine (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).



**Chart 2.** Super Bio-Curcumin® (BCM-95®) showed 6.9 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with conventional curcumin (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).



**Chart 3.** Bioavailability in rats fed with BCM-95® is 7.8 times higher than conventional curcumin.

**To order Super Bio-Curcumin®**  
**call 1-800-544-4440**  
**or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

# SHIELD YOUR PRECIOUS EYESIGHT

AT FANTASTICALLY DISCOUNTED PRICES!



ITEM #00657 SolarShield®



ITEM #00747 OverRxCast

**Shielding your eyes from destructive ultraviolet sun rays is one of the most effective means of protecting against ocular disease.**

Consumers often spend hundreds of dollars on just one pair of so-called “designer” sunglasses. Life Extension® members can obtain superior protection against damaging solar radiation at a fraction of the price of commercially sold sunglasses.

**SolarShield®** sunglasses are recognized as the **number-one doctor-recommended sunglass** in the world, with more than 50 million pairs sold to date. Patented **SolarShield®** sunglasses with **durable polycarbonate lenses** and **100% UV protection** fit **comfortably over prescription eyewear**, providing convenient protection from the harmful effects of ultraviolet radiation.

For those who desire the added benefit of lenses that reduce distracting glare, **OverRxCast**

sunglasses come with **polarized** gray lenses that provide natural color definition with **100% UV** protection. Like the **SolarShield®** sunglasses, **OverRxCast polarized** sunglasses are designed to be worn over your prescription eyeglasses.

SolarShield® sunglasses retail for **\$12.99** for one pair, and the member price is **\$9.74**. If a member buys two pairs, the price is reduced to only **\$8.63** a pair. One pair of **OverRxCast** sunglasses retails for **\$27**, and the member price is **\$20.25**. If a member orders two pairs, the price is reduced to just **\$15.75** per pair.

Compare these **low prices** to sunglasses sold in stores and see savings exceeding **90%!**

SolarShield® is a registered trademark Dioptrics, Inc.

**To order SolarShield® or OverRxCast sunglasses, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**



Enhanced Night Vision!

# EYE PROTECTION FORMULA

## Maintain Macular Density

The **macular pigment** is composed of lutein, zeaxanthin, and meso-zeaxanthin. The *density* of the macula is essential to proper vision. Macular density declines naturally over time.

Eating lots of lutein- and zeaxanthin-containing vegetables can help maintain the structural integrity of the macula. However, since **meso-zeaxanthin** is not part of the typical diet, it cannot be easily replaced. Young people convert lutein into meso-zeaxanthin inside their macula. Some aging people, however, lose their ability to convert lutein into **meso-zeaxanthin**.

The **Super Zeaxanthin** formula provides **zeaxanthin, lutein and meso-zeaxanthin** to help maintain macular density.

Falling down is responsible for 70% of accidental deaths in older people.<sup>1</sup> Poor lighting conditions are often the culprit.

Fortunately, **C3G** derived from **black currant extract** supports eyesight in **dark** conditions by promoting the healthy function of delicate structures within the retina that support **night vision**.<sup>2</sup>

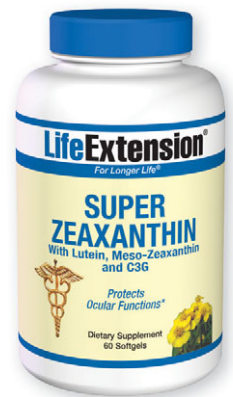
**Super Zeaxanthin** contains a potent dose of **C3G** to nourish cells throughout the body.

## Comprehensive Ocular Protection in One Daily Softgel

The **Super Zeaxanthin** formula provides ingredients that have been shown to promote healthy eyesight. Just one softgel of **Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G** provides:

<b>OptiLut®</b> , <b>Lutein Plus®</b> and <b>MZ®</b>	<b>38 mg</b>
Marigold ( <i>Tagetes erecta</i> ) extract (flower) [free lutein equivalent 10 mg]	
<b>Zeaxanthin &amp; Meso-zeaxanthin blend</b>	<b>3.75 mg</b>
[Paprika ( <i>capsicum annum</i> ) extract (fruit), <b>OptiLut®</b> , <b>Lutein Plus®</b> and <b>MZ®</b> Marigold Extract (flower)]	
<b>C3G</b> (Cyanidin-3-glucoside)	<b>2.2 mg</b>
[from European black currant ( <i>Ribes nigrum</i> ) extract (fruit)]	

The retail price for a bottle containing 60 softgels of **Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G** is \$22. If a member buys four bottles, the price is reduced to **\$14.85** per bottle.



Item # 01685

OptiLut® is a registered trademark of NutriScience Innovations, LLC.  
LuteinPlus® and MZ® are registered trademarks of Nutriproducts Ltd., 7  
Marfleet, CB22 5LA, UK, licensed under US Patents 6,218,436 & 6,329,432.

### References

1. Available at: <http://www.aafp.org/afp/20000401/2159.html>. Accessed August 10, 2010.
2. *Alt Med Rev.* 2000;5(6):553-62.

To order **Super Zeaxanthin with Lutein, Meso-Zeaxanthin and C3G**,  
call **1-800-544-4440** or visit **www.LifeExtension.com**



# SAVE THE DATES!

SEPTEMBER 6-8, 2013

MARRIOTT LOS ANGELES AIRPORT HOTEL, CALIFORNIA

Register  
now at  
[PCRI.org](http://PCRI.org)

*Making a Positive Impact on Quality of Life*

**Register Early and Save!**

[www.pcri.org](http://www.pcri.org) or 310.743.2116

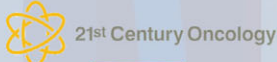
Join us in Los Angeles for the 2013 Prostate Cancer Conference, September 6-8, at the Marriott Los Angeles Airport Hotel. This year's conference will focus on "Quality of Life" issues for men dealing with prostate cancer. PCRI has collected an outstanding faculty to discuss important subjects ranging from new treatments, active surveillance, nutrition and fitness, immunotherapy, hormone treatments, radiation, chemotherapy and much more!

## CONFERENCE HIGHLIGHTS

- Presentations on:
  - Treatment-Related Side Effects
  - Advanced Disease
  - Radiation Oncology
  - Surgery vs. Observation
  - The PSA Screening Controversy
  - New Treatments
  - Women's Issues
- Featuring a live on stage Prostate Biopsy
- Round-Table Discussions: Listen to real clinical cases and obtain answers to your questions during this multi-disciplinary panel discussion.
- Opportunities to interact with speakers after their presentations
- Ask the Experts: question-and-answer sessions with participating faculty and other experts and conference attendees
- Exhibits from participating supporters and other members of the prostate cancer community
- Support group meetings will be held all throughout the conference – courtesy of UsToo and Women Against Prostate Cancer
- Saturday Night Gala Dinner (optional) - Live Entertainment with the The Harry Pinchot and Catalyst Awards
- Los Angeles Excursions (optional) - Hollywood Bowl featuring the Blue Man Group (Sept. 6) and the Grammy Museum (Sept. 8).

## CONFERENCE FACULTY

Duke Bahn, MD, Charles Drake, MD, PhD, Steven Finkelstein, MD, Mark Kawachi, MD, John Kurhanewicz, MD, Mark Moyad, MD, Charles Myers, MD, Mack Roach III, MD, Mark Scholz, MD, Andrea Singer, MD, Jeff Turner, MD, Nicholas Vogelzang, MD, and Timothy Wilt, MD



Proudly Produced By:



Helping Men Know Their Options

Sponsorship Opportunities are available! Email [Cathy@pcri.org](mailto:Cathy@pcri.org) or call 310.743.2116

# FEEL YOUNG, STAY HEALTHY!

*Discover  
Hormone Optimization*

HGH & Testosterone



**AAG HEALTH**

Celebrating 10 Years

1.888.387.0999

AAGHEALTH.COM

Over 20 Locations Nationwide

"We Believe Everyone, Regardless Of Age, Can Accomplish Their Dreams"



**B**lood testing provides the ultimate information regarding correctable risk factors that may predispose you to disorders such as cancer, diabetes, cardiovascular disease, and more. Information about general health and nutritional status can also be gained through standard blood analysis. Standing behind the belief that blood testing is an essential component of any program designed to attain optimal health and longevity, *Life Extension®* offers this innovative and convenient service at a very affordable price. Not only is comprehensive blood testing an important step in safeguarding your health, it is a simple process from virtually anywhere in the United States.

#### Five Easy Steps:

1. Call 1-800-208-3444 to discuss and place your order with one of our knowledgeable health advisors. (This order form can also be faxed to 1-866-728-1050 or mailed). Online orders can also be placed at [www.lifeextension.com](http://www.lifeextension.com).
2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit; whichever is applicable (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be sent directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable health advisors by calling 1-800-226-2370; or review the results with your personal physician.

It's that simple! Don't delay—call today!

#### For Our Local Members:

For those residing in the Ft. Lauderdale, Florida area, blood-draws are also performed at the Life Extension Nutrition Center from 9:00 am to 2:00 pm Monday through Saturday. Simply purchase the blood test and have it drawn with no wait! Our address is 5990 North Federal Highway, Ft. Lauderdale, FL, 33308-2633.

# Blood Testing The Ultimate Information

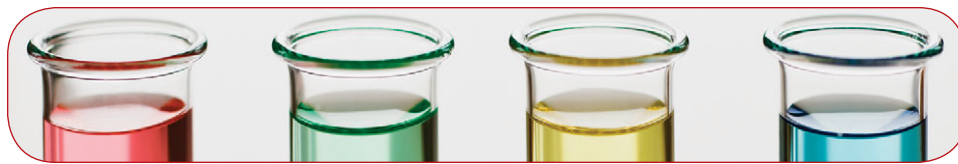
## MOST POPULAR PANELS

### Life Extension Member Pricing

<p><b>○ COMPREHENSIVE PANELS</b></p> <p><b>MALE LIFE EXTENSION PANEL (LC322582)</b> <b>\$269</b></p> <p><b>Chemistry Profile</b> includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. <b>CBC</b> includes immune (white) cell count, red blood cell count and platelet count. Also includes:</p> <p><b>DHEA-S</b> <b>C-Reactive Protein</b></p> <p><b>TSH for thyroid function</b> <b>Homocysteine</b></p> <p><b>Estradiol</b> <b>Free Testosterone</b></p> <p><b>Vitamin D 25- hydroxy</b> <b>Total Testosterone</b></p> <p><b>Hemoglobin A1c</b> <b>PSA (prostate-specific antigen)</b></p>	<p><b>○ THE CBC/CHEMISTRY PROFILE (LC381822)</b> <b>\$35</b></p> <p><b>Note:</b> This CBC/Chemistry Profile is included in many Life Extension panels. Please check panel descriptions.</p> <p><b>CARDIOVASCULAR RISK PROFILE</b></p> <p>Total Cholesterol Cholesterol/HDL Ratio</p> <p>HDL Cholesterol Estimated CHD Risk</p> <p>LDL Cholesterol Glucose</p> <p>Triglycerides Iron</p> <p><b>LIVER FUNCTION PANEL</b></p> <p>AST (SGOT) Total Bilirubin</p> <p>ALT (SGPT) Alkaline Phosphatase</p> <p>LDH</p>
<p><b>○ FEMALE LIFE EXTENSION PANEL (LC322535)</b> <b>\$269</b></p> <p><b>Chemistry Profile</b> includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. <b>CBC</b> includes immune (white) cell count, red blood cell count and platelet count. Also includes:</p> <p><b>DHEA-S</b> <b>C-Reactive Protein</b></p> <p><b>TSH for thyroid function</b> <b>Homocysteine</b></p> <p><b>Estradiol</b> <b>Free Testosterone</b></p> <p><b>Progesterone</b> <b>Total Testosterone</b></p> <p><b>Hemoglobin A1c</b> <b>Vitamin D 25- hydroxy</b></p>	<p><b>KIDNEY FUNCTION PANEL</b></p> <p>BUN BUN/Creatinine Ratio</p> <p>Creatinine Uric Acid</p> <p><b>BLOOD PROTEIN LEVELS</b></p> <p>Total Protein Globulin</p> <p>Albumin Albumin/Globulin Ratio</p> <p><b>BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE</b></p> <p>Red Blood Cell Count Monocytes</p> <p>White Blood Cell Count Lymphocytes</p> <p>Eosinophils Platelet Count</p> <p>Basophils Hemoglobin</p> <p>Polys (Absolute) Hematocrit</p> <p>Lymphs (Absolute) MCV</p> <p>Monocytes (Absolute) MCH</p> <p>Eos (Absolute) MCHC</p> <p>Baso (Absolute) Polynucleated Cells</p> <p>RDW</p>
<p><b>○ MALE WEIGHT LOSS PANEL (LCWLM)</b> <b>\$299</b></p> <p><b>Chemistry Profile</b> includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. <b>CBC</b> includes immune (white) cell count, red blood cell count and platelet count. Also includes:</p> <p><b>DHEA-S</b> <b>C-Reactive Protein</b></p> <p><b>SHBG</b> <b>Insulin</b></p> <p><b>Estradiol</b> <b>Free Testosterone</b></p> <p><b>Free T3</b> <b>Total Testosterone</b></p> <p><b>TSH for thyroid function</b> <b>Free T4</b></p> <p><b>PSA (prostate-specific antigen)</b></p>	<p><b>BLOOD MINERAL PANEL</b></p> <p>Calcium Sodium</p> <p>Potassium Chloride</p> <p>Phosphorus Iron</p>
<p><b>○ FEMALE WEIGHT LOSS PANEL (LCWLF)</b> <b>\$299</b></p> <p><b>Chemistry Profile</b> includes glucose, cholesterol, LDL, HDL, triglycerides, liver and-kidney function tests PLUS 20 additional tests. <b>CBC</b> includes immune (white) cell count, red blood cell count and platelet count. Also includes:</p> <p><b>DHEA-S</b> <b>C-Reactive Protein</b></p> <p><b>Progesterone</b> <b>Insulin</b></p> <p><b>Estradiol</b> <b>Free Testosterone</b></p> <p><b>Free T3</b> <b>Total Testosterone</b></p> <p><b>TSH for thyroid function</b> <b>Free T4</b></p> <p><b>SHBG</b></p>	<p><b>○ COMPREHENSIVE THYROID PANEL (LC100018)</b> <b>\$199</b></p> <p>TSH, T4, Free T4, Free T3, Reverse T3, TPO, ATA</p> <p><b>○ FOOD SAFE ALLERGY TEST** (LCM73001)</b> <b>\$198</b></p> <p>This test measures delayed (IgG) food allergies for 95 common foods.</p>
<p><b>○ MALE HORMONE ADD-ON PANEL (LCADDM)*</b> <b>\$155</b></p> <p><b>Pregnenolone and Dihydrotestosterone (DHT)</b></p> <p>To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides valuable information about a testosterone metabolite that can affect the prostate, and the mother hormone that acts as a precursor to all other hormones.</p>	<p><b>○ ADRENAL FUNCTION PANEL (LC100021)</b> <b>\$136</b></p> <p>DHEA-S, AM/PM Cortisol, Glucose, Insulin, Lipid Panel, RBC magnesium</p>
<p><b>○ FEMALE HORMONE ADD-ON PANEL (LCADDF)*</b> <b>\$125</b></p> <p><b>Pregnenolone and Total Estrogens</b></p> <p>To provide an even more in-depth analysis of a woman's hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel. This panel provides valuable information about total estrogen status, and the mother hormone that acts as a precursor to all other hormones.</p>	<p><b>○ OMEGA SCORE™*** (LCOMEGA)</b> <b>\$131.25</b></p> <p>Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.</p>
<p><b>○ LIFE EXTENSION THYROID PANEL (LC304131)</b> <b>\$75</b></p> <p>TSH, T4, Free T3, Free T4.</p>	<p><b>○ MITOCHONDRIAL FUNCTION PANEL* (LC100020)</b> <b>\$159</b></p> <p>Carnitine (Free with Total), CoQ10, Glucose</p>
<p><b>○ FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011)</b> <b>\$299</b></p> <p>CBC/Chemistry Profile (see description above), DHEA-S, Estradiol, Total Estrogens, Progesterone, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3.</p>	<p><b>○ VAP™ TEST* (LC804500)</b> <b>\$90</b></p> <p>The VAP™ cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.</p>
<p><b>○ MALE COMPREHENSIVE HORMONE PANEL* (LC100010)</b> <b>\$299</b></p> <p>CBC/Chemistry Profile (see description above), DHEA-S, Estradiol, DHT, PSA, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3.</p>	

\* 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, requiring a finger stick performed at home.



