

CONGRESS SEEKS TO CURB FDA CENSORSHIP

LifeExtension®

www.lef.org

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

August 2011

STARTLING LINK BETWEEN BONE INTEGRITY AND OVERALL HEALTH

**Exclusive Interview
With Dr. Bruce Ames**

**FDA Claims Walnuts
Are Illegal Drugs**

**Lipoic Acid
Reverses
Mitochondrial
Decay**

Plus—

**Lung Disease Patients Benefit From Vitamin D
Topical DNA Repair for Youthful Skin
Memory Loss Linked to Metabolic Syndrome**



Are You Getting Curcumin's Benefits?

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 organic, 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:^{1,2}

- Nearly twice the support for **immune** health.
- Approximately twice the support for **inflammatory** issues.
- Almost double the **antioxidant** support.

A separate study³ indicated powerful support for heart health using a comparable extract.

Unrivaled 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 **7 times higher concentration** in the blood than standard curcumin.⁴

Absorption studies further demonstrate that just one **400 mg** vegetarian capsule per day of **Super Bio-Curcumin®** supplies the equivalent of **2,500-2,800 mg** of commercial curcumin supplements.

A bottle containing 60 vegetarian capsules of **Super Bio-Curcumin®** retails for \$38. If a member buys 4 bottles, the price is reduced to only **\$26.25** per bottle. Contains rice.

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.

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.

To order **Super Bio-Curcumin®**
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.



Item #00407

REPORTS



30 EXCLUSIVE INTERVIEW WITH ANTI-AGING PIONEER DR. BRUCE AMES

Dr. Bruce Ames is devoted to identifying strategies that combat degenerative disease and reverse aging processes. Best known for his groundbreaking research on *mitochondria*, the UC Berkeley professor emeritus discusses his innovative *Triage Theory of Aging*.



38 LIPOIC ACID REVERSES MITOCHONDRIAL DECAY

An estimated **85%** of the oxygen contained in every breath you take is consumed by the *mitochondria*. Age-related mitochondrial decay in turn lies at the core of most degenerative diseases. **Lipoic acid** may induce a *profound* regeneration of these cellular powerhouses, thwarting the onset of **cancer**, **heart disease**, and more.



50 WHAT ELSE INCREASES YOUR RISK OF OSTEOPOROSIS?

Osteoporosis ignites multiple killer diseases of aging, including diabetes and cancer. **Lara Pizzorno** and **Jonathan Wright, MD** show how drugs, surgery, and other factors threaten bone health in this enlightening excerpt from the book *Your Bones*.



74 TOPICAL COMPOUNDS REPAIR DNA AND DELAY SKIN AGING

A sequence of your DNA called the *telomere* determines how long your skin cells live and when they die. Supporting their function lies at the forefront of skin rejuvenation research. Dermatologists have recently identified a key topical nutrient that may turn back the clock on skin aging.



62 ON THE COVER

STARTLING LINK BETWEEN BONE HEALTH AND TOTAL HEALTH

Strong bones do more than prevent life-altering fractures. Recent research shows a healthy skeletal system is *also* essential to **insulin sensitivity**, **energy metabolism**, and **weight management**. Find out how a comprehensive nutrient regimen, including calcium, trace minerals, and vitamins D3 and K optimizes bone health and total health.

DEPARTMENTS

7 FDA SAYS WALNUTS ARE ILLEGAL DRUGS

Life Extension® has published **57** articles documenting the many health benefits of walnuts. When Diamond Foods referenced scientific data detailing these benefits on its website, the FDA classified Diamond's walnuts as "illegal drugs." Here we examine the scientific blackout caused by this outrageous bureaucratic act and what you can do to support a bill in Congress that prohibits this kind of police state censorship.

21 IN THE NEWS

Metabolic syndrome impairs memory; low testosterone leads to glucose intolerance in men; green tea polyphenols offer skin protection; and more.

83 PROFILE: LISA OZ

Lisa Oz is married to America's most *famous* physician, Dr. Mehmet Oz. Here she offers **Life Extension** readers an inside look into their shared passion for changing lives through new medical knowledge, finding ways to communicate with the widest possible audience—and the pivotal role she played in making Dr. Oz famous.

89 SUPERFOODS: THE WEALTH OF WALNUTS

The exceptional nutritional value of walnuts is universally acknowledged among researchers. From beneficial phenolic acids and tannins to vitamins and omega-3s, the array of nutrients they contain have been shown to prevent cancer, diabetes, and cognitive decline.

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-5 pm, Sunday 12 pm-4 pm

EDITORIAL

Editor-in-Chief • Philip Smith
Executive Managing Editor • Renee Price
Senior Editor • Carey Monserrate
Senior Medical Editor • Elizabeth Wagner, ND
Department Editor • Jon Finkel
Creative Director • Robert Vergara
Associate Art Director • Alexandra Maldonado
Cover Design • Harby Bonello

VICE PRESIDENT, SCIENTIFIC AFFAIRS AND MEDICAL DEVELOPMENT

Steven Joyal, MD

SCIENTIFIC ADVISORY BOARD

Örn Adalsteinsson, PhD • Russell L. Blaylock, MD • John Boik, PhD
Eric R. Braverman, MD • 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 • Stephen B. Strum, MD, FACP
Jonathan Treasure, AHG, MNIMH • Jonathan V. Wright, MD

CONTRIBUTORS

Michael Anderson • D. Dye • Carley Eder • Gary Goldfaden, MD
Robert Goldfaden • Ron Perez • Lara Pizzorno, MA, LMT • Philip Smith
Jonathan V. Wright, MD

ADVERTISING

Marketing Director • Rey Searles • rsearles@lifeextension.com
National Advertising Manager • Eric Brown • 404-347-8992

DIRECTOR OF BUSINESS DEVELOPMENT

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

CIRCULATION & DISTRIBUTION

Life Extension • 1100 West Commercial Blvd., Ft. 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

LIFE EXTENSION Vol. 17, No. 8 ©2011 LE Publications, Inc. All rights reserved. USPS #95. 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, Ft. Lauderdale, Florida 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. Application to mail at Periodicals Postage Rates is pending at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to LE Publications, 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. ISSN: 1524-198X. Agreement Number 40028967. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7. ISSN: 1524-198X.

Restore
Cellular
Energy
with...

NEXT-GENERATION

CoQ10

Since **Life Extension**® introduced CoQ10 in 1983, our scientists have continued to develop increased potency and absorbability.

Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™ contains **PrimaVie**® shilajit that doubles levels of CoQ10 in the mitochondria.¹

Combining CoQ10 and **shilajit** produced a **56%** increase in cellular energy production in the **brain**, and in muscle there was a **144%** increase in cellular energy production.²

Shilajit boosts CoQ10's beneficial effects by stabilizing CoQ10 in the superior ubiquinol form, which *prolongs* its action at the cellular level.^{3,4} Additionally, **shilajit** facilitates the more efficient *delivery* of CoQ10 into the mitochondria, which results in enhanced cellular energy.⁵⁻⁹

Shilajit helps the mitochondria convert fats and sugars into the body's main source of energy, ATP (adenosine triphosphate).⁵⁻⁹

Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

Combining ubiquinol CoQ10 with **shilajit** generates a powerful *synergy* that supports more youthful cellular energy production than CoQ10 alone.^{2,4,5}

References:

1. Systemic CoQ level in animals: Part II. Unpublished study. Natreon, Inc.; 2007.
2. Pharmacologyonline. 2009;1:817-25.
3. Pharmacologyonline. 2009;2:690-8.
4. Electronic Journal of Biotechnology. 2008 Jul 15;11(3).

5. Ghosal S. *Shilajit in Perspective*. Alpha Science International Limited; 2006.
6. *Sci Total Environ*. 1987 Apr;62:347-54.
7. *Environ Sci Technol*. 2002 Jul 15;36(14):3170-5.
8. *Environ Sci Technol*. 2002 May 1;36(9):1939-46.
9. *Environ Sci Technol*. 2009 Feb 1;43(3):878-83.

PrimaVie® is a registered trademark of Natreon, Inc. Kaneka QH® is a registered trademark of Kaneka Corporation.



The retail price for 60 100 mg softgels of **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** is \$62. If a member buys four bottles, the price is reduced to \$42 per bottle. **Item # 01426**



The retail price for 100 50 mg softgels of **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** is \$58. If a member buys four bottles, the price is reduced to \$39.75 per bottle. **Item # 01425**



The retail price for 30 200 mg softgels of **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** is \$62. If a member buys four bottles, the price is reduced to \$42 per bottle. **Item # 01431**

To order Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™
call 1-800-544-4440 or visit www.LifeExtension.com

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.

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.

John Crisler, DO, is an osteopathic physician and president of The All Things Male Center for Men's Health in Lansing, MI. Dr. Crisler is a distinguished leader in the field of anti-aging medicine.

William Davis, MD, is medical director of Milwaukee Heart Scan and developer of the web-based initiative Track Your Plaque, the only heart disease prevention program that uses the new CT heart scans to detect, track, and control coronary plaque.

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.

Dr. John DeLuca 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.

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.

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.

R. Arnold Smith, MD, is a clinical radiation oncologist who specializes in using immunotherapy to enhance the safety and efficacy of conventional cancer therapies.

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, 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*.



Russell L. Blaylock, MD, is a board-certified neurosurgeon, author, and lecturer. He recently retired from his neurosurgical practice to devote his time to nutritional studies and research. He has written numerous journal articles and three books (*Excitotoxins: The Taste That Kills*, *Health and Nutrition Secrets That Can Save Your Life*, and *Natural Strategies for the Cancer Patient*) and currently publishes a monthly nutrition newsletter, *The Blaylock Wellness Report*.



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



Eric R. Braverman, MD, is director of the Place for Achieving Total Health (PATH Medical and the PATH Foundation) in New York City. Dr. Braverman received his BA from Brandeis University Summa Cum Laude/Phi Beta Kappa and his MD from New York University Medical School with Honors. He is the author of *Younger You* (2006) and *Younger Thinner You* (2009) and over 100 research papers and is clinical assistant professor of integrative medicine in the Department of Neurosurgery at Cornell Weill Medical College, as well as a lecturer on mild cognitive decline.



Frank Eichhorn, 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 special focus on natural and translational medicine.



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



Steven B. Harris, MD, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA. Dr. Harris participates in ground-breaking 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.



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.



Stephen B. 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.



Jonathan Treasure, AHG, MNIMH, is a British medical herbalist at the Centre for Natural Healing in Ashland, OR. Originally a medical sciences graduate from Cambridge University, he studied herbal medicine at the UK School of Phytotherapy. His clinical specialty is integrative botanical medicine for cancer, and his principal research interest is herb/drug interactions.



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.

Advanced RESVERATROL Formula

In 2003, the **Life Extension Foundation**® introduced a standardized **resveratrol** extract shown to favorably alter genes implicated in the aging process—many of the same genes that respond to **calorie restriction**.

Since then, we have identified additional compounds that simulate calorie restriction's ability to trigger youthful **gene expression**—the process by which genes transmit signals that slow certain aspects of aging.

Compelling evidence reveals that certain compounds found in berries, such as **pterostilbene** and **fisetin**, possess potent “longevity gene” activators that work in synergy with **resveratrol**. For example, **fisetin** (found in strawberries) has been shown to **stabilize** resveratrol in the body by shielding it from metabolic breakdown,¹⁻¹⁰ thus extending its beneficial effects.

High-Potency Resveratrol with Synergistic Activators

Life Extension members gain access to standardized **trans-resveratrol** combined with plant extracts that favorably influence longevity gene expression. Unlike many commercial formulas, Life Extension standardizes to **trans-resveratrol**, which researchers contend is the most active constituent.

A bottle containing 60 vegetarian capsules of **Optimized Resveratrol with Synergistic Grape-Berry Actives** retails for \$46. If a member buys four bottles, the price is reduced to just **\$31** per bottle. The suggested dose of one capsule a day provides:

Trans-Resveratrol	250 mg
Grape-Berry Actives	85 mg
Quercetin	60 mg
Trans-Pterostilbene	0.5 mg
Fisetin	10 mg

Contains yeast.

Item #01430



References

1. *Cell*. 2006 Dec 15;127(6):1109-22.
2. *Endocrinology*. 2008 Jan;149(1):84-92.
3. *Crit Care Med*. 2004 Oct;32(10):2097-103.
4. *J Agric Food Chem*. 1999 Apr;47(4):1416-21.
5. *Arch Pharm Res*. 2002 Oct;25(5):561-71.
6. *Nutr Cancer*. 1999;35(1):80-6.
7. *Anticancer Agents Med Chem*. 2006 Sep;6(5):389-406.
8. *Nature*. 2006 Nov 16;444(7117):337-42.
9. *Nature*. 2004 Aug 5;430(7000):686-9.
10. *Xenobiotica*. 2000 Sep;30(9):857-66.

To order Optimized Resveratrol,
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.

FDA Says Walnuts Are Illegal Drugs



BY WILLIAM FALOON



Life Extension[®] has published 57 articles that describe the health benefits of **walnuts**.

Some of this same scientific data was featured on the website of **Diamond Foods, Inc.**, a distributor of packaged walnuts.

Last year the **FDA** determined that walnuts sold by Diamond Foods cannot be legally marketed because the walnuts “***are not generally recognized as safe and effective***” for the medical conditions referenced on Diamond Foods’s website.

According to the FDA, these walnuts were classified as “***drugs***” and the “***unauthorized health claims***” cause them to become “***misbranded***,” thus subjecting them to government “***seizure or injunction***.”

Diamond Foods capitulated and removed statements about the health benefits of walnuts from its website.

Let’s take a look at the science supporting the consumption of walnuts to see what the **FDA** censored...and what you can do to stop it in the future!

AS WE SEE IT

Eating Walnuts Cuts Heart Disease Risk

Ingesting nuts used to be considered unhealthy because of their high fat content. This misconception has changed over the past 18 years as human studies have revealed sharply reduced incidence of heart disease in those who consume walnuts.¹⁻¹²

Unlike some nuts, **walnuts** provide a unique blend of polyunsaturated fatty acids (including **omega-3s**), along with nutrients like **gamma-tocopherol** that have demonstrated heart health benefits.¹³⁻²⁴

The March 4, 1993, issue of the *New England Journal of Medicine* published the first clinical study showing significant reductions in dangerous **LDL** and improvement in the lipoprotein profile in response to moderate consumption of walnuts.¹⁴ Later studies revealed that walnuts improve **endothelial function** in ways that are independent of cholesterol reduction.^{1, 25-27}



One study published by the **American Heart Association** journal *Circulation* on April 6, 2004, showed a **64% improvement** in a measurement of **endothelial function** when walnuts were substituted for other fats in a Mediterranean diet.¹

As most **Life Extension** members are aware, the underlying cause of atherosclerosis is progressive **endothelial dysfunction**.²⁸ Walnuts contain a variety of nutrients including arginine, polyphenols, and omega-3s that support the inner arterial lining and guard against abnormal platelet aggregation.^{2, 13, 29-31} These favorable biological effects explain why walnut consumption confers protection against coronary artery disease.

The US National Library of Medicine database contains no fewer than 35 peer-reviewed published papers supporting a claim that ingesting walnuts improves vascular health and may reduce heart attack risk.

FDA Ignores the Science

The federal agency responsible for protecting the health of the American public views this differently.

On our website, we reprint the FDA's entire warning letter to Diamond Foods. Nowhere in this bureaucratic albatross is there any discussion of the science cited by Diamond Foods to support their health claims.

Instead, the FDA's language resembles that of an *out-of-control* police state where tyranny reins over rationality. To enable you to recognize the absurdity of all of this, I excerpted a few paragraphs from the FDA's warning letter to Diamond Foods starting on the next column.³²

Excerpt from FDA Letter

"Based on our review, we have concluded that your walnut products are in violation of the Federal Food, Drug, and Cosmetic Act (the Act) and the applicable regulations in Title 21, Code of Federal Regulations (21 CFR).

"Based on claims made on your firm's website, we have determined that your walnut products are promoted for conditions that cause them to be drugs because these products are intended for use in the prevention, mitigation, and treatment of disease.

"Because of these intended uses, your walnut products are drugs within the meaning of section 201 (g)(1)(B) of the Act [21 U.S.C. § 321(g)(B)]. Your walnut products are also new drugs under section 201(p) of the Act [21 U.S.C. § 321(p)] because they are not generally recognized as safe and effective for the above referenced conditions. Therefore, under section 505(a) of the Act [21 U.S.C. § 355(a)], they may not be legally marketed with the above claims in the United States without an approved new drug application.

"Additionally, your walnut products are offered for conditions that are not amenable to self-diagnosis and treatment by individuals who are not medical practitioners; therefore, adequate directions for use cannot be written so that a layperson can use these drugs safely for their intended purposes. Thus, your walnut products are also misbranded under section 502(f)(1) of the Act, in that the labeling for these drugs fails to bear adequate directions for use [21 U.S.C. § 352(f)(1)]."

This verbiage makes it clear that the FDA does not even consider the underlying science when censoring truthful, non-misleading



AS WE SEE IT

FDA Allows Potato Chips to Be Advertised as “Heart Healthy”

Frito-Lay® is a subsidiary of the **PepsiCo, Inc.**, makers of Pepsi-Cola. Frito-Lay® sells **\$12 billion** a year of products that include:

Lays® Potato Chips
Doritos®
Tostitos®
Cheetos®
Fritos®

You might not associate these mostly-fried snack foods as being good for you, but the **FDA** has no problem allowing the **Frito-Lay®** website to state the following:

“Frito-Lay® snacks start with real farm-grown ingredients. You might be surprised at how much good stuff goes into your favorite snack. Good stuff like potatoes, which naturally contain vitamin C and essential minerals. Or corn, one of the world’s most popular grains, packed with thiamin, vitamin B6, and phosphorous—all necessary for healthy bones, teeth, nerves and muscles.

“And it’s not just the obvious ingredients. Our all-natural sunflower, corn and soybean oils contain good polyunsaturated and monounsaturated fats, which help lower total and LDL ‘bad’ cholesterol and maintain HDL ‘good’ cholesterol levels, which can support a healthy heart. Even salt, when eaten in moderation as part of a balanced diet, is essential for the body.”³⁷

Wow! Based on what Frito-Lay® is allowed to state, it sounds like we should be living on these snacks. Who would want to ingest walnuts, pomegranate, or green tea (which

health claims. The chilling effect on the ability of consumers to discover lifesaving medical information is a wake-up call for all who recognize the ramifications of this latest act of FDA malfeasance.

What the FDA Allows You to Hear

The number of people logging on to the website of Diamond Foods was miniscule. I suspect that before the FDA took this draconian action, hardly anyone even knew this website existed.

What the public hears loud and clear, however, are endless advertisements for artery-clogging junk foods. Fast food chains relentlessly promote their 99-cent double-cheese burger as being *bigger* than their rivals. These advertisements induce many consumers to salivate

for these *toxic calories* that are a contributing cause of coronary artery disease. Yet the FDA does not utter a peep in suggesting that their advertising be curtailed.

On the contrary, the FDA has issued waves of warning letters to companies making foods (pomegranate juice, green tea, and walnuts) that *protect* against atherosclerosis.^{1,32-36} The FDA is blatantly demanding that these companies stop informing the public about the scientifically validated health benefits these foods provide.

The FDA obviously does not want the public to discover that they can reduce their risk of age-related disease by consuming healthy foods. They prefer consumers only learn about mass-marketed garbage foods that shorten life span by increasing degenerative disease risk.



the FDA is attacking) when these fat calorie-laden, mostly-fried carbohydrates are so widely available?

According to the Frito Lay® website, Lays® potato chips are “heart healthy” because the level of **saturated fat** was reduced and replaced with **sunflower oil**.³⁸ Scientific studies do show that when a *polyunsaturated* fat (like sunflower oil) is substituted for *saturated* fat, favorable changes in blood cholesterol occur.³⁹

Fatally omitted from the Frito Lay® website is the fact that **sunflower oil** supplies lots of **omega-6** fats, but **no omega-3s**.⁴⁰ The American diet already contains too many omega-6 fats and woefully inadequate omega-3.

Excess omega-6 fats in the diet in the absence of adequate omega-3s produce devastating effects, including the production of pro-inflammatory compounds that contribute to virtually every age-related disease, including atherosclerosis.⁴¹⁻⁴⁵

For the FDA to allow Frito-Lay® to pretend there are heart benefits to ingesting their unhealthy snack products, while **censoring** the ability of walnut companies to make scientifically substantiated claims, is tantamount to **treason** against the health of the American public.

Don't Forget the Acrylamides

When carbohydrate foods are cooked at high temperature (as occurs when potatoes are fried in sunflower oil to make potato chips), a toxic compound called **acrylamide** is formed.⁴⁶

According to the **National Cancer Institute**, “acrylamide is considered to be a **mutagen** and a **probable human carcinogen**, based mainly on studies in laboratory animals. Scientists do not yet know with any certainty whether the levels of acrylamide typically found in some foods pose a health risk for humans.”⁴⁷

In response to these kinds of concerns, the FDA funded a massive study to ascertain the acrylamide content of various foods. The FDA found that potato chips and other fried carbohydrate foods were especially high in acrylamides.⁴⁸

The FDA, however, has not stopped companies selling high acrylamide-containing fried carbohydrates from promoting these foods as “healthy.”

Pharmaceutical Companies Benefit From FDA's Misdeeds

As the aging population develops coronary atherosclerosis, pharmaceutical companies stand to reap tens of billions of dollars each year in profits. An obstacle standing in their way is scientific

evidence showing that a healthy diet can prevent heart disease from developing in many people.

It is thus in the *economic* interests of pharmaceutical giants that the FDA forcibly **censor** the ability of companies making heart healthy foods to inform the public of the underlying science. The fewer consumers who know the facts about walnuts, pomegranate, and green tea, the greater the demand will be for expensive cardiac drugs, stents, and coronary bypass procedures.

Once again, the FDA overtly functions to enrich Big Pharma, while the public shoulders the financial burden of today's health care cost crisis.

In this particular case, however, **processed food** companies also stand to profit from the FDA's attacks on healthy foods as competition from walnut growers is stifled.





Chilling Effect on Innovation

Headquartered in Stockton, California, Diamond Foods is a processor and marketer of nuts, with distribution in over 80% of US supermarkets. Most of Diamond's 1,700 walnut growers are family farmers with orchards in the heartland of California's Central Valley. Their association with Diamond guarantees a market for their crops and provides the company with high-quality walnuts.

In response to independent scientific studies validating the health benefits of walnuts, Diamond Foods made financial investments to educate the public and supply them with walnuts. With one misguided letter issued by the FDA, all of Diamond Foods's good work was undone.

This kind of bureaucratic tyranny sends a strong signal to the food industry not to innovate in a way that informs the public about foods that protect against disease. While consumers increasingly reach for healthier dietary choices, the federal government wants to deny food companies the ability to convey findings from scientific studies about their products.

FDA/FTC Wants More Control Over What You Are Allowed to Learn

The FDA and FTC (Federal Trade Commission) are proposing new regulations that will stifle the ability of natural food companies to disseminate scientific research findings.

One proposal being discussed within the FTC would require that supplement companies conduct studies analogous to what the FDA requires to approve new drugs. In a perfect world, *Life Extension* would agree with some of the FTC's objectives. As far as we are concerned, the more scientific research to validate a health claim, the better.

The reality is that natural foods do not carry high prescription drug price markups, so it would be economically impossible to conduct the same kinds of voluminous clinical studies as pharmaceutical companies do. As readers of this column know, many of the clinical studies the FDA relies on to approve new drugs are *fraudulent* to begin with. So even if it were feasible to conduct more clinical research on foods and supplements, that still does not guarantee the precise accuracy the FTC is seeking.

If these agency proposals are enacted, consumers will be barred from learning about new ways to protect their health until a food or nutrient meets stringent new requirements. A look at the warn-

ing letter the FDA sent to Diamond Foods is a frightening example of how scientific information can be harshly censored by unelected bureaucrats.

If anyone still thinks that federal agencies like the FDA protect the public, this proclamation that healthy foods are **illegal drugs** exposes the government's sordid charade.

Companies That Sell Healthy Foods Try to Fight Back

The combined sales of the companies attacked by the FDA are only a fraction of those of food giant Frito-Lay®. Yet some of these companies are fighting back against the FDA's absurd position

AS WE SEE IT

that it is illegal to disseminate scientific research showing the favorable effects these foods produce in the body. The makers of pomegranate juice, for example, have sued the FTC for censoring their First Amendment right to communicate scientific information to the public.

As a consumer, you should be outraged that disease-promoting foods are protected by the federal government, while nutritious foods are censored. There is no scientific rationale for the FDA to do this. On the contrary, the dangerous foods ubiquitously advertised in the media are replacing cigarettes as the leading killers in modern society.

The federal government is heavily lobbied by companies selling processed foods. As *Life Extension* revealed long ago, an insidious activity of lobbyists is to incite federal agencies and prosecutors to eliminate free competition in the marketplace.