## Other Popular Tests and Panels Life Extension Member Pricing

- ☐ **ENERGY PROFILE (LC100005)** **\$375**  
CBC/Chemistry Profile (see description), Epstein-Barr Virus antibodies (IgG and IgM), Cytomegalovirus Antibodies (IgG and IgM), Ferritin, Total and Free Testosterone, DHEA-S, Free T3, Free T4, Cortisol, C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Insulin.
- ☐ **ANEMIA PANEL (LC100006)** **\$86**  
CBC/Chemistry Profile (see description), Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate, Reticulocyte Count.
- ☐ **INFLAMMATION PANEL (LC100007)** **\$135**  
CBC/Chemistry Profile (see description above), C-Reactive Protein (high sensitivity), Sedimentation Rate, Rheumatoid (RA) Factor, Antinuclear Antibodies (ANA) Screen.
- ☐ **THYROID ANTIBODY PROFILE (LC100004)** **\$99**  
Thyroid Antithyroglobulin Antibody (ATA) and Thyroid Peroxidase Antibody (TPO).
- ☐ **CARDIAC PLUS\* (LC100008)** **\$145**  
CBC/Chemistry profile (see description), Vitamin D 25-hydroxy, C-Reactive Protein (high sensitivity), Fibrinogen, Homocysteine.
- ☐ **VAP™ PLUS\* (LC100009)** **\$330**  
VAP, C-Reactive Protein (high sensitivity), Homocysteine, Fibrinogen, PLAC® Test (Lp-PLA2), Vitamin D 25-hydroxy.
- ☐ **CARDIAC RISK COQ10\* (COENZYME Q10) (LC120251)** **\$99**  
This test is used to check the blood level of CoQ10 and will enable more precise dosing for anyone seeking to achieve and maintain high levels of this critical antioxidant.
- ☐ **Lp-PLA2 (PLAC® TEST) (LC123240)** **\$125**  
This test is used to aid in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.
- ☐ **C-REACTIVE PROTEIN (HIGH-SENSITIVITY) (LC120766)** **\$42**  
Measures inflammation factors in arteries. Recent studies indicate that C-reactive protein may be the most accurate risk factor for predicting heart attack and stroke.
- ☐ **FIBRINOGEN\* (LC001610)** **\$31**  
High levels of this blood-clotting factor increase the risk of heart attack and stroke.
- ☐ **HOMOCYSTEINE (LC706994)** **\$64**  
Can indicate if you are likely to have a heart attack or stroke. Even if you take folic acid, you still may have dangerously high levels of this artery-clotting metabolic debris that can be lowered with high doses of TMG, vitamin B6, and vitamin B12.
- ☐ **MALE HEALTH PSA (PROSTATE-SPECIFIC ANTIGEN) (LC010322)** **\$31**  
Can provide an early warning sign for prostate disorders and possible cancer.
- ☐ **FREE-PSA (INCLUDES TOTAL PSA)\* (LC480780)** **\$61**  
Recommended to determine if an elevated PSA is indicative of prostate cancer.

- ☐ **HORMONES DHEA-SULFATE (LC004020)** **\$61**  
This test shows if you are taking the proper amount of DHEA. This test normally costs \$100 or more at commercial laboratories.
- ☐ **DIABESITY PANEL\* (LC100019)** **\$159**  
Glucose, Insulin, HbA1c, VAP™, Cortisol, C-Reactive Protein
- ☐ **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)** **\$99**  
Measures serum concentrations of DHT.
- ☐ **ESTRADIOL (LC004515)** **\$33**  
For men and women. Determines the proper amount in the body.
- ☐ **INSULIN FASTING (LC004333)** **\$42**  
Can predict those at risk of diabetes, obesity, and 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.
- ☐ **BONE HEALTH VITAMIN D (25OH) (LC081950)** **\$47**  
This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.
- ☐ **OSTEOCALCIN\* (LC010249)** **\$91**  
Osteocalcin is often used as a biochemical marker, or biomarker, for the bone formation process. It has been routinely observed that higher serum osteocalcin levels are relatively well correlated with bone diseases characterized by increased bone turnover, especially osteoporosis.
- ☐ **DPD CROSS LINK URINE TEST (LC511105)** **\$79**  
The deoxypyridinoline (DPD) urine test can be used to measure bone re-absorption rates in healthy individuals and in those with enhanced risk of developing metabolic bone diseases. Deoxypyridinoline can be used to monitor therapies (which may include bisphosphonate drugs) in people diagnosed with osteoporosis.

**Blood tests available only in the continental United States. Not available in Maryland.**

**For non-member prices call 1-800-208-3444**

## 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 the Life Extension Foundation 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 the Life Extension Foundation® 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 of Life Extension Member

X

Life Extension Foundation Members only

### MEMBER 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

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

# PRODUCTS

## AMINO ACIDS

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
Branched Chain Amino Acids  
D, L-Phenylalanine Capsules  
Glycine Capsules  
L-Arginine Capsules  
Arginine/L-Ornithine Capsules  
L-Carnitine Capsules  
L-Carnitine Powder Natural Lemon Flavor  
L-Glutathione, L-Cysteine & C  
L-Glutamine Capsules  
L-Glutamine Powder  
L-Lysine Capsules  
L-Tyrosine Tablets  
Mega L-Glutathione Capsules  
N-Acetyl-L-Cysteine Capsules  
Optimized Carnitine with GlycoCarn®  
PharmaGABA  
Super Carnosine Capsules  
Taurine Capsules

## BONE & JOINT HEALTH

ArthroMax™ with Theaflavins and AprèsFlex®  
ArthroMax™ Advanced with UC-II® and  
AprèsFlex®  
Bone-Up™  
Bone Restore  
Bone Restore w/Vitamin K2  
Bone Strength Formula w/KoAct™  
Fast Acting Joint Formula  
Glucosamine Chondroitin Capsules

## BRAIN HEALTH

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
CDP Choline Capsules  
Cognitex® with NeuroProtection Complex  
Cognitex® with Pregnenolone &  
NeuroProtection Complex  
Cognitex® Basics  
DMAE Bitartrate  
Ginkgo Biloba Certified Extract™  
Huperzine A  
Lecithin Granules  
Methylcobalamin Lozenges  
Neuro-Mag™ Magnesium L-Threonate  
Optimized Ashwagandha Extract  
Phosphatidylserine Capsules  
Rhodiola Extract  
Super Ginkgo Extract  
Vinpocetine

## DIGESTIVE

Bifido GI Balance  
Carnosoothe w/PicroProtect  
Digest RC™  
Enhanced Super Digestive Enzymes  
Extraordinary Enzymes  
Life Flora™  
Natural EsophaGuard  
Pancreatin  
Probiotic All-Flora®  
Regimint  
Theralac Probiotics

## DURK AND SANDY PRODUCTS

Blast™  
Inner Power™

## EYE CARE

Bilberry Extract  
Brite Eyes III  
Eye Pressure Support with Mirtogenol®  
Overxcast Polarized Sunglasses  
Solarshield Sunglasses  
Super Zeaxanthin with Lutein &  
Meso-Zeaxanthin Plus Astaxanthin and C3G  
Super Zeaxanthin with Lutein &  
Meso-Zeaxanthin and C3G

## FIBER

AppleWise Polyphenol  
Fiber Food  
TruFiber®  
WellBetX PGX® plus Mulberry

## FOOD

Rich Rewards™ Black Bean Vegetable Soup  
Rich Rewards™ Spicy Cruciferous Vegetable Soup  
Rich Rewards™ Cruciferous Vegetable Soup  
Rich Rewards™ Lentil Soup  
Rich Rewards® Coffee

## HAIR CARE

Dr. Proctor's Advanced Hair Formula  
Dr. Proctor's Shampoo  
Super-Absorbable Tocotrienols

## HEART HEALTH

AppleWise Polyphenol  
Advanced Lipid Control  
Aspirin (Enteric Coated)  
Cardio Peak™ w/Standardized Hawthorn and Arjuna  
Cho-Less™  
D-Ribose Tablets  
D-Ribose Powder  
Endothelial Defense™ with  
Full-Spectrum Pomegranate™  
Fibrinogen Resist  
Forskolin  
Homocysteine Resist  
Krill Healthy Joint Formula  
Natural BP Management  
Olive Leaf Vascular Support  
Peak ATP® with GlycoCarn®  
PhosphOmega®  
Policosanol  
Pycnogenol® French Maritime Pine Bark Extract  
Red Yeast Rice  
Super Absorbable CoQ10™ with d-Limonene  
Super Omega-3 EPA/DHA with Sesame  
Lignans & Olive Fruit Extract  
Super Ubiquinol CoQ10  
Super Ubiquinol CoQ10 with BioPQQ®  
Super Ubiquinol CoQ10 with Enhanced  
Mitochondrial™ Support  
Theaflavin Standardized Extract  
TMG Powder  
TMG Tablets

## HERBAL/PHYTO PRODUCTS

Artichoke Leaf Extract  
Astaxanthin w/Phospholipids  
Berry Complete  
Blueberry Extract  
Blueberry Extract w/Pomegranate  
Butterbur Extract w/Standardized  
Rosmarinic Acid  
Calcium D-Glucarate  
Enhanced Berry Complete with Acai  
Full-Spectrum Pomegranate™  
Grapeseed Extract with Resveratrol &  
Pterostilbene  
Huperzine A  
Kyolic® Garlic Formula 102 + 105  
Kyolic® Reserve  
Mega Green Tea Extract  
Mega Green Tea Extract (Decaffeinated)  
(also w/CoffeeGenic® Green Coffee Extract)  
Mega Lycopene Extract  
Optimized Ashwagandha Extract  
Optimized Garlic  
Pomegranate Extract  
Pomegranate Juice Concentrate  
Pycnogenol  
Optimized Quercetin  
Resveratrol with Synergistic Grape-Berry Actives  
Rhodiola Extract  
Silymarin  
SODzyme™ with GliSODin®

Stevia Extract  
Super Bio-Curcumin®  
Super Ginkgo Extract  
Triple Action Cruciferous Vegetable Extract  
Venotone  
Whole Grape Extract

## HORMONES

Advanced Natural Sex for Women® 50+  
7-Keto® DHEA  
DHEA  
DHEA Complete  
GH Pituitary Support Day Formula  
GH Pituitary Support Night Formula  
Liquid Melatonin  
Melatonin  
Melatonin Timed Release  
Natural Estrogen with Pomegranate Extract  
Pregnenolone  
ProgestaCare for Women  
Super Miraforte with Standardized Lignans

## IMMUNE ENHANCEMENT

AHCC® (Active Hexose Correlated Compound)  
Black Cumin Seed Oil  
Black Cumin Seed Oil w/Bio-Curcumin®  
Buffered Vitamin C Powder  
Echinacea Extract  
i26 Hyperimmune Egg  
Immune Modulator w/Tinofend®  
Immune Protect with PARACTIN®  
Lactoferrin  
Norwegian Shark Liver Oil  
Optimized Fucoidan w/Maritech® 926  
ProBoost™ Thymic Protein A  
Reishi Extract Mushroom Complex  
Vitamin C with Dihydroquercetin  
Zinc Lozenges

## INFLAMMATORY REACTIONS

Arthro-Immune Joint Support  
ArthroMax™ with Theaflavins  
Boswellia  
Bromelain (Specially-coated)  
DHA (Vegetarian Sourced)  
Fast Acting Joint Formula  
Ginger Force  
Krill Oil  
5-LOX Inhibitor w/AprèsFlex®  
Mega EPA/DHA  
Mega GLA with Sesame Lignans  
MSM  
Natural Relief 1222™ Cream  
Omega-3 Whirl  
Serrafazyme  
SODzyme™ with GliSODin® and Wolfberry  
Super Omega-3 EPA/DHA with Sesame  
Lignans & Olive Fruit Extract  
Tart Cherry w/Standardized CherryPURE®  
Zyflamend® Whole Body

## LIVER HEALTH

Branch Chain Amino Acids  
N-Acetyl Cysteine  
Liver Efficiency Formula  
Certified European Milk Thistle  
Hepatopro  
SAME  
Silymarin

## MINERALS

Biosil  
Bone Restore  
Bone Strength Formula w/KoAct®  
Bone-Up™  
Boron Capsules  
Calcium Citrate with D3  
Chromium Ultra  
Copper  
Iodoral

Iron Protein Plus  
Magnesium  
Magnesium Citrate  
Only Trace Minerals  
Optimized Chromium w/Crominex® 3+  
OptiZinc  
Sea-Iodine™  
Selenium  
Se-Methyl L-Selenocysteine  
Strontium  
Vanadyl Sulfate  
Zinc Lozenges

## MISCELLANEOUS

Blood Pressure Monitor Arm Cuff  
CR Way Edition Advanced Dietary Software

## MITOCHONDRIAL SUPPORT

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
Mitochondrial Basics w/BioPQQ®  
Mitochondrial Energy Optimizer w/BioPQQ®  
Optimized Carnitine with GlycoCarn®  
Super Absorbable CoQ10™ with d-Limonene  
Super Alpha Lipoic Acid with Biotin  
Super R-Lipoic Acid  
Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

## MOOD RELIEF

Adrenal Energy Formula  
Bioactive Milk Peptides  
L-Theanine  
5 HTP  
Enhanced Natural Sleep® w/ Melatonin  
Enhanced Natural Sleep® w/o Melatonin  
Natural Stress Relief  
SAME  
St. John's Wort Extract  
L-Tryptophan  
Optimized Tryptophan Plus

## MOUTH CARE

Advanced Oral Hygiene  
Mouthwash w/Pomegranate  
Toothpaste

## MULTIVITAMIN

Booster  
Children's Formula Life Extension Mix™  
Comprehensive Nutrient Packs Basic  
Comprehensive Nutrient Packs Advanced  
Life Extension Mix™ Capsules  
Life Extension Mix™ Powder  
Life Extension Mix™ Tablets  
Life Extension Mix™ w/o Copper Capsules  
Life Extension Mix™ w/o Copper Tablets  
Life Extension Mix™ w/Extra Niacin  
Life Extension Mix™ w/Extra Niacin w/o Copper  
Life Extension Mix™ w/Stevia Powder  
Life Extension Mix™ w/Stevia w/o Copper Powder  
Life Extension One-Per-Day  
Life Extension Two-Per-Day  
Super Booster Softgels w/Advanced K2 Complex

## PET CARE

Cat Mix  
Dog Mix

## PROSTATE & URINARY HEALTH

Optimized Cran-Max® with UTIRose™  
5-LOXIN®  
(Water-Soluble) Pumpkin Seed Extract  
Super Saw Palmetto with Beta-Sitosterol  
Super Saw Palmetto/Nettle Root Formula w/Beta-Sitosterol  
Ultra Natural Prostate Formula

## SKIN CARE

Advanced Under Eye Serum with Stem Cells  
Amber Self MicroDermAbrasion  
Anti-Aging Mask  
Anti-Glycation Serum  
Antioxidant Rejuvenating Foot Cream  
Antioxidant Rejuvenating Foot Scrub  
Antioxidant Rejuvenating Hand Cream  
Antioxidant Rejuvenating Hand Scrub  
Anti-Redness & Blemish Lotion  
Bio-Collagen w/Patented UC-II®  
Bioflavonoid Cream  
Broccoli Sprout  
Corrective Clearing Mask  
DNA Repair Cream  
Dual-Action MicroDermAbrasion  
Essential Plant Lipids Reparative Serum  
Face Master® Platinum  
Face Rejuvenating Antioxidant Cream  
Enhanced FernBlock® with Red Orange Complex  
Fine Line-Less  
Hair Suppress Formula  
Healing Formula All-in-One Cream  
Healing Mask  
Hyaluronic Facial Moisturizer  
Hydrating Anti-oxidant Face Mist  
Hydroderm®  
Lifting & Tightening Complex  
Lycopene Cream  
Melatonin Cream  
Mild Facial Cleanser  
Neck Rejuvenating Antioxidant Cream  
Peel Off Cleansing Mask  
Pigment Correcting Cream  
(Ultra) Rejuvenex®  
Rejuvenex® Body Lotion  
Rejuvenex® Factor Firming Serum  
Rejuvenating Serum  
Renewing Eye Cream  
Resveratrol Anti-Oxidant Serum  
Skin Lightening Serum  
Skin Restoring Phytoceramides w/Lipowheat®  
Skin Stem Cell Serum  
Stem Cell Cream w/Alpine Rose  
Supercritical Omega 7™  
Ultra Rejuvenex®  
Ultra RejuveNight® w/o Progesterone  
Ultra Lip Plumper  
Ultra Wrinkle Relaxer  
Under Eye Refining Serum  
Under Eye Rescue Cream  
Vitamin C Serum  
Vitamin D Lotion  
Vitamin E-ssential Cream  
Vitamin K Healing Cream  
Youth Serum