The simple fact is that walnuts are healthy to eat, while carbohydrates fried in fat are not. The FDA permits companies selling disease-promoting foods to deceive the public, while it suppresses the dissemination of peer-reviewed scientific information about healthy foods.

Now the Good News...

On April 5, 2011, a bipartisan bill was introduced into the House of Representatives called the **Free Speech About Science Act** (H.R. 1364). This landmark legislation protects basic free speech rights, ends censorship of science, and enables the natural health products community to share peer-reviewed scientific findings with the public.

The **Free Speech About Science** bill has the potential to transform medical practice by educating the public about the real science behind natural health.

For this very reason, the bill will encounter opposition. It will be opposed by the FDA since it restricts their ability to censor the dissemination of published scientific data. It will be opposed by drug companies fearing competition from natural health approaches based on diet, dietary supplements, and lifestyle.

The public, on the other hand, wants access to credible information they can use to make wise dietary choices. Please don't let special interests stop this bill.

I ask that each of you log on to our Legislative Action Website (www.lef.org/lac) that enables you to conveniently email and ask your Representative to co-sponsor the **Free Speech About Science Act** (H.R. 1364).

Passage of the **Free Speech About Science Act** will stop fed-



eral agencies from squandering tax dollars censoring what you are allowed to learn about health-promoting foods.

Our Legislative Action Website provides you direct contact with your Representative to let them know that you want H.R. 1364 (**Free Speech About Science Act**) enacted into law.

The letter on the right-hand page is what you can easily send to your Representative by logging on to www.lef.org/lac. Those who don't have Internet access can copy and mail this letter to their Representative in Congress.

For longer life,

William Faloan

"When the people fear their government, there is tyranny; when the government fears the people, there is liberty."

—Thomas Jefferson

To the Honorable:

Please co-sponsor the **Free Speech About Science Act (H.R. 1364)**.

This is critical because more Americans are taking charge of their personal health—determined to improve their diets and emphasize preventive care in order to stay or get healthy. Consumers are looking for reliable information backed by legitimate scientific research to assist in making informed choices.

But FDA regulations currently prohibit producers of food from referring to any scientific study documenting the potential effect of the substance on a health condition. Violation of this ban can result in the FDA declaring common foods to be “unapproved drugs,” the sale of which is subject to large fines and jail. Even cherry growers have been told by the FDA that they face jail if they link to Harvard and other studies outlining the health benefits of cherries for gout or arthritis pain. The FDA has taken these actions against walnut growers as well.

The **Free Speech About Science Act of 2011** provides a limited and carefully targeted change to FDA regulations so that legitimate, peer-reviewed, scientific studies may be referenced by manufacturers and producers without converting a healthy food into an unapproved drug. The bill amends the appropriate sections of current law to allow the flow of legitimate scientific and educational information while still giving the FDA and FTC the right to take action against misleading information and against false and unsubstantiated claims.

The **Free Speech About Science Act**:

- (1) Provides a clear definition of the types of research that may be referenced by growers and manufacturers;
- (2) Ensures that referencing such research does not convert a food or dietary supplement into an “unapproved [and therefore illegal] new drug;”
and
- (3) Does not in any way limit FDA and FTC authority to pursue any fraudulent and misleading statements.

All of us, no matter what our party or views about healthcare, are coming to see the importance of preventive care, or preventing illnesses before they start. Diet, dietary supplements, and lifestyle play a large role in prevention. The FDA should be at the forefront of this. Instead, it is blocking producers from giving consumers truthful scientific information about healthy foods.

The FDA responds that cherries and the like should be subjected to the full FDA approval process. But this would cost as much as a billion dollars. With few exceptions, it is not possible for food producers to assume such costs for natural and therefore non-patentable products.

This is the great Catch-22 of contemporary American medicine. The FDA should find a less expensive way to “vet” natural products. Respected university research suggests that in many cases natural products are safer, more efficacious, and of course much cheaper than drugs. In the meantime, we should modify the law to at least let producers cite valid peer-reviewed science.

Please help me gain the information I need to stay healthy; co-sponsor the **Free Speech About Science Act (H.R. 1364)**!

Name: _____

Address: _____

Email: _____

References

1. Ros E, Nunez I, Perez-Heras A, et al. A walnut diet improves endothelial function in hypercholesterolemic subjects: a randomized crossover trial. *Circulation*. 2004 Apr 6;109(13):1609-14.
2. Feldman EB. The scientific evidence for a beneficial health relationship between walnuts and coronary heart disease. *J Nutr*. 2002 May;132(5):1062S-1101S.
3. Blomhoff R, Carlsen MH, Andersen LF, Jacobs DR Jr. Health benefits of nuts: potential role of antioxidants. *Br J Nutr*. 2006 Nov;96 Suppl 2:S52-60.
4. Mozaffarian D. Does alpha-linolenic acid intake reduce the risk of coronary heart disease? A review of the evidence. *Altern Ther Health Med*. 2005 May-Jun;11(3):24-30; quiz 31, 79.
5. Zhao G, Etherton TD, Martin KR, West SG, Gillies PJ, Kris-Etherton PM. Dietary alpha-linolenic acid reduces inflammatory and lipid cardiovascular risk factors in hypercholesterolemic men and women. *J Nutr*. 2004 Nov;134(11):2991-7.
6. Tapsell LC, Gillen LJ, Patch CS, Batterham M, Owen A, Baré M, Kennedy M. Including walnuts in a low-fat/modified-fat diet improves HDL cholesterol-to-total cholesterol ratios in patients with type 2 diabetes. *Diabetes Care*. 2004 Dec;27(12):2777-83.
7. West SG, Boseka L, Wagner P. Alpha-linolenic acid from walnuts and flax increases flow-mediated dilation of the brachial artery in a dose-dependent fashion. Poster presented at the American Heart Association's 5th Annual Conference on Arteriosclerosis, Thrombosis, and Vascular Biology. San Francisco, CA: May 6, 2004.
8. Iwamoto M, Imaizumi K, Sato M, Hirooka Y, Sakai K, Takeshita A, Kono M. Serum lipid profiles in Japanese women and men during consumption of walnuts. *Eur J Clin Nutr*. 2002 Jul;56(7):629-37.
9. Morgan JM, Horton K, Reese D, et al. Effects of walnut consumption as part of a low-fat, low-cholesterol diet on serum cardiovascular risk factors. *Int J Vit Nutr Research*. 2002 Oct;72(5):341-7.
10. Hu FB, Stampfer MJ, Manson JE, et al. Frequent nut consumption and risk of coronary heart disease in women: prospective cohort study. *BMJ*. 1998 Nov 14;317(7169):1341-5.
11. Chisholm A, Mann J, Skeaff M, et al. A diet rich in walnuts favourably influences plasma fatty acid profile in moderately hyperlipidaemic subjects. *Eur J Clin Nutr*. 1998 Jan;52(1):12-6.
12. de Lorgeril M, Renaud S, Mamelle N, et al. Mediterranean alpha-linolenic acid-rich diet in secondary prevention of coronary heart disease. *Lancet*. 1994 Jun 11;343(8911):1454-9.
13. Maguire LS, O'Sullivan SM, Galvin K, O'Connor TP, O'Brien NM. Fatty acid profile, tocopherol, squalene and phytosterol content of walnuts, almonds, peanuts, hazelnuts and the macadamia nut. *Int J Food Sci Nutr*. 2004 May;55(3):171-8.
14. Sabate J, Fraser GE, Burke K, Knutsen SF, Bennett H, Lindsted KD. Effects of walnuts on serum lipid levels and blood pressure in normal men. *N Engl J Med*. 1993 Mar 4;328(9):603-7.



15. Zambon D, Sabate J, Munoz S, et al. Substituting walnuts for monounsaturated fat improves the serum lipid profile of hypercholesterolemic men and women. A randomized crossover trial. *Ann Intern Med*. 2000 Apr 4;132(7):538-46.
16. Iwamoto M, Imaizumi K, Sato M, et al. Serum lipid profiles in Japanese women and men during consumption of walnuts. *Eur J Clin Nutr*. 2002 Jul;56(7):629-37.
17. Simopoulos AP. Essential fatty acids in health and chronic disease. *Am J Clin Nutr*. 1999 Sep;70(3 Suppl):560S-569S.
18. Hu FB, Stampfer MJ. Nut consumption and risk of coronary heart disease: a review of epidemiologic evidence. *Curr Atheroscler Rep*. 1999 Nov;1(3):204-9.
19. Zibaenezhad MJ, Rezaeizadeh M, Mowla A, Ayatollahi SM, Panjehshahin MR. Antihypertriglyceridemic effect of walnut oil. *Angiology*. 2003 Jul-Aug;54(4):411-4.
20. Almaro RU, Vonghavaravat V, Wong R, Kasim-Karakas SE. Effects of walnut consumption on plasma fatty acids and lipoproteins in combined hyperlipidemia. *Am J Clin Nutr*. 2001 Jul;74(1):72-9.
21. Anderson KJ, Teuber SS, Gobeille A, Cremin P, Waterhouse AL, Steinberg FM. Walnut polyphenolics inhibit in vitro human plasma and LDL oxidation. *J Nutr*. 2001 Nov;131(11):2837-42.
22. Singh I, Turner AH, Sinclair AJ, Li D, Hawley JA. Effects of gamma-tocopherol supplementation on thrombotic risk factors. *Asia Pac J Clin Nutr*. 2007;16(3):422-8.
23. McCarty MF. Gamma-tocopherol may promote effective no synthase function by protecting tetrahydrobiopterin from peroxynitrite. *Med Hypotheses*. 2007;69(6):1367-70.
24. Park SK, Page GP, Kim K, et al. alpha- and gamma-Tocopherol prevent age-related transcriptional alterations in the heart and brain of mice. *J Nutr*. 2008 Jun;138(6):1010-8.
25. Cortés B, Núñez I, Cofán M, et al. Acute effects of high-fat meals enriched with walnuts or olive oil on postprandial endothelial function. *J Am Coll Cardiol*. 2006 Oct 17;48(8):1666-71.
26. Ros E, Mataix J. Fatty acid composition of nuts—implications for cardiovascular health. *Br J Nutr*. 2006 Nov;96 Suppl 2:S29-35.
27. Ma Y, Njike VY, Millet J, et al. Effects of walnut consumption on endothelial function in type 2 diabetic subjects: a randomized controlled crossover trial. *Diabetes Care*. 2010 Feb;33(2):227-32.
28. Le Brocq M, Leslie SJ, Milliken P, Megson IL. Endothelial dysfunction: from molecular mechanisms to measurement, clinical implications, and therapeutic opportunities. *Antioxid Redox Signal*. 2008 Sep;10(9):1631-74.
29. Ros E. Nuts and novel biomarkers of cardiovascular disease. *Am J Clin Nutr*. 2009 May;89(5):1649S-56S.
30. Feldman EB. The scientific evidence for a beneficial health relationship between walnuts and coronary heart disease. *J Nutr*. 2002 May;132(5):1062S-1101S.
31. Ristic-Medic D, Ristic G, Tepsic V. Alpha-linolenic acid and cardiovascular diseases. *Med Pregl*. 2003;56 Suppl 1:19-25.
32. Available at: <http://www.fda.gov/ICECI/EnforcementActions/WarningLetters/ucm202825.htm>. Accessed March 26, 2010.
33. 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.
34. Oyama J, Maeda T, Kouzuma K, et al. Green tea catechins improve human forearm endothelial dysfunction and have antiatherosclerotic effects in smokers. *Circ J*. 2010 Mar;74(3):578-88.
35. Available at: <http://www.fda.gov/ICECI/EnforcementActions/WarningLetters/ucm202785.htm>. Accessed April 11, 2011.
36. Available at: <http://www.fda.gov/ICECI/EnforcementActions/WarningLetters/ucm224509.htm>. Accessed April 11, 2011.
37. Available at: <http://www.fritolay.com/your-health/whats-in-our-snacks.html>. Accessed March 25, 2010.
38. Available at: <http://www.fritolay.com/about-us/press-release-20060503.html>. Accessed March 25, 2010.
39. Jakobsen MU, O'Reilly EJ, Heitmann BL, et al. Major types of dietary fat and risk of coronary heart disease: a pooled analysis of 11 cohort studies. *Am J Clin Nutr*. 2009 May;89(5):1425-32.
40. Scherr C, Ribeiro JP. Fat content of dairy products, eggs, margarines and oils: implications for atherosclerosis. *Arq Bras Cardiol*. 2010 Jul;95(1):55-60.
41. Available at: <http://www.kedu.us/Ask%20the%20Doctor/omega%203%20cardiovascular.pdf>. Accessed March 29, 2010.
42. Simopoulos AP. The importance of the omega-6/omega-3 fatty acid ratio in cardiovascular disease and other chronic diseases. *Exp Biol Med (Maywood)*. 2008 Jun;233(6):674-88.
43. Okuyama H, Kobayashi T, Watanabe S. Dietary fatty acids—the N-6/N-3 balance and chronic elderly diseases. Excess linoleic acid and relative N-3 deficiency syndrome seen in Japan. *Prog Lipid Res*. 1996 Dec;35(4):409-57.
44. Kiecolt-Glaser JK, Belury MA, Porter K, et al. Depressive symptoms, omega-6:omega-3 fatty acids, and inflammation in older adults. *Psychosom Med*. 2007 Apr;69(3):217-24.
45. Guebre-Egziabher F, Rabasa-Lhoret R, Bonnet F, et al. Nutritional intervention to reduce the n-6/n-3 fatty acid ratio increases adiponectin concentration and fatty acid oxidation in healthy subjects. *Eur J Clin Nutr*. 2008 Nov;62(11):1287-93.
46. Jackson LS, Al-Taher F. Effects of consumer food preparation on acrylamide formation. *Adv Exp Med Biol*. 2005 561:447-65.
47. Available at: http://www.cancer.gov/cancertopics/factsheet/Risk/Fs3_96.pdf. Accessed April 11, 2010.
48. Available at: <http://www.fda.gov/food/foodsafety/foodcontaminants/adulteration/chemicalcontaminants/acrylamide/ucm053569.htm>. Accessed April 11, 2011.





ADVANCED Anti-Adipocyte FORMULA

CELLULAR SUPPORT FOR HEALTHY BODY WEIGHT

If you're struggling to maintain healthy body weight, you're not alone. Up to **65%** of Americans face the same challenge.¹ Even a modest increase in fat pounds can have an impact on overall health, especially when it's stubborn belly or visceral fat.

The problem is that conventional methods to combat *age-related* changes that predispose us to weight gain have proven *ineffective*. Adjustments in diet and lifestyle alone are often not enough. But there's hope . . .

State-of-the-Art Dual Plant Extract Technology

To help maturing individuals deal effectively with this serious health issue, **Life Extension®** introduces

a brand new, clinically validated solution: **Advanced Anti-Adipocyte Formula with AdipoStat.**

AdipoStat is the first dietary intervention to support healthy body weight using these innovative approaches.² Through multiple pathways, it targets the mechanisms by which fat-storing cells or **adipocytes** become bloated and metabolically dysfunctional.

This widely overlooked *cellular* condition leads to excess fat accumulations in the belly and throughout your body.

After careful scientific analysis of over **1,000** plant extracts,² researchers identified the two species included in **AdipoStat** that target adipocytes: ***Sphaeranthus indicus*** flower (*S. indicus*) and the **mangosteen** fruit (*Garcinia mangostana*).

Optimal results were shown in studies when these two **plant extracts** were combined.

Three Ways to Fight Fat Cell Derangements

AdipoStat functions via the following mechanisms to support healthy body weight:²

1. **AdipoStat** targets adipocyte (fat cell) creation.
2. **AdipoStat** impedes adipocyte growth (adipogenesis).
3. **AdipoStat** induces fat in adipocytes to break down (lipolysis).

Success in Clinical Trials

AdipoStat's performance in clinical studies indicates it can safely deliver impressive results.

In a key study, 30 adults with difficulty maintaining healthy body weight ingested **800 mg per day of AdipoStat** while following a 2,000-calorie-per-day diet and were asked to walk just 30 minutes five days a week. A group of equal size was given placebo.³

After just eight weeks, the **AdipoStat** group:

- Lost **4.05 inches** of harmful belly fat—**2.0** times the placebo group.
- Experienced a **2.05** drop in body mass index (BMI)—**3.9** times over placebo.
- Shed **11.4 pounds** of total body weight—**3.7** times over placebo.

These improvements began to emerge after just **14 days**.³

After eight weeks, the **AdipoStat** group saw a noticeable drop in **waist-to-hip ratio**,³ indicating they experienced **fat loss** in the **abdominal** area, where excess fat mass is associated with serious health issues.

They also exhibited favorably elevated levels of a hormone called **adiponectin**.² Adiponectin sends command signals that determine how big your fat cells get, how much they break down (*lipolysis*), and how often they are produced (*adipogenesis*).⁴

A second human clinical trial yielded similar results, confirming **AdipoStat**'s beneficial effects.²

The New AdipoStat Formulas

There are two ways you can easily incorporate **AdipoStat** into your daily supplement program.

The first option is to take **AdipoStat** by itself. The daily dose of one vegetarian capsule of **Advanced Anti-Adipocyte Formula** taken 30 minutes before each of the two heaviest meals of the day provides:

AdipoStat Proprietary Blend **800 mg**
(*Sphaeranthus indicus* extract and
Garcinia mangostana extract)

Caution: These products are designed to target several critical factors involved in age-related weight gain. Those who ingest more calories than what their body has the metabolic capacity to utilize will not see results. This is because some people are ingesting so many excess calories that no matter how much their metabolic rate is increased, or how much improvement occurs in their after-meal blood sugar and triglyceride levels, or by how much youthful insulin sensitivity and other body fat-regulating systems are restored, they are overwhelming the metabolic capacity to utilize these calories. This will result in excess calories being stored in adipocytes. One cannot consume limitless calories and expect to shed fat pounds by taking drugs, nutrients, and/or hormones that demonstrate weight loss in clinical studies.

These supplements should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.

*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.

The second option enables consumers to obtain the same dose of **AdipoStat** along with the highly popular **Integra-Lean**® (*Irvingia gabonensis*). **Irvingia** operates via additional mechanisms to combat surplus fat storage, including inhibition of **glycerol-3-phosphate dehydrogenase**,⁵ an enzyme involved in the conversion of glucose and triglycerides into adipocyte fat storage.

The **Advanced Anti-Adipocyte Formula with AdipoStat and Integra-Lean**® supplies **800 mg** of **AdipoStat** and **300 mg** of proprietary *Irvingia* extract in the same suggested daily serving of one vegetarian capsule before each of the two heaviest meals.



Advanced Anti-Adipocyte Formula with AdipoStat

Item # 01510

A bottle containing **60** vegetarian capsules of **Advanced Anti-Adipocyte Formula with AdipoStat** retails for \$35. If a member buys four bottles, the price is reduced to just **\$24** per bottle.



Advanced Anti-Adipocyte Formula with AdipoStat and Integra-Lean® African Mango Irvingia

Item # 01509

A bottle containing **60** vegetarian capsules of **Advanced Anti-Adipocyte Formula with AdipoStat and Integra-Lean**® African Mango *Irvingia* retails for \$39. If a member buys four bottles, the price is reduced to just **\$27** per bottle.

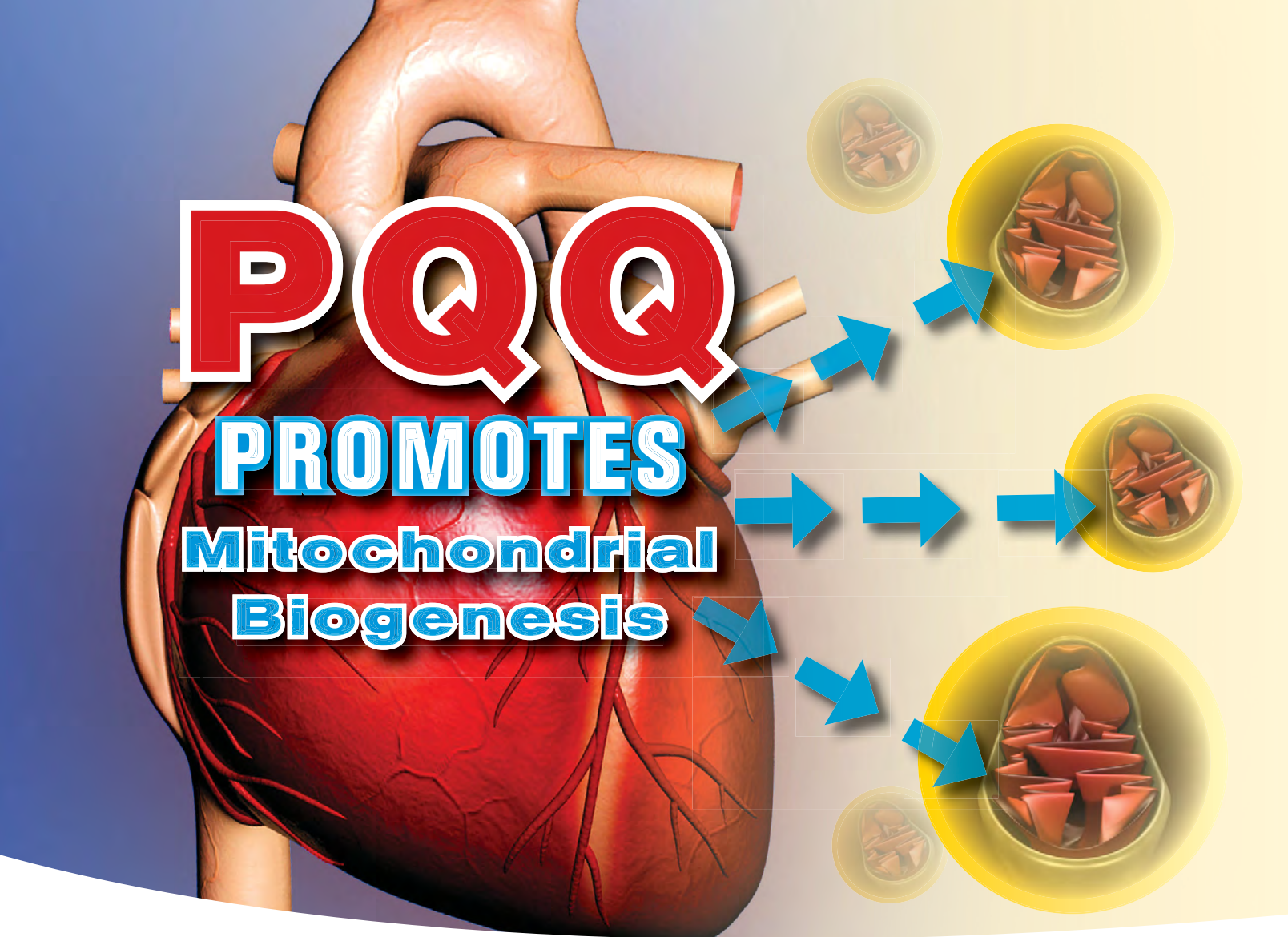
Integra-Lean® *Irvingia* is protected by U.S. Patent No. 7,537,790. Other patents pending. **AdipoStat** is a proprietary ingredient derived from natural plant extracts exclusively distributed by InterHealth N.I.

References

1. Available at: http://www.usatoday.com/news/health/2003-05-13-obesity-usat_x.htm. Accessed April 29, 2011.
2. Results based on initial analyses of unpublished research data.
3. Adapted from FASEB J. April 2011; 25:(Meeting Abstract Supplement) 601.9. Presented at Experimental Biology 2011, Washington, DC. April 10, 2011. Program No. 601.9, Poster No. A278.
4. J Mol Med. 2002 Nov;80(11):696-702.
5. Lipids Health Dis. 2008 Nov 13;7:44.

To order either of the new Advanced Anti-Adipocyte Formulas

call **1-800-544-4440** or visit
www.LifeExtension.com



PQQ

PROMOTES

Mitochondrial Biogenesis

Critical Importance of Mitochondria

Back in 1983, **Life Extension®** was the first to introduce **CoQ10** as a proven method to enhance **mitochondrial** energy production.

CoQ10 has since gained universal recognition for its role in supporting cellular performance throughout the body.¹⁻⁶

In an unprecedented breakthrough, a compound called **PQQ** (*pyrroloquinoline quinone*) has been shown to support **mitochondrial biogenesis**—the spontaneous generation of **new mitochondria** in aging cells.⁷ **PQQ** is available as a low-cost dietary supplement.

Mitochondria are cellular energy generators that supply virtually all the power your body requires for a healthy life span. An abundance of published studies underscores the critical importance of the **mitochondria** to overall health, especially as we age.⁸⁻¹⁴ Energy-intensive organs like the heart and brain are *dense* with mitochondria.

Until recently, the only natural ways for aging individuals to increase the number of mitochondria in their bodies were long-term calorie restriction or exhaustive physical activity—which are difficult or impractical for most people to implement.

PQQ offers a viable alternative.

The Ultimate Cell Rejuvenator

The enormous amount of energy generated within the mitochondria exposes them to constant free radical attack. The resulting **mitochondrial decay** is a hallmark of aging.

PQQ protects and augments delicate mitochondrial structures to promote *youthful* cellular function in **three** distinct ways:

- **Antioxidant power.** Like CoQ10, **PQQ** is a highly potent antioxidant. Its extraordinary molecular stability enables it to facilitate thousands of biochemical reactions in the mitochondria without breaking down, for maximum antioxidant and bioenergetic support.¹⁵
- **Favorably modulates gene expression.** PQQ activates *genes* that promote formation of new mitochondria⁷—and beneficially interacts with genes directly involved in mitochondrial health. These same genes also support **healthy body weight**, normal **fat** and **sugar metabolism**, and **youthful cellular proliferation**.¹⁶
- **Mitochondrial defense.** Mitochondria possess their *own* DNA, distinct from the DNA contained in the nucleus. Unfortunately, compared to nuclear DNA, mitochondrial DNA is relatively unprotected. PQQ's antioxidant potency and favorable gene expression profile act to support mitochondrial defense.

Vital Protection for the Aging Heart and Brain

PQQ is an **essential nutrient**, meaning your body cannot make it on its own. A growing body of research indicates that PQQ's unique nutritional profile supports heart health and cognitive function— alone and in combination with CoQ10.^{17,18} This comes as no surprise, given how much energy these vital organs need.

Research shows that **PQQ** supports **heart cell function** in the presence of free radicals and promotes blood flow in heart muscle.¹⁹

When taken in combination with **CoQ10**, just **20 mg per day** of **PQQ** has been shown to promote **memory, attention, and cognition** in maturing individuals.²⁰

A Breakthrough Weapon in the Battle Against Aging

Life Extension® has identified a purified, highly potent form of PQQ from Japan that is produced through a natural fermentation process. The result is the highest quality PQQ available on the market today called **BioPQQ™**.

A bottle containing **30 10 mg** vegetarian capsules of **PQQ Caps with BioPQQ™** retails for \$24. If a member buys four bottles, the price is reduced to just **\$16.50** per bottle.

A 10 mg dose of **PQQ** is also included in the **Mitochondrial Energy Optimizer** and **Mitochondrial Basics** formulas.

Contains rice.



Item #01500

To order
PQQ Caps with BioPQQ™
standalone or any other
PQQ-containing formula
call 1-800-544-4440 or visit
www.LifeExtension.com

BioPQQ™ is a trademark of MGC (Japan)

References

1. *Mitochondrion*. 2007 Jun;7 Suppl:S103-11.
2. *Mech Ageing Dev*. 1978 Mar;7(3):189-97.
3. *Arch Biochem Biophys*. 1992 Jun;295(2):230-4.
4. *Lipids*. 1989 Jul;24(7):579-84.
5. *Biogerontology*. 2002;3(1-2):37-40.
6. *Exp Gerontol*. 2004 Feb;39(2):189-94.
7. *J Biol Chem*. 2010 Jan 1;285:142-52.
8. *Biochimie*. 1999 Dec;81(12):1131-2.
9. *Lancet*. 1989 Mar 25;1(8639):642-5.
10. *Curr Opin Clin Nutr Metab Care*. 2010 Jul 7.
11. *Age (Dordr)*. 2010 Mar 20.
12. *Ageing Res Rev*. 2010 Jun 25.
13. *Cell Mol Life Sci*. 2010 Jun 25.
14. *Zhonghua Yi Xue Za Zhi (Taipei)*. 2001 May;64(5):259-70.
15. *J Nutr*. 2000 Apr;130(4):719-27.
16. Entrez Gene: PARGC1A peroxisome proliferator-activated receptor gamma, coactivator 1 alpha [Homo sapiens] GeneID: 10891.
17. *Cardiovasc Drugs Ther*. 2004 Nov;18(6):421-31.
18. *J Cardiovasc Pharmacol Ther*. 2006 Jun;11(2):119-28.
19. *Biochem Biophys Res Commun*. 2007 Nov 16;363(2):257-62.
20. *FOOD Style*. 2009;21:13(7)50-3. [Tokyo].



GREEN TEA EXTRACT

Large volumes of published **scientific findings** validate the multiple health benefits of **green tea**.

The active constituents in green tea are **polyphenols**, with **epigallocatechin-3-gallate (EGCG)** being the most powerful. The antioxidant activity of **EGCG** is about **25-100 times** more potent than **vitamins C** and **E**.

When Life Extension® introduced the first **standardized green tea extract** in **1993**, the supplement was very expensive. As more research was published about green tea's multifaceted benefits, more companies competed to make **higher-potency** extracts at **lower** prices.

The good news for consumers is that they can obtain **high-potency** **standardized** green tea extract capsules at a fraction of the prices charged just five years ago.

The Life Extension Foundation Buyers Club offers **98% green tea extracts** in either a **lightly caffeinated** or **decaffeinated** form. These **98%** extracts are **standardized** to provide high potencies of critical **EGCG**, the most important **polyphenol** found in green tea. Each capsule of **Mega Green Tea Extract** provides **more** polyphenols than are found in three cups of green tea.

These highly concentrated **Mega Green Tea Extract Caps** contain **725 mg** of either **lightly caffeinated** or **decaffeinated 98% standardized green tea** extracts. The retail price for a **100 vegetarian capsules bottle of Mega Green Tea Extract** is **\$28**.

If a member buys four bottles of 725-mg **Mega Green Tea Extract** capsules, the price is reduced to **\$19.88 per bottle**.

Contains rice.



Item #00953

Item #00954

To order Mega Green Tea Extract,
call 1-800-544-4440
or visit www.LifeExtension.com



IN THE NEWS

Green Tea Polyphenols Protect and Benefit Skin

A report published in the *Journal of Nutrition* describes protective benefits of green tea polyphenols against ultraviolet light-induced skin damage, as well as an ability to improve skin elasticity and density.*

Sixty women were assigned a green tea beverage or a control beverage daily for twelve weeks. Before the treatment period and at six and twelve weeks, participants received a dose of irradiation to the skin from a solar simulator.

Ultraviolet-induced reddening of the skin was reduced by 16% after six weeks and 25% at 12 weeks compared to pretreatment responses among those who received green tea, indicating increased photoprotection. Skin elasticity, density, hydration, blood flow, and oxygen saturation increased in those who received green tea, while roughness, volume, and scaling declined.

"These observed skin changes were probably an outcome associated with long-term consumption of green tea polyphenols and not likely a transitory response," the authors note.

Editor's note: The authors remark that, "The mechanisms underlying photoprotective effects of flavonoids in humans have not been elucidated; however, they are efficient antioxidants contributing to photoprotection in plants."

—D. Dye

* *J Nutr.* 2011 Apr 27.

Apigenin May Help Protect Against Synthetic Hormone Replacement Risk

A flavonoid found in celery, apples, and other plant foods could help decrease the likelihood of developing breast cancer experienced by women using progestins: synthetic hormones which have been associated with increased breast cancer risk.

Salman M. Hyder and colleagues describe their findings in an article published in *Cancer Prevention Research*.^{*} They evaluated the effect of apigenin in a rat model of progestin-accelerated mammary cancer in which tumors were induced by the carcinogen DMBA. Three weeks following injection with DMBA, rats received apigenin or a control substance daily for one week, followed by implantation with the progestin medroxyprogesterone acetate or a placebo.

The researchers observed a delay in the development of tumors as well as a reduction in their incidence and multiplicity among animals that received apigenin compared with those that did not receive the compound. Dr. Hyder believes the finding could benefit women who currently use progestins in combination with estrogen as hormone therapy for menopausal symptoms.

Editor's note: Dr. Hyder noted that, "It appears that keeping a minimal level of apigenin in the bloodstream is important to delay the onset of breast cancer that progresses in response to progestins such as MPA. It's probably a good idea to eat a little parsley and some fruit every day to ensure the minimal amount. However, you can also find this compound in pill supplements in the health food section of many stores." This study corroborates the carcinogenic effect of synthetic progestin drugs and provides further rationale to use natural progesterone instead.

—D. Dye

* *Cancer Prev Res.* 2011 Apr 19.



Epicatechin Extends Life Span in Fruit Flies and Diabetic Mice

The *Journal of Nutrition* published the finding of researchers at Virginia Tech University of increased survival in fruit flies and obese diabetic mice that were given epicatechin, a flavonoid compound that occurs in tea and cocoa.*

Five-week-old diabetic mice were divided to receive regular drinking water or water containing epicatechin for 15 weeks. At the end of the study, 50% of the untreated diabetic mice had died, compared with only 8.4% of those that received epicatechin. Treatment with epicatechin was associated with a reduction in aortic vessel and liver degeneration, as well as less liver fat deposition compared to untreated animals.

In another experiment, the researchers gave fruit flies diets that provided varying concentrations of epicatechin or no epicatechin for up to 72 days. Flies that received the three highest concentrations of epicatechin exhibited a significant increase in mean life span.

Editor's note: Mice that received epicatechin also experienced decreases in low-density lipoprotein cholesterol, insulin-like growth factor-1 (IGF-1) and markers of inflammation, as well as increases in skeletal muscle function and liver antioxidant glutathione and superoxide dismutase (one of the body's antioxidants) activity, all of which are associated with a healthier and longer life span.

—D. Dye

* *J Nutr.* 2011;141(6):1095-100.



Lower Testosterone May Lead to Glucose Intolerance in Men

An article in the journal *Endocrinology and Nutrition* submitted by the Hospital Universitario Central de Asturias, Oviedo, Spain, studied the relationship between glucose tolerance and plasma testosterone concentrations in men.* The objective of the study was to evaluate circulating levels of total testosterone, SHB, and bioavailable testosterone in the cohort of the Asturias Study and their association with the degree of glucose tolerance and metabolic syndrome.

The study included the evaluation of 282 men aged 36 to 85 years old with normal concentrations of total testosterone. Serum concentrations of testosterone and bioavailable testosterone were negatively correlated with age, body mass index, waist circumference, blood glucose, glycated hemoglobin levels, and insulin. Serum concentrations of total testosterone, bioavailable testosterone and SHBG were lower in men with glucose intolerance or diabetes than in those with normal glucose tolerance.

The study concluded that men with lower plasma concentrations of total testosterone—even when within the normal range—have an increased risk of glucose intolerance or diabetes, regardless of age and body mass index.

—J. Finkel



* *Endocrinol Nutr* 2011 Jan 5.

Curcumin Compound Boosts Head and Neck Cancer Therapy

Archives of Otolaryngology–Head and Neck Surgery published the finding of a benefit for a derivative of curcumin, which occurs in the spice turmeric, in the treatment of head and neck cancer with cisplatin, a platinum-based chemotherapeutic drug.* The development of chemotherapy-resistant tumor cells is a major cause of treatment failure in head and neck cancer, resulting in relapse or metastasis.

University of Michigan professor of otolaryngology and pharmacology Thomas Carey, PhD, and his associates evaluated the effects of varying doses of cisplatin or cisplatin combined with the curcumin-derived compound FLLL32 on cisplatin-sensitive and cisplatin-resistant cultured head and neck cancer cell lines. FLLL32 added to a low dose of cisplatin was found to be as effective at inducing programmed cell death in cisplatin-resistant cells as four times as much cisplatin alone.

“This work opens the possibility of using lower, less toxic doses of cisplatin to achieve an equivalent or enhanced tumor kill,” he remarked.

Editor's note: FLLL32 reduced activation of the protein known as signal transducer and activator of transcription 3 (STAT3), which is elevated in approximately 82% of head and neck cancers and has been associated with cisplatin resistance.

—D. Dye

* *Arch Otolaryngol Head Neck Surg.* 2011;137(5):499-507.

Lung Disease Patients Benefit From High-Dose Vitamin D

A new study suggests that among people who have chronic obstructive pulmonary disease (COPD), taking a high-dose supplement of vitamin D may increase their exercise capacity and strength of respiratory muscles.*

The findings, which were presented at the recent American Thoracic Society conference in Denver, show that a monthly dose of 100,000 IU (international units) of vitamin D given to COPD patients showed significant improvements in exercise capacity and respiratory muscle strength compared to a placebo group.

COPD is an affliction suffered mostly by smokers. It is described as chronic inflammation in the small airways of the lung and leads to too much mucous production, excessive fibrous connective tissue development, otherwise known as fibrosis, and degradation of proteins (proteolysis).

The United States government currently recommends 600 IU of vitamin D per day for adults up to age 70 and 800 IU daily for people over 70 years old, which are woefully inadequate doses.

"Low levels of vitamin D in the blood have been related with muscle weakness, a major target for respiratory rehabilitation and increased risk of falls," said Miek Hornikx from the Katholieke Universiteit Leuven in Belgium.

"These results support the idea that correcting vitamin D deficiency by adding vitamin D supplements to training programs allows COPD patients to achieve better results from rehabilitation, including improvements in muscle strength and exercise capacity," she added.

Editor's note: This study validates the safety and efficacy of roughly 3,333 IU daily of vitamin D. Life Extension has long stated that the recommended amount of vitamin D for adults by the FDA was low.

—J. Finkel

* Presented at the International Thoracic Society Conference, May 13-18, Denver, Colorado.

Review Recommends Bone-Building Nutrients Before Drugs

A review published in the journal *Nutrients* concludes that calcium and vitamin D supplements should be tried before resorting to drugs to help maintain normal bone density.*

For their review, Karen Plawecki and Karen Chapman-Novakofski of the University of Illinois selected 62 human studies conducted over the past decade that evaluated the impact on bone health of calcium and vitamin D from food, calcium and vitamin D from supplements, other bone health-related nutrients, and portfolio diets, such as the DASH and Mediterranean diets. The researchers confirmed a benefit for supplements, food-based interventions and educational strategies on bone health. The findings suggest nutrition therapies as first-line treatments for those at risk of osteoporosis, particularly in light of the side effects associated with pharmaceutical agents used to treat the condition.

"I suspect that many doctors reach for their prescription pads because they believe it's unlikely that people will change their diets," Dr. Chapman-Novakofski remarked.

Editor's note: Dr. Plawecki, who is the director of the University of Illinois' dietetics program, recommends adopting a portfolio diet that provides numerous beneficial nutrients, including high amounts of magnesium and potassium in addition to calcium.

—D. Dye

* *Nutrients*. 2010 Nov 8.

Study Reveals That Many Americans Are Not Getting Enough Calcium

The *Journal of the American Dietetic Association* published the conclusion of researchers at Yale University and the University of Connecticut that many older Americans have an insufficient intake of calcium.*

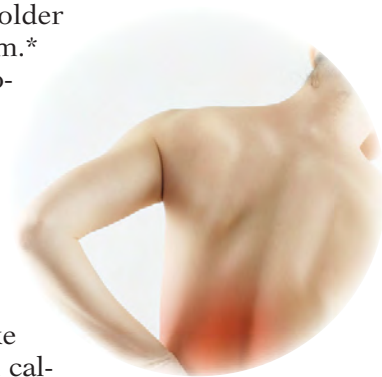
Jane E. Kerstetter, RD, PhD, and her associates analyzed data from 9,475 adults enrolled in the National Health and Nutrition Examination Survey 2003-2006. Dietary interviews ascertained calcium intake from both food and supplements. While total calcium intake increased with age, insufficiency remained prevalent among older adults.

"In light of evidence that energy intake declines with aging, calcium dense foods and calcium supplements become vital factors in maintaining adequate calcium intake across the life span," Dr. Kerstetter commented. "Encouraging calcium supplementation is an established approach to addressing this issue in the clinical setting—one that needs additional emphasis in order to promote more frequent and sufficient supplementation in meeting adequate intake levels."

Editor's note: Adequate intake of the mineral has been defined by the Institute of Medicine as 1,000 milligrams per day for adults aged 19 to 50 years and 1,200 milligrams per day for those over 50.

—D. Dye

* *J Am Diet Assoc*. 2011 May;111(5):687-95.



Memory Loss Linked to Metabolic Syndrome

Aging humans with indications of the metabolic syndrome, which include high blood pressure, increased fat around the waist, and other risk factors may be more susceptible to succumbing to memory loss, according to a recent study published in the online issue of *Neurology*, the medical journal of the *American Academy of Neurology*.*

Metabolic syndrome is often defined as having three or more of the following risk factors: high blood sugar and low high-density lipoprotein (HDL), high blood pressure, excess fat around the waist, and higher than normal triglycerides (a type of fat found in the blood).

Seven thousand eighty-seven people age 65 and older from three French cities were used in the study. After initial testing, 16% of the subjects had metabolic syndrome. All the people in the study were given a series of memory and cognitive function tests over two- and four-year periods. The tests included a memory test, a test of visual working memory and a test of word fluency. The results indicated that people who had metabolic syndrome were 20% more likely to have cognitive decline on the memory test than those who did not have metabolic syndrome. Similar negative outcomes were shown with the other tests as well.

—J. Finkel

* <http://www.aan.com/press/index.cfm?fuseaction=release.view&release=897>. Accessed February 8th, 2011.

Johnson & Johnson Settles Bribery Complaint for \$70 Million

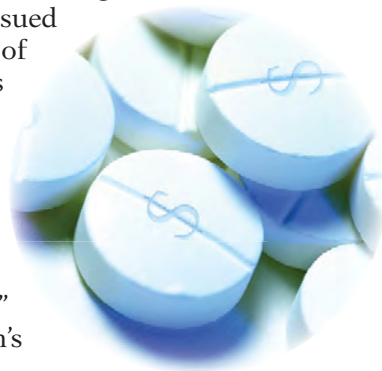
Big Pharma giant Johnson & Johnson admitted bribing European doctors and agreed to pay \$70 million in civil and criminal court, according to a recent article in *The New York Times*.*

The bribes were so egregious that one copy of an internal company e-mail stated that providing “cash incentives to surgeons is common knowledge in Greece,” and that, were the company to stop paying bribes, “we’d lose 95% of our business by the end of the year.”

Robert Khuzami, director of the Securities and Exchange Commission’s division of enforcement, said that the company tried to hide its activities by “using sham contracts, off-shore companies and slush funds.”

These heinous acts are just the most recent in a string of missteps by Johnson & Johnson, which has issued more than 50 product recalls since the start of last year involving such household brands as Tylenol®, Motrin®, Roloids®, and Benadryl®. It also recalled two popular hip implants that a recent study suggested might fail soon after surgery in close to half of the patients who received them.

“We are deeply disappointed by the unacceptable conduct that led to these violations,” said William C. Weldon, Johnson and Johnson’s chairman and chief executive, said.



—J. Finkel

* <http://www.nytimes.com/2011/04/09/business/09drug.html>

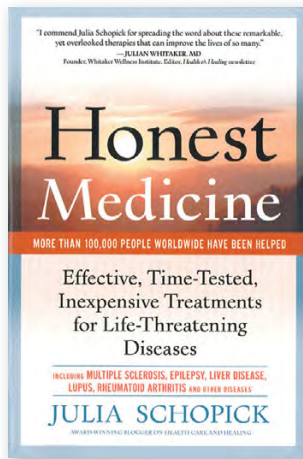
Life Extension Magazine® Now Available to Kindle Owners!

For *Life Extension* readers who own the Amazon Kindle e-reader, you can now download your favorite magazine to your device and read it on the go. Once you set up your subscription to your Kindle, your *Life Extension Kindle Magazine* is auto-delivered wirelessly to your device when the physical issue hits the newsstand. Kindle magazines are fully downloaded

onto your Kindle so you can read them even when you’re not wirelessly connected. For set-up and ordering information, type in “Life Extension Magazine” in the search engine of the Kindle Store on Amazon.com. You must have a Kindle device to order this product.



BOOK REVIEW



HONEST MEDICINE:

Effective, Time-Tested, Inexpensive Treatments
for Life-Threatening Diseases

BY JULIA SCHOPICK

When it comes down to it, honesty is all most people really want from the medical field. What works? What doesn't work? Those are the main questions people want answered. Unfortunately, with Big Pharma money lining the pockets of the FDA with one hand and cutting doctors checks behind the backs of regulators with the other, very few doctors are in a position to offer objective advice about any of the available remedies for traditional deadly diseases. That's where award-winning health care blogger Julia Schopick's book *Honest Medicine* comes in.

The book is written in honor of her late husband, Timothy Fisher, who lived fifteen years after having surgery for a brain tumor the size of an orange. The doctors only gave him three years to live, but through Schopick's tireless research, she and her husband discovered diet changes and supplements that kept Mr. Fisher alive for twelve years beyond his original prognosis.

In Schopick's own words: "This book is written because of Tim. And this book is written for you and your loved ones. Because I want you to find the potentially lifesaving treatments your doctor probably doesn't know about—treatments like those that helped Tim live years beyond his doctors' prognoses—so that you can find them before it's too late."

The focus of this book addresses three treatments, all available in the United States, the United Kingdom, and Canada: intravenous alpha-lipoic acid, the ketogenic diet, and low-dose naltrexone. As you'll see in this book, these treatments have been around for decades and have benefited thousands of patients, from those that are extremely sick to those with chronic, debilitating diseases. In addition, the shocking reality is that these treatments often work for condi-

tions where conventional medicine doesn't offer successful solutions.

To highlight the success of the treatments she writes about, Schopick shines a light on what she calls "Champions," or people who have it "as their mission to get the message out about treatments that have saved many, many lives." As she says, "with all three of these treatments, my heroes would not let people keep dying or get worse by using the standard-of-care treatments their doctors were encouraging them to use."

In the example of intravenous alpha-lipoic acid, Dr. Burt Berkson writes about his time as the principal FDA investigator for the intravenous use of alpha-lipoic acid (ALA). What did he find? His words are chilling, but will be very familiar to *Life Extension*® readers: "Personally, I also believe that because ALA is effective for many different diseases, no pharmaceutical company wants to go through the expensive clinical trial approval process. In order to make the most money, they want one medication per disease... In other words, alpha-lipoic acid could save lives, but because it was such an inexpensive substance and natural product, it would not make anyone a significant amount of money."

For those not familiar with the concept of Big Pharma placing profits over saving lives, the above words are a brisk eye-opener. *Honest Medicine* is filled with examples and tales of average people going from passive patients to powerful advocates for their own health. Readers will be hooked as they follow along with the people Schopick has chosen as they discover the overlooked cures that saved their lives, and may one day save yours or a loved one's.

To obtain the book, *Honest Medicine*, visit www.amazon.com.



Higher Potency ArthroMax™

Full-Spectrum Joint Support
Now with Standardized Theaflavins

As we age, structural alterations occur in our joints, leading to painful inflammation, discomfort, and loss of mobility.

ArthroMax™ is a multi-nutrient formula designed to provide broad-spectrum support for aging joints and cartilage. Based on recent scientific findings, **ArthroMax™ has been improved with higher potencies and an exciting new ingredient.**

ArthroMax™ contains more **glucosamine sulfate** along with a special **Boswellia extract** known as **5-LOXIN®**. Glucosamine sulfate provides underlying structural foundation for joints, while **5-LOXIN®** inhibits the **5-lipoxygenase** enzyme, thereby reducing levels of pro-inflammatory **leukotriene B4**.*

Key New Ingredient... Black Tea Theaflavins

Inflammatory reactions are regulated by a series of "cytokines" produced in the body. Normal aging results in an unfavorable balance of these **cytokines** that contributes to persistent inflammatory conditions. New studies have shown that a special fraction found in **black tea** suppresses proinflammatory cytokines at the genomic level. Scientists have found that these compounds called **theaflavins** uniquely down-regulate the expression of genes and cytokines associated with inflammatory conditions.

5-LOXIN® is used under license by P.L. Thomas-Laila Nutra LLC and is registered in the United States and other countries. International Patents Pending.

FruiteX B® and OsteoBoron® are a registered trademark of VDF FutureCeuticals, Inc. U.S. Patent #5,962,049.

ArthroMax™ formula provides these bioactive **theaflavin** fractions, along with **methylsulfonylmethane (MSM)**, which contains sulfur components that are critically important in maintaining comfortable joint function.* **ArthroMax™** also contains **FruiteX B® OsteoBoron®**, a patented form of boron that is identical to natural plant forms found in food. Considered more bioavailable than other forms of boron, **FruiteX B® OsteoBoron®** also supports healthy bones and joints.*

Four vegetarian capsules of new **ArthroMax™ with Theaflavins** provide the following nutrients in one convenient, joint-protecting formula:

Black tea theaflavins with TF-2a fraction 440 mg
(decaffeinated)

Glucosamine sulfate 2KCl (from corn) 2000 mg

MSM (methylsulfonylmethane) 1000 mg

5-LOXIN® 100 mg

Boron 1.5 mg
(as patented FruiteX B® OsteoBoron®)

The retail price of a bottle of 120 vegetarian capsules of **ArthroMax™ with Theaflavins** is \$44. If a member buys four bottles, the price is reduced to only \$30 a bottle. **Contains corn.**

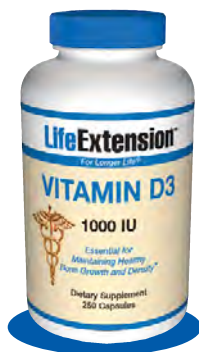
Item #01317



**To order ArthroMax™ with Theaflavins,
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.

Which VITAMIN D is Right for You?