## SOY

Natural Estrogen w/Pomegranate  
Super Absorbable Soy Isoflavones

## SPECIAL PURPOSE FORMULA

Anti-Alcohol Antioxidants w/HepatoProtection Complex  
Benfotiamine w/Thiamine  
Breast Health Formula  
Butterbur Extract w/Standardized Rosmarinic Acid  
Chlorella  
Chlorophyllin  
Green Coffee Extract CoffeeGenic® (also w/Glucose control)  
Coriolus Super Strength  
CR Mimetic Longevity Formula  
Cinsulin® w/InSea2® and Crominex® 3+  
European Leg Solution Diosmin 95  
Fem Dophilus

Femmenessence MacaPause®  
GlycemicPro™ Transglucosidase  
Migra-eeze™  
Natural Female Support  
Organic Total Body Cleanse  
Pecta-Sol®  
Potassium Iodide  
PQQ Caps with BioPQQ®  
PteroPure™  
Prelox® Natural Sex for Men®  
Pyridoxal 5' - Phosphate  
Ultra Natural Prostate w/AprèsFlex® and Standardized Lignans

## SPORTS PERFORMANCE

Creatine Capsules  
DMG (N, N-dimethylglycine)  
L-Glutamine Capsules  
L-Glutamine Powder  
Whey Protein Isolate  
Whey Protein Concentrate

## VITAMINS

Ascorbyl Palmitate Capsules  
B12  
Beta-Carotene  
Biotin Capsules  
Buffered Vitamin C Powder  
Complete B Complex  
Fast-C®  
Folic Acid + B12  
Gamma E Tocopherol w/Sesame Lignans  
Gamma E Tocopherol/Tocotrienols  
Inositol Capsules  
Mega Lycopene Extract  
Methylcobalamin  
MK-7  
No-Flush Niacin  
Optimized Folate  
Super Ascorbate C Capsules  
Super Ascorbate C Powder  
Super K w/Advanced K2 Complex  
Tocotrienols w/Sesame Lignans  
Vitamin B3 (Niacin) Capsules  
Vitamin B6  
Vitamin B12 Tablets  
Vitamin C  
Vitamin D  
Vitamin D3  
Vitamin D3 w/Sea-Iodine™  
Vitamins D and K w/Sea-Iodine™  
Vitamin E  
Vitamin K1

## WEIGHT MANAGEMENT

Alli® Refill Pack  
Advanced Anti-Adipocyte Formula w/AdipoStat & Integra Lean®  
Calorie Control Weight Management™ Formula w/CoffeeGenic® Green Coffee Extract  
CoffeeGenic® Weight Management™ with Green Coffee Extract  
7-Keto DHEA  
DHEA® Complete  
Fucoxanthin Slim™  
HCA  
Integra-Lean® Irvingia  
LuraLean® Caps Special Propolmannan Particle Size  
Optimized Irvingia w/Phase 3™ Calorie Control Complex  
Optimized Saffron with Satiereal®  
Natural Appetite Control  
Natural Glucose Absorption Control  
Super CLA Blend w/Guarana and Sesame Lignans  
Super CLA Blend w/Sesame Lignans  
WellBetX PGX® plus Mulberry

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
<b>A</b>					
01524	<b>ACETYL-L-CARNITINE</b> - 500 mg, 100 veg. caps	\$34.00	\$25.50		
	Buy 4 bottles, price each	30.00	22.50		
01525	<b>ACETYL-L-CARNITINE ARGINATE</b> - 100 veg. caps	59.00	44.25		
	Buy 4 bottles, price each	50.99	38.24		
01628	<b>ADRENAL ENERGY FORMULA</b> - 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01630	<b>ADRENAL ENERGY FORMULA</b> - 120 veg. caps	46.00	34.50		
	Buy 4 bottles, price each	42.00	31.50		
01308	<b>ADVANCED LIPID CONTROL</b> - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01521	<b>ADVANCED ORAL HYGIENE</b> - 60 veg. mint lozenges	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
00681	<b>AHCC</b> - 500 mg, 30 caps	59.98	44.99		
	Buy 4 bottles, price each	53.33	40.00		
*46925	<b>ALLI® REFILL PACK</b> - 120 caps	69.95	58.00		
00457	<b>ALPHA-LIPOIC ACID w/BIOTIN (SUPER)</b> - 250 mg, 60 caps	37.00	27.75		
	Buy 4 bottles, price each	32.00	24.00		
01440	<b>ANTI-ALCOHOL ANTIOXIDANTS w/HEPATOPRO</b> - 100 caps	26.00	19.50		
	Buy 4 bottles, price each	23.00	17.25		
01509	<b>ANTI-ADIPOCYTE FORMULA w/ADIPOSTAT &amp; INTEGRA LEAN®(ADVANCED)</b> - 60 veg. caps	39.00	29.25		
	Buy 4 bottles, price each	36.00	27.00		
01625	<b>APPLEWISE POLYPHENOL EXTRACT</b> - 600 mg, 30 veg. caps	21.00	15.75		
	Buy 4 bottles, price each	19.00	14.25		
01039	<b>ARGININE/ORNITHINE</b> - 500/250, 100 caps	16.00	12.00		
	Buy 4 bottles, price each	14.50	10.88		
00038	<b>ARGININE/ORNITHINE POWDER</b> - 150 grams	22.95	17.21		
	Buy 4 bottles, price each	19.00	14.25		
01624	<b>(L)-ARGININE CAPS</b> - 700 mg, 200 veg. caps	26.50	19.88		
	Buy 4 bottles, price each	23.25	17.44		
01617	<b>ARTHRONAX™ w/THEAFLAVINS &amp; APRESFLEX®</b> - 120 veg. caps	44.00	33.00		
	Buy 4 bottles, price each	40.00	30.00		
01618	<b>ARTHRONAX™ ADVANCED w/UC-II® &amp; APRESFLEX®</b> - 60 caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
01404	<b>ARTHRO-IMMUNE JOINT SUPPORT</b> - 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
00919	<b>ARTICHOKE LEAF EXTRACT</b> - 500 mg, 180 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.38	19.04		
01533	<b>ASCORBYL PALMITATE</b> - 500 mg, 100 veg. caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
00888	<b>ASHWAGANDHA EXTRACT (OPTIMIZED)</b> - 60 veg. caps	10.00	7.50		
	Buy 4 bottles, price each	9.00	6.75		
01066	<b>ASPIRIN</b> - 81 mg, 300 enteric coated tablets	6.00	4.50		
	Buy 4 bottles, price each	5.33	4.00		
01720	<b>ASTAXANTHIN WITH PHOSPHOLIPIDS</b> - 4 mg, 30 softgels	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		

**SUB-TOTAL OF COLUMN 1**

SEPTEMBER 2013

No.		Retail Each	Member Each	Qty	Total
<b>B</b>					
00920	<b>BENFOTIAMINE w/ THIAMINE</b> - 100 mg, 120 veg. caps	\$19.95	\$14.96		
	Buy 4 bottles, price each	18.60	13.95		
00925	<b>BENFOTIAMINE (MEGA)</b> - 250 mg, 120 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01206	<b>BERRY COMPLETE</b> - 30 veg. caps	21.00	15.75		
	Buy 4 bottles, price each	18.67	14.00		
01496	<b>BERRY COMPLETE w/ACAI (ENHANCED)</b> - 60 veg. caps	29.00	21.75		
	Buy 4 bottles, price each	26.00	19.50		
00664	<b>BETA-CAROTENE</b> - 25,000 IU, 100 softgels	11.25	8.44		
	Buy 4 bottles, price each	10.13	7.60		
01622	<b>BIFIDO GI BALANCE</b> - 60 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01073	<b>BILBERRY EXTRACT</b> - 100 mg, 100 veg. caps	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
01512	<b>BIOACTIVE MILK PEPTIDES</b> - 30 caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01631	<b>BIO-COLLAGEN w/PATENTED UC-II®</b> - 60 caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
*01006	<b>BIOSIL™</b> - 5 mg, 30 veg. caps	18.95	15.16		
*01007	<b>BIOSIL™</b> - 1 fl oz	29.99	23.99		
00102	<b>BIOTIN</b> - 600 mcg, 100 caps	7.50	5.63		
	Buy 4 bottles, price each	6.50	4.88		
01709	<b>BLACK CUMIN SEED OIL</b> - 60 softgels	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		
01710	<b>BLACK CUMIN SEED OIL w/BIO-CURCUMIN®</b> - 60 softgels	32.00	24.00		
	Buy 4 bottles, price each	30.00	22.50		
01008	<b>BLAST™</b> - 600 grams of powder	26.95	20.21		
70000	<b>BLOOD PRESSURE MONITOR</b> - ARM CUFF (medium)	99.95	64.97		
70004	<b>BLOOD PRESSURE MONITOR</b> - WRIST (travel size)	69.95	52.46		
01214	<b>BLUEBERRY EXTRACT</b> - 60 veg. caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
01438	<b>BLUEBERRY EXTRACT w/ POMEGRANATE</b> - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01726	<b>BONE RESTORE</b> - 120 caps	22.00	16.50		
	Buy 4 bottles, price each	19.00	14.25		
01727	<b>BONE RESTORE w/VITAMIN K2</b> - 120 caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01725	<b>BONE STRENGTH FORMULA w/KOACT®</b> - 120 veg. caps	45.00	33.75		
	Buy 4 bottles, price each	40.00	30.00		
00313	<b>BONE-UP®</b> - 240 caps	28.95	21.71		
	Buy 4 bottles, price each	27.21	20.41		
01379	<b>BOOSTER</b> - 60 softgels	48.00	36.00		
	Buy 4 bottles, price each	44.00	33.00		
01680	<b>BOOSTER w/ADVANCED K2 COMPLEX (SUPER)</b> - 60 softgels	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
01661	<b>BORON</b> - 3 mg, 100 veg. caps	5.95	4.46		
	Buy 4 bottles, price each	5.25	3.94		
00202	<b>BOSWELLA</b> - 100 caps	38.00	28.50		
	Buy 4 bottles, price each	30.00	22.50		

**SUB-TOTAL OF COLUMN 2**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

To order online visit: [www.LifeExtension.com](http://www.LifeExtension.com)

# Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01253	<b>BRANCHED CHAIN AMINO ACIDS</b> - 90 veg. caps Buy 4 bottles, price each	\$19.50 17.00	\$14.63 12.75		
01699	<b>BREAST HEALTH FORMULA</b> - 60 veg. caps Buy 4 bottles, price each	34.00 30.00	25.50 22.50		
00893	<b>BRITE EYES III</b> - 2 vials, 5 ml each Buy 4 boxes, price each	34.00 32.00	25.50 24.00		
01203	<b>BROMELAIN (SPECIALLY-COATED)</b> - 500 mg, 60 enteric coated tablets Buy 4 bottles, price each	21.00 19.00	15.75 14.25		
00884	<b>BUTTERBUR EXT. w/STANDARDIZED ROSMARINIC ACID</b> - 60 softgels Buy 4 bottles, price each	44.00 39.60	33.00 29.70		
<b>C</b>					
01653	<b>CALCIUM CITRATE w/VITAMIN D</b> - 300 caps Buy 4 bottles, price each	\$24.00 21.25	\$18.00 15.94		
01651	<b>CALCIUM D-GLUCARATE</b> - 200 mg, 60 veg. caps Buy 4 bottles, price each	18.00 15.00	13.50 11.25		
01693	<b>CALORIE CONTROL WEIGHT MANAGEMENT FORMULA w/COFFEEGENIC® GREEN COFFEE EXTRACT BLUEBERRY FLAVOR</b> - 414 grams powder Buy 4 jars, price each Buy 8 jars, price each	60.00 54.00 50.00	45.00 40.50 37.50		
01694	<b>CALORIE CONTROL WEIGHT MANAGEMENT FORMULA w/COFFEEGENIC® GREEN COFFEE EXTRACT BLUEBERRY FLAVOR</b> - 60 individual packs Buy 4 boxes, price each Buy 8 boxes, price each	64.00 60.00 56.00	48.00 45.00 42.00		
01700	<b>CARDIO PEAK™ w/STANDARDIZED HAWTHORN &amp; ARJUNA</b> - 120 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
00916	<b>CARNITINE w/GLYCOCARN® (OPTIMIZED)</b> - 60 veg. caps Buy 4 bottles, price each	36.00 32.00	27.00 24.00		
01532	<b>L-CARNITINE</b> - 500 mg, 30 veg. caps Buy 4 bottles, price each	15.00 13.20	11.25 9.90		
01719	<b>L-CARNITINE POWDER NATURAL LEMON FLAVOR</b> - 114 grams Buy 4 jars, price each	28.00 24.00	21.00 18.00		
01258	<b>CARNOSOOTHIE w/PICROPROTECT™</b> - 60 veg. caps Buy 4 bottles, price each	29.95 27.00	22.46 20.25		
01687	<b>CARNOSINE (SUPER)</b> - 500 mg, 90 veg. caps Buy 4 bottles, price each	66.00 60.00	49.50 45.00		
01003	<b>CAT MIX</b> - 100 grams powder Buy 4 jars, price each	15.00 12.00	11.25 9.00		
01659	<b>CDP CHOLINE CAPS</b> - 250 mg, 60 veg. caps Buy 4 bottles, price each	36.00 34.00	27.00 25.50		
01391	<b>CHILDREN'S FORMULA LIFE EXTENSION MIX™</b> - 100 chewable tablets Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
00550	<b>CHLORELLA</b> - 500 mg, 200 tablets Buy 4 bottles, price each	23.50 21.00	17.63 15.75		
01571	<b>CHLOROPHYLLIN</b> - 100 mg, 100 veg. caps Buy 4 bottles, price each	24.00 20.00	18.00 15.00		
01359	<b>CHO-LESS™</b> - 90 capsules	32.50	24.38		
01477	<b>CHROMIUM ULTRA</b> - 100 veg. caps Buy 4 bottles, price each	24.00 21.00	18.00 15.75		
01504	<b>CHROMIUM W/CROMINEX® 3+ (OPTIMIZED)</b> - 500 mcg, 60 veg. caps Buy 4 bottles, price each	9.00 8.00	6.75 6.00		