Vitamin D3 1,000 IU 250 capsules

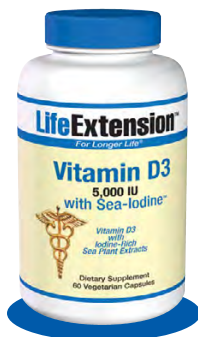
Retail: \$12.50

Four-bottle Member Price: \$8.44 ea.

Commercial companies offered only 400 IU vitamin D products when Life Extension long ago introduced this 1,000 IU version. For most people, this 1,000 IU potency is *insufficient* to attain optimal vitamin D blood levels. For smaller individuals who obtain 2,000-3,000 IU in their multi-nutrient formulas (and children), this potency of vitamin D may be suitable.

Item # 00251

Please refer to website for allergen information.



Vitamin D3 5,000 IU with Sea-Iodine™* 60 vegetarian capsules

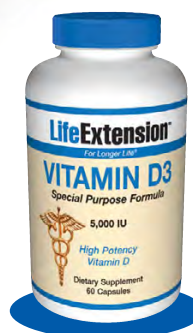
Retail: \$14

Four-bottle Member Price: \$9.38 ea.

Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining 5,000 IU of vitamin D3 and 1,000 mcg of iodine into one capsule makes taking these two nutrients economical and convenient.

Item # 01372

Please refer to website for allergen information.



Vitamin D3 5,000 IU 60 capsules

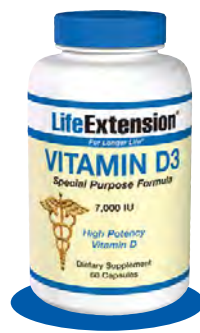
Retail: \$11

Four-bottle Member Price: \$7.43 ea.

For those obtaining 1,000-3,000 IU of vitamin D in their multi-nutrient formulas, this 5,000 IU potency is what most need to *achieve* optimal vitamin D blood levels.

Item # 00713

Please refer to website for allergen information.



Vitamin D3 7,000 IU 60 capsules

Retail: \$14

Four-bottle Member Price: \$9.45 ea.

Some individuals (such as those weighing more than 180 pounds) may require higher potencies of vitamin D. When combined with 1,000-3,000 IU obtained from multi-nutrient formulas, this 7,000 IU vitamin D3 capsule should enable these individuals to attain 25-hydroxyvitamin D blood levels above the desired range of 50 ng/mL.

Item # 01418

Please refer to website for allergen information.



Vitamin D3 Liquid Emulsion 2,000 IU 1 ounce

Retail: \$28

Four-bottle Member Price: \$18.75 ea.

For those rare individuals who have difficulty absorbing enough vitamin D3 from powdered capsules, this liquid emulsion of vitamin D can be used.

Item # 00864

**To order any of these high-potency
vitamin D3 supplements, call 1-800-544-4440
or visit www.LifeExtension.com**

CAUTION: Individuals consuming more than 2,000 IU/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxyvitamin D measurement. Do not exceed 10,000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with hypercalcemia (high blood calcium levels). People with kidney disease, certain medi-

cal conditions (such as hyperparathyroidism or sarcoidosis), and those who use cardiac glycosides (digoxin) or thiazide diuretics should consult a physician before using supplemental vitamin D.

* If you have a thyroid condition or are taking antithyroid medications, do not use without consulting your healthcare practitioner.

THE ULTIMATE TWO-PER-DAY TABLET

The following table compares the daily dosage of key nutrients included in both the Life Extension® **Two-Per-Day Tablet** and **Centrum®**'s Daily Tablet:

SAMPLE INGREDIENT COMPARISON	LIFE EXTENSION TWO-PER-DAY	CENTRUM®
Vitamin C	500 mg	60 mg
Vitamin D	2,000 IU	400 IU
Vitamin B1	75 mg	1.5 mg
Vitamin B2	50 mg	1.7 mg
Vitamin B6	75 mg	2 mg
Vitamin B12	300 mcg	6 mcg
Niacin (as niacinamide)	50 mg	20 mg
Pantothenic acid	100 mg	10 mg
Vitamin E	200 IU (natural)	30 IU (synthetic)
Natural Folate	400 mcg	400 mcg
Zinc	30 mg	11 mg
Selenium	200 mcg	55 mcg
Lutein	5 mg	(none)*
Lycopene	2 mg	(none)*
Biotin	300 mcg	30 mcg
Boron	3 mg	75 mcg
Chromium	200 mcg	35 mcg
Molybdenum	100 mcg	45 mcg
Magnesium	100 mg	50 mg
Manganese	2 mg	2.3 mg
Iodine	150 mcg	150 mcg
Potassium	25 mg	80 mg
Vitamin A (preformed)	500 IU	1,015 IU
Vitamin A (as beta-carotene)	4,500 IU	2,485 IU
Choline (as bitartrate)	20 mg	(none)
Inositol	50 mg	(none)
PABA	30 mg	(none)
Calcium	12 mg	200 mg

Contains soybeans, rice, and corn.

* Centrum® no longer contains significant amounts of lycopene nor lutein.

For many years, Life Extension members had to rely on commercial "one-a-day" supplements that provide very low potencies.

In response to requests for a science-based multi-nutrient, a special formula was compounded to provide the greatest potencies that can fit into two tablets. When compared to conventional "one-a-day" products, **Life Extension Two-Per-Day** contains up to **50 times more potency!**

The box on this page reveals how much more potent the **Two-Per-Day** formula is compared to the leading commercial multi-vitamin. Few consumers realize that commercial supplements often contain the cheapest form of nutrients that don't provide optimal benefits. For example, the 30 IU of synthetic vitamin E contained in Centrum® may provide relatively little vitamin E to the bloodstream. The 200 IU of natural vitamin E contained in Two-Per-Day provides about **14 times more** vitamin E activity than does Centrum® because natural vitamin E is twice as bioavailable as synthetic.



Item #01515

Compared to Centrum®, Two-Per-Day Tablets provide about:

- 5 times more Vitamin D
- 8 times more Vitamin C
- 7 times more Vitamin E
- 10 times more Biotin
- 40 times more Boron
- 4 times more Selenium
- 37 times more Vitamin B6
- 50 times more Vitamin B1
- 50 times more Vitamin B12
- More than twice as much niacin, zinc, and many other nutrients

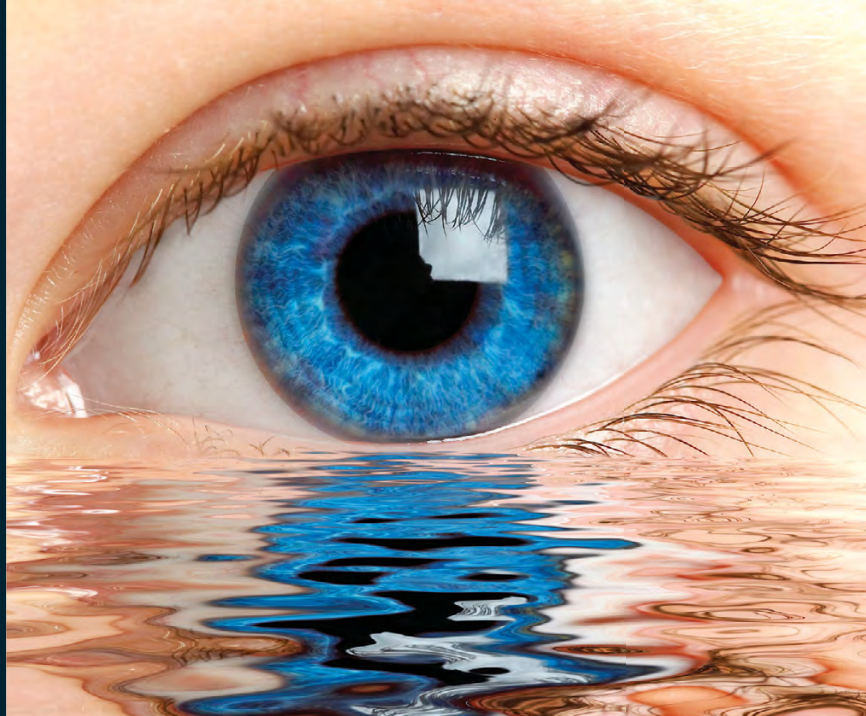
Life Extension Two-Per-Day Tablets provide much higher potencies of key nutrients and represent a better value than many commercial brands.

A bottle of 120 Life Extension Two-Per-Day Tablets retails for \$18.95. If a member buys four bottles, the price is reduced to \$12.75 per bottle. (The retail price for 180 tablets of Centrum® is around \$14.)

**To order Life Extension Two-Per-Day Tablets,
call 1-800-544-4440 or visit www.LifeExtension.com**

Enhanced Night Vision!

EYE PROTECTION FORMULA



Falling down is responsible for 70% of accidental deaths in older people.¹ Poor lighting conditions are often the culprit.

Fortunately, **C3G** derived from **black currant** supports eyesight in **dark** conditions by promoting the healthy function of delicate structures within the retina that support **night vision**.²

Super Zeaxanthin contains a potent dose of **C3G** to nourish cells throughout the body.

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.

Combat "Eye Fatigue"

Staring at a fixed-distance object such as a computer screen for a long period of time can cause the muscles that focus your eyes (called the ciliary body) to tire or go into spasm. This can result in physical symptoms such as head discomfort, sensitivity to glare, tiredness, soreness, dryness, and blurry vision.

Super Zeaxanthin contains a potent dose of **astaxanthin**, a carotenoid found in red algae. Studies show that taking astaxanthin with other carotenoids protects against free radical induced DNA damage, repairs UVA-irradiated cells, and inhibits inflammatory cell infiltration.³⁻⁶

Astaxanthin also helps support vascular health within the eye and improves visual acuity.⁵ Its fat-soluble nature offers protection to sensitive cells inside the eye.⁷

Comprehensive Ocular Protection in One Daily Capsule

The new **Super Zeaxanthin** formula provides natural plant extracts that have been shown to promote healthy eyesight. Just one softgel of **Super Zeaxanthin with Lutein, Meso-Zeaxanthin Plus Astaxanthin and C3G** provides:

OptiLut[®], Lutein Plus[®] and MZ[®]	38 mg
Marigold (<i>Tagetes erecta</i>) Extract (flower)	
[free lutein equivalent 10 mg]	
Zeaxanthin & Meso-zeaxanthin blend	3.75 mg
[micronized zeaxanthin, OptiLut[®], Lutein Plus[®]	
and MZ[®] Marigold Extract (flower)]	
Natural Astaxanthin	6 mg
(AstaREAL [®] and Zanthin [®] CO2 extracts of <i>Haematococcus pluvialis</i> algae)	
C3G (Cyanidin-3-glucoside)	2.2 mg
[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 Plus Astaxanthin and C3G** is \$42. If a member buys four bottles, the price is reduced to just **\$28.50** per bottle.



Item # 01586

To order **Super Zeaxanthin with Lutein, Meso-zeaxanthin Plus Astaxanthin and C3G**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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. AstaREAL[®] is a registered trademark of Fuji Chemical Industry Co., Ltd. Zanthin[®] is a registered trademark of Valensa International, Inc., used under license. U.S. Patent 5,527,533.

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.
3. *J Photochem Photobiol B.* 2007 Jul 27;88(1):1-10.
4. *J Photochem Photobiol B.* 2006 Dec 1;85(3):205-15.
5. *Ophthalmology.* 2008 Feb;115(2):324-33.e2.
6. *Invest Ophthalmol Vis Sci.* 2008 Apr;49(4):1679-85.
7. *Biochimica et Biophysica Acta.* 2001;1512:251-8.

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.

LIFE EXTENSION® Interview with
DR. BRUCE AMES





BY PHILIP SMITH

Dr. Bruce Ames is devoted to uncovering strategies to reverse the aging process, primarily by identifying the underlying mechanisms of degenerative disease. Best known for his groundbreaking research on the mitochondria, Dr. Ames's lab was the first to document the synergy of **lipoic acid** and **acetyl-L-carnitine** for optimizing mitochondrial function.

Following this work, Dr. Ames recently developed the Triage Theory of Aging. His hypothesis centers on the potentially long-term damage of moderate micronutrient deficiencies, including DNA damage leading to cancer. The scope of his research also includes investigations into the mutagenic causes of cancer.

Dr. Ames has authored over 500 research papers. Currently, Dr. Ames is emeritus professor of biochemistry and molecular biology at the University of California, Berkeley and a senior scientist at Children's Hospital Oakland Research Institute. In this exclusive interview with *Life Extension Magazine*®, Dr. Ames discusses some of his major areas of research.



Life Extension: One of your best known accomplishments is research into the field of mitochondrial health. You were one of the main investigators to describe the relationship of youthful mitochondria to longevity and disease prevention. Only recently, the idea of mitochondrial vitality has attracted the interest of scientists and the medical profession as an area worthy of significant research. What made you decide to investigate this particular area?

Bruce Ames: Initially, I was curious about cancer prevention and how mutagens damage the human genome. To me it was obvious that cancer was most likely a degenerative disease of aging. Cancer development dramatically increases with age.

The link between my interest in cancer and mitochondria came together because mitochondria were postulated to be important in aging. A tremendous amount of dangerous metabolism occurs in the body's mitochondria that, if left unchecked, can lead to a host of degenerative diseases. In addition, a first-rate post-doctoral candidate, Tory Hagen, was enthusiastic about tackling the problem.

Normally, to research such a topic you use mice. The problem is that you don't want to sit around for three years while the mice get older. Instead, we decided to set up numerous functions in mitochondria that were known to decay with age and that we could measure. For example, with age, mitochondria put out more mutagenic oxidant byproducts which are

oxygen radicals. In addition, *cardiolipin*, a key lipid in mitochondrial membrane, declines. Also, the mitochondrial membrane potential declines. We decided to investigate four different functions known to decay in the mitochondria with age. We were looking to understand and optimize metabolic function to prevent mitochondrial decay.

As we were developing these assays in young and old rats, we came across a paper by some Italian researchers who had fed old rats acetyl-L-carnitine. What they found was that mitochondrial transcription improved. Even though this wasn't one of our initial assays, we became very interested in trying acetyl-L-carnitine. So we fed it to old rats, and as a result, three of the four functions that decayed with age suddenly became more like those of a young rat. Carnitine declines with age, and when we fed high levels to rats, it seemed to alter a number of factors of aging.

While acetyl-L-carnitine provided a great solution to the three functions, we still needed to solve the fourth assay, the increase in mutagenic oxidants, that was not helped by acetyl-L-carnitine. And so we tried a number of things including all the conventional antioxidants—such as vitamin C and vitamin E—but they didn't work. Lester Packer, at Berkeley, had been saying for years that lipoic acid, which is a normal mitochondrial metabolite, was a terrific antioxidant. Finally, we tried lipoic acid and it worked! We found that together, carnitine and lipoic acid complemented each other and were actually somewhat synergistic. The end result was that the mitochondria of the aging rats appeared to be more like mitochondria of young rats. Jiankang Liu and I had shown that the cognition in these old rats gets better and also in dogs when they are fed these substances. We also have some preliminary evidence that it works in people as well.



Life Extension: The implications of mitochondrial health permeate every aspect of our systemic well-being.

Bruce Ames: Yes, we have enough evidence to demonstrate that mitochondrial decay can contribute to degenerative diseases, including cancer and neurological decline, that are all associated with aging. The impact of mitochondrial decay is far-reaching. Old mitochondria generate increased amounts of mutagenic by-products along with decreased membrane potential and cellular oxygen consumption. All of this decline cascades into DNA and RNA damage and into cells, tissues, and eventually the organs. Our inability to produce ATP as we did when we were younger is also a result of aging mitochondria.

Life Extension: The combination of acetyl-L-carnitine and lipoic acid have been cited in the literature as effective caloric restriction mimetics.

Bruce Ames: The work on that concept was done by Tomas Prolla in Wisconsin. Tom had been looking at the array of proteins that get turned on and how they change with age. He was also investigating what changes occur with calorie restriction, which is known to prolong life span. When he looked for small molecules that mimicked the changes created by caloric restriction, he found that both acetyl-L-carnitine and lipoic acid are good mimics. However, one is more effective in the heart and one is more effective in the brain. We were happy with his paper, because it reinforced all our evidence on acetyl-L-carnitine and lipoic acid.

Life Extension: Another area of your research has been the Triage Theory that posits that moderate deficiencies of one of the 40 essential nutrients may lead to DNA damage.

Bruce Ames: Correct. It's based on a simple analogy. The term "triage" is borrowed from the field of urgent medical care. Triage means deciding which patients to treat when faced with limited resources. When presented with more patients than there are resources to treat them all at the same time, doctors must decide which patients to treat first based on the severity of their condition.

So the patient in cardiac arrest comes first, followed by the patient with a hemorrhaging wound in need of stitches, then the patient with severe influenza, and so on. This provides the best chance for all the patients to survive.

The Importance of Multivitamins

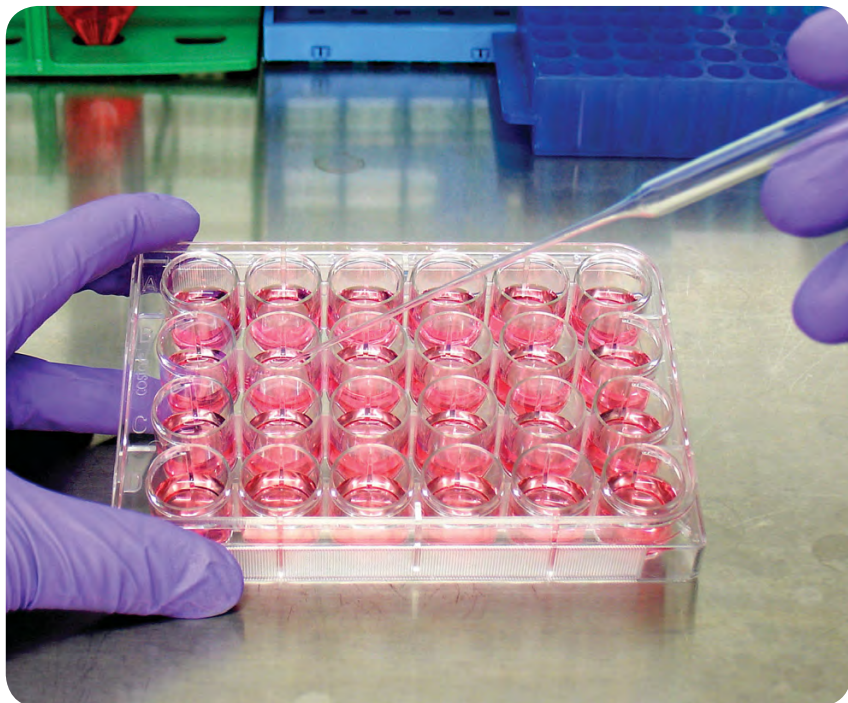
As this article was going to press, the prestigious *Journal of the Federation of American Societies for Experimental Biology (FASEB J)* published an article authored by Bruce Ames that supports the fundamental philosophy to health and longevity that Life Extension® has promoted for thirty years.

The article builds upon Dr. Ames's Triage Theory of optimal nutrition, which states that the human body prioritizes the use of vitamins and minerals when it is getting an insufficient amount to keep functioning. While short-term deficiencies are common, they are often not taken seriously by mainstream physicians. Dr. Ames's research may change all that, as his paper shows how bodily insults accumulated over time as a result of vitamin and mineral loss can lead directly to age-related diseases.

"Understanding how best to define and measure optimum nutrition will make the application of new technologies to allow each person to optimize their own nutrition a much more realistic possibility than it is today," said Joyce C. McCann, PhD, a co-author of the study from the Nutrition and Metabolism Center at Children's Hospital Oakland Research Institute in Oakland, California. "If the principles of the theory, as demonstrated for vitamin K and selenium, can be generalized to other vitamins and minerals, this may provide the foundation needed."

Echoing the importance of this research, Gerald Weissmann, MD, Editor-in-Chief of the *FASEB Journal* said, "This paper should settle any debate about the importance of taking a good, complete, multivitamin every day. As this report shows, taking a multivitamin that contains selenium is a good way to prevent deficiencies that, over time, can cause harm in ways that we are just beginning to understand."





Practically every American is deficient at some level of these nutrients because of our bad diet.

My goal was to explore what could be done in terms of diet to avoid these diseases of aging. The thing that got me going on this was a guy named Jim MacGregor, a scientist who came to my lab on sabbatical. His research had just shown that folic acid deficiency in mice broke chromosomes, just like radiation. He took the experiments further and showed that folic acid deficiency broke chromosomes in people as well, which was quite alarming. According to his research, this was occurring in about 10% of the US population and about half of those that are poor. A significant portion of the American population is experiencing critical DNA damage without realizing it. Very simply, if you don't eat whole grains or your greens, or take a supplement, it's like getting irradiated.

Based on this idea, we began to look in the literature and doing experiments. Whenever we made human cells in culture a little deficient in a vitamin or mineral, we started getting DNA damage. I realized that this was an overlooked area of research. It was this fundamental observation that led me to the Triage Theory.

Life Extension: You and Dr. Joyce McCann have done some interesting work on vitamin K. *Life Extension* readers have been following the latest research on all the benefits of vitamin K with regard to heart disease and cancer.

Bruce Ames: Vitamin K is not a single vitamin but rather a collection of structurally related molecules from different sources. There are K1, MK-4, and MK-7, all with different benefits for the body. We looked at how vitamin K could be used to prevent age-related conditions such as bone fragility, arterial and kidney calcification, cardiovascular disease, and even cancer. In Germany, where vitamin K was discovered, it is known as the "Koagulation" vitamin because it factors so heavily in blood clotting. However, the coagulation factors originate in the liver while other forms of vitamin K are sent to the other tissues in the body. We are beginning to see interesting studies concerning vitamin K deficiencies and mortality from coronary heart disease.

In the United States, the population tends to be fairly low with regards to vitamin K intake, largely due to the fact that we do not consume sufficient greens. In

Our bodies evolved to do pretty much the same thing. Faced with limited nutritional resources, the human physiology must "decide" which biological functions to prioritize in order to give the total organism—and the species—the best chance to survive and reproduce.

My work suggests that if you're even modestly deficient in one of the essential micronutrients, your body has to "ration" them in terms of priority. Under this scenario, the body will always direct nutrients *toward* short-term health and reproductive capability—and away from regulation and repair of cellular DNA and proteins that increase longevity.

This means that while your body may be providing nutritional support in an effort to sustain system-wide physiological function and reproduction, at the cellular level, the process of decay and death is *accelerating*. Now let's look at how this plays out in real-world dietary terms.

To run your metabolism you need the basic macronutrients of fuel, fats, and carbohydrates. But you also need 15 or so vitamins that are co-enzymes and 15 or so minerals that are required in enzymes, and then you need two essential fatty acids, omega-3 and omega-6, and then there are seven or eight essential amino acids, so all together, it's roughly 40 substances. Virtually every metabolic pathway requires micronutrients. Deficiencies in these micronutrients may not be severe enough to create immediate clinical symptoms, but the long-range implications could lead to an increased risk of diseases associated with aging.

Japan, people obtain healthy amounts of MK-7 from a soy product called natto. We believe that natto consumption may be responsible for the decreased risks of fractures and bone loss among Japanese women. Additionally, natto may be responsible for the lower prevalence of atherosclerosis in Japan.

Life Extension: Additionally, those people taking vitamin K antagonists such as warfarin (Coumadin®) to prevent strokes are experiencing serious vitamin K deficiencies and are at increased risk for osteoporosis and calcification of their arteries.

Bruce Ames: Exactly. There are estimates that more than 30 million prescriptions for warfarin are written each year. Long-term warfarin therapy is linked to increased arterial calcification and bone loss. Additionally, there are observational studies that report associations between aortic valve calcification and long-term anticoagulant therapy. Coumadin® blocks the biosynthesis of MK-4 from vitamin K1.

Life Extension: How does this very basic information about the importance of vitamin K for people taking warfarin get into the hands of doctors prescribing the drug and for patients taking the drug? It seems pretty basic... you're taking a drug that has a range of highly detrimental side effects. By taking a simple vitamin you can protect your skeletal system and limit atherosclerotic progression.

Bruce Ames: Most doctors don't know anything about nutrition and have completely abdicated. Medicine is almost useless as far as nutrition goes. The only people interested in nutrition are those alternative medicine docs. When I go to the alternative medicine doc conventions, I'm treated like a rock star. They've read all my papers and are passionately into nutrition and preventive medicine.

Life Extension: Based on many facets of your research, if humans ingest optimal levels of nutrients from carnitine and lipoic acid to vitamin K, they could postpone degenerative diseases such as diabetes, cancer, and heart disease in addition to delaying the ravages of aging. As a result of strong nutritional practices and interventions, the doctors might be a little less busy.

Bruce Ames: There will always be a need for doctors. Everybody is going to die of something, we're just extending the time frame. I'm a firm believer in preventive medicine—it's much cheaper and you cut out expensive doctors, tests, procedures, and medications. Within about ten years, you're going to put your finger in a machine, it'll take a finger prick of blood

and you will compare your numbers with some schedule on the Internet and you won't need a doctor in most instances. Our analytic methods are improving in sensitivity and range every day.

Life Extension: Speaking of people dying, the incidence of obesity is astonishing. It simply did not exist in these proportions 20–30 years ago. Many doctors bemoan the fact that this is the first generation that the parents will outlive the children. Any thoughts?

Bruce Ames: Obese people are hungry all the time because the body is craving missing nutrients such as magnesium. Sixty percent of the American population is too low in magnesium. Instead of whole grains and vegetables, Americans are filling up with junk and are wildly deficient in vitamins and minerals. Even though people are obese and look like they are well fed, they are basically starving for vitamins and minerals.

According to a colleague of mine, Americans aren't getting enough fiber especially because they need to eat more vegetables and whole grains. On top of which people are consuming vast amounts of simple sugars, which can poke holes in your gut. Bacteria are leaking through, triggering inflammation. The purpose of a balanced diet is to get all your vitamins and minerals, and we're not doing that. We're eating calorie-rich refined foods, and what we should be doing is eating more fruits and vegetables, more fish, more whole grains, less red meat, all the things your Mom told you about, and then we'll be fine.

Life Extension: You've done a lot of work in cancer research. What, in your estimation, are the key factors for preventing cancer?

Bruce Ames: Eat a good diet. And then don't smoke, because smoking takes about 8 or 10 years off your life. And I think bad diets are probably another 8 or 10 years off your life, though we don't know the exact number. But I suspect it's going to be even worse than smoking. And the costs are huge. You have to convince people that they're going to lead miserable lives if they get fat, have years suffering from diabetes and their brain will be all fogged. The choice seems obvious to me.

Life Extension: Dr. Ames, many thanks for all your good work. We all benefit from your innovative research.



Top Off Your TESTOSTERONE *Naturally*

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 contains the following testosterone supporting ingredients:

1500 mg	Chrysin
15 mg	Bioperine®
850 mg	Muira puama
282 mg	Nettle root
50 mg	Ginger root
15 mg	Chelated elemental zinc
320 mg	Maca
33.4 mg	HMRlignan™ Norway Spruce lignan extract

Contains corn.



Item # 01315

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.

Super Health. Super Libido.
Super MiraForte.

To order **Super MiraForte** call **1-800-544-4440** or visit **www.LifeExtension.com**

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.

Mitochondrial Basics

with BioPQQ™

Energy to burn. It's more than just a phrase. It's the key to a healthy life span.

Behind every process your body needs to survive and thrive are the cellular energy generators known as **mitochondria**. Their function is so crucial that a growing number of scientists now believe mitochondrial longevity may determine *overall* longevity in aging humans.¹⁻⁵ That's why **Life Extension®** has remained at the forefront in identifying innovative compounds that specifically support mitochondrial health.

In addition to the more comprehensive **Mitochondrial Energy Optimizer with BioPQQ™** and standalone **PQQ** products, we now offer a one capsule per day formula for individuals seeking a simplified, low-cost option called **Mitochondrial Basics with BioPQQ™**.

The reason? We want all members to have access to targeted nutrients required to support mitochondrial function and the generation of healthy new mitochondria.

Three Premium Compounds in One Low-Cost Formula

Mitochondrial Basics with BioPQQ™ brings together cutting-edge mitochondrial energizers, including the most exciting nutrient to emerge in recent years called *pyrroloquinoline quinone* or **PQQ**. The three ingredients in value-priced **Mitochondrial Basics with BioPQQ™** are:

1. PQQ. This breakthrough micronutrient has recently been shown to trigger **mitochondrial biogenesis**—the growth of new mitochondria in aging cells!⁶ PQQ also activates *genes* involved in protecting the delicate structures within the mitochondria.⁷⁻¹⁰

2. R-lipoic acid. The detrimental effects of free radicals comprise one of the chief obstacles to optimal mitochondrial energy production. Published studies confirm R-lipoic acid's power to promote mitochondrial bioenergetics while simultaneously *blunting* free radical activity.¹¹⁻¹⁶ **Mitochondrial Basics with BioPQQ™** contains the superior **Bio-Enhanced® R-lipoic acid** and is in a proprietary *microencapsulated* form for better absorption.

3. Acetyl-L-carnitine arginate. Fats are shuttled into the mitochondria for metabolic combustion by the amino acid **carnitine**. The *acetylated* form of carnitine helps to facilitate more efficient utilization of fats than carnitine alone.

Life Extension® members continue to enjoy access to a full range of targeted supplements clinically shown to optimize energy production in the mitochondria. Just one capsule a day of **Mitochondrial Basics with BioPQQ™** supplies:

BioPQQ™ 10 mg
R-lipoic acid 100 mg
Acetyl-L-carnitine 250 mg
arginate dihydrochloride

Item # 01569



A bottle containing 30 capsules of **Mitochondrial Basics with BioPQQ™** retails for \$52. If a member buys four bottles, the price is reduced to just **\$34.50** per bottle.

PQQ can also be obtained as a low-cost standalone or in the **Mitochondrial Energy Optimizer with BioPQQ™** formula.

**To order
Mitochondrial Basics
with BioPQQ™
call 1-800-544-4440 or visit
www.LifeExtension.com**

BioPQQ™ is a trademark of MGC (Japan). Bio-Enhanced® is a registered trademark of Geronova Research, Inc.

ArginoCarn® is a registered trademark of Sigma-tau Health Sciences, Inc. and is protected by US patents 6,365,622, US 6,703,042, and EP 1202956.

References

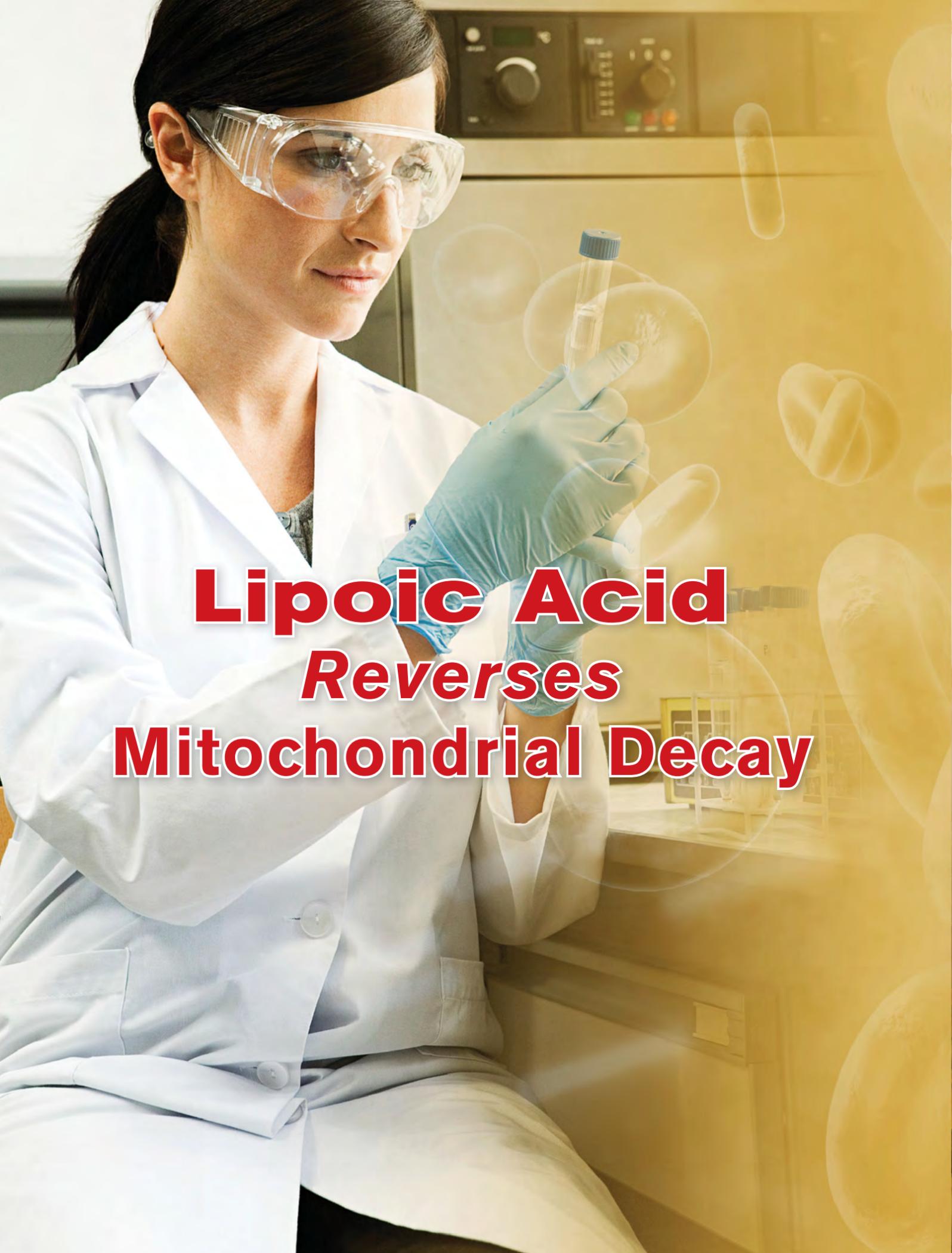
1. *Biochimie*. 1999 Dec;81(12):1131-2.
2. *Lancet*. 1989 Mar 25;1(8639):642-5.
3. *Curr Opin Clin Nutr Metab Care*. 2010 Jul 7.
4. *Age (Dordr)*. 2010 Mar 20.
5. *Ageing Res Rev*. 2010 Jun 25.
6. *J Biol Chem*. 2010. Jan 1;285:142-152.

7. *Alt Med Rev*. 2009; 14(3):268-77.
8. Entrez Gene: PARGC1A peroxisome proliferator-activated receptor gamma, coactivator 1 alpha [Homo sapiens] GenelD: 10891.
9. Entrez Gene: CREBBP CREB binding protein [Homo sapiens] GenelD: 1387.

10. *Hum Mol Genet*. 2008 Nov 1;17(21):3357-67.
11. *Biochem Biophys Res Commun*. 1996 Apr 16;221(2):422-9.
12. *FASEB J*. 1999 Feb;13(2):411-8.
13. *Antioxid Redox Signal*. 2000 Fall;2(3):473-83.
14. *Biochem Mol Biol Int*. 1995 Oct;37(2):361-70.
15. *Arch Biochem Biophys*. 2004 Mar 1;423(1):126-35.
16. *Redox Rep*. 2005;10(1):52-60.

Contains soybeans.

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.

A female scientist with dark hair tied back, wearing a white lab coat, clear safety goggles, and blue nitrile gloves, is holding a small test tube with a blue cap. She is looking down at the test tube with a focused expression. The background is a laboratory setting with a control panel featuring knobs and buttons. The entire image is overlaid with a semi-transparent yellow filter. Faint, stylized diagrams of cells or organelles are visible in the background, particularly on the right side.

Lipoic Acid
Reverses
Mitochondrial Decay



BY MICHAEL ANDERSON

It is estimated that **85%** of the oxygen contained in every breath you take is consumed by the **mitochondria** within each cell of your body.¹

The decay of these energy-producing powerhouses in turn lies at the core of most age-related pathologies.

In experimental models examining the mitochondrial theory of aging, it has been shown that cells microinjected with mitochondria isolated from old animals degenerate far more rapidly than those microinjected with mitochondria from *young* animals.²

The good news is that when supplied with a nutrient regimen that includes **lipoic acid**, a profound **regeneration** is observed in similar animal models,³ including improved metabolic function and a marked decline in oxidative stress.

In this article, the recent data on lipoic acid's multimodal power to combat a host of age-related diseases is detailed. You will learn how it may help prevent cardiovascular disease, obesity, diabetes, neurodegenerative disorders, and cancer. You will also learn of drug company efforts to produce high-cost, *synthetic* forms of lipoic acid to capitalize on its unique health-promoting properties at your expense. > >

Mitochondrial Decay and Aging

The mitochondrial theory of aging has long held a prominent place in scientists' understanding of the processes that impact aging. First proposed by Denman Harman in 1972, this theory posits that accumulated DNA damage to mitochondria, the cells' energy generators, leads to increased free radical stress and decreased cellular energy production.⁴ In the past 30 years, a wealth of evidence supporting the mitochondrial theory of aging has led prominent researchers such as Bruce Ames to consider it a major contributor to aging.⁵

Experimental models support this theory and demonstrate the importance of youthful mitochondria function in maintaining cellular health. For example, cells microinjected with mitochondria from aged animals display greater cellular degeneration, compared with cells microinjected with mitochondria from youthful animals.² The mitochondrial theory of aging has analyzed the components of young and old cells. Youthful organisms contain abundant numbers of smaller, bioenergetically efficient mitochondria, while older organisms contain larger, inefficient mitochondria that decrease energy supply in the cells.^{6,7}

Delaying mitochondrial aging through the use of nutrients such as lipoic acid and acetyl-L-carnitine has been proposed as a top-line strategy for preventing aging-related diseases.⁸

How Lipoic Acid Combats Cellular Degeneration

Lipoic acid is a vital "co-factor" for enzymatic reactions within the mitochondria, helping to *optimize* energy conversion.^{9,10} It possesses unique properties that specifically *slow* mitochondrial aging by preventing release of mutagenic oxidants.¹¹ Recent research further reveals lipoic acid's ability to alleviate mitochondrial dysfunction in aging cells (thus improving *mitochondrial function*).^{12,13}

Researchers have further discovered that **lipoic acid** enhances the effects of **insulin**, benefitting glucose metabolism and lowering blood sugar levels.¹⁰

This in turn mitigates the pathologic cross-linking of glucose and protein that result in *advanced glycation end products* (AGEs).¹⁴

These advanced glycation end products have been shown to *accelerate* the onset of cardiovascular disease, brain degeneration, ocular disorders, and cancer.¹⁴⁻¹⁷

Lipoic acid also suppresses production of inflammatory cell-signaling molecules, while increasing production of molecules involved in vascular tone, such as endothelial nitric oxide synthase (eNOS).^{18,19}

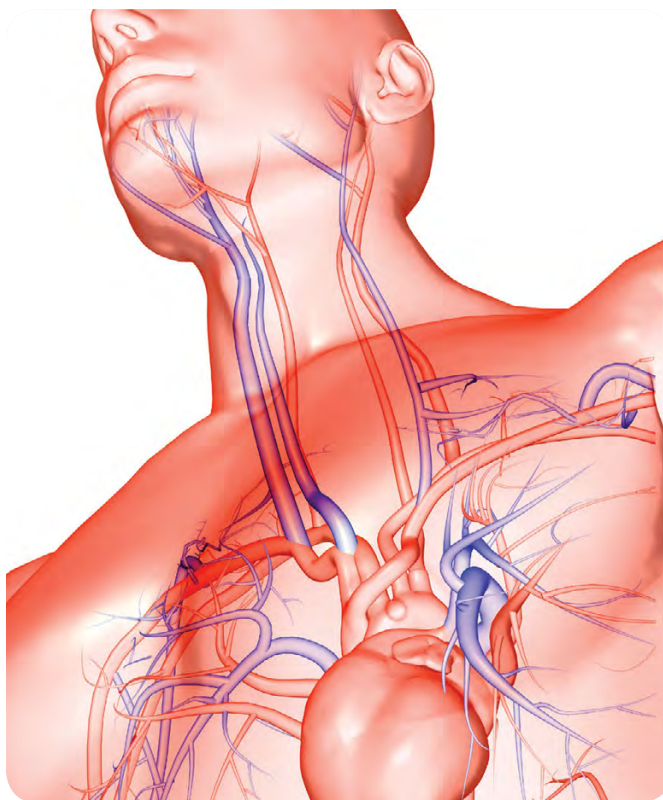
Owing to its pronounced power to combat mitochondrial aging, behemoth pharmaceutical companies are now attempting to *manipulate* its molecular structure and render it *patentable*.²⁰ Such drugs include more complex molecules in which lipoic acid is "conjugated," or chemically joined, to form hybrid compounds with additional biological characteristics.

This would allow drug manufacturers to make absurd claims of superior benefit for their artificial, synthetic lipoic acid products. The result would be needless additional cost for what is already a proven multi-modal nutrient.

Lipoic acid in the biologically active "R" form (see sidebar on page 42) is readily available without a prescription and affordable.

Cardiovascular Defense

Lipoic acid's powerful antioxidant, anti-inflammatory, and lipid-lowering capabilities make it an ideal, multi-targeted nutrient for reducing cardiovascular risk.^{23,24} Lipoic acid helps protect the endothelium, the delicate, one-cell-thick lining of blood vessels.



Additionally, lipoic acid improves blood vessels' ability to relax, helping to lower blood pressure, improve blood flow, and reduce risk for cardiovascular events such as heart attack and stroke.²⁵⁻²⁸ Better blood flow in legs can also mean reduced pain with prolonged walking or other exercise.²⁹

Cardiac surgeons are now beginning to recommend lipoic acid, along with other antioxidants such as CoQ10, prior to surgery in order to protect delicate blood vessels during surgery. Improved physical and mental quality of life in such patients has been reported to last for more than a month after the surgery.³⁰

You can use lipoic acid to help lower your risk for cardiovascular disease long before you need cardiac surgery, though. Lipoic acid lowers total cholesterol and low-density lipoprotein (LDL) levels and reduces the size and number of atherosclerotic plaques, the dangerous points of arterial narrowing that produce heart attacks and strokes.^{23,24,28,31} In addition, lipoic acid may also lower levels of certain cellular toxins that contribute to cardiovascular diseases, especially those related to diabetes.^{32,33}

Even people with pre-existing heart disease can benefit from lipoic acid. Cardiac stents, intended to improve blood flow following a heart attack, can become blocked by formation of unwanted new tissue, an effect that is prevented by lipoic acid supplementation.³⁴ And, lipoic acid prevents death of heart cells exposed to high blood sugar levels, a contributor to diabetic heart disease.³⁵

Targeting Obesity

Lipoic acid has beneficial effects on the forces that cause us to gain weight and store excess fat. It works on brain areas to reduce appetite, food intake, and body weight.³⁶⁻³⁹ Lipoic acid also stimulates increased energy expenditure, burning excess calories by activating cellular energy signaling complexes.^{13,36}

Overweight and obese people lose their normal sensitivity to insulin, resulting in ever-higher levels of blood sugar and advanced glycation end product-induced tissue damage. Lipoic acid improves insulin sensitivity and stimulates sugar uptake from the blood to help normalize sugar levels.⁴⁰⁻⁴³ In the liver, lipoic acid decreases fat production and accumulation, helping to prevent development of dangerous non-alcoholic fatty liver disease (NAFLD).^{44,45}

Lipoic acid has been successfully used in patients taking medications that stimulate weight gain, such as antipsychotic drugs.⁴⁶ Even in people who are only overweight (not yet obese), lipoic acid reduced body weight by 8% while shrinking waist size by more than



Lipoic Acid Reverses Mitochondrial Aging

- Cells with mitochondria isolated from old animals degenerate far more rapidly than those with mitochondria from young animals.
- When supplied with a nutrient regimen that includes lipoic acid, a profound regenerative effect is observed.
- Experimental models show that lipoic acid optimizes function of the mitochondria in aging cells and *reverses* cell aging.
- Recent data reveal that lipoic acid specifically targets factors that contribute to mitochondrial aging, dysfunction, and cell death.
- Lipoic acid can help to prevent cardiovascular disease, obesity, insulin resistance, and diabetic complications.
- Lipoic acid protects against nerve and brain cell damage induced by aging and trauma.
- New evidence suggests that lipoic acid may also have important cancer-preventive effects, even against some of the most difficult-to-treat malignancies.

2 inches.⁴⁷ In patients who are already obese, there was a 9% loss of weight and a decrease in waist size of more than 3 inches.⁴⁷

An Anti-Diabetic

Lipoic acid has an important role in managing diabetes, particularly the massive oxidative and inflammatory changes the disease produces.^{48,49} The benefits of lipoic acid include promoting insulin sensitivity and glucose uptake.⁵⁰⁻⁵² Diabetics are at increased risk for the kinds of cardiovascular problems that lipoic acid can prevent, including accumulation of cellular toxins.^{32,53} By protecting against endothelial damage, lipoic acid reduces the threat of diabetic vascular and kidney complications.^{26,54}

Lipoic acid is proving to be especially effective at preventing the painful and debilitating condition known as *diabetic neuropathy*, an almost inevitable complication in people with poor blood sugar control.⁵⁵ Diabetic neuropathy begins with pain, burning, and/or stabbing sensations in the extremities.⁵⁶ In more advanced stages of this condition, the pain disappears as severe damage is done to microscopic blood vessels. Ultimately the loss of nerve function can lead to open sores, infections, and even amputations. Despite considerable knowledge about how diabetic neuropathy arises, no drug treatment has yet proved effective in preventing or reversing the condition.⁵⁶

Lipoic acid's powerful antioxidant actions limit damage to the lining and blood supply of nerves, helping to reduce both symptoms and nerve dysfunction.⁵⁷ Clinical studies have uniformly demonstrated

Use the "Right" form of Lipoic Acid

Lipoic acid comes in two "mirror image" forms labeled "R" and "S." Only the R form is produced and used by life processes. Inexpensive chemical manufacturing produces equal quantities of R and S lipoic acid, often labeled "R/S Lipoic Acid" or simply "alpha lipoic acid" (ALA).