**SUB-TOTAL OF COLUMN 3**

No.		Retail Each	Member Each	Qty	Total
01503	<b>CINSULIN® W/INSEA® AND CROMINEX® 3+ -</b> 90 veg. caps Buy 4 bottles, price each	\$38.00 34.00	\$28.50 25.50		
00818	<b>CLA BLEND w/SESAME LIGNANS (SUPER)</b> - 1000 mg, 120 softgels Buy 4 bottles, price each Buy 10 bottles, price each	36.00 33.00 26.33	27.00 24.75 19.75		
00819	<b>CLA BLEND w/GUARANA &amp; SESAME (SUPER)</b> -1000 mg, 120 softgels Buy 4 bottles, price each	42.00 38.33	31.50 28.75		
01707	<b>COFFEEGENIC® WEIGHT MANAGEMENT™ w/GREEN COFFEE EXTRACT</b> - 90 veg. caps Buy 4 bottles, price each	48.00 42.00	36.00 31.50		
01697	<b>COGNITEX® w/PREGNENOLONE &amp; NEUROPROTECTION COMPLEX</b> - 90 softgels Buy 4 bottles, price each Buy 8 bottles, price each	74.00 66.60 58.89	55.50 49.95 44.17		
01696	<b>COGNITEX® w/o PREGNENOLONE w/NEUROPROTECTION COMPLEX</b> - 90 softgels Buy 4 bottles, price each Buy 8 bottles, price each	72.00 64.00 56.96	54.00 48.00 42.72		
01421	<b>COGNITEX® BASICS</b> - 60 softgels Buy 4 bottles, price each Buy 12 bottles, price each	38.00 35.00 32.00	28.50 26.25 24.00		
01735	<b>COMPLETE B-COMPLEX</b> - 60 veg. caps Buy 4 bottles, price each	10.00 9.00	7.50 6.75		
01795	<b>COMPREHENSIVE NUTRIENT PACKS BASIC</b> - 30 packs Buy 4 boxes, price each	48.00 44.00	36.00 33.00		
01796	<b>COMPREHENSIVE NUTRIENT PACKS ADVANCED</b> - 30 packs Buy 4 boxes, price each	90.00 82.00	67.50 61.50		
00119	<b>COPPER CAPSULES</b> - 2 mg, 100 caps Buy 4 bottles, price each	9.91 8.96	7.43 6.72		
00949	<b>COQ10™ w/ #LIMONENE (SUPER ABSORBABLE)</b> - 50 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	25.00 22.00 20.00	18.75 16.50 15.00		
00950	<b>COQ10™ w/ #LIMONENE (SUPER ABSORBABLE)</b> - 100 mg, 100 softgels Buy 4 bottles, price each Buy 10 bottles, price each	66.00 60.00 56.00	49.50 45.00 42.00		
01226	<b>COQ10 (SUPER UBIQUINOL)</b> - 100 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	56.00 52.00 48.00	42.00 39.00 36.00		
01733	<b>COQ10 w/BIOPQQ® (SUPER UBIQUINOL)</b> - 100 mg, 30 softgels Buy 4 bottles, price each Buy 10 bottles, price each	54.00 50.00 46.00	40.50 37.50 34.50		
01426	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> -100 mg, 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	62.00 56.00 52.00	46.50 42.00 39.00		
01425	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> -50 mg, 100 softgels Buy 4 bottles, price each Buy 10 bottles, price each	58.00 53.00 50.00	43.50 39.75 37.50		
01427	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> -50 mg, 30 softgels Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01431	<b>COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL)</b> -200 mg, 30 softgels Buy 4 bottles, price each Buy 10 bottles, price each	62.00 56.00 52.00	46.50 42.00 39.00		
01053	<b>CORIOLUS SUPER STRENGTH</b> - 600 mg, 150 veg. caps	99.95	74.96		

**SUB-TOTAL OF COLUMN 4**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

SEPTEMBER 2013

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
<b>C CONTINUED</b>					
80140	<b>COSMESIS ADVANCED UNDER EYE SERUM w/STEM CELLS</b> - .33 oz	\$49.00	\$36.75		
	Buy 2 bottles, price each	42.00	31.50		
80139	<b>COSMESIS AMBER SELF MICRODERMABRASION</b> - 2 oz	49.00	36.75		
	Buy 2 jars, price each	42.00	31.50		
80118	<b>COSMESIS ANTI-AGING MASK</b> - 2 oz	72.00	54.00		
	Buy 2 bottles, price each	63.36	47.52		
80134	<b>COSMESIS ANTI-GLYCATION SERUM</b> - 1 oz	33.00	24.75		
	<b>W/BLEBERRY &amp; POMEGRANATE EXTRACTS</b>				
	Buy 2 bottles, price each	31.35	23.51		
80133	<b>COSMESIS ANTIOXIDANT FACIAL MIST</b> - 2 oz	32.00	24.00		
	Buy 2 bottles, price each	30.40	22.80		
80127	<b>COSMESIS ANTIOXIDANT REJUVENATING FOOT CREAM</b> - 2 oz	45.00	33.75		
	Buy 2 jars, price each	42.80	32.10		
80128	<b>COSMESIS ANTIOXIDANT REJUVENATING FOOT SCRUB</b> - 2 oz	59.00	44.25		
	Buy 2 jars, price each	51.92	38.94		
80117	<b>COSMESIS ANTIOXIDANT REJUVENATING HAND CREAM</b> - 2 oz	64.00	48.00		
	Buy 2 jars, price each	57.49	43.12		
80121	<b>COSMESIS ANTIOXIDANT REJUVENATING HAND SCRUB</b> - 2 oz	58.00	43.50		
	Buy 2 jars, price each	51.04	38.28		
80105	<b>COSMESIS ANTI-REDNESS &amp; ADULT BLEMISH LOTION</b> - 1 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80147	<b>COSMESIS BIOFLAVONOID CREAM</b> - 1 oz jar	46.00	34.50		
	Buy 2 jars, price each	39.00	29.25		
80144	<b>COSMESIS BROCCOLI SPROUT CREAM</b> - 1 oz	46.00	34.50		
	Buy 2 jars, price each	39.00	29.25		
80120	<b>COSMESIS CORRECTIVE CLEARING MASK</b> - 2 oz	64.50	48.38		
	Buy 2 jars, price each	56.76	42.57		
80141	<b>COSMESIS DNA REPAIR CREAM</b> - 1 oz jar	49.00	36.75		
	Buy 2 jars, price each	42.00	31.50		
80108	<b>COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM</b> - 1 oz	74.95	56.21		
	Buy 2 bottles, price each	65.95	49.46		
80123	<b>COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM</b> - 2 oz	69.50	52.13		
	Buy 2 jars, price each	61.16	45.87		
80107	<b>COSMESIS FINE LINE-LESS</b> - 1 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80131	<b>COSMESIS HAIR SUPPRESS FORMULA</b> - 4 oz	59.00	44.25		
	Buy 2 bottles, price each	51.92	38.94		
80137	<b>COSMESIS HEALING FORMULA ALL-IN-ONE CREAM</b> - 1 oz	53.00	39.75		
	Buy 2 jars, price each	45.43	34.07		
80115	<b>COSMESIS HEALING MASK</b> - 2 oz	64.50	48.38		
	Buy 2 bottles, price each	56.76	42.57		
80102	<b>COSMESIS HEALING VITAMIN K CREAM</b> - 1 oz	79.50	59.63		
	Buy 2 bottles, price each	69.96	52.47		
80109	<b>COSMESIS HYALURONIC FACIAL MOISTURIZER</b> - 1 oz	58.00	43.50		
	Buy 2 bottles, price each	51.04	38.28		
80110	<b>COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER</b> - 1 oz	58.00	43.50		
	Buy 2 bottles, price each	51.04	38.28		
80138	<b>COSMESIS HYDRATING ANTIOXIDANT FACE MIST</b> - 4 oz	39.95	29.96		
	Buy 2 bottles, price each	38.00	28.50		
80103	<b>COSMESIS LIFTING &amp; TIGHTENING COMPLEX</b> - 1 oz	74.50	55.88		
	Buy 2 tubes, price each	65.56	49.17		
80146	<b>COSMESIS LYCOPENE CREAM</b> - 1 oz jar	28.00	21.00		
	Buy 2 jars, price each	25.40	19.05		

**SUB-TOTAL OF COLUMN 5**

No.		Retail Each	Member Each	Qty	Total
80135	<b>COSMESIS MELATONIN CREAM</b> - 1 oz	\$33.00	\$24.75		
	Buy 2 jars, price each	27.10	20.33		
80114	<b>COSMESIS MILD FACIAL CLEANSER</b> - 8 oz	59.00	44.25		
	Buy 2 bottles, price each	51.92	38.94		
80122	<b>COSMESIS NECK REJUVENATING ANTIOXIDANT CREAM</b> - 2 oz	64.00	48.00		
	Buy 2 jars, price each	56.32	42.24		
80111	<b>COSMESIS PIGMENT CORRECTING CREAM</b> - 1/2 oz	74.00	55.50		
	Buy 2 bottles, price each	65.12	48.84		
80106	<b>COSMESIS REJUVENATING SERUM</b> - 1 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80150	<b>COSMESIS RENEWING EYE CREAM</b> - 1/2 oz	65.00	48.75		
	Buy 2 jars, price each	57.00	42.75		
80142	<b>COSMESIS RESVERATROL ANTI-OXIDANT SERUM</b> - 1 oz	46.00	34.50		
	Buy 2 bottles, price each	39.00	29.25		
80112	<b>COSMESIS SKIN LIGHTENING SERUM</b> - 1/2 oz	85.00	63.75		
	Buy 2 bottles, price each	74.80	56.10		
80130	<b>COSMESIS SKIN STEM CELL SERUM</b> - 1 oz	74.00	55.50		
	Buy 2 bottles, price each	69.00	51.75		
80143	<b>COSMESIS STEM CELL CREAM W/ALPINE ROSE</b> - 1 oz jar	66.00	49.50		
	Buy 2 jars, price each	58.00	43.50		
80148	<b>COSMESIS TIGHTENING &amp; FIRMING NECK CREAM</b> - 2 oz jar	39.00	29.25		
	Buy 2 jars, price each	35.00	26.25		
80116	<b>COSMESIS ULTRA LIP PLUMPER</b> - 1/3 oz	64.00	48.00		
	Buy 2 bottles, price each	56.32	42.24		
80101	<b>COSMESIS ULTRA WRINKLE RELAXER</b> - 1 oz	89.95	67.46		
	Buy 2 bottles, price each	79.76	59.82		
80113	<b>COSMESIS UNDER EYE REFINING SERUM</b> - 1/2 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80104	<b>COSMESIS UNDER EYE RESCUE CREAM</b> - 1/2 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80129	<b>COSMESIS VITAMIN C SERUM</b> - 1 oz	85.00	63.75		
	Buy 2 bottles, price each	74.80	56.10		
80136	<b>COSMESIS VITAMIN D LOTION</b> - 4 oz	36.00	27.00		
	Buy 2 bottles, price each	33.66	25.25		
80145	<b>COSMESIS VITAMIN E-ESSENTIAL CREAM</b> - 1 oz	28.00	21.00		
	Buy 2 jars, price each	26.00	19.50		
80149	<b>COSMESIS YOUTH SERUM</b> - 1 oz	65.00	48.75		
	Buy 2 bottles, price each	57.00	42.75		
00862	<b>CRAN-MAX®</b> - 500 mg, 60 veg. caps	17.50	13.13		
	Buy 4 bottles, price each	15.00	11.25		
01424	<b>CRAN-MAX® with UTI-ROSE™ (OPTIMIZED)</b> - 60 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01529	<b>CREATINE CAPSULES</b> - 120 veg. caps	10.95	8.21		
	Buy 4 bottles, price each	9.25	6.94		
01746	<b>CREATINE WHEY GLUTAMINE POWDER</b> - 454 grams (vanilla)	30.00	22.50		
	Buy 4 jars, price each	27.00	20.25		
01429	<b>CR MIMETIC LONGEVITY FORMULA</b> - 60 veg. caps	39.00	29.25		
	Buy 4 bottles, price each	36.00	27.00		
*33840	<b>CRWAY GREAT GLUCOSE CONTROL CD</b>	98.00	82.00		
**CRWAY	<b>CR WAY OPTIMAL HEALTH PROGRAM SOFTWARE</b>	195.00	195.00		
00407	<b>CURCUMIN® (SUPER BIO)</b> - 400 mg, 60 veg. caps	38.00	28.50		
	Buy 4 bottles, price each	35.00	26.25		

**SUB-TOTAL OF COLUMN 6**

To order online visit: [www.LifeExtension.com](http://www.LifeExtension.com)

No.		Retail Each	Member Each	Qty	Total
<b>D</b>					
00658	<b>7-KETO® DHEA METABOLITE</b> - 25 mg, 100 caps	\$28.00	\$21.00		
	Buy 4 bottles, price each	24.00	18.00		
01479	<b>7-KETO® DHEA METABOLITE</b> - 100 mg, 60 veg. caps	40.00	30.00		
	Buy 4 bottles, price each	36.00	27.00		
01640	<b>DHA (VEGETARIAN SOURCED)</b> - 200 mg, 30 veg. softgels	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
00607	<b>DHEA</b> - 25 mg, 100 tablets (dissolve in mouth)	14.00	10.50		
	Buy 4 bottles, price each	11.75	8.81		
01478	<b>DHEA COMPLETE</b> - 60 veg. caps	48.00	36.00		
	Buy 4 bottles, price each	43.20	32.40		
00335	<b>DHEA</b> - 25 mg, 100 caps	18.00	13.50		
	Buy 4 bottles, price each	15.00	11.25		
00454	<b>DHEA</b> - 15 mg, 100 caps	14.00	10.50		
	Buy 4 bottles, price each	12.00	9.00		
00882	<b>DHEA</b> - 50 mg, 60 caps	19.00	14.25		
	Buy 4 bottles, price each	17.00	12.75		
01689	<b>DHEA</b> - 100 mg, 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01358	<b>DIGEST RC</b> - 30 tablets	19.95	14.96		
	Buy 4 boxes, price each	17.00	12.75		
01272	<b>DIGESTIVE ENZYMES (ENHANCED SUPER)</b> - 100 veg. caps	18.95	14.21		
	Buy 4 bottles, price each	16.00	12.00		
01671	<b>D,L-PHENYLALANINE CAPSULES</b> - 500 mg, 100 veg. caps	18.75	14.06		
	Buy 4 bottles, price each	16.00	12.00		
01540	<b>DMAE BITARTRATE</b> - 150 mg, 200 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	15.00	11.25		
00059	<b>DMG</b> - 125 mg, 60 tablets	22.80	17.10		
	Buy 4 boxes, price each	21.00	15.75		
01570	<b>DNA PROTECTION FORMULA</b> - 60 veg. caps	34.00	25.50		
	Buy 4 bottles, price each	32.00	24.00		
00544	<b>DOG MIX</b> - 100 grams powder	19.50	14.63		
	Buy 4 jars, price each	16.00	12.00		
00321	<b>DR. PROCTOR'S ADVANCED HAIR FORMULA</b> - 2 oz	39.95	29.96		
	Buy 4 bottles, price each	32.00	24.00		
00320	<b>DR. PROCTOR'S HAIR FORMULA SHAMPOO</b> - 8 oz	24.95	18.71		
	Buy 4 bottles, price each	22.00	16.50		
00899	<b>DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE</b> - 2.4 oz	39.95	29.96		
	Buy 4 jars, price each	38.95	29.21		
<b>E</b>					
01528	<b>ECHINACEA EXTRACT</b> - 250 mg, 60 veg. caps	\$14.35	\$10.76		
	Buy 4 bottles, price each	12.50	9.38		
01498	<b>ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™</b> - 60 softgels	56.00	42.00		
	Buy 4 bottles, price each	52.00	39.00		
00997	<b>ENDOTHELIAL DEFENSE™ w/GLISODIN®</b> - 60 veg. caps	54.00	40.50		
	Buy 4 bottles, price each	48.00	36.00		
00625	<b>EPA/DHA (MEGA)</b> - 120 softgels	19.95	14.96		
	Buy 4 bottles, price each	18.00	13.50		
01042	<b>EUROPEAN LEG SOLUTION DIOSMIN 95</b> - 600 mg, 30 veg. tabs	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01706	<b>EXTRAORDINARY ENZYMES</b> - 60 caps	26.00	19.50		
	Buy 4 bottles, price each	24.00	18.00		
01514	<b>EYE PRESSURE SUPPORT w/MIRTOGENOL®</b> - 30 veg. caps	38.00	28.50		
	Buy 4 bottles, price each	34.00	25.50		