Newer precision techniques allow production of a pure R-lipoic acid, which has a much higher potency. A dose of pure R-lipoic acid provides twice the active ingredient as a typical R/S-alpha lipoic acid supplement, simply because the whole dose consists of the active "R" molecule. Look for the "R" label to assure you are getting the most potent form of this valuable nutrient.^{21,22}



improvements in pain, numbness, and stinging, while also improving nerve conduction velocity, a measure of how efficiently nerves transmit electrical impulses.⁵⁸⁻⁶¹ Studies have shown that lipoic acid produces significant improvements when administered for 3 weeks, and longer studies have shown sustained effects.^{62,63} Lipoic acid also has beneficial effects on circulation in patients with diabetic neuropathy, improving blood flow and the amount of blood reserve available during high demand.⁶⁴

It's essential to start early with optimal levels of lipoic acid to prevent diabetic neuropathy. People with good blood sugar control and younger patients do better, as do women, and thinner patients in general.⁵⁸ While doses of up to 1,800 mg/day are well-tolerated, 600 mg/day of alpha-lipoic acid seems to produce the best results in those with diabetes.⁵⁹ This translates into a **300 mg** dose of **R-lipoic acid** to obtain the same biological activity.^{21,22}

Protection from Brain Cell Degeneration

Lipoic acid protects brain tissue from the long-term effects of *advanced glycation end products* and the resulting inflammation and oxidative damage, conditions that lead to neurodegenerative diseases like Alzheimer's disease.^{9,65,66} A hallmark of Alzheimer's disease is the formation of an abnormal protein called amyloid-beta, the result of chronic inflammation and a producer of increased oxidative stress. Lipoic acid reduces amyloid-beta-induced inflammation

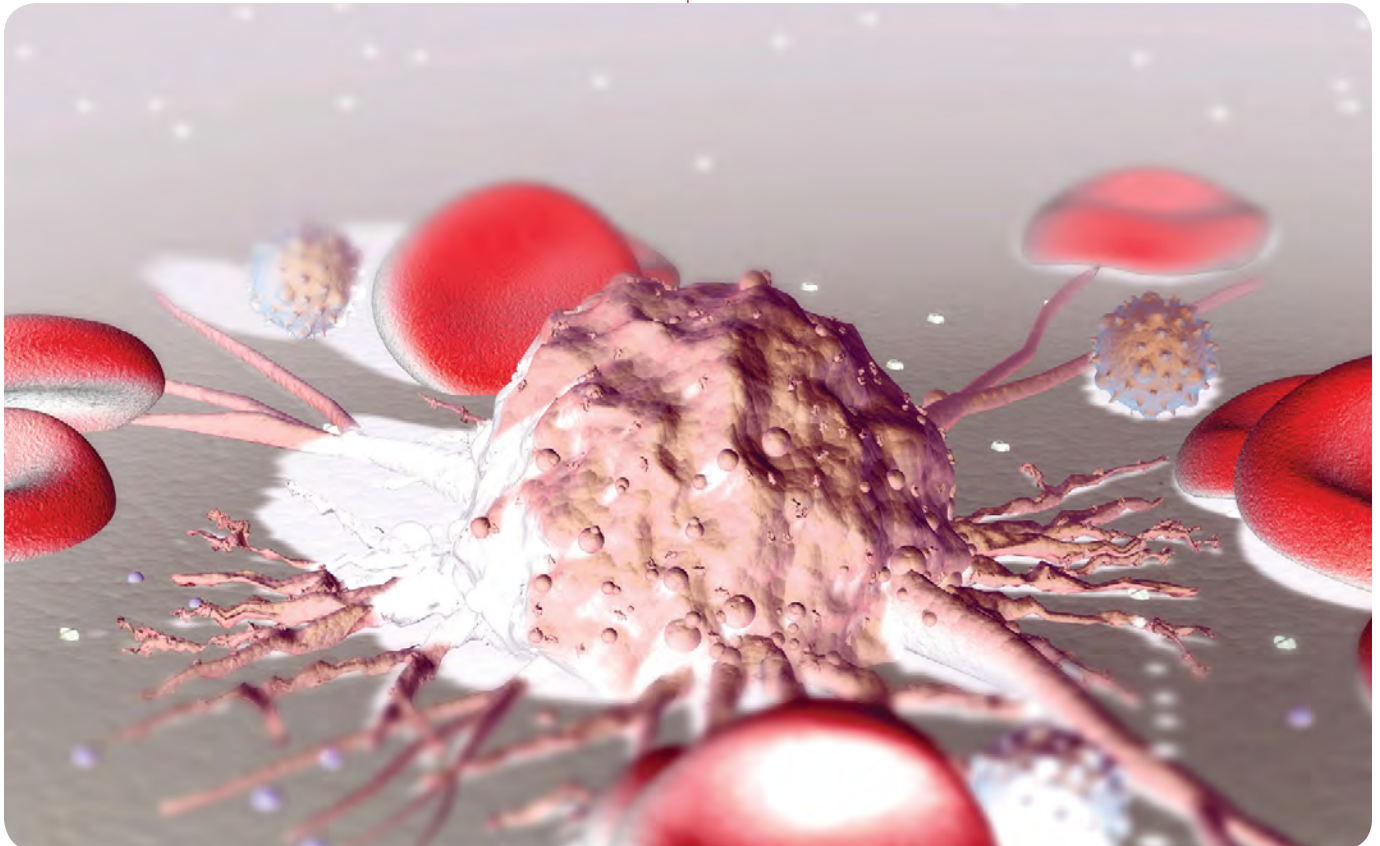
and improves brain cells' production of the chemical signaling molecules called neurotransmitters.^{67,68} Mitochondrial function is significantly impaired in the brains of Alzheimer's and Parkinson's disease patients and lipoic acid decreases mitochondrial oxidant stress in those cells.^{69,70}

These effects work together with other nutrients like acetyl-L-carnitine, docosahexaenoic acid (DHA), phosphatidylserine (PS), and glyceryl-phosphoryl-choline (GPC) to improve cognitive performance.⁷¹ Research has shown that lipoic acid prevents cell death in the brain regions most affected in Parkinson's disease.⁷² These findings are both good news and important reminders of the need to incorporate lipoic acid early, before symptoms progress in these chronic, debilitating diseases. Lipoic acid may also have an important role in preventing the immune over-response that causes multiple sclerosis, another chronic, progressive brain disease.⁷³⁻⁸¹

By increasing antioxidant capacity, scavenging free radicals, reducing lipid peroxidation, and enhancing energy utilization, lipoic acid may also minimize the damage produced by brain trauma.⁸² Lipoic acid has shown benefit in preventing trauma-related injuries to the brain, spinal cord, and even peripheral nerves, all of which are vulnerable following a major accident.⁸³⁻⁸⁵

Anti-Cancer Mechanisms

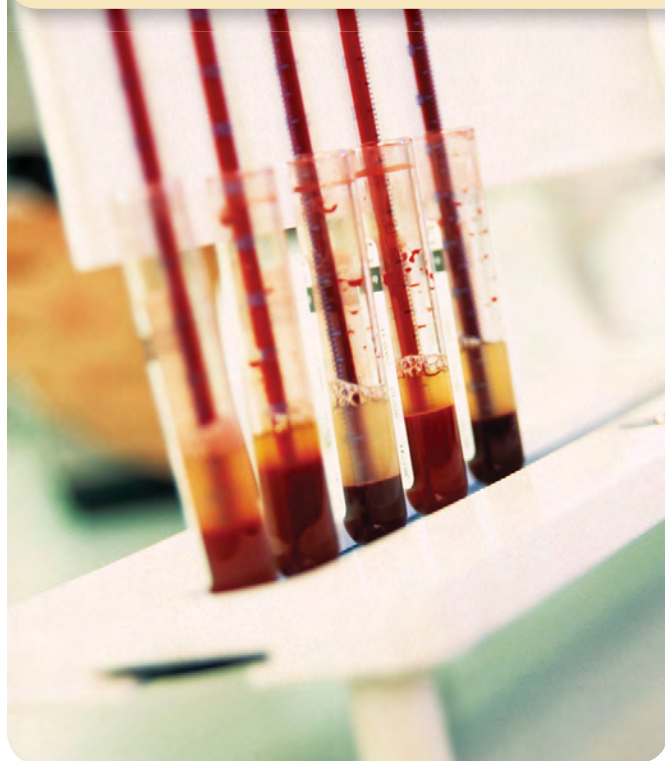
Cancer scientists are growing increasingly interested in lipoic acid because cancer cells offer many targets for its anti-inflammatory attributes.⁸⁶ These attributes allow lipoic acid to intervene at multiple points in the chain of carcinogenesis.^{86,87} In experimental studies, lipoic acid shows promise against cancers of the blood (leukemia), lung, breast, and liver.⁸⁸⁻⁹³ Preliminary research indicates that lipoic acid acts to halt the cell reproductive cycle of cancer cells, slowing or stopping tumor growth.^{88,89} Lipoic acid may also help induce apoptosis, the programmed cell death that is the body's natural control mechanism for weeding out nascent cancers.⁸⁸⁻⁹³ Lipoic acid also protects against chemical-induced DNA damage that can lead to cancerous transformation.⁹⁴ Lipoic acid may help prevent metastatic cancer spread by reducing activity of enzymes that tumors use to invade tissues.⁹³ Finally, in those unfortunate enough to require chemotherapy to treat an existing cancer, lipoic acid can afford powerful protection against some of the side effects, such as diarrhea, intestinal cramping, and ulcers, thanks to its antioxidant capabilities.⁸⁷



Lipoic Acid: Research Update

An abundance of recently published studies reveals a wide range of new findings about lipoic acid:

- **Weight loss support.** Overweight or obese individuals who received 1,800 mg of alpha lipoic acid daily for 20 weeks lost more weight compared with subjects who did not receive lipoic acid.⁹⁵ This translates into 900 mg of the biologically active **R-lipoic acid**.
- **Migraine prevention.** Individuals with frequent or poorly controlled migraine attacks who consumed lipoic acid each day displayed a trend toward fewer migraines.⁹⁶ These findings build on earlier research suggesting a role for lipoic acid in migraine prevention.⁹⁷
- **Improving endothelial function.** Impaired glucose tolerance contributes to endothelial function, an underlying cause of cardiovascular disease. When lipoic acid was administered to individuals with newly diagnosed impaired fasting glucose, endothelial function improved, as did a marker of oxidative stress.⁹⁸
- **Benefits for polycystic ovary syndrome.** Polycystic ovary syndrome (PCOS) is characterized by hormone imbalances, irregular or absent menstrual periods, and blood sugar and lipid abnormalities.
- **Lean, non-diabetic women with PCOS** who consumed 600 mg of alpha lipoic acid daily demonstrated improved insulin sensitivity, decreased triglycerides, and beneficial changes in low-density lipoprotein (LDL), and some experienced more regular menstrual periods.⁹⁹
- **Relieving back pain.** Individuals undergoing rehabilitation therapy for back pain caused by disc compression of nerves who consumed 600 mg of alpha lipoic acid and 360 mg of gamma-linolenic acid (GLA) daily experienced greater improvements in nerve pain, compared with patients undergoing rehabilitation alone.¹⁰⁰
- **Preventing steroid-induced osteonecrosis.** Corticosteroids such as prednisone threaten bone health and increase fracture risk by impairing blood flow to bone.¹⁰¹ In an animal model, lipoic acid helped prevent steroid-induced osteonecrosis (bone death that increases fracture risk), possibly by reducing oxidative stress and/or by improving endothelial function.¹⁰²
- **Decreasing leptin levels.** Elevated levels of the fat-secreted hormone leptin are involved in the development of metabolic syndrome and diabetes. Lipoic acid administration to animals decreased circulating leptin and leptin expression in fat tissue.¹⁰³



Summary

Cells with mitochondria isolated from old animals degenerate far more rapidly than those with mitochondria from young animals, revealing the importance of healthy mitochondria to delay the aging process. When supplied with a nutrient regimen that includes lipoic acid, a profound regenerative effect is observed, including improved metabolic function and significant declines in oxidative stress.

Recent data reveal that lipoic acid specifically targets factors that contribute to mitochondrial aging, dysfunction, and cell death. Lipoic acid can prevent and even mitigate cardiovascular diseases, obesity, insulin resistance, and complications of diabetes. Lipoic acid protects against nerve and brain cell damage induced by aging and trauma.

New evidence suggests that lipoic acid may also have important cancer-preventive effects, even against some of the most difficult-to-treat malignancies. ●

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

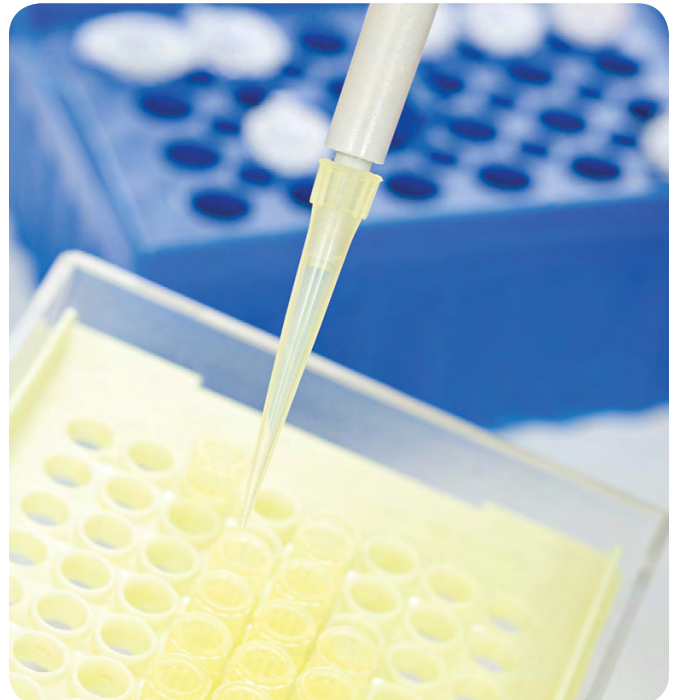
References

- Available at: <http://www.antiaging-systems.com/articles/66-the-mitochondrial-theory-of-aging>. Accessed May 12, 2011.
- Sastre J, Millán A, García de la Asunción J, et al. A Ginkgo biloba extract (EGb 761) prevents mitochondrial aging by protecting against oxidative stress. *Free Radic Biol Med*. 1998 Jan 15;24(2):298-304.
- Hagen TM, Liu J, Lykkesfeldt J, et al. Feeding acetyl-L-carnitine and lipoic acid to old rats significantly improves metabolic function while decreasing oxidative stress. *Proc Natl Acad Sci U S A*. 2002 Feb 19;99(4):1870-5.
- Harman D. The aging process. *Proc Natl Acad Sci U S A*. 1981 Nov;78(11):7124-8.
- Ames BN, Shigenaga MK, Hagen TM. Mitochondrial decay in aging. *Biochim Biophys Acta*. 1995 May 24;1271(1):165-70.
- Miquel J. An update on the mitochondrial-DNA mutation hypothesis of cell aging. *Mutat Res*. 1992 Sep;275(3-6):209-16.
- Bertoni-Freddari C, Fattoretti P, Casoli T, Spagna C, Meier-Ruge W. Morphological alterations of synaptic mitochondria during aging. The effect of Hydergine treatment. *Ann N Y Acad Sci*. 1994 Jun 30;717:137-49.
- Ames BN. Optimal micronutrients delay mitochondrial decay and age-associated diseases. Optimal micronutrients delay mitochondrial decay and age-associated diseases. *Mech Ageing Dev*. 2010 Jul-Aug;131(7-8):473-9.
- Maczurek A, Hager K, Kenkies M, et al. Lipoic acid as an anti-inflammatory and neuroprotective treatment for Alzheimer's disease. *Adv Drug Deliv Rev*. 2008 Oct-Nov;60(13-14):1463-70.
- Salinthe S, Yadav V, Bourdette DN, Carr DW. Lipoic acid: a novel therapeutic approach for multiple sclerosis and other chronic inflammatory diseases of the CNS. *Endocr Metab Immune Disord Drug Targets*. 2008 Jun;8(2):132-42.
- Ames BN. Prevention of mutation, cancer, and other age-associated diseases by optimizing micronutrient intake. *J Nucleic Acids*. 2010 Sept 22;2010.
- Liu J. The effects and mechanisms of mitochondrial nutrient alpha-lipoic acid on improving age-associated mitochondrial and cognitive dysfunction: an overview. *Neurochem Res*. 2008 Jan;33(1):194-203.
- Wang Y, Li X, Guo Y, Chan L, Guan X. alpha-Lipoic acid increases energy expenditure by enhancing adenosine monophosphate-activated protein kinase-peroxisome proliferator-activated receptor-gamma coactivator-1alpha signaling in the skeletal muscle of aged mice. *Metabolism*. 2010 Jul;59(7):967-76.
- Kunt T, Forst T, Wilhelm A, et al. Alpha-lipoic acid reduces expression of vascular cell adhesion molecule-1 and endothelial adhesion of human monocytes after stimulation with advanced glycation end products. *Clin Sci (Lond)*. 1999 Jan;96(1):75-82.
- Midaoui AE, Elimadi A, Wu L, Haddad PS, de Champlain J. Lipoic acid prevents hypertension, hyperglycemia, and the increase in heart mitochondrial superoxide production. *Am J Hypertens*. 2003 Mar;16(3):173-9.
- Thirunavukkarasu V, Anitha Nandhini AT, Anuradha CV. Lipoic acid improves glucose utilisation and prevents protein glycation and AGE formation. *Pharmazie*. 2005 Oct;60(10):772-5.
- Gasic-Milenkovic J, Loske C, Deuther-Conrad W, Münch G. Protein "AGEing"—cytotoxicity of a glycated protein increases with its degree of AGE-modification. *Z Gerontol Geriatr*. 2001 Dec;34(6):457-60.
- Shay KP, Moreau RF, Smith EJ, Smith AR, Hagen TM. Alpha-lipoic acid as a dietary supplement: molecular mechanisms and therapeutic potential. *Biochim Biophys Acta*. 2009 Oct;1790(10):1149-60.
- Li L, Smith A, Hagen TM, Frei B. Vascular oxidative stress and inflammation increase with age: ameliorating effects of alpha-lipoic acid supplementation. *Ann N Y Acad Sci*. 2010 Aug;1203:151-9.
- Koufaki M, Detsi A, Kiziridi C. Multifunctional lipoic acid conjugates. *Curr Med Chem*. 2009;16(35):4728-42.
- Smith JR, Thiagaraj HV, Seaver B, Parker KK. Differential activity of lipoic acid enantiomers in cell culture. *J Herb Pharmacother*. 2005;5(3):43-54.
- Streeper RS, Henriksen EJ, Jacob S, Hokama JY, Fogt DL, Tritschler HJ. Differential effects of lipoic acid stereoisomers on glucose metabolism in insulin-resistant skeletal muscle. *Am J Physiol*. 1997 Jul;273(1 Pt 1):E185-91.
- Amom Z, Zakaria Z, Mohamed J, et al. Lipid lowering effect of antioxidant alpha-lipoic Acid in experimental atherosclerosis. *J Clin Biochem Nutr*. 2008 Sep;43(2):88-94.
- Zulhairi A, Zaiton Z, Jamaluddin M, et al. Alpha lipoic acid possess dual antioxidant and lipid lowering properties in atherosclerotic-induced New Zealand White rabbit. *Biomed Pharmacother*. 2008 Dec;62(10):716-22.
- McMackin CJ, Widlansky ME, Hamburg NM, et al. Effect of combined treatment with alpha-Lipoic acid and acetyl-L-carnitine on vascular function and blood pressure in patients with coronary artery disease. *J Clin Hypertens (Greenwich)*. 2007 Apr;9(4):249-55.
- Xiang GD, Sun HL, Zhao LS, Hou J, Yue L, Xu L. The antioxidant alpha-lipoic acid improves endothelial dysfunction induced by acute hyperglycaemia during OGTT in impaired glucose tolerance. *Clin Endocrinol (Oxf)*. 2008 May;68(5):716-23.
- Heinisch BB, Francesconi M, Mittermayer F, et al. Alpha-lipoic acid improves vascular endothelial function in patients with type 2 diabetes: a placebo-controlled randomized trial. *Eur J Clin Invest*. 2010 Feb;40(2):148-54.
- Ying Z, Kherada N, Farrar B, et al. Lipoic acid effects on established atherosclerosis. *Life Sci*. 2010 Jan 16;86(3-4):95-102.



29. Vincent HK, Bourguignon CM, Vincent KR, Taylor AG. Effects of alpha-lipoic acid supplementation in peripheral arterial disease: a pilot study. *J Altern Complement Med*. 2007 Jun;13(5):577-84.
30. Hadj A, Esmore D, Rowland M, et al. Pre-operative preparation for cardiac surgery utilising a combination of metabolic, physical and mental therapy. *Heart Lung Circ*. 2006 Jun;15(3):172-81.
31. Zhang WJ, Bird KE, McMillen TS, LeBoeuf RC, Hagen TM, Frei B. Dietary alpha-lipoic acid supplementation inhibits atherosclerotic lesion development in apolipoprotein E-deficient and apolipoprotein E/low-density lipoprotein receptor-deficient mice. *Circulation*. 2008 Jan 22;117(3):421-8.
32. Mittermayer F, Pleiner J, Francesconi M, Wolzt M. Treatment with alpha-lipoic acid reduces asymmetric dimethylarginine in patients with type 2 diabetes mellitus. *Transl Res*. 2010 Jan;155(1):6-9.
33. Mattioli LF, Holloway NB, Thomas JH, Wood JG. Fructose, but not dextrose, induces leukocyte adherence to the mesenteric venule of the rat by oxidative stress. *Pediatr Res*. 2010 Apr;67(4):352-6.
34. Kim HJ, Kim JY, Lee SJ, et al. -Lipoic acid prevents neointimal hyperplasia via induction of p38 mitogen-activated protein kinase/Nur77-mediated apoptosis of vascular smooth muscle cells and accelerates postinjury reendothelialization. *Arterioscler Thromb Vasc Biol*. 2010 Nov;30(11):2164-72.
35. Li CJ, Zhang QM, Li MZ, Zhang JY, Yu P, Yu DM. Attenuation of myocardial apoptosis by alpha-lipoic acid through suppression of mitochondrial oxidative stress to reduce diabetic cardiomyopathy. *Chin Med J (Engl)*. 2009 Nov 5;122(21):2580-6.
36. Doggrell SA. Alpha-lipoic acid, an anti-obesity agent? *Expert Opin Investig Drugs*. 2004 Dec;13(12):1641-3.
37. Kim MS, Park JY, Namkoong C, et al. Anti-obesity effects of alpha-lipoic acid mediated by suppression of hypothalamic AMP-activated protein kinase. *Nat Med*. 2004 Jul;10(7):727-33.
38. Lee WJ, Koh EH, Won JC, Kim MS, Park JY, Lee KU. Obesity: the role of hypothalamic AMP-activated protein kinase in body weight regulation. *Int J Biochem Cell Biol*. 2005 Nov;37(11):2254-9.
39. Prieto-Hontoria PL, Perez-Matute P, Fernandez-Galilea M, Barber A, Martinez JA, Moreno-Aliaga MJ. Lipoic acid prevents body weight gain induced by a high fat diet in rats: effects on intestinal sugar transport. *J Physiol Biochem*. 2009 Mar;65(1):43-50.
40. Eason RC, Archer HE, Akhtar S, Bailey CJ. Lipoic acid increases glucose uptake by skeletal muscles of obese-diabetic ob/ob mice. *Diabetes Obes Metab*. 2002 Jan;4(1):29-35.
41. Lee WJ, Song KH, Koh EH, et al. Alpha-lipoic acid increases insulin sensitivity by activating AMPK in skeletal muscle. *Biochem Biophys Res Commun*. 2005 Jul 8;332(3):885-91.
42. Muellenbach EM, Diehl CJ, Teachey MK, et al. Metabolic interactions of AGE inhibitor pyridoxamine and antioxidant alpha-lipoic acid following 22 weeks of treatment in obese Zucker rats. *Life Sci*. 2009 Apr 10;84(15-16):563-8.
43. Timmers S, de Vogel-van den Bosch J, Towler MC, et al. Prevention of high-fat diet-induced muscular lipid accumulation in rats by alpha lipoic acid is not mediated by AMPK activation. *J Lipid Res*. 2010 Feb;51(2):352-9.
44. Park KG, Min AK, Koh EH, et al. Alpha-lipoic acid decreases hepatic lipogenesis through adenosine monophosphate-activated protein kinase (AMPK)-dependent and AMPK-independent pathways. *Hepatology*. 2008 Nov;48(5):1477-86.
45. Butler JA, Hagen TM, Moreau R. Lipoic acid improves hypertriglyceridemia by stimulating triacylglycerol clearance and downregulating liver triacylglycerol secretion. *Arch Biochem Biophys*. 2009 May 1;485(1):63-71.
46. Kim E, Park DW, Choi SH, Kim JJ, Cho HS. A preliminary investigation of alpha-lipoic acid treatment of antipsychotic drug-induced weight gain in patients with schizophrenia. *J Clin Psychopharmacol*. 2008 Apr;28(2):138-46.
47. Carbonelli MG, Di Renzo L, Bigioni M, Di Daniele N, De Lorenzo A, Fusco MA. Alpha-lipoic acid supplementation: a tool for obesity therapy? *Curr Pharm Des*. 2010;16(7):840-6.
48. Gianturco V, Bellomo A, D'Ottavio E, et al. Impact of therapy with alpha-lipoic acid (ALA) on the oxidative stress in the controlled NIDDM: a possible preventive way against the organ dysfunction? *Arch Gerontol Geriatr*. 2009;49 Suppl 1:129-33.
49. Poh ZX, Goh KP. A current update on the use of alpha lipoic acid in the management of type 2 diabetes mellitus. *Endocr Metab Immune Disord Drug Targets*. 2009 Dec;9(4):392-8.
50. Jacob S, Henriksen EJ, Schiemann AL, et al. Enhancement of glucose disposal in patients with type 2 diabetes by alpha-lipoic acid. *Arzneimittelforschung*. 1995 Aug;45(8):872-4.
51. Jacob S, Ruus P, Hermann R, et al. Oral administration of RAC-alpha-lipoic acid modulates insulin sensitivity in patients with type-2 diabetes mellitus: a placebo-controlled pilot trial. *Free Radic Biol Med*. 1999 Aug;27(3-4):309-14.
52. Kamenova P. Improvement of insulin sensitivity in patients with type 2 diabetes mellitus after oral administration of alpha-lipoic acid. *Hormones (Athens)*. 2006 Oct-Dec;5(4):251-8.
53. Chang JW, Lee EK, Kim TH, et al. Effects of alpha-lipoic acid on the plasma levels of asymmetric dimethylarginine in diabetic end-stage renal disease patients on hemodialysis: a pilot study. *Am J Nephrol*. 2007;27(1):70-4.
54. Morcos M, Borcea V, Isermann B, et al. Effect of alpha-lipoic acid on the progression of endothelial cell damage and albuminuria in patients with diabetes mellitus: an exploratory study. *Diabetes Res Clin Pract*. 2001 Jun;52(3):175-83.
55. Vallianou N, Evangelopoulos A, Koutalas P. Alpha-lipoic Acid and diabetic neuropathy. *Rev Diabet Stud*. 2009 Winter;6(4):230-6.
56. Tahrani AA, Askwith T, Stevens MJ. Emerging drugs for diabetic neuropathy. *Expert Opin Emerg Drugs*. 2010 Dec;15(4):661-83.
57. Winkler G, Kempler P. Pathomechanism of diabetic neuropathy: background of the pathogenesis-oriented therapy. *Orv Hetil*. 2010 Jun 13;151(24):971-81.
58. Negrisanu G, Rosu M, Bolte B, Lefter D, Dabelea D. Effects of 3-month treatment with the antioxidant alpha-lipoic acid in diabetic peripheral neuropathy. *Rom J Intern Med*. 1999 Jul-Sep;37(3):297-306.
59. Ziegler D, Ametov A, Barinov A, et al. Oral treatment with alpha-lipoic acid improves symptomatic diabetic polyneuropathy: the SYDNEY 2 trial. *Diabetes Care*. 2006 Nov;29(11):2365-70.
60. Liu F, Zhang Y, Yang M, et al. Curative effect of alpha-lipoic acid on peripheral neuropathy in type 2 diabetes: a clinical study. *Zhonghua Yi Xue Za Zhi*. 2007 Oct 16;87(38):2706-9.
61. Mijnhout GS, Alkhalaf A, Kleefstra N, Bilo HJ. Alpha lipoic acid: a new treatment for neuropathic pain in patients with diabetes? *Neth J Med*. 2010 Apr;68(4):158-62.
62. Ruhnau KJ, Meissner HP, Finn JR, et al. Effects of 3-week oral treatment with the antioxidant thioctic acid (alpha-lipoic acid) in symptomatic diabetic polyneuropathy. *Diabet Med*. 1999 Dec;16(12):1040-3.
63. Burekovic A, Terzic M, Alajbegovic S, Vukojevic Z, Hadzic N. The role of alpha-lipoic acid in diabetic polyneuropathy treatment. *Bosn J Basic Med Sci*. 2008 Nov;8(4):341-5.
64. Haak E, Usadel KH, Kusterer K, et al. Effects of alpha-lipoic acid on microcirculation in patients with peripheral diabetic neuropathy. *Exp Clin Endocrinol Diabetes*. 2000;108(3):168-74.
65. Munch G, Kuhla B, Luth HJ, Arendt T, Robinson SR. Anti-AGEing defences against Alzheimer's disease. *Biochem Soc Trans*. 2003 Dec;31(Pt 6):1397-9.
66. Zhang L, Xing GQ, Barker JL, et al. Alpha-lipoic acid protects rat cortical neurons against cell death induced by amyloid and hydrogen peroxide through the Akt signalling pathway. *Neurosci Lett*. 2001 Oct 26;312(3):125-8.
67. Jesudason EP, Masilamani JG, Ashok BS, et al. Inhibitory effects of short-term administration of DL-alpha-lipoic acid on oxidative vulnerability induced by Abeta amyloid fibrils (25-35) in mice. *Mol Cell Biochem*. 2008 Apr;311(1-2):145-56.
68. Holmquist L, Stuchbury G, Berbaum K, et al. Lipoic acid as a novel treatment for Alzheimer's disease and related dementias. *Pharmacol Ther*. 2007 Jan;113(1):154-64.
69. Beal MF. Bioenergetic approaches for neuroprotection in Parkinson's disease. *Ann Neurol*. 2003;53 Suppl 3:S39-47; discussion S47-8.
70. Moreira PI, Harris PL, Zhu X, et al. Lipoic acid and N-acetyl cysteine decrease mitochondrial-related oxidative stress in Alzheimer disease patient fibroblasts. *J Alzheimers Dis*. 2007 Sep;12(2):195-206.

71. Suchy J, Chan A, Shea TB. Dietary supplementation with a combination of alpha-lipoic acid, acetyl-L-carnitine, glycerophosphocoline, docosahexaenoic acid, and phosphatidylserine reduces oxidative damage to murine brain and improves cognitive performance. *Nutr Res*. 2009 Jan;29(1):70-4.
72. Karunakaran S, Diwakar L, Saeed U, et al. Activation of apoptosis signal regulating kinase 1 (ASK1) and translocation of death-associated protein, Daxx, in substantia nigra pars compacta in a mouse model of Parkinson's disease: protection by alpha-lipoic acid. *FASEB J*. 2007 Jul;21(9):2226-36.
73. Chaudhary P, Marracci GH, Bourdette DN. Lipoic acid inhibits expression of ICAM-1 and VCAM-1 by CNS endothelial cells and T cell migration into the spinal cord in experimental autoimmune encephalomyelitis. *J Neuroimmunol*. 2006 Jun;175(1-2):87-96.
74. Marracci GH, Marquardt WE, Strehlow A, et al. Lipoic acid downmodulates CD4 from human T lymphocytes by dissociation of p56(Lck). *Biochem Biophys Res Commun*. 2006 Jun 9;344(3):963-71.
75. Marracci GH, McKeon GP, Marquardt WE, Winter RW, Riscoe MK, Bourdette DN. Alpha lipoic acid inhibits human T-cell migration: implications for multiple sclerosis. *J Neurosci Res*. 2004 Nov 1;78(3):362-70.
76. Morini M, Roccatagliata L, Dell'Eva R, et al. Alpha-lipoic acid is effective in prevention and treatment of experimental autoimmune encephalomyelitis. *J Neuroimmunol*. 2004 Mar;148(1-2):146-53.
77. Salinthe S, Schillace RV, Marracci GH, Bourdette DN, Carr DW. Lipoic acid stimulates cAMP production via the EP2 and EP4 prostanoid receptors and inhibits IFN gamma synthesis and cellular cytotoxicity in NK cells. *J Neuroimmunol*. 2008 Aug 13;199(1-2):46-55.
78. Schillace RV, Pisenti N, Pattamanuch N, et al. Lipoic acid stimulates cAMP production in T lymphocytes and NK cells. *Biochem Biophys Res Commun*. 2007 Mar 2;354(1):259-64.
79. Schreibelt G, Musters RJ, Reijerkerk A, et al. Lipoic acid affects cellular migration into the central nervous system and stabilizes blood-brain barrier integrity. *J Immunol*. 2006 Aug 15;177(4):2630-7.
80. Yadav V, Marracci G, Lovera J, et al. Lipoic acid in multiple sclerosis: a pilot study. *Mult Scler*. 2005 Apr;11(2):159-65.
81. Yadav V, Shinto L, Bourdette D. Complementary and alternative medicine for the treatment of multiple sclerosis. *Expert Rev Clin Immunol*. 2010 May;6(3):381-95.
82. Toklu HZ, Hakan T, Biber N, Solakoglu S, Ogunc AV, Sener G. The protective effect of alpha lipoic acid against traumatic brain injury in rats. *Free Radic Res*. 2009 Jul;43(7):658-67.
83. Mitsui Y, Schmelzer JD, Zollman PJ, Mitsui M, Tritschler HJ, Low PA. Alpha-lipoic acid provides neuroprotection from ischemia-reperfusion injury of peripheral nerve. *J Neurol Sci*. 1999 Feb 1;163(1):11-6.
84. Senoglu M, Nacitarhan V, Kurutas EB, et al. Intraperitoneal Alpha-Lipoic Acid to prevent neural damage after crush injury to the rat sciatic nerve. *J Brachial Plex Peripher Nerve Inj*. 2009;4:22.
85. Ranieri M, Sciuscio M, Cortese A, et al. Possible role of alpha-lipoic acid in the treatment of peripheral nerve injuries. *J Brachial Plex Peripher Nerve Inj*. 2010 Aug 31;5(1):15.
86. Novotny L, Rauko P, Cojocel C. alpha-Lipoic acid: the potential for use in cancer therapy. *Neoplasma*. 2008;55(2):81-6.
87. Dadhania VP, Tripathi DN, Vikram A, Ramarao P, Jena GB. Intervention of alpha-lipoic acid ameliorates methotrexate-induced oxidative stress and genotoxicity: A study in rat intestine. *Chem Biol Interact*. 2010 Jan 5;183(1):85-97.
88. Selvakumar E, Hsieh TC. Regulation of cell cycle transition and induction of apoptosis in HL-60 leukemia cells by lipoic acid: role in cancer prevention and therapy. *J Hematol Oncol*. 2008;1:4.
89. Na MH, Seo EY, Kim WK. Effects of alpha-lipoic acid on cell proliferation and apoptosis in MDA-MB-231 human breast cells. *Nutr Res Pract*. 2009 Winter;3(4):265-71.
90. Shi DY, Liu HL, Stern JS, Yu PZ, Liu SL. Alpha lipoic acid induces apoptosis in hepatoma cells via the PTEN/Akt pathway. *FEBS Lett*. 2008 May 28;582(12):1667-71.
91. Choi SY, Yu JH, Kim H. Mechanism of alpha-lipoic acid-induced apoptosis of lung cancer cells. *Ann N Y Acad Sci*. 2009 Aug;1171:149-55.
92. Dozio E, Ruscica M, Passafaro L, et al. The natural antioxidant alpha-lipoic acid induces p27(Kip1)-dependent cell cycle arrest and apoptosis in MCF-7 human breast cancer cells. *Eur J Pharmacol*. 2010 Sep 1;641(1):29-34.
93. Lee HS, Na MH, Kim WK. alpha-Lipoic acid reduces matrix metalloproteinase activity in MDA-MB-231 human breast cancer cells. *Nutr Res*. 2010 Jun;30(6):403-9.
94. Kumar S, Budhwar R, Nigam A, Priya S. Cytoprotection against Cr(6+)-induced DNA damage by alpha-lipoic acid: implications in reducing occupational cancer risk. *Mutagenesis*. 2009 Nov;24(6):495-500.
95. Koh EH, Lee WJ, Lee SA, et al. Effects of alpha-lipoic acid on body weight in obese subjects. *Am J Med*. 2011 Jan;124(1):85.e1-8.
96. Schiapparelli P, Allais G, Castagnoli Gabellari I, Rolando S, Terzi MG, Benedetto C. Non-pharmacological approach to migraine prophylaxis: part II. *Neurol Sci*. 2010 Jun;31 Suppl 1:S137-9.
97. Magis D, Ambrosini A, Sándor P, Jacquy J, Laloux P, Schoenen J. A randomized double-blind placebo-controlled trial of thioctic acid in migraine prophylaxis. *Headache*. 2007 Jan;47(1):52-7.
98. Xiang G, Pu J, Yue L, Hou J, Sun H. -lipoic acid can improve endothelial dysfunction in subjects with impaired fasting glucose. *Metabolism*. 2011 Apr;60(4):480-5.
99. Masharani U, Gjerde C, Evans JL, Youngren JF, Goldfine ID. Effects of controlled-release alpha lipoic acid in lean, nondiabetic patients with polycystic ovary syndrome. *J Diabetes Sci Technol*. 2010 Mar 1;4(2):359-64.
100. Ranieri M, Sciuscio M, Cortese AM, et al. The use of alpha-lipoic acid (ALA), gamma linolenic acid (GLA) and rehabilitation in the treatment of back pain: effect on health-related quality of life. *Int J Immunopathol Pharmacol*. 2009 Jul-Sep;22(3 Suppl):45-50.
101. Gourlay M, Franceschini N, Sheyn Y. Prevention and treatment strategies for glucocorticoid-induced osteoporotic fractures. *Clin Rheumatol*. 2007 Feb;26(2):144-5.
102. Lu BB, Li KH. Lipoic acid prevents steroid-induced osteonecrosis in rabbits. *Rheumatol Int*. 2011 Mar 23.
103. Prieto-Hontoria PL, Pérez-Matute P, Fernández-Galilea M, Martínez JA, Moreno-Aliaga MJ. Lipoic acid inhibits leptin secretion and Sp1 activity in adipocytes. *Mol Nutr Food Res*. 2011 Feb 23.



Natural Support for Cellular Energy Production

Optimized Carnitine with GlycoCarn®

Diminished cellular energy production is an inevitable consequence of aging. As adults mature, the cellular power plants known as the *mitochondria* become dysfunctional. The resulting slowdown in energy production manifests in numerous health problems.

Nutritional researchers have discovered that the amino acid **carnitine** promotes the burning of fat for fuel in the mitochondria, thus promoting youthful levels of cellular energy production.* Researchers have now identified several optimized, next-generation forms of **carnitine** that not only help boost cellular energy production, but also may confer targeted benefits for the brain, heart, muscles, and central nervous system.

Optimized Carnitine with GlycoCarn® combines these advanced forms of carnitine—*acetyl L-carnitine*, *glycine propionyl L-carnitine*, and *acetyl L-carnitine arginate*—in a single formula that provides balanced, broad-spectrum support for cellular energy production throughout the body.

Acetyl L-carnitine readily crosses the blood-brain barrier to combat oxidative stress and promote energy production in critical brain and central nervous system tissues.¹ Acetyl L-carnitine also supports healthy brain function by stimulating the release of acetylcholine and dopamine, two neurotransmitters that play vital roles in brain health and communication.*

Acetyl L-carnitine arginate has an added molecule of arginine that enables it to augment the effects of acetyl L-carnitine, promoting the growth of neurites that facilitate communication among nerve cells in the brain.²

GlycoCarn® is a patented form of **glycine propionyl L-carnitine** that quickly penetrates into heart, endothelial, and muscle cells, with effects that range from protecting heart muscle from lack of blood flow to combating muscle fatigue by increasing muscle energy stores of glycogen.³

Two capsules of **Optimized Carnitine with GlycoCarn®** provide:

Acetyl L-carnitine HCl	800 mg
ArginoCarn® Acetyl L-carnitine Arginate Di-HCl	300 mg
GlycoCarn® Glycine Propionyl L-Carnitine HCl	300 mg

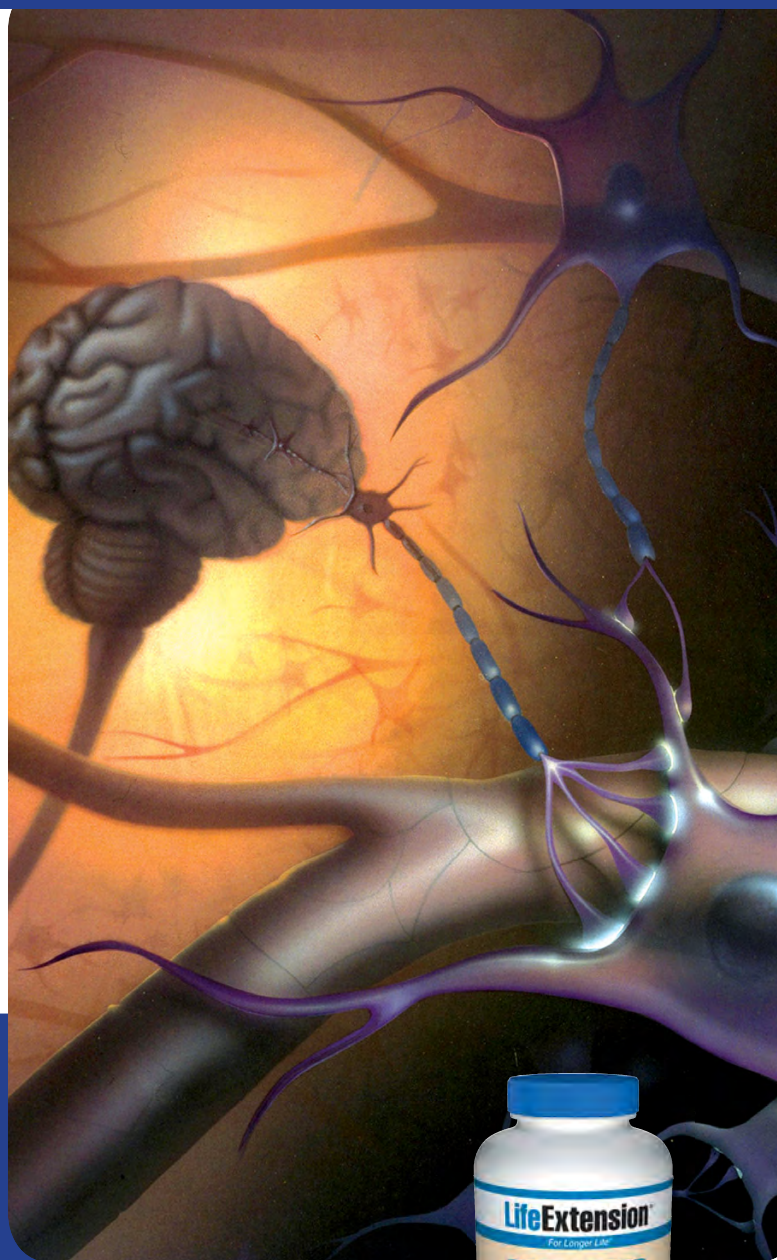
A bottle of 60 vegetarian capsules of **Optimized Carnitine with GlycoCarn®** retails for \$29. If a member buys four bottles, the price is reduced to only **\$19.58 per bottle**.

References

1. *Alzheimer Dis Assoc Disord.* 1995;9(3):128-31.
2. *Neurochem Res.* 1995 Jan;20(1):1-9.
3. *Mol Cell Biochem.* 2003 Dec;254(1-2):227-34.

GlycoCarn® and ArginoCarn® are registered trademarks of Sigma-tau HealthScience, Inc., and are protected by US patent Nos. 6,703,042 and worldwide patent EP1202956. The combination of multiple forms of Carnitine is protected by Sigma-tau patent # 6,245,378.

*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 #00916

To order **Optimized Carnitine with GlycoCarn®**,
call **1-800-544-4440** or visit
www.LifeExtension.com

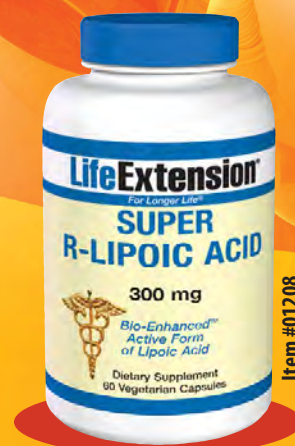
Preserve Youthful Cellular ENERGY

with Next-Generation LIPOIC ACID

Published studies have shown the critical importance of **lipoic acid** in supporting healthy mitochondrial function.

Unlike other forms of lipoic acid, **SUPER R-Lipoic Acid** is more bioavailable, stable, and potent, achieving 10-30 times higher peak blood levels than pure R-lipoic acid.¹ This unique **sodium-R-lipoate** can help you reach peak plasma concentrations within just 10-20 minutes² of supplementation.

Super R-Lipoic Acid provides more of the active "R" form of lipoic acid than any other supplement.



To order **Super R-Lipoic Acid**,
call **1-800-544-4440** or
visit **www.LifeExtension.com**

A bottle of **Super R-Lipoic Acid** containing 60 vegetarian capsules retails for \$49. If a member buys four bottles, the cost is only **\$33.75 per bottle**. Each capsule contains **300 mg** of stabilized, Bio-Enhanced[®] **Super R-lipoic acid** supplying **240 mg** of R-lipoic acid. Suggested dose is one capsule each day.

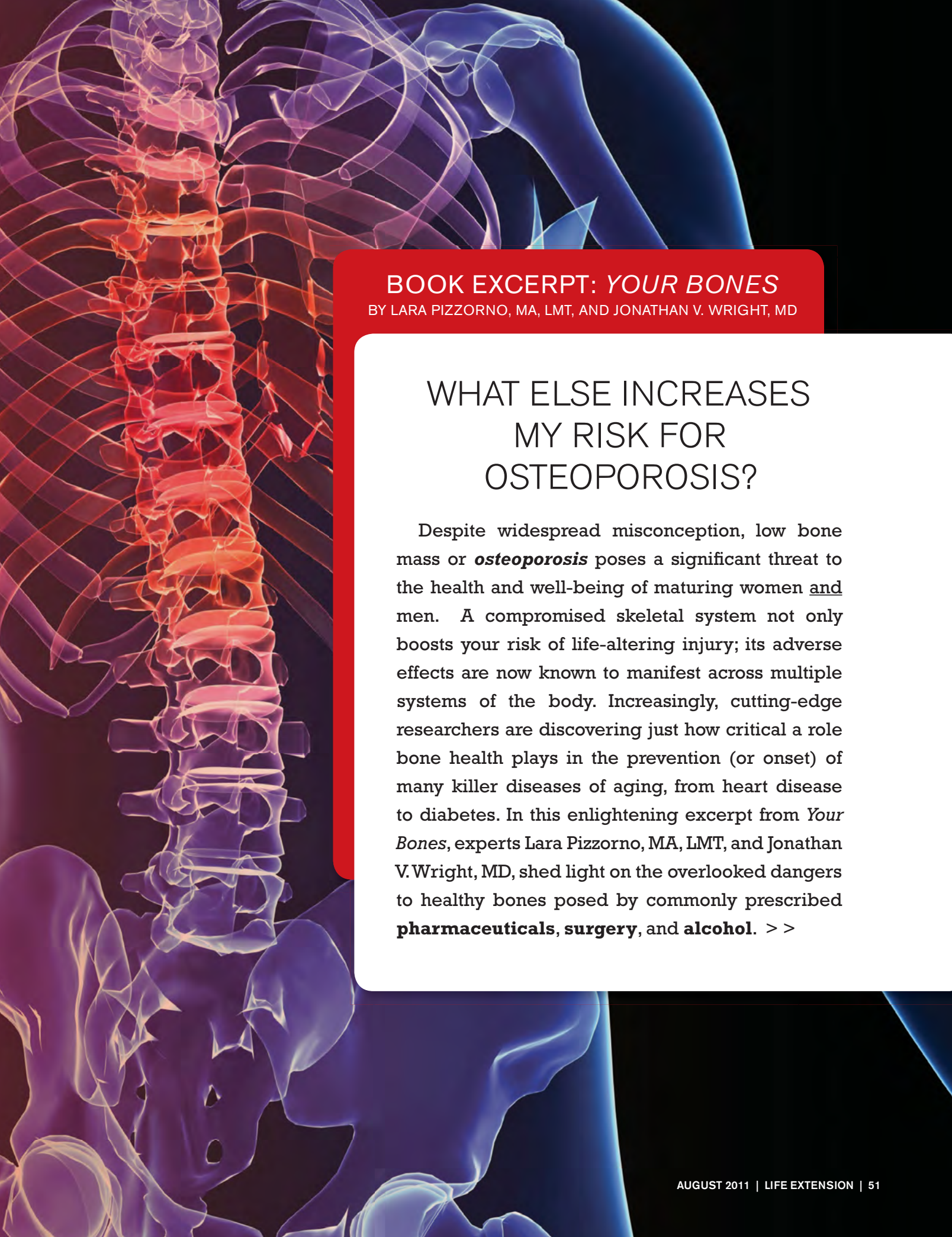
Contains rice.

References:

1. Carlson DA, Young KL, Fischer SJ, Ulrich H. In: Packer L, Patel M. eds. *Lipoic Acid: Energy Production, Antioxidant Activity and Health Effects*. London: Taylor & Francis Publishers; 2008:235-70.
2. Carlson DA, Smith AR, Fischer SJ, Young KL, Packer L. *Altern Med Rev*. 2007 Dec;12(4):343-51.

Bio-Enhanced[®] is a registered trademark of GeroNova Research, Inc.





BOOK EXCERPT: *YOUR BONES*

BY LARA PIZZORNO, MA, LMT, AND JONATHAN V. WRIGHT, MD

WHAT ELSE INCREASES MY RISK FOR OSTEOPOROSIS?

Despite widespread misconception, low bone mass or ***osteoporosis*** poses a significant threat to the health and well-being of maturing women and men. A compromised skeletal system not only boosts your risk of life-altering injury; its adverse effects are now known to manifest across multiple systems of the body. Increasingly, cutting-edge researchers are discovering just how critical a role bone health plays in the prevention (or onset) of many killer diseases of aging, from heart disease to diabetes. In this enlightening excerpt from *Your Bones*, experts Lara Pizzorno, MA, LMT, and Jonathan V. Wright, MD, shed light on the overlooked dangers to healthy bones posed by commonly prescribed **pharmaceuticals, surgery, and alcohol.** > >

Gastric Bypass: Free Pass? Not for Your Bones

Gastric bypass (or small-bowel resection) reduces the amount of absorptive surface area in the intestines, and by doing so lessens the body's ability to absorb not just fat and calories, but also all the nutrients needed to maintain and form healthy bone.

The gastric bypass is the leading surgery to treat morbid obesity performed in the United States. Since this operation causes the primary sites where calcium absorption occurs to be bypassed, patients become deficient in calcium and vitamin D. In response to these deficiencies, the body up-regulates the secretion and activity of parathyroid hormone. Parathyroid hormone has two bone-related effects: it causes an increase in the production of the most active form of vitamin D (1,25-dihydroxyvitamin D), which helps us absorb more calcium from food, but it also causes increased bone resorption (bone breakdown) to liberate more calcium for calcium's many other uses in the body.^{1,2}

Calcium wears a lot of "hats" in the body, playing vital roles in a number of critical physiological processes not related to its use in bone. These include helping blood to clot, so we don't bleed to death when cut; helping nerves to send impulses and muscles to contract (in the case of the heart muscle, contraction = heartbeat); and regulating our cell membranes, so our cells can allow entry of what they need and send out what they don't.

Because these activities are essential to life, the body tightly controls the amount of calcium in the blood to ensure that sufficient calcium is available for them. Our bones, where approximately 99% of the calcium in our bodies is stashed, serve as a calcium "bank" from which withdrawals can be made to maintain normal blood concentrations whenever the need arises—which it surely will after gastric bypass (or if we fail to consume calcium-rich foods and/ or supplemental calcium sufficient to meet our body's needs).

Gastric banding, another surgical procedure for morbid obesity, is a safer, potentially reversible, and effective alternative to the Roux-en-Y gastric bypass that has not been shown to produce as much bone loss as the Roux-en-Y procedure. In gastric banding, an inflatable silicone device is placed around the top portion of the stomach to create a small pouch at the top of the stomach that holds about 3.5 to 6.5 ounces of food. When a person eats, the pouch quickly fills with food, and the band slows its passage from the pouch to the lower part of the stomach. As soon as

the upper part of the stomach registers as full, the brain is sent a message that the entire stomach is full, which helps the person eat smaller portions, eat less often, and lose weight over time. Within six to eight years, weight loss from gastric banding is comparable to that achieved by gastric bypass; however, many physicians and patients choose gastric bypass because it results in faster weight loss and resolution of diabetes.³ The fact that some of the weight lost comes from the patient's bones is somehow overlooked.