**SUB-TOTAL OF COLUMN 7**

# Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
<b>F</b>					
01054	<b>FACE MASTER® PLATINUM</b>	\$199.00	\$199.00		
00965	<b>FAST-ACTING JOINT FORMULA</b> - 30 caps	39.00	29.25		
	Buy 4 bottles, price each	36.00	27.00		
01717	<b>FAST-C® w/DIHYDROQUERCETIN</b> - 120 veg. tabs	26.00	19.50		
	Buy 4 bottles, price each	24.00	18.00		
20053	<b>FEM DOPHILUS®</b> - 30 caps	25.95	19.46		
20055	<b>FEM DOPHILUS®</b> - 60 caps	39.95	29.96		
01064	<b>FEMMENESSENCE MACAPAUSE®</b> - 120 veg. caps	34.99	26.24		
01728	<b>FERNBLOCK® w/RED ORANGE COMPLEX (ENHANCED)</b> - 30 veg. caps	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
01670	<b>FIBER FOOD CAPS</b> - 200 veg. caps	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		
	Buy 10 bottles, price each	13.00	9.75		
00718	<b>FIBRINOGEN RESIST™</b> - 30 veg. caps	49.00	36.75		
	Buy 4 bottles, price each	44.00	33.00		
01439	<b>FOLATE (OPTIMIZED) (L-METHYL FOLATE)</b> 1000 mcg - 100 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01641	<b>FOLIC ACID + B12 CAPSULES</b> - 200 veg. caps	10.50	7.88		
	Buy 4 bottles, price each	9.50	7.13		
01544	<b>FORSKOLIN</b> - 10 mg, 60 veg. caps	16.00	12.00		
	Buy 4 bottles, price each	14.00	10.50		
01513	<b>FUCOIDAN w/MARITECH® 926 (OPTIMIZED)</b> - 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	33.00	24.75		
00993	<b>FUCOXANTHIN-SLIM™</b> - 90 softgels	44.00	33.00		
	Buy 4 bottles, price each	39.00	29.25		
<b>G</b>					
00559	<b>GAMMA E TOCOPHEROL/TOCOTRIENOLS</b> - 60 softgels	\$42.00	\$31.50		
	Buy 4 bottles, price each	37.00	27.75		
00759	<b>GAMMA E TOCOPHEROL w/SESAME LIGNANS</b> - 60 softgels	32.00	24.00		
	Buy 4 bottles, price each	29.00	21.75		
01394	<b>(OPTIMIZED) GARLIC</b> - 200 veg. caps	24.95	18.71		
	Buy 4 bottles, price each	21.00	15.75		
01301	<b>GH PITUITARY SUPPORT DAY FORMULA</b> - 120 vegetarian tabs	48.00	36.00		
	Buy 4 bottles, price each	44.00	33.00		
01302	<b>GH PITUITARY SUPPORT NIGHT FORMULA</b> - 120 veg. caps	25.00	18.75		
	Buy 4 bottles, price each	22.50	16.88		
01228	<b>GINGER FORCE</b> - 60 softgels	29.95	22.46		
01658	<b>GINKGO BILOBA CERTIFIED EXTRACT™</b> - 120 mg, 365 veg. caps	46.00	34.50		
	Buy 2 bottles, price each	43.50	32.63		
01648	<b>GINKGO EXTRACT 28/7 (SUPER)</b> - 120 mg, 100 veg. caps	29.00	21.75		
	Buy 4 bottles, price each	26.50	19.88		
00756	<b>GLA WITH SESAME LIGNANS (MEGA)</b> - 60 softgels	19.50	14.63		
	Buy 4 bottles, price each	18.00	13.50		
00345	<b>(L) GLUTAMINE CAPSULES</b> - 500 mg, 100 caps	14.95	11.21		
	Buy 4 bottles, price each	13.50	10.13		
00141	<b>(L)-GLUTAMINE POWDER</b> - 100 grams	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
00522	<b>GLUCOSAMINE/CHONDROITIN CAPSULES</b> - 100 caps	38.00	28.50		
	Buy 4 bottles, price each	32.00	24.00		
01541	<b>GLUTATHIONE, CYSTEINE &amp; C</b> - 100 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		

**SUB-TOTAL OF COLUMN 8**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

SEPTEMBER 2013

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
<b>G CONTINUED</b>					
00314	<b>L-GLUTATHIONE (MEGA)</b> - 250 mg, 60 caps	\$39.64	\$29.73		
	Buy 4 bottles, price each	35.68	26.76		
01731	<b>GLYCEMICPRO™ TRANSGLUCOSIDASE</b> - 60 veg. caps	54.00	40.50		
	Buy 4 bottles, price each	50.00	37.50		
01669	<b>GLYCINE</b> - 1,000 mg, 100 veg. caps	12.00	9.00		
	Buy 4 bottles, price each	10.80	8.10		
01091	<b>GRAPE EXTRACT w/RESVERATROL (WHOLE)</b> - 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	34.00	25.50		
01411	<b>GRAPE SEED EXTRACT w/RESVERATROL &amp; PTEROSTILBENE</b> - 100 mg, 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	34.00	25.50		
01604	<b>GREEN COFFEE EXTRACT COFFEEGENIC®</b> - 200 mg, 90 veg. caps	25.00	18.75		
	Buy 4 bottles, price each	22.00	16.50		
01620	<b>GREEN COFFEE EXTRACT COFFEEGENIC®</b> - 400 mg, 90 veg. caps	38.00	28.50		
	Buy 4 bottles, price each	34.00	25.50		
00953	<b>GREEN TEA EXTRACT (MEGA)</b> - lightly caffeinated - 100 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
00954	<b>GREEN TEA EXTRACT (MEGA)</b> - decaffeinated - 100 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
<b>H</b>					
01074	<b>5 HTP</b> - 100 mg, 60 caps	\$27.95	\$20.96		
01675	<b>HCA</b> - 90 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	15.50	11.63		
01393	<b>HEPATOPRO</b> - 900 mg, 60 softgels	50.00	37.50		
	Buy 4 bottles, price each	46.00	34.50		
01435	<b>HOMOCYSTEINE RESIST</b> - 100 caps	24.00	18.00		
	Buy 4 bottles, price each	21.60	16.20		
01527	<b>HUPERZINE A</b> - 200 mcg, 60 veg caps	40.00	30.00		
	Buy 4 bottles, price each	36.00	27.00		
00661	<b>HYDRODERM®</b> - 1 oz	79.95	59.96		
	Buy 2 bottles, price each	65.33	49.00		
<b>I</b>					
*01060	<b>i26® HYPERIMMUNE EGG</b> - 140 grams powder	\$54.99	\$46.75		
01704	<b>IMMUNE MODULATOR W/TINOFEND®</b> - 60 veg. caps	17.00	12.75		
	Buy 4 bottles, price each	15.00	11.25		
00955	<b>IMMUNE PROTECT W/PARACTIN®</b> - 30 veg. caps	29.50	22.13		
	Buy 4 bottles, price each	26.55	19.91		
01049	<b>INNERPOWER™</b> - 555 grams powder	42.00	31.50		
01674	<b>INOSITOL CAPSULES</b> - 1000 mg, 360 veg. caps	52.00	39.00		
	Buy 4 bottles, price each	48.00	36.00		
01292	<b>INTEGRA-LEAN® AFRICAN MANGO IRVINGIA</b> - 150 mg, 60 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
01002	<b>IODORAL®</b> - 180 tabs	50.00	37.50		
01677	<b>IRON PROTEIN PLUS</b> - 300 mg, 100 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	26.00	19.50		
01492	<b>IRVINGIA W/PHASE 3™</b> - 120 veg. caps	56.00	42.00		
	<b>CALORIE CONTROL COMPLEX (OPTIMIZED AFRICAN MANGO)</b>				
	Buy 4 bottles, price each	48.00	36.00		

**SUB-TOTAL OF COLUMN 9**

SEPTEMBER 2013

No.		Retail Each	Member Each	Qty	Total
<b>J, K</b>					
00056	<b>JARRO-DOPHILUS EPS™</b> - 60 veg. caps	\$22.95	\$17.21		
01387	<b>JARRO-DOPHILUS ORAL PROBIOTIC GUM</b> - Pom-Berry flavor, 8 pieces	4.95	3.71		
01388	<b>JARRO-DOPHILUS ORAL PROBIOTIC LOZENGE</b> - Pom-Berry flavor, 8 pieces	4.95	3.71		
01724	<b>K w/ADVANCED K2 COMPLEX (SUPER)</b> - 90 softgels	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01600	<b>KRILL HEALTHY JOINT FORMULA</b> - 30 softgels	32.00	24.00		
	Buy 4 bottles, price each	29.00	21.75		
01050	<b>(NKO) KRILL OIL PHOSPH OMEGA</b> - 60 softgels	33.95	25.46		
00316	<b>KYOLIC® GARLIC FORMULA 102</b> - 200 caps	26.45	19.84		
	Buy 4 bottles, price each	23.00	17.25		
00214	<b>KYOLIC® GARLIC FORMULA 105</b> - 200 caps	27.45	20.59		
	Buy 4 bottles, price each	25.00	18.75		
00789	<b>KYOLIC® RESERVE</b> - 600 mg, 120 caps	27.95	20.96		
	Buy 4 bottles, price each	25.00	18.75		
<b>L</b>					
01681	<b>LACTOFERRIN (APOLACTOFERRIN) CAPS</b> - 60 caps	\$48.00	\$36.00		
	Buy 4 bottles, price each	44.00	33.00		
00020	<b>LECITHIN</b> - 16 oz. granules	15.00	11.25		
	Buy 4 jars, price each	12.50	9.38		
01755	<b>LIFE EXTENSION MIX™</b> - 315 tablets	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	69.50	52.13		
01757	<b>LIFE EXTENSION MIX™ W/EXTRA NIACIN</b> - 315 tablets	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	69.50	52.13		
01754	<b>LIFE EXTENSION MIX™</b> - 490 caps	110.00	82.50		
	Buy 4 bottles, price each	98.00	73.50		
	Buy 10 bottles, price each	85.00	63.75		
01756	<b>LIFE EXTENSION MIX™ POWDER</b> - 14.81 oz	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	72.00	54.00		
01765	<b>LIFE EXTENSION MIX™</b> - 315 tablets w/o copper	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	69.50	52.13		
01767	<b>LIFE EXTENSION MIX™ W/EXTRA NIACIN</b> 315 tablets w/o copper	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	69.50	52.13		
01764	<b>LIFE EXTENSION MIX™</b> - 490 caps w/o copper	110.00	82.50		
	Buy 4 bottles, price each	98.00	73.50		
	Buy 10 bottles, price each	85.00	63.75		
01766	<b>LIFE EXTENSION MIX™ POWDER</b> - 14.81 oz w/o copper	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	72.00	54.00		
00263	<b>LIFE FLORA™</b> - 300 mg, 120 caps	20.50	15.38		
	Buy 4 bottles, price each	18.75	14.06		
01608	<b>LIVER EFFICIENCY FORMULA</b> - 30 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01639	<b>5-LOX INHIBITOR W/APRESFLEX®</b> - 100 mg, 60 veg. caps	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
01678	<b>L-LYSINE</b> - 620 mg, 100 veg. caps	9.00	6.75		
	Buy 4 bottles, price each	8.00	6.00		

**SUB-TOTAL OF COLUMN 10**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

To order online visit: [www.LifeExtension.com](http://www.LifeExtension.com)

No.		Retail Each	Member Each	Qty	Total
01470	<b>LURALEAN® CAPS SPECIAL PROPOLMANNAN</b> PARTICLE SIZE - 120 veg. caps Buy 4 bottles, price each	\$28.00 25.00	\$21.00 18.75		
00455	<b>LYCOPENE EXTRACT (MEGA)</b> - 15 mg, 90 softgels Buy 4 bottles, price each	35.00 30.00	26.25 22.50		
<b>M</b>					
01459	<b>MAGNESIUM CAPS</b> - 500 mg, 100 veg. caps Buy 4 bottles, price each	\$12.00 10.00	\$9.00 7.50		
01682	<b>MAGNESIUM CITRATE</b> - 160 mg, 100 veg. caps Buy 4 bottles, price each	9.00 7.50	6.75 5.63		
01668	<b>MELATONIN</b> - 300 mcg, 100 veg. caps Buy 4 bottles, price each	5.75 5.00	4.31 3.75		
01083	<b>MELATONIN</b> - 500 mcg, 200 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
00329	<b>MELATONIN</b> - 1 mg, 60 caps Buy 4 bottles, price each	5.00 4.63	3.75 3.47		
00330	<b>MELATONIN</b> - 3 mg, 60 caps Buy 4 bottles, price each	8.00 6.88	6.00 5.16		
01786	<b>MELATONIN TIME RELEASE</b> - 3 mg, 60 veg. tabs Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
00331	<b>MELATONIN</b> - 10 mg, 60 caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
00332	<b>MELATONIN</b> - 3 mg, 60 veg. lozenges Buy 4 bottles, price each	8.00 6.88	6.00 5.16		
01734	<b>MELATONIN</b> (Fast Acting Liquid) - 3 mg (Natural Citrus-Van) Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
01787	<b>MELATONIN TIME RELEASE</b> - 300 mcg, 100 veg. tabs Buy 4 bottles, price each	12.00 11.00	9.00 8.25		
01788	<b>MELATONIN TIME RELEASE</b> - 750 mcg, 60 veg. tablets Buy 4 bottles, price each	8.00 7.00	6.00 5.25		
01536	<b>METHYLCOBALAMIN</b> - 1 mg, 60 lozenges (vanilla) Buy 4 bottles, price each	9.95 8.00	7.46 6.00		
01537	<b>METHYLCOBALAMIN</b> - 5 mg, 60 lozenges (vanilla) Buy 4 bottles, price each Buy 10 bottles, price each	32.00 25.00 23.00	24.00 18.75 17.25		
00709	<b>MIGRA-EEZE™ (BUTTERBUR)</b> - 60 softgels Buy 4 bottles, price each	29.50 26.33	22.13 19.75		
01522	<b>MILK THISTLE (CERTIFIED EUROPEAN)</b> - 750 mg, 60 veg. caps Buy 4 bottles, price each	34.00 30.00	25.50 22.50		
01517	<b>MILK THISTLE (CERTIFIED EUROPEAN)</b> - 120 veg. caps Buy 4 bottles, price each	52.00 48.00	39.00 36.00		
01698	<b>MIRAFORTE w/STANDARDIZED LIGNANS (SUPER)</b> - 120 caps Buy 4 bottles, price each	62.00 56.00	46.50 42.00		
01769	<b>MITOCHONDRIAL BASICS w/BIOPQQ®</b> - 30 caps Buy 4 bottles, price each	52.00 46.00	39.00 34.50		
01768	<b>MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ®</b> - 120 caps Buy 4 bottles, price each	94.00 84.00	70.50 63.00		
00065	<b>MK-7</b> - 90 mcg, 60 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
01279	<b>MOUTHWASH w/POMEGRANATE</b> - 16 oz Buy 4 bottles, price each	18.50 17.00	13.88 12.75		
00451	<b>MSM (METHYLSULFONYLMETHANE)</b> - 1000 mg, 100 caps Buy 4 bottles, price each	14.00 11.95	10.50 8.96		

**SUB-TOTAL OF COLUMN 11**

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

# Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
<b>N</b>					
01534	<b>N-ACETYL-L-CYSTEINE</b> - 600 mg, 60 veg. caps Buy 4 bottles, price each	\$14.00 13.50	\$10.50 10.13		
00066	<b>NATTOKINASE</b> - 60 softgels	25.50	19.13		
00891	<b>NATURAL APPETITE CONTROL</b> - 90 softgels Buy 4 bottles, price each	28.00 25.20	21.00 18.90		
00984	<b>NATURAL BP MANAGEMENT</b> - 60 tablets Buy 4 bottles, price each	42.00 37.80	31.50 28.35		
00913	<b>NATURAL ESOPHAGUARD</b> - 10 softgels Buy 2 boxes, price each	19.95 19.00	14.96 14.25		
01692	<b>NATURAL ESTROGEN w/POMEGRANATE EXTRACT</b> - 60 caplets Buy 4 bottles, price each	38.00 33.00	28.50 24.75		
01221	<b>NATURAL FEMALE SUPPORT</b> - 30 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01471	<b>NATURAL GLUCOSE ABSORPTION CONTROL</b> - 60 veg. caps Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
00698	<b>NATURAL RELIEF 1222™</b> - 2 oz Buy 4 tubes, price each	28.00 25.00	21.00 18.75		
01626	<b>NATURAL SEX FOR WOMEN® 50+ (ADVANCED)</b> - 90 veg. caps Buy 4 bottles, price each	59.00 45.33	44.25 34.00		
01444	<b>NATURAL SLEEP®</b> - 60 veg. caps Buy 4 bottles, price each	13.00 10.00	9.75 7.50		
01551	<b>NATURAL SLEEP® w/ MELATONIN (ENHANCED)</b> - 30 caps Buy 4 bottles, price each	22.00 20.00	16.50 15.00		
01511	<b>NATURAL SLEEP® w/o MELATONIN (ENHANCED)</b> - 30 caps Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01445	<b>NATURAL SLEEP® MELATONIN</b> - 5 mg, 60 veg. caps Buy 4 bottles, price each	18.00 16.00	13.50 12.00		
00987	<b>NATURAL STRESS RELIEF</b> - 30 veg. caps Buy 4 bottles, price each	28.00 24.00	21.00 18.00		
01603	<b>NEURO-MAG™ MAGNESIUM L-THREONATE</b> - 90 veg. caps Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
01602	<b>NEURO-MAG™ L-THREONATE w/CALCIUM &amp; VITAMIN D</b> 225 grams - Lemon flavor Buy 4 bottles, price each	40.00 36.00	30.00 27.00		
00373	<b>NO-FLUSH NIACIN</b> - 800 mg, 100 caps Buy 4 bottles, price each	19.00 17.00	14.25 12.75		
<b>O</b>					
01623	<b>OLIVE LEAF VASCULAR SUPPORT</b> - 500 mg, 60 veg. caps Buy 4 bottles, price each	\$22.00 20.00	\$16.50 15.00		
01483	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> - 60 softgels Buy 4 bottles, price each Buy 10 bottles, price each	18.00 16.00 14.00	13.50 12.00 10.50		
01482	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> - 120 softgels Buy 4 bottles, price each Buy 10 bottles, price each	32.00 28.00 24.90	24.00 21.00 18.68		
01484	<b>OMEGA 3 EPA/DHA w/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> Buy 4 bottles, price each Buy 10 bottles, price each	34.00 31.00 28.00	25.50 23.25 21.00		