What Does This Mean for YOU?

Either of these surgeries will lessen your body's ability to absorb calcium and the other nutrients necessary for bone health. If you have had or are considering either of these surgical interventions for morbid obesity, please discuss the potential adverse effects on your bones with your physician. Medical journal articles alerting physicians to these concerns are just beginning to appear, and many doctors remain unaware of these issues.⁴

Although increasing calcium or vitamin D intake does not suppress parathyroid hormone or prevent the acceleration in bone resorption caused by gastric bypass, it is possible that highly absorbable supplements may help lessen the damage.⁵ Anyone who has had either of these surgeries should be using calcium supplements.

The Liver-Kidney Connection to Bone

You've probably heard about how important vitamin D is for bone health. Here's why: vitamin D stimulates the absorption of calcium from the intestines and also calcium's resorption from the kidneys, greatly improving the likelihood that adequate calcium will be present in the bloodstream for all the body's calcium needs.

However, these effects of vitamin D do not occur until *after* vitamin D has been converted into its most active form in the body. This conversion occurs in two stages, the first of which takes place in the liver, and the second in the kidneys. For this reason, dysfunction in either the liver or the kidneys can compromise vitamin D activation, calcium absorption, and bone health.

Approximately 23% of patients with chronic liver disease have osteoporosis. You may be thinking that this couldn't possibly concern you, that liver disease is uncommon and caused only by alcoholism or hepatitis. You'd be wrong.

Today, the most rapidly increasing liver disease is nonalcoholic fatty liver disease or NAFLD, and it is caused by insulin resistance and type 2 diabetes. Following menopause, risk for NAFLD goes up significantly. In a surprising 55% of women over age 60, liver function is compromised by NAFLD.⁶⁻⁹ High blood pressure and diabetes also increase risk for chronic kidney disease, which is estimated to affect 11.5% of adults aged 20 or older in the US.¹⁰

What Does This Mean for YOU?

NAFLD and other liver diseases often produce no noticeable symptoms and may therefore go undiagnosed. Particularly if you have been diagnosed with metabolic syndrome or type 2 diabetes, be sure your annual physical includes the standard lab tests that check liver function.¹¹

Symptoms of worsening kidney function are also unspecific and may go unnoticed. Symptoms include feeling generally unwell and loss of appetite. Check to be sure that the lab tests run for your annual physical include *creatinine*. Higher levels of creatinine indicate a decrease in kidney function and the ability to excrete waste products.

Anyone suffering from chronic liver or kidney disease is at significantly increased risk for vitamin D deficiency and osteoporosis. Supplemental vitamin D has been found to help lessen bone loss associated with liver and/or kidney disease.¹²⁻¹⁶

What's Hyperparathyroidism and Why Should My Bones Care?

Hyperparathyroidism is overactivity of the parathyroid glands (hyper = excessive, above normal), resulting in excessive production of parathyroid hormone. Hyperparathyroidism is divided into "primary" and "secondary" types.

"Primary" hyperparathyroidism is relatively rare. It's a disease of the parathyroid glands themselves, usually of unknown origin, and is almost always the more severe form. Sometimes surgery is required as part of treatment.

"Secondary" hyperparathyroidism is almost always milder, and not always diagnosed as such. Secondary hyperparathyroidism is not a disease (as the primary form is) but a protective response by the body to increase blood levels of calcium from unhealthy low levels caused by inadequate calcium intake or the many other causes listed below.



Osteoporosis Risk

- Many physicians are unaware that gastric bypass threatens bone health and bone density by decreasing the stomach's calcium-absorptive area.
- Some of patients' weight loss following gastric banding or gastric bypass represents lost bone mass.
- Additional calcium intake is crucial for individuals who have undergone these procedures.
- Optimal liver and kidney health is crucial for the activation of vitamin D, a mineral that helps the body absorb calcium.
- Individuals with chronic liver or kidney disease risk vitamin D deficiency and osteoporosis.
- Maintaining healthy parathyroid levels is also crucial for optimal bone health. Higher-than-normal parathyroid levels may indicate you are not achieving adequate calcium and vitamin D levels.
- Hyperthyroidism and anorexia nervosa can also threaten bone health.
- Medications like Actos®, anticonvulsants, opioids, glucocorticoids, antacids, and proton-pump inhibitors also threaten bone health.

But although parathyroid hormone causes an increase in the body's production of the most active form of vitamin D (1,25-dihydroxyvitamin D), which helps us absorb more calcium from our intestines, parathyroid hormone also causes increased osteoclast activity and bone resorption (bone breakdown) in order to liberate calcium from bone for calcium's many other immediate uses in the body.

Blood levels of calcium low enough to cause secondary hyperparathyroidism are typically due to not getting enough daily calcium, vitamin D deficiency, chronic kidney disease, chronic liver disease, low levels of stomach acid (hypochlorhydria, relatively common after age 50), malabsorption of calcium (and other minerals, most often caused by "hidden" gluten sensitivity), or gastric bypass surgery. Obesity has also been shown to increase parathyroid hormone levels, which, in addition, tend to increase with age in both men and women.

Above normal levels of parathyroid hormone have recently been associated not only with osteoporosis, but also with cognitive decline and senile dementia (Alzheimer's disease). The connection is most likely explained by the fact that sustained high levels of parathyroid hormone in the brain increase risk of calcium overloading, which leads to impaired blood flow and brain degeneration.¹⁷

Fortunately, a recent study involving 37 institutionalized women, ranging in age from their late 70s to late 80s, has shown that consumption of a fortified dairy product, containing only about 17–25% of the recommended daily intakes for calcium and vitamin D, lowered levels of parathyroid hormone and increased levels of both vitamin D and markers of bone formation in just one month.¹⁸

What Does This Mean for YOU?

The lab tests ordered at your annual physical should include blood levels of parathyroid hormone. Normal values range from 10–55 picograms per milliliter (pg/mL); however, recent research suggests values higher than 30 may indicate suboptimal intake of calcium and vitamin D.¹⁹

Higher than normal levels of parathyroid hormone indicate that you are not meeting your body's needs for calcium and vitamin D, and that you are at increased risk not only for osteoporosis but cognitive decline and Alzheimer's disease. Work with your doctor to increase your consumption of calcium and vitamin D, and recheck your levels of parathyroid hormone after a month to two months on your new and improved bone health promotion program.

Is Your Thyroid on Overdrive?

Hyperthyroidism (a "hyperactive" thyroid) is a well-known risk factor for osteoporosis, regardless of sex or age. The hormones produced and secreted by the thyroid gland regulate the body's metabolic rate. When thyroid hormone levels are too high, regardless of whether we are pre- or post-menopausal, female or male, it's like putting the body into overdrive, accelerating all its metabolic activities, including the rate at which bones are remodeled, all the time.

Each bone remodeling cycle involves 3–5 weeks of bone breakdown by osteoclasts followed by about 3 months during which osteoblasts lay down new bone to replace the bone that was removed. The result of the fast-forward bone metabolism seen in hyperthyroidism is increased bone resorption that leads to a loss of approximately 10% of bone mass per remodeling cycle. Not surprisingly, this can quickly result in lowered bone mineral density and increased risk of fracture.^{20,21} Fortunately, hyperthyroidism is relatively uncommon.





**Gloria Vanderbilt Once Said,
“A Woman Can’t Be Too Rich or Too Thin.”
She Was Half-Wrong.**

Anorexia nervosa, an eating disorder characterized by intense fear of gaining weight and becoming fat, despite being underweight (weighing less than 85% of the weight considered normal or healthy for one’s height and build), causes bone loss, particularly in the spine and hip.^{22,23} This is not surprising since bones cannot be built without a whole team of nutrients and also respond by strengthening when stressed by weight—which is why resistance exercises help build bone.

Avoiding food, self-induced vomiting, and use of laxatives, diuretics, and/or appetite suppressants is a sure-fire recipe for bone starvation. Lack of sufficient nourishment not only causes a premenopausal woman to stop menstruating and lose bone, but also causes her to lose muscle and turn into a Skeletor cartoon character look-alike.

The stress that muscles put on bone when they contract is a key “time to build more bone” signal. Women are already at a bone-building disadvantage compared to men because our muscles are smaller. Cannibalize your muscles, and you thin your bones. The complete loss of menstrual periods, *amenorrhea*, occurs largely because the body is no longer willing to use the energy needed to produce estrogen, which regulates osteoclasts, preventing them from removing too much bone.

Bone-Busting Patent Medicines

If you are taking any of the following patent medicines, work with your physician to help compensate for their bone-destroying effects or, if possible, to find an alternative less harmful to your bones.

Avandia® (rosiglitazone) and Actos® (pioglitazone): Use of the diabetes patent medicines Avandia® or Actos® for more than a year doubles to triples risk of hip fractures.²⁴⁻²⁷

These patent medicines, members of a class of patent medicines called thiazolidinediones (also known as glitazones), are insulin-sensitizing medications that account for approximately 21% of the oral blood sugar-lowering patent medicines used in the US. Although their main therapeutic effects occur in fat tissue, muscles, and the liver, studies show they affect bone as well. They do so by triggering mesenchymal stem cells, which can become any one of several different types of cells, including osteoblasts, chondrocytes (cells that produce cartilage), or adipocytes (fat cells), into choosing to become adipocytes. When you take these patent medicines, your body makes more fat and less bone.

Because studies have demonstrated accelerated bone loss, impaired bone mineral density, and increased fracture risk for thiazolidinedione users, clinicians have been told to carefully assess the fracture risk in their patients with type 2 diabetes before starting them on thiazolidinediones.²⁸

Anticonvulsants: Barbituates such as phenobarbital or Mysoline® (primidone) alter the metabolism of vitamin D. Dilantin® (phenytoin) interferes with vitamin D and may also cause a deficiency of folate or B6, or a reduction in blood levels of vitamin K, all of which are essential for building and maintaining bone.

Chronic Opioid Therapy: Used in the management of chronic pain, opioid patent medicines (e.g., morphine, codeine, hydrocodone, oxycodone, methadone, tramadol) greatly impact the production of a number of hormones, including two with significant effects on bone: estrogen and thyroid-stimulating hormone (TSH). A study of 47 women, aged 30 to 75, who were using oral or transdermal opioids for control of nonmalignant pain found estradiol levels were 57% lower than in control subjects! These patent medicines inhibit estrogen production so effectively that among premenopausal women, menstruation typically ceases soon after initiating opioid therapy. In contrast, opioid patent medicines *increase* the production of TSH, which directly suppresses bone remodeling. The combined effect of suppressing estrogen production



and increasing that of TSH is greatly increased risk of osteoporosis. Women needing opioids for relief of chronic pain should discuss bioidentical hormone replacement with their physicians.²⁹⁻³³

Glucocorticoid patent medicines: Often mistakenly termed “cortisone,” these patent medicines include prednisone, prednisolone, Kenalog®, dexamethasone, and nearly anything else ending in “-one,” along with the nonpatentable Cortef®, which is bioidentical cortisol, but as a prescription often used in excess of normal body levels. These patent medicines kill osteocytes (which is what osteoblasts turn into after they begin secreting the bone matrix). Thus, these patent medicines cause a rapid weakening of bone architecture (within 6 months of initiating treatment) even at very low doses. In addition, the glucocorticoid patent medicines deplete the body of vitamin D3, interfering with normal calcium metabolism and absorption. One reason smoking is so harmful to bone is that nicotine causes the body to produce excess cortisol.³⁴⁻³⁶

Antacids/Proton-pump inhibitors: For calcium to be absorbed, it must first be made soluble and ionized by stomach acid. These patent medicines inhibit or even totally prevent your body’s ability to produce stomach acid.

Are Your Bones Going Up in Smoke?

Smokers lose bone more rapidly, have lower bone mass (a full one-third of a standard deviation less at the hip and a one-tenth standard deviation less for all sites combined), and a higher fracture rate. In addition, women who smoke reach menopause, when estrogen levels plummet causing bone loss, up to two years earlier than their nonsmoking peers.³⁷⁻⁴⁰

Approximately 19% of the hip fractures occurring in a study that pooled data from three population studies involving a total of 13,393 women and 17,379 men were attributable to smoking.⁴¹ In other research, smoking increased risk of spinal osteoporosis in men by 230%!⁴²

More than Two Drinks of Liquor Makes Bone Loss Much Quicker

Alcohol has a dose-dependent toxic effect on osteoblast activity. One to two drinks a day appears to be beneficial. More than two drinks a day prevents bone repair and renewal and significantly increases fracture risk.^{43,44}

Using data from the Third National Health and Nutrition Examination Survey, researchers found that moderate drinkers (less than 29 drinks per month) actually had higher BMD than abstainers. Moderate consumption of alcohol translated to 2.1% higher BMD in men and 3.8% higher BMD in postmenopausal women.⁴⁵ Another large study, this one involving 11,032 women and 5,939 men, found no increase in fracture risk when two ounces or less of alcohol was consumed daily, but drinking more than this increased risk of any osteoporotic fracture by 38% and hip fracture by 68%.⁴⁶

Your choice of which alcoholic beverage to consume can also affect the health of your bones. Several recent studies suggest moderate intake (no more than two servings a day) of beer and/or wine may have beneficial effects on bone. (One serving of beer = 8 ounces; one serving of wine = 4 ounces.) A study of 1,697 healthy women, of whom 710 were premenopausal, 176 were perimenopausal, and 811 were postmenopausal, found that beer drinkers had slightly higher bone mass.⁴⁷

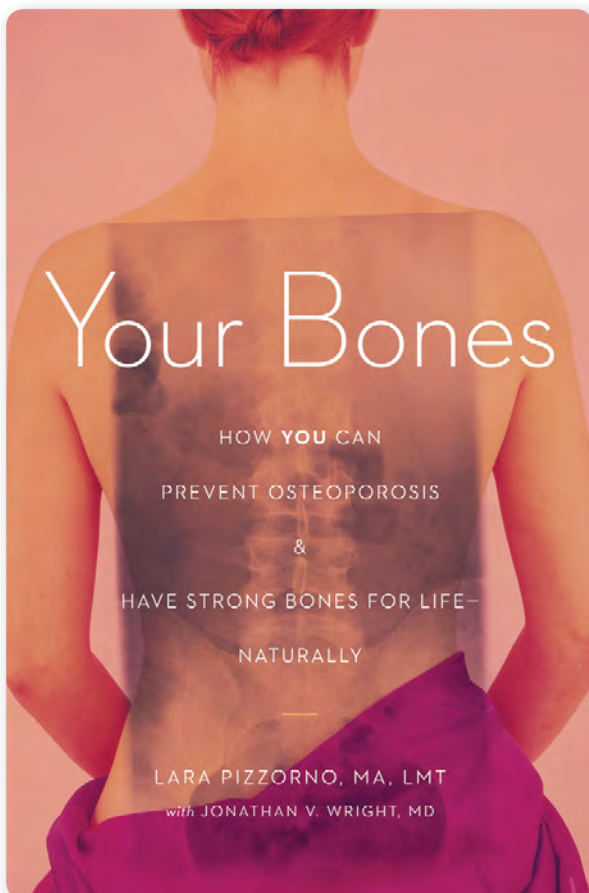
A second large study involving 1,182 men, 1,289 postmenopausal woman, and 248 premenopausal women found bone mineral density was 3.0–4.5% greater in men consuming 2 daily drinks of alcohol or beer, and 5.0–8.3 greater in postmenopausal women consuming 1–2 drinks of alcohol or wine daily. More

than 2 drinks a day, however, was associated with significantly lower (3.0–5.2% lower) bone mineral density in the hip and spine in men.

Beer's beneficial effects on bone are thought to be due to its silicon content. One can of beer contains around 7 milligrams of silicon; a 4-ounce glass of wine provides around 1 milligram of silicon. (For comparison, a half cup of cooked spinach contains around 5 milligrams of silicon.)

Wine's bone benefits may be linked to its content of phytochemicals, especially the resveratrol present in red wine, which has been shown to have estrogenic effects and might therefore help protect against bone loss in postmenopausal women in whom estrogen levels are low. In rat studies, resveratrol has been shown to have an estrogenic effect and to promote increased BMD in ovariectomized rats (rats whose ovaries have been removed to simulate menopause).⁴⁸⁻⁵⁰ ●

To order *Your Bones*, by Lara Pizzorno,
call 1-800-544-4440 or visit www.lifeextension.com
Retail price \$12 • Member price \$9
Item #33832



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

- Valderas, J. P., S. Velasco, S. Solari, et al. 2009. Increase of bone resorption and the parathyroid hormone in postmenopausal women in the longterm after Roux-en-Y gastric bypass. *Obes Surg* Aug;19(8):1132–8. Epub 2009 Jun 11. PMID: 19517199.
- De Prisco, C. and S. N. Levine. 2005. Metabolic bone disease after gastric bypass surgery for obesity. *Am J Med Sci* Feb;329(2):57–61. PMID: 15711420.
- Tice, J. A., L. Karliner, J. Walsh, et al. 2008. Gastric banding or bypass? A systematic review comparing the two most popular bariatric procedures. *Am J Med* Oct;121(10):885–93. PMID: 18823860.
- Wang, A. and A. Powell. 2009. The effects of obesity surgery on bone metabolism: what orthopedic surgeons need to know. *Am J Orthop* (Belle Mead NJ) Feb;38(2):77–9. PMID: 19340369.
- Goode, L. R., R. E. Brolin, H. A. Chowdhury, et al. 2004. Bone and gastric bypass surgery: effects of dietary calcium and vitamin D. *Obes Res* Jan;12(1):40–7. PMID: 14742841.
- Nakchbandi, I. A., S. W. van der Merwe. 2009. Current understanding of osteoporosis associated with liver disease. *Nat Rev Gastroenterol Hepatol* Nov;6(11):660–70. PMID: 19881518.
- Jean, G., J. C. Terrat, T. Vanel, et al. 2008. Daily oral 25-hydroxycholecalciferol supplementation for vitamin D deficiency in haemodialysis patients: effects on mineral metabolism and bone markers. *Nephrol Dial Transplant* Nov;23(11):3670–6. PMID: 18579534.
- Jean, G., J. C. Terrat, T. Vanel, et al. 2008. Evidence for persistent vitamin D 1-alpha-hydroxylation in hemodialysis patients: evolution of serum 1,25-dihydroxycholecalciferol after 6 months of 25-hydroxycholecalciferol treatment. *Nephron Clin Pract* 110(1):c58–65. PMID: 18724068.
- Frith, J. and J. L. Newton. 2009. Liver disease in older women. *Maturitas* Dec 2. [Epub ahead of print] PMID: 19962256.
- Levey, A. S., L. A. Stevens, C. H. Schmid, et al. 2009. A new equation to estimate glomerular filtration rate. *Ann Intern Med* May 5;150(9):604–12. PMID: 19414839.
- Frith, J., D. Jones and J. L. Newton. 2009. Chronic liver disease in an ageing population. *Age Ageing* Jan;38(1):11–8. Epub 2008 Nov 22. PMID: 19029099.
- George, J., H. K. Ganesh, S. Acharya, et al. 2009. Bone mineral density and disorders of mineral metabolism in chronic liver disease. *World J Gastroenterol* Jul 28;15(28):3516–22. PMID: 19630107.
- Murlikiewicz, K., A. Zawiasa, M. Nowicki. 2009. [Vitamin D—a panacea in nephrology and beyond] *Pol Merkur Lekarski* Nov;27(161):437–41. PMID: 19999813.
- Moe, S. M., T. Drüeke, N. Lameire, et al. 2007. Chronic kidney disease-mineral-bone disorder: a new paradigm. *Adv Chronic Kidney Dis* Jan;14(1):3–12. PMID: 17200038.
- Spasovski, G. B. 2007. Bone health and vascular calcification relationships in chronic kidney disease. *Int Urol Nephrol* 39(4):1209–16. Epub 2007 Sep 26. PMID: 17899431.
- Jean, G., B. Charra and C. Chazot. 2008. Vitamin D deficiency and associated factors in hemodialysis patients. *J Ren Nutr* Sep;18(5):395–9. PMID: 18721733.
- Braverman, E. R., T. J. Chen, A. L. Chen, et al. 2009. Age-related increases in parathyroid hormone may be antecedent to both osteoporosis and dementia. *BMC Endocr Disord* Oct 13;9:21. PMID: 19825157.

18. Bonjour, J. P., V. Benoit, O. Pourchaire, et al. 2009. Inhibition of markers of bone resorption by consumption of vitamin D and calcium-fortified soft plain cheese by institutionalised elderly women. *Br J Nutr* Oct;102(7):962–6. PMID: 19519975.
19. Braverman, E. R., T. J. Chen, A. L. Chen, et al. 2009. Age-related increases in parathyroid hormone may be antecedent to both osteoporosis and dementia. *BMC Endocr Disord* Oct 13;9:21. PMID: 19825157.
20. Williams, G. R. 2009. Actions of thyroid hormones in bone. *Endokrynol Pol* Sep-Oct;60(5):380–8. PMID: 19885809.
21. Zaidi, M., T. F. Davies, A. Zallone, H. C. Blair, et al. 2009. Thyroid-stimulating hormone, thyroid hormones, and bone loss. *Curr Osteoporos Rep* Jul;7(2):47–52. PMID: 19631028.
22. Legroux-Gérot, I., J. Vignau, M. D'Herbomez, et al. 2007. Evaluation of bone loss and its mechanisms in anorexia nervosa. *Calcif Tissue Int* Sep;81(3):174–82. PMID: 17668143.
23. Legroux-Gérot, I., J. Vignau, E. Biver, et al. 2010. Anorexia nervosa, osteoporosis and circulating leptin: the missing link. *Osteoporos Int* Jan 6. [Epub ahead of print] PMID: 20052458.
24. Loke, Y. K., S. Singh, C. D. Furberg. 2009. Longterm use of thiazolidinediones and fractures in type 2 diabetes: a meta-analysis. *CMAJ* Jan 6;180(1):32–9. PMID: 19073651.
25. Dormuth, C. R., G. Carney, B. Carleton, et al. 2009. Thiazolidinediones and fractures in men and women. *Arch Intern Med* Aug 10;169(15):1395–402. PMID: 19667303.
26. Douglas, I. J., S. J. Evans, S. Pocock, et al. 2009. The risk of fractures associated with thiazolidinediones: a self-controlled case-series study. *PLoS Med* Sep;6(9):e1000154. PMID: 19787025.
27. Meier, C., M. Bodmer, C. R. Meier, et al. 2009. [Thiazolidinediones and skeletal health] *Rev Med Suisse* Jun 10;5(207):1309–10, 1312–3. PMID: 19626930.
28. McDonough, A. K., R. S. Rosenthal, et al. 2008. The effect of thiazolidinediones on BMD and osteoporosis. *Nat Clin Pract Endocrinol Metab* Sep;4(9):507–13. PMID: 18695700.
29. Daniell, H. W. 2008. Opioid endocrinopathy in women consuming prescribed sustained-action opioids for control of nonmalignant pain. *J Pain* Jan;9(1):28–36. PMID: 17936076.
30. Vuong, C., S. H. Van Uum, L. E. O'Dell, et al. 2010. The effects of opioids and opioid analogs on animal and human endocrine systems. *Endocr Rev* Feb;31(1):98–132. PMID: 19903933.
31. Katz, N., N. A. Mazer. 2009. The impact of opioids on the endocrine system. *Clin J Pain* Feb;25(2):170–5. PMID: 19333165.
32. Bassett, J. H., P. J. O'Shea, S. Sriskantharajah, et al. 2007. Thyroid hormone excess rather than thyrotropin deficiency induces osteoporosis in hyperthyroidism. *Mol Endocrinol* May;21(5):1095–107. PMID: 17327419.
33. Zaidi, M., T. F. Davies, A. Zallone, et al. 2009. Thyroid-stimulating hormone, thyroid hormones, and bone loss. *Curr Osteoporos Rep* Jul;7(2):47–52. PMID: 19631028.
34. Weng, M.Y., N. E. Lane. 2007. Medication-induced osteoporosis. *Curr Osteoporos Rep* Dec;5(4):139–45. PMID: 18430387.
35. De Nijs, R. N. 2008. Glucocorticoid-induced osteoporosis: a review on pathophysiology and treatment options. *Minerva Med* Feb;99(1):23–43. PMID: 18299694.
36. Silverman, S.L., N. E. Lane. 2009. Glucocorticoid-induced osteoporosis. *Curr Osteoporos Rep* Mar;7(1):23–6. PMID: 19239826.
37. Slemenda, C.W., S. L. Hui, C. Longcope and C. C. Johnston, Jr. 1989. Cigarette smoking, obesity, and bone mass. *J Bone Miner Res* Oct;4(5):737–41. PMID: 2816518.
38. Krall, E. A. and B. Dawson-Hughes. 1991. Smoking and bone loss among postmenopausal women. *J Bone Miner Res* Apr;6(4):331–8. PMID: 1858519.
39. Vestergaard, P. and L. Mosekilde. 2003. Fracture risk associated with smoking: a meta-analysis. *J Intern Med* Dec;254(6):572–83. PMID: 14641798.
40. Ward, K. D. and R. C