**SUB-TOTAL OF COLUMN 12**

SEPTEMBER 2013

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
CONTINUED					
01485	<b>OMEGA 3 EPA/DHA W/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> - 60 enteric coated softgels	\$20.00	\$15.00		
	Buy 4 bottles, price each	18.00	13.50		
	Buy 10 bottles, price each	16.00	12.00		
01619	<b>OMEGA 3 EPA/DHA W/SESAME LIGNANS &amp; OLIVE FRUIT EXTRACT (SUPER)</b> (SMALL SOFTGEL)	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
	Buy 10 bottles, price each	24.90	18.68		
01632	<b>OMEGA-3 LEMON WHIRL</b> - 16 oz bottle	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01633	<b>OMEGA-3 TROPICAL WHIRL</b> - 16 oz bottle	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01701	<b>ONE-PER-DAY</b> - 60 tablets	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
01328	<b>ONLY TRACE MINERALS</b> - 90 caps	15.00	11.25		
	Buy 4 bottles, price each	12.50	9.38		
00915	<b>OPTIZINC</b> ® - 30 mg, 90 veg. caps	5.95	4.46		
	Buy 4 bottles, price each	5.00	3.75		
01070	<b>ORGANIC TOTAL BODY CLEANSE™</b> - 14-day supply	34.99	26.24		
P					
00073	<b>PANCREATIN</b> - 500 mg, 50 caps	\$13.22	\$9.92		
	Buy 4 bottles, price each	12.12	9.09		
01323	<b>PEAK ATP® WITH GLYCOCARN®</b> - 60 veg. caps	54.00	40.50		
	Buy 4 bottles, price each	50.00	37.50		
00342	<b>PECTA SOL-C® MODIFIED CITRUS PECTIN</b> - 454 grams powder	99.95	74.96		
	Buy 4 jars, price each	95.70	71.78		
01080	<b>PECTA SOL-C® MODIFIED CITRUS PECTIN</b> - 270 veg. caps	69.95	52.46		
00673	<b>PGX™ PLUS MULBERRY (WELLBETX®)</b> -180 caps	34.95	26.21		
00865	<b>PHARMAGABA®</b> - 60 chewable tablets	29.95	22.46		
	Buy 4 bottles, price each	27.00	20.25		
01676	<b>PHOSPHATIDYL SERINE CAPS</b> - 100 mg, 100 veg. caps	54.00	40.50		
	Buy 4 bottles, price each	48.00	36.00		
01390	<b>PHOSPHOMEGA®</b> - 60 softgels	39.95	26.96		
00561	<b>POLICOSANOL</b> - 10 mg, 60 tablets	24.00	18.00		
	Buy 6 bottles, price each	18.00	13.50		
01423	<b>POMEGRANATE™ (FULL-SPECTRUM)</b> - 30 softgels	24.00	18.00		
	Buy 4 bottles, price each	21.00	15.75		
00956	<b>POMEGRANATE EXTRACT</b> - 30 veg. caps	19.50	14.63		
	Buy 4 bottles, price each	17.55	13.16		
00957	<b>POMEGRANATE JUICE CONCENTRATE</b> - 16 oz. liquid	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
00577	<b>POTASSIUM IODIDE</b> - 1 box, 14 tablets	6.95	5.21		
	Buy 4 boxes, price each	5.25	3.94		
01500	<b>PQQ CAPS W/BIOPQQ®</b> - 10 mg, 30 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01647	<b>PQQ CAPS W/BIOPQQ®</b> - 20 mg, 30 veg. caps	40.00	30.00		
	Buy 4 bottles, price each	36.00	27.00		
00302	<b>PREGNENOLONE</b> - 50 mg, 100 caps	26.00	19.50		
	Buy 4 bottles, price each	22.00	16.50		
00700	<b>PREGNENOLONE</b> - 100 mg, 100 caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		

SUB-TOTAL OF COLUMN 13

SEPTEMBER 2013

No.		Retail Each	Member Each	Qty	Total
***01373	<b>PRELOX® NATURAL SEX FOR MEN®</b> - 60 tablets	\$52.00	\$39.00		
	Buy 4 bottles, price each	48.00	36.00		
01329	<b>PROBIOTIC ALL-FLORA®</b> - 60 veg. caps	25.95	19.46		
00525	<b>PROBOOST THYMIC PROTEIN A™</b> - 4 mcg, 30 packets	59.95	44.96		
01441	<b>PROGESTACARE FOR WOMEN</b> - 4 oz cream	34.95	26.21		
01695	<b>PROSTATE FORMULA W/APRESFLEX® STAND. LIGNANS (ULTRA NAT)</b> 60 softgels	38.00	28.50		
	Buy 4 bottles, price each	35.00	26.25		
	Buy 12 bottles, price each	32.00	24.00		
01742	<b>PROTEIN-ISOLATE (WHEY) VANILLA</b> - 1 lb. powder	30.00	22.50		
	Buy 4 jars, price each	27.00	20.25		
01743	<b>PROTEIN-ISOLATE (WHEY) CHOCOLATE</b> - 1 lb. powder	30.00	22.50		
	Buy 4 jars, price each	27.00	20.25		
01770	<b>PROTEIN CONCENTRATE</b> (New Zealand Whey) <b>Vanilla</b> - 520 gr	30.00	22.50		
	Buy 4 bottles, price each	26.60	19.95		
01771	<b>PROTEIN CONCENTRATE</b> (New Zealand Whey) <b>Chocolate</b> - 520 gr	30.00	22.50		
	Buy 4 bottles, price each	26.60	19.95		
01508	<b>PTEROPURE™</b> - 50 mg Pterostilbene 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	30.00	22.50		
01587	<b>PURE PLANT PROTEIN</b> - Veg. Vanilla 540 grams powder	38.00	28.50		
	Buy 4 jars, price each	35.00	26.25		
01209	<b>PUMPKIN SEED EXTRACT (WATER-SOLUBLE)</b> - 60 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01210	<b>PUMPKIN SEED EXT w/SOY ISOFLAVONES (WATER-SOLUBLE)</b> - 60 veg. caps	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
01637	<b>PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT</b> -100 mg, 60 veg. caps	64.00	48.00		
	Buy 4 bottles, price each	60.00	45.00		
01217	<b>PYRIDOXAL 5'-PHOSPHATE</b> - 100 mg, 60 veg. caps	22.00	16.50		
	Buy 4 bottles, price each	19.80	14.85		
Q, R					
01309	<b>QUERCETIN (OPTIMIZED)</b> - 250 mg, 60 veg. caps	\$22.00	\$16.50		
	Buy 4 bottles, price each	20.00	15.00		
01030	<b>RED YEAST RICE</b> (Bluebonnet)- 600 mg, 60 veg. caps	16.95	13.56		
00979	<b>RED YEAST RICE</b> (Nature's Plus)- 600 mg, 60 veg. caps	23.95	17.96		
00060	<b>RED YEAST RICE EXTENDED RELEASE</b> - 30 veg. tablets	21.50	16.13		
00605	<b>REGIMINT</b> - 60 enteric-coated caps	19.95	14.96		
	Buy 4 bottles, price each	18.67	14.00		
01708	<b>REISHI EXTRACT MUSHROOM COMPLEX</b> - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01448	<b>REJUVENEX® BODY LOTION</b> - 6 oz	24.00	18.00		
	Buy 4 tubes, price each	19.80	14.85		
	Buy 8 tubes, price each	17.00	12.75		
01621	<b>REJUVENEX® FACTOR FIRMING SERUM</b> - 1.7 oz	65.00	48.75		
	Buy 2 bottles, price each	50.66	38.00		
	Buy 6 bottles, price each	38.52	28.89		
01220	<b>REJUVENEX® (ULTRA)</b> - 2 oz	52.00	39.00		
	Buy 2 jars, price each	48.00	36.00		
	Buy 4 jars, price each	44.00	33.00		
	Buy 8 jars, price each	39.93	29.95		
00676	<b>REJUVENIGHT® (ULTRA)</b> - 2 oz	39.95	29.96		
	Buy 4 jars, price each	36.00	27.00		
01413	<b>RESVERATROL W/PTEROSTILBENE</b> - 20 mg, 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		

SUB-TOTAL OF COLUMN 14

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

No.		Retail Each	Member Each	Qty	Total
01410	<b>RESVERATROL W/PTEROSTILBENE</b> - 100 mg, 60 veg. caps	\$36.00	\$27.00		
	Buy 4 bottles, price each	32.00	24.00		
01430	<b>RESVERATROL w/SYNERGISTIC GRAPE-BERRY ACTIVES (OPTIMIZED)</b> - 250 mg, 60 veg. caps	46.00	34.50		
	Buy 4 bottles, price each	41.33	31.00		
00889	<b>RHODIOLA EXTRACT</b> - 250 mg, 60 veg. caps	11.75	8.81		
	Buy 4 bottles, price each	10.58	7.94		
00972	<b>(D) RIBOSE POWDER</b> - 150 grams	27.50	20.63		
	Buy 4 jars, price each	24.75	18.56		
01473	<b>(D) RIBOSE TABLETS</b> - 100 veg. tabs	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
01609	<b>RICH REWARDS® BREAKFAST GROUND COFFEE</b> - 12 oz. bag	13.00	9.75		
01729	<b>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE</b> - 12 oz. bag	15.00	11.25		
	Natural Vanilla				
01730	<b>RICH REWARDS® BREAKFAST BLEND GROUND COFFEE</b> - 12 oz. bag	15.00	11.25		
	Natural Mocha				
01609	<b>RICH REWARDS® BREAKFAST GROUND COFFEE</b> - 12 oz. bag	13.00	9.75		
01610	<b>RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE</b> - 12 oz. bag	14.00	10.50		
01712	<b>RICH REWARDS™ BLACK BEAN VEGETABLE SOUP</b> - 32 oz. bottle	13.00	9.75		
	Buy 6 bottles, price each	12.25	9.19		
01530	<b>RICH REWARDS™ CRUCIFEROUS VEGETABLE SOUP</b> - 32 oz. bottle	11.95	8.96		
	Buy 6 bottles, price each	11.25	8.44		
01531	<b>RICH REWARDS™ (SPICY) CRUCIFEROUS VEGETABLE SOUP</b> - 32 oz. bottle	11.95	8.96		
	Buy 6 bottles, price each	11.25	8.44		
01705	<b>RICH REWARDS™ LENTIL VEGETABLE SOUP</b> - 32 oz. bottle	13.00	9.75		
	Buy 6 bottles, price each	12.25	9.19		
01208	<b>R-LIPOIC ACID (SUPER)</b> - 300 mg, 60 veg. caps	49.00	36.75		
	Buy 4 bottles, price each	45.00	33.75		
00070	<b>RNA CAPSULES</b> - 500 mg, 100 caps	17.95	13.46		
	Buy 4 bottles, price each	16.16	12.12		
<b>S</b>					
01432	<b>SAFFRON w/SATIEREAL (OPTIMIZED)</b> - 60 veg. caps	\$36.00	\$27.00		
	Buy 4 bottles, price each	32.00	24.00		
00358	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 200 mg, 20 enteric coated tablets	16.00	12.00		
	Buy 8 boxes, price each	14.00	10.50		
00453	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 200 mg, 50 enteric coated tablets	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
00557	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 400 mg, 20 enteric coated tablets	28.00	21.00		
	Buy 6 boxes, price each	24.00	18.00		
01055	<b>SAME (S-ADENOSYL-METHIONINE)</b> - 400 mg, 50 enteric coated tablets	66.00	49.50		
	Buy 4 bottles, price each	60.00	45.00		
01543	<b>SEA-IODINE™</b> - 1000 mcg, 60 caps	8.00	6.00		
	Buy 4 bottles, price each	7.20	5.40		
00046	<b>SELENIUM</b> - 2 oz dropper bottle	9.95	7.46		
	Buy 4 bottles, price each	9.45	7.09		
01679	<b>SE-METHYL L-SELENOCYSTEINE</b> - 200 mcg, 100 veg. caps	12.00	9.00		
	Buy 4 bottles, price each	11.00	8.25		
00318	<b>SERRAFLAZYME</b> - 100 tablets	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00284	<b>SHARK LIVER OIL (NORWEGIAN)</b> - 1000 mg, 30 softgels	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01684	<b>SILYMARIN</b> - 100 mg, 50 veg. caps	9.25	6.94		
	Buy 4 bottles, price each	8.25	6.19		

**SUB-TOTAL OF COLUMN 15**

No.		Retail Each	Member Each	Qty	Total
01596	<b>SKIN RESTORING PHYTCERAMIDES w/LIPOWHEAT®</b> - 30 veg. liquid caps	\$25.00	\$18.75		
	Buy 4 bottles, price each	23.00	17.25		
00961	<b>SODZYME® w/GLISODIN® AND WOLFBERRY</b> - 90 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
00657	<b>SOLARSHIELD SUNGLASSES</b> - 1 pair smoke color	12.99	9.74		
	Buy 2 pairs, price each	11.50	8.63		
00432	<b>STEVIA EXTRACT</b> - 100 packets, 1 gram each	9.95	7.46		
	Buy 4 boxes, price each	9.00	6.75		
01396	<b>ST. JOHN'S WORT EXTRACT</b> - 300 mg, 60 veg. caps	10.98	8.24		
	Buy 4 bottles, price each	10.00	7.50		
01476	<b>STRONTIUM</b> - 750 mg, 90 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
00747	<b>SUNGLASSES (OVERXCAS POLARIZED)</b> - gray color, large	27.00	20.25		
	Buy 2 pairs, price each	21.00	15.75		
01649	<b>SUPER ABSORBABLE SOY ISOFLAVONES</b> - 60 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01408	<b>SUPER SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL</b> - 60 softgels	28.00	21.00		
	Buy 4 bottles, price each	26.00	19.50		
	Buy 12 bottles, price each	24.00	18.00		
01407	<b>SUPER SAW PALMETTO W/BETA-SITOSTEROL</b> - 30 softgels	15.00	11.25		
	Buy 12 bottles, price each	12.00	9.00		
01778	<b>SUPER SELENIUM COMPLEX</b> - 200 mcg, 100 veg. caps	14.00	10.50		
	Buy 4 bottles, price each	12.00	9.00		
	Buy 12 bottles, price each	11.00	8.25		
<b>T</b>					
01723	<b>TART CHERRY EXTRACT w/STANDARDIZED CHERRYPURE®</b> - 60 veg. caps	\$22.00	\$16.50		
	Buy 4 bottles, price each	20.00	15.00		
00199	<b>TAURINE</b> - 1000 mg, 50 caps	8.95	6.71		
	Buy 4 bottles, price each	8.00	6.00		
00133	<b>TAURINE POWDER</b> - 300 grams	20.00	15.00		
	Buy 4 bottles, price each	16.88	12.66		
01304	<b>THEAFLAVIN STANDARDIZED EXTRACT</b> - 30 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01683	<b>(L) THEANINE</b> - 100 mg, 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	20.50	15.38		
**01038	<b>THERALAC PROBIOTICS</b> - 30 caps	47.95	35.96		
00668	<b>THYROID FORMULA™ (METABOLIC ADVANTAGE)</b> - 100 caps	21.95	16.46		
00349	<b>TMG POWDER</b> - 50 grams	14.00	10.50		
	Buy 4 bottles, price each	11.00	8.25		
01559	<b>TMG</b> - 500 mg, 60 veg. tablets	11.00	8.25		
	Buy 4 boxes, price each	10.00	7.50		
00781	<b>TOCOTRIENOLS WITH SESAME LIGNANS</b> - 60 softgels	38.00	28.50		
	Buy 4 bottles, price each	36.00	27.00		
01400	<b>TOCOTRIENOLS (SUPER-ABSORBABLE)</b> - 60 softgels	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
01278	<b>TOOTH PASTE</b> - 4 oz (Mint)	9.50	7.13		
	Buy 4 tubes, price each	8.67	6.50		
01468	<b>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT</b> - 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01469	<b>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL</b> - 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	29.60	22.20		

**SUB-TOTAL OF COLUMN 16**

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
<b>T CONTINUED</b>					
01386	<b>TRUFIBER®</b> - 180 grams	\$32.95	\$24.71		
01389	<b>TRUFLORA PROBIOTICS &amp; ENZYMES</b> - 32 veg. caps	42.95	32.21		
01722	<b>L-TRYPTOPHAN</b> - 500 mg, 90 veg. caps	33.00	24.75		
	Buy 4 bottles, price each	30.00	22.50		
01721	<b>TRYPTOPHAN PLUS (OPTIMIZED)</b> - 90 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	29.00	21.75		
01716	<b>TWO-PER-DAY</b> - 60 tablets	10.50	7.88		
	Buy 4 bottles, price each	9.50	7.13		
01715	<b>TWO-PER-DAY</b> - 120 tablets	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01714	<b>TWO-PER-DAY</b> - 120 caps	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
00326	<b>L-TYROSINE</b> - 500 mg, 100 tablets	12.98	9.74		
	Buy 4 bottles, price each	11.81	8.86		
<b>V</b>					
00213	<b>VANADYL SULFATE</b> - 7.5 mg, 100 tablets	\$15.00	\$11.25		
	Buy 4 bottles, price each	12.50	9.38		
00408	<b>VENOTONE</b> - 60 caps	18.95	14.21		
	Buy 4 bottles, price each	16.00	12.00		
01327	<b>VINPOCETINE</b> - 10 mg, 100 tablets	18.00	13.50		
	Buy 4 bottles, price each	14.00	10.50		
01526	<b>VITAMIN B3 NIACIN</b> - 1,000 mg, 100 veg. caps	12.75	9.56		
	Buy 4 bottles, price each	12.00	9.00		
00372	<b>VITAMIN B3 NIACIN</b> - 500 mg, 100 caps	7.65	5.74		
	Buy 4 bottles, price each	6.65	4.99		
00098	<b>VITAMIN B5</b> - 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88		
	Buy 4 bottles, price each	9.38	7.04		
01535	<b>VITAMIN B6</b> - 250 mg, 100 veg. caps	12.50	9.38		
	Buy 4 bottles, price each	11.00	8.25		
00361	<b>VITAMIN B12</b> - 500 mcg, 100 lozenges	8.75	6.56		
	Buy 4 bottles, price each	7.25	5.44		
01634	<b>VITAMIN C w/ DIHYDROQUERCETIN</b> - 1000 mg, 60 tablets	10.00	7.50		
	Buy 4 bottles, price each	9.00	6.75		
00927	<b>VITAMIN C w/ DIHYDROQUERCETIN</b> - 1000 mg, 250 tablets	25.50	19.13		
	Buy 4 bottles, price each	23.25	17.44		
00084	<b>VITAMIN C (BUFFERED) POWDER</b> - 454.6 grams	23.95	17.96		
	Buy 4 bottles, price each	22.00	16.50		
01732	<b>VITAMIN D3</b> - 2000 IU, 1 fl oz, Mint flavor	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01753	<b>VITAMIN D3</b> - 1000 IU, 90 softgels	7.00	5.25		
	Buy 4 bottles, price each	6.00	4.50		
01751	<b>VITAMIN D3</b> - 1000 IU, 250 softgels	12.50	9.38		
	Buy 4 bottles, price each	11.25	8.44		
01713	<b>VITAMIN D3</b> - 5000 IU, 60 softgels	11.00	8.25		
	Buy 4 bottles, price each	9.90	7.43		
01718	<b>VITAMIN D3</b> - 7000 IU, 60 softgels	14.00	10.50		
	Buy 4 bottles, price each	12.60	9.45		
01573	<b>VITAMIN D3 w/SEA-IODINE™</b> - 5000 IU, 60 caps	14.00	10.50		
	Buy 4 bottles, price each	12.50	9.38		
01572	<b>VITAMINS D AND K w/SEA-IODINE™</b> - 60 caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		

**SUB-TOTAL OF COLUMN 17**

No.		Retail Each	Member Each	Qty	Total
01763	<b>VITAMIN E (NATURAL)</b> - 400 IU, 100 softgels	\$30.00	\$22.50		
	Buy 4 bottles, price each	28.00	21.00		
	Buy 10 bottles, price each	26.00	19.50		
01225	<b>VITAMIN K2 (LOW-DOSE)</b> - 45 mcg, 90 softgels	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
<b>Z</b>					
01686	<b>ZEAXANTHIN w/LUTEIN &amp; MESO-ZEAXANTHIN PLUS ASTAXANTHIN AND C3G (SUPER)</b> - 60 softgels	\$42.00	\$31.50		
	Buy 4 bottles, price each	38.00	28.50		
01685	<b>ZEAXANTHIN w/LUTEIN &amp; MESO-ZEAXANTHIN AND C3G (SUPER)</b> - 60 softgels	22.00	16.50		
	Buy 4 bottles, price each	19.80	14.85		
00061	<b>ZINC LOZENGES</b> - 75 lozenges	9.50	7.13		
	Buy 4 bottles, price each	6.75	5.06		
01051	<b>ZYFLAMEND® WHOLE BODY</b> - 120 softgels	60.95	45.71		

\* These products are not 25% off retail price.

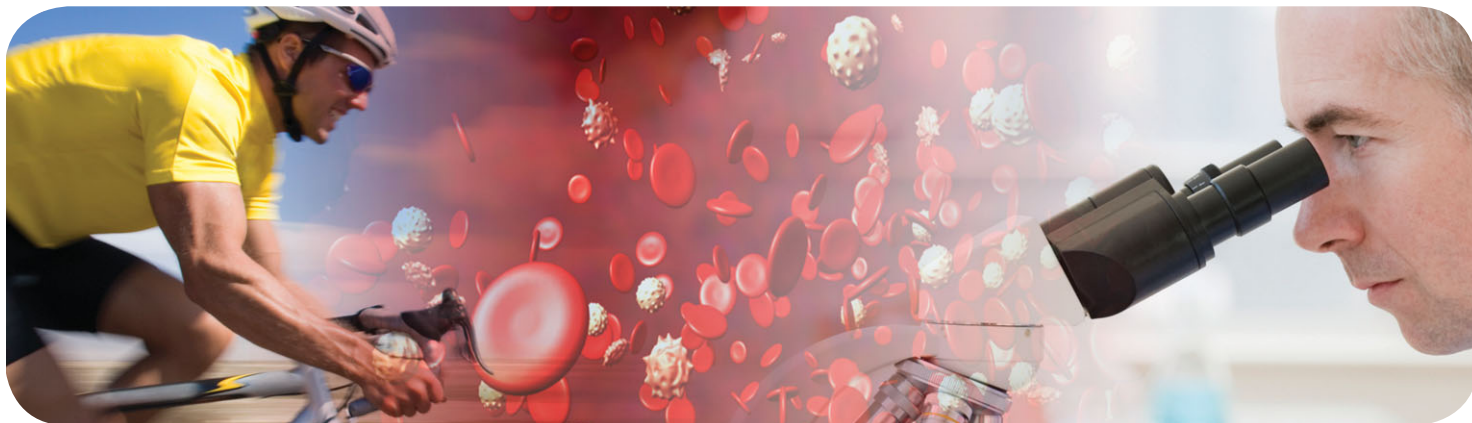
\*\* Not eligible for member discount or member renewal product credit.

\*\*\* Due to license restrictions, this product is not for sale to customers outside of the USA.

† Member pricing not valid on this item.

†† Due to license restrictions, this product is not for sale to Canada.

**SUB-TOTAL OF COLUMN 18**



## GIVE THE GIFT of HEALTH, with a LIFE EXTENSION GIFT CARD!



**GIVE THE LIFE-ENHANCING  
BENEFITS OF LIFE EXTENSION®  
WITH A GIFT OF  
\$10, \$25, \$50 OR \$100**

**To order a Life Extension Gift Card  
for someone special, call 1-800-544-4440.**

### HOW TO JOIN THE LIFE EXTENSION FOUNDATION®

As a member of the Life Extension Foundation®, you have the opportunity to participate in a great scientific endeavor. We are the world's premier organization dedicated to stopping and reversing aging.

Our 32-year track record shows that we have been five to ten years ahead of conventional and alternative medicine in making new life-saving therapies available to our members.

When you join the Life Extension Foundation®, we update you on the latest published medical research by sending you FREE books. Our most impressive publication is the 1,400-page *Disease Prevention and Treatment* protocol book that contains novel therapies to treat 130 common diseases of aging. *Disease Prevention and Treatment* is the only book that combines conventional and alternative therapies in order to implement a treatment regimen for fighting the multiple processes involved in degenerative disease.

Each month, Life Extension Foundation® members receive a magazine packed with the latest medical findings from around the world. Members also can call a toll-free phone number to talk to our knowledgeable health advisors about their health issues.

**If your number one priority is good health and a long life,  
please join our not-for-profit organization.**

#### Four Easy Ways to Join

1. Call toll-free 1-800-544-4440
2. Go to [www.lef.org](http://www.lef.org)
3. Fax back to 1-866-728-1050
4. Mail to: Life Extension Foundation® • PO Box 407198  
Ft. Lauderdale, FL 33340-7198 • Local Number: 954-766-8433

### MEMBERSHIP APPLICATION

I want to contribute to your research efforts to extend the healthy human life span. Enclosed is my first year's membership donation of \$75 to join the most elite group of longevity enthusiasts in the world. (Canadians add \$7, all others outside the U.S. add \$35) Item code: MEMB1. Call for multiple year membership rates.

Name

Address

City  ST  ZIP

Email  Phone

☐ Check enclosed (payable to Life Extension Foundation®)

☐ Charge my cc:

Card #  Exp.

## ORDER SUBTOTALS

SUB-TOTAL COLUMN 1	
SUB-TOTAL COLUMN 2	
SUB-TOTAL COLUMN 3	
SUB-TOTAL COLUMN 4	
SUB-TOTAL COLUMN 5	
SUB-TOTAL COLUMN 6	
SUB-TOTAL COLUMN 7	
SUB-TOTAL COLUMN 8	
SUB-TOTAL COLUMN 9	
SUB-TOTAL COLUMN 10	
SUB-TOTAL COLUMN 11	
SUB-TOTAL COLUMN 12	
SUB-TOTAL COLUMN 13	
SUB-TOTAL COLUMN 14	
SUB-TOTAL COLUMN 15	
SUB-TOTAL COLUMN 16	
SUB-TOTAL COLUMN 17	
SUB-TOTAL COLUMN 18	

## ORDER TOTALS

Sub-Total A (Sub-total of Columns 1 through 18)

Postage And Handling (Any size order, continental U.S.) **\$5.50**

C.O.D.s (Add \$7 for C.O.D. orders)

Shipping UPS OVERNIGHT add \$16, UPS 2nd DAY AIR add \$7. For Puerto Rico, US Virgin Islands, Alaska & Hawaii, add \$7. CANADA UPS EXPRESS Flat rate \$17.50, UK Flat rate \$25 USD. ALL OTHER INTERNATIONAL AIR WILL BE ADDED.

**GRAND TOTAL** (Must be in U.S. dollars)

## Buyers Club Order Form



### PLEASE MAIL TO:

Life Extension Foundation® Buyers Club, Inc.  
P.O. Box 407198 • Ft. Lauderdale, Florida 33340-7198  
Or Call Toll Free 1-800-544-4440 • Fax: 866-728-1050  
Local Number: 954-766-8433

ORDER ONLINE AT: [www.LifeExtension.com](http://www.LifeExtension.com)

### LIFE EXTENSION FOUNDATION® MEMBERS ONLY

MEMBER NO.

PRINT MEMBERSHIP NO. FOR MEMBER DISCOUNT

### NOT A MEMBER? JOIN TODAY!

- ☐ I want to join the Life Extension Foundation®.  
Enclosed is \$75 for annual membership. (Canadians add \$7.00, all others outside the U.S. add \$35.00). Send me: *Disease Prevention & Treatment Protocol Book*

- ☐ CHECK HERE FOR C.O.D. ORDERS
- ☐ CHECK HERE FOR UPS BLUE LABEL (2ND DAY)
- ☐ CHECK HERE FOR UPS RED LABEL (OVERNIGHT)

### BILL TO ADDRESS

NAME E-MAIL

---

ADDRESS

---

CITY/STATE/ZIP-POSTAL CODE COUNTRY

---

PHONE FAX

---

VISA/MASTERCARD/AMEX/DISCOVER #

---

EXP. DATE

---

SIGNATURE

---

### SHIP TO ADDRESS

NAME E-MAIL

---

ADDRESS

---

CITY/STATE/ZIP-POSTAL CODE COUNTRY

---

PHONE FAX

---

SIGNATURE

---

PRICES SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE NOTIFY THE LIFE EXTENSION FOUNDATION® OF ANY ADDRESS CHANGE

To order online visit: [www.LifeExtension.com](http://www.LifeExtension.com)

# Buyers Club Order Form

No.			Retail	Member Price	Qty	Total
	<b>LIFE EXTENSION MEDIA</b>					
DPT05	<b>DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION</b> (hardcover) Until January 31, 2014	2014	\$69.95	\$24.95		
33861	<b>THE SOUTH BEACH DIET GLUTEN SOLUTION</b> • Dr. Arthur Agatston	2013	\$25.99	\$19.49		
33860	<b>YOUNG FOR LIFE</b> • by Marilyn Diamond and Dr. Donald Schnell	2013	\$26.99	\$20.24		
33835	<b>PHARMOCRACY</b> • by William Faloon Buy 4 books, price each	2011	\$24.00	\$9.60 \$8.00		
33859	<b>THE BLOOD SUGAR SOLUTION</b> • by Mark Hyman, MD	2013	\$27.99	\$20.99		
33855	<b>POWER FOODS FOR THE BRAIN</b> • by Neal D. Barnard, MD	2013	\$26.99	\$20.24		
33854	<b>THE GREAT CHOLESTEROL MYTH</b> • by Jonny Bowden, PhD, CNS and Stephen Sinatra, MD	2012	\$19.99	\$14.99		
33852	<b>THE MAGIC OF CHOLESTEROL NUMBERS</b> • by Dr. Sergey Dzigan	2012	\$29.95	\$22.46		
33848	<b>YOUR BEST INVESTMENT SECRETS TO A HEALTHY BODY AND MIND</b> • by Edwin Lee, MD	2012	\$24.95	\$18.71		
33847	<b>THE FATIGUE SOLUTION</b> • by Dr. Eva Cwynar	2012	\$24.95	\$18.71		
33844	<b>ABUNDANCE: THE FUTURE IS BETTER THAN YOU THINK</b> • by Steven Kotler and Petere Diamandis	2012	\$26.99	\$20.24		
33843	<b>BOMBSHELL</b> • by Suzanne Somers	2012	\$26.00	\$19.50		
33845	<b>DRUG MUGGERS</b> • by R.Ph. Susy Cohen	2012	\$21.99	\$16.49		
33842	<b>HEART ATTACK PROOF</b> • by Michael Ozner, MD	2012	\$19.95	\$14.96		
33839	<b>THE GOLDEN RATIO LIFESTYLE DIET</b> • by Robert Friedman, MD, and Matthew Cross	2012	\$19.95	\$14.96		
33838	<b>YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY</b> • by Gary Goldfaden, MD	2012	\$26.00	\$15.00		
33837	<b>WHEAT BELLY</b> • by William Davis, MD	2011	\$25.99	\$19.49		
33833	<b>THE LIFE PLAN</b> • by Jeffrey S. Life, MD, PhD	2011	\$26.00	\$19.50		
33832	<b>YOUR BONES</b> • by Lara Pizzorno, MA, LMT	2011	\$12.00	\$9.00		
33829	<b>THE IMMORTALITY EDGE</b> • by Michael Fossel, MD, PhD, Greta Blackburn, David Woynarowski, MD	2011	\$25.95	\$18.17		
33824	<b>VITAMIN D SOLUTION</b> • by Michael F. Holick, PhD, MD	2010	\$25.95	\$18.17		
33822	<b>BREAKTHROUGH: EIGHT STEPS TO WELLNESS</b> • by Suzanne Somers (paperback)	2010	\$15.00	\$10.50		
33836	<b>WEIGHT LOSS GUIDE</b> • by Steven V. Joyal, MD and William Faloon (hardcover) (3rd Edition)	2010	\$29.95	\$8.99		
33816	<b>FDA: FAILURE, DECEPTION, ABUSE</b> • by Life Extension Foundation	2010	\$20.00	\$15.00		
33818	<b>STAY YOUNG &amp; SEXY WITH BIO-IDENTICAL HORMONE REPLACEMENT</b> • by Jonathan Wright, MD	2010	\$19.95	\$14.96		
33815	<b>KNOCKOUT</b> • by Suzanne Somers	2009	\$25.99	\$17.00		
33812	<b>LIFE OVER CANCER</b> • by Keith Block, MD (hardcover)	2009	\$25.00	\$17.50		
33809	<b>TESTOSTERONE FOR LIFE</b> • by Abraham Morgentaler, MD	2008	\$16.95	\$11.87		
33599	<b>YOUNGER YOU</b> • by Eric Braverman, MD	—	\$24.95	\$15.75		
33696	<b>LIFE EXTENSION REVOLUTION</b> • by Philip Lee Miller, MD (paperback)	—	\$16.00	\$12.00		
33805	<b>MIAMI MEDITERRANEAN DIET WITH 300 RECIPES</b> • by Michael D. Ozner, MD, FACC, FAHA (hardcover)	2008	\$24.95	\$16.25		
33906	<b>THE MIGRAINE CURE</b> • by Sergey Dzigan, MD, PhD	2006	\$24.00	\$15.60		
33670	<b>A PRIMER ON PROSTATE CANCER</b> (2nd edition) • by Stephen B. Strum, MD, and Donna Pogliano	2005	\$28.95	\$21.71		
33806	<b>THE CR WAY</b> • by Paul McGlothlin and Meredith Averill		\$15.95	\$11.25		
33828	<b>THE SEXY YEARS</b> • by Suzanne Somers (paperback)	2004	\$15.00	\$10.50		
33803	<b>WHAT YOUR DOCTOR MAY NOT TELL YOU ABOUT DIABETES</b> • by Steven V. Joyal, MD	2008	\$14.99	\$10.49		
33703	<b>JOHN ABDO'S NO EXCUSES WORKOUT DVD</b>	2008	\$13.30	\$9.98		
33804	<b>YOU: STAYING YOUNG: THE OWNER'S MANUAL FOR EXTENDING YOUR WARRANTY</b> • by Mehmet Oz, MD	2008	\$26.00	\$18.20		
Sub-Total (U.S. Dollars)						
Shipping only \$5.50 U.S. • \$17.50 Canada • \$12.50 Hawaii, Alaska, U.S. Virgin Islands, Puerto Rico • UK Flat rate \$25 USD						
(Add \$7 for C.O.D. • Add \$16.00 for UPS overnight • Add \$7.00 for UPS 2nd day air • International air mail costs will be added.)						
PRICES SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE NOTIFY THE LIFE EXTENSION FOUNDATION* OF ANY ADDRESS CHANGE						<b>TOTAL</b>

**PLEASE MAIL TO:** Life Extension Foundation Buyers Club, Inc.  
P.O. Box 407198 • Ft. Lauderdale, Florida 33340-7198  
Or Call Toll Free 1-800-544-4440 • Fax: 866-728-1050 • Local Number: 954-766-8433  
Other International Shipping Restrictions May Apply. Please visit  
[www.lef.org/vitamins-supplements/shipping/shipping-information.htm](http://www.lef.org/vitamins-supplements/shipping/shipping-information.htm) for details.

## LIFE EXTENSION FOUNDATION® MEMBERS ONLY

MEMBER NO.

PRINT MEMBERSHIP NO. FOR MEMBER DISCOUNT

NOT A MEMBER? JOIN TODAY!

☐ I want to join the Life Extension Foundation®.

Enclosed is \$75 for annual membership. (Canadians add \$7.00, all others outside the U.S. add \$35.00). Send me: *Disease Prevention & Treatment Protocol Book*

NAME

E-MAIL

ADDRESS

CITY/STATE/ZIP-POSTAL CODE

COUNTRY

PHONE

FAX

VISA/MASTERCARD/AMEX/DISCOVER #

EXP. DATE

SIGNATURE

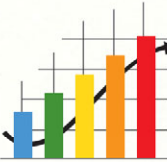
☐ COD

☐ UPS RED LABEL

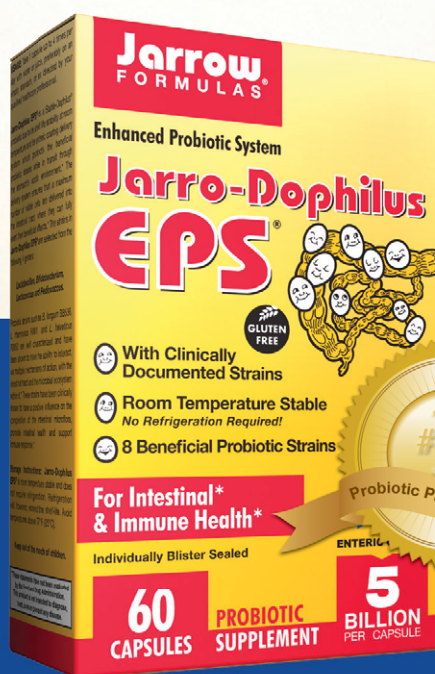
☐ UPS BLUE LABEL

  **Innovative.**

 **Clinically**  **Studied.**

 **Industry**  **Leading.**

**Jarro-Dophilus EPS®**  
60 caps Item #00056  
Retail Price - \$22.95  
Member Price - \$17.21



## Superior Probiotics from Jarro Formulas®

The proper balance of microflora in the intestines is crucial for health and well-being. **Jarro Formulas®** probiotic dietary supplements are designed to maintain a healthy balance of these microflora to maximize your digestive and immune system.\*

**Jarro Formulas®** is a probiotic pioneer and has a complete line of probiotic products, including the #1 seller in the U.S.† - **Jarro-Dophilus EPS®**.

† #1 in Unit Volume in the Natural Channel, according to SPINS, a market research and consulting firm for the Natural Product Industry (SPINScan Natural, 52 Weeks Ending 09/01/2012).

**[www.Jarrow.com](http://www.Jarrow.com)**

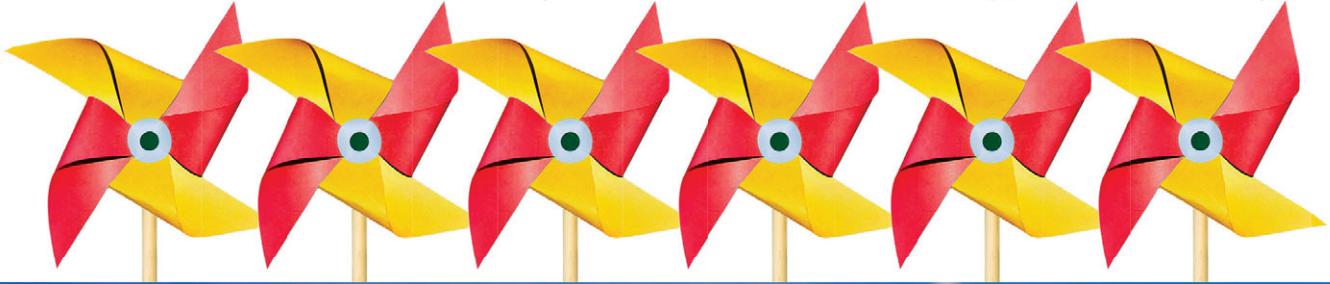
To order call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**Jarrow**  
F O R M U L A S®

\* These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

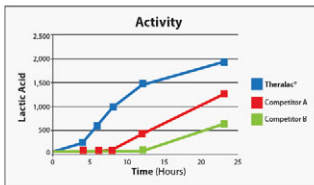
© 2013 Jarro FORMULAS®

# Quantity does not necessarily mean quality.



**It is not just how many CFU, but how much lactic acid is produced that makes a probiotic effective.**

Lactic acid is a powerful inhibitor of undesirable flora in our intestinal tract. It gives yogurt its tartness, but yogurt fails to produce a sufficient amount.



By producing lactic acid in effective amounts, probiotics help insure a positive microbial balance. Both Theralac® and Truflora® probiotics produce commanding amounts of lactic acid.

Many competitive probiotics fail to achieve these effective levels! To see results of standardized tests that simulate intestinal conditions and show the powerful lactic acid production, plus CFU count and purity, visit [theralac.com](http://theralac.com) and [truflora.com](http://truflora.com).



Master Supplements Inc. has posted third party online testing for strength, purity and activity for 10 years. Our probiotics are covered by 6 U.S. Patents.

Call your *Life Extension*® advisor to learn more.

Call Life Extension to place your order today.

**1-800-544-4440**

**Theralac®**  
30 capsules  
Item# 01038  
Retail: \$47.95

**TruFlora®**  
32 capsules  
Item# 01389  
Retail: \$42.95

**TruFiber®**  
6.2 OZ  
Item# 01386  
Retail: \$32.95

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease.



[master-supplements.com](http://master-supplements.com)  
**Master Supplements**  
INCORPORATED

# A Partnership in Heart Health

## New Chapter Zyflamend & Life Extension Super Omega-3

### A Holistic Approach to Cardiovascular Health

Maintaining heart health and a strong cardiovascular system are vital to a healthy body. Diet and exercise are the most important factors. Scientists and doctors both agree that a program of preventive health today is preferable to a treatment program tomorrow. But unfortunately, most Americans don't eat enough heart-healthy foods or get enough exercise. We now know that there are several additional factors that can support cardiovascular health, including:

- Supporting the body's healthy inflammation response\*
- Consuming "good fats" such as Omega-3 fatty acids

### What is the Inflammation Response?

Our body's inflammation response is a natural healing process. We often think of the inflammation response as something we can feel—such as in our joints and muscles where there are large numbers of sensitive nerve endings. But we can also have a response we can't feel, where sensitive nerves aren't concentrated—including in the heart and blood vessels. Whether we're aware of it or not, this inflammation response can affect every organ and cell.

### Extensively Researched Herbal Blend

New Chapter's Zyflamend represents a scientific breakthrough in supporting a healthy inflammation response.\* Zyflamend is formulated based on a large body of scientific research showing its ten herbs and spices contain hundreds of plant compounds that support a healthy inflammation response.\* Just as important as a daily multivitamin, Zyflamend is the patented herbal protocol to help your whole body's natural inflammation process stay balanced and healthy every day.\* Zyflamend has been studied at leading research institutions and shown to benefit multiple areas of health, including heart health.\*



**Super Omega-3**  
120 Softgels Item #01482  
Retail Price: ~~\$32.00~~  
Member Price: **\$24.00**

**Zyflamend**  
120 Softgels Item #01051  
Retail Price: ~~\$60.95~~  
Member Price: **\$45.71**

### Omega-3 is Important for Cardiovascular Health

Life Extension's Super Omega-3 is a premium, scientifically validated fish oil concentrate. Super Omega-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract promotes a healthy heart.\* Fish oils (and other fatty acids) have a tendency to oxidize, rendering them nutritionally inferior. Scientific studies show that when added to fish oil, sesame lignans safeguard against oxidation and direct fatty acids toward pathways that help with inflammatory reactions.<sup>1</sup> To further emulate the benefits of a Mediterranean diet, Super Omega-3 delivers standardized, high-potency olive fruit extract. Research shows that when combined with olive oil, fish oil supplements help with inflammation better than fish oil alone.<sup>2\*\*</sup>

1. *Biochem Biophys Acta*. 2004 Jun 1;1682(1-3):80-91.
2. *Nutrition*. 2005 Feb;21(2):131-6.

© 2012 New Chapter, Inc.

\* According to 2012 SPINS® Market Research

\*\*Supportive but not conclusive evidence shows that consumption of EPA and DHA Omega-3 fatty acids may reduce the risk of coronary heart disease.

To order Zyflamend or Super Omega-3, call  
1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

 **NEWCHAPTER®**

\* These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

# Top Off Your TESTOSTERONE *Naturally*

Low Testosterone Levels May Lead to:

**Reduced Sex Drive • Less Energy**  
**Cloudy Thinking • Weight Gain**  
**Cardiovascular Issues**

Maintaining healthy testosterone levels is one of the most important steps you can take to regain your health and improve your performance. With research showing that by the time a man is 60 years old, he may produce 60% less testosterone than he did in his 20s, the time is now to add Life Extension®'s Super MiraForte with Standardized Lignans to your supplement regimen.



Each daily dose of Super MiraForte with Standardized Lignans contains the following testosterone supporting ingredients:

1500 mg	Chrysin
15 mg	Bioperine®
850 mg	Muira puama
282 mg	Nettle root
15 mg	Chelated elemental zinc
320 mg	Maca
33.4 mg	HMRLignan™
	Norway Spruce lignan extract



Item # 01698

The retail price for a bottle of 120 capsules of **Super MiraForte with Standardized Lignans** is **\$62**. If a member buys four bottles, the price is reduced to **\$42** per bottle.

**To order Super MiraForte with Standardized Lignans**  
**call 1-800-544-4440**  
**or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

**Super Health. Super Libido.**  
*Super MiraForte.*

Caution: If you are taking any medication, use only under physician supervision. Men with existing prostate cancer may not be able to use this product. Elevations in free testosterone can unmask an occult (hidden) prostate cancer. Anyone with this concern should have a baseline PSA prior to using this product and a follow-up PSA test 60 days later. If a significant elevation of PSA is found, discontinue this product and advise physician. Do not take more than 15 mg per day of Bioperine®.

Bioperine® is a registered trademark of Sabinsa Corp. HMRLignan™ is a registered trademark used under sublicense from Linnea S.A.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



## WHAT'S INSIDE

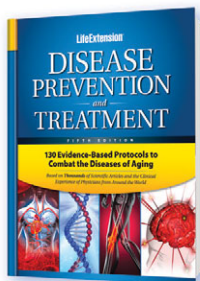
Visit us at [www.LifeExtension.com](http://www.LifeExtension.com)

# LifeExtension® Magazine



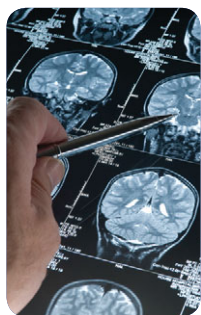
### 7 HORRIFIC CONDITIONS INSIDE DRUG FACTORIES

The **FDA** pretends to protect the public against contaminated drugs. The sordid facts reveal an agency incapable of acting in a rational manner. When FDA does react “after the fact,” they often create worse problems.



### 30 YOUR ESSENTIAL MEDICAL GUIDE

Today's leading cause of death is **medical ignorance**. To combat this epidemic, Life Extension researchers have spent the past ten years accumulating a wealth of new lifesaving knowledge. This has been compiled into the **2014** edition of **Disease Prevention and Treatment**.



### 40 MELATONIN: HORMONAL BRAIN PROTECTION

Scientific studies show how **melatonin** can protect against common age-related **brain** disorders including Alzheimer's and Parkinson's.



### 52 WHEY PROTEIN'S NEW LONGEVITY BENEFITS

New data uncover longevity benefits of **whey protein** that mimic some of the effects of **calorie restriction**, while optimizing **immunity**.



### 68 CONFERENCE REPORT: AGING AND DISEASES OF AGING

At *The Aging and Diseases of Aging* conference in Tokyo, scientists report on their latest investigations to understand and circumvent the diseases of aging.



### 78 UNSURPASSED QUALITY-CONTROL

**Life Extension's** standards to ensure purity, active ingredient status, and overall integrity of dietary supplements exceed FDA mandates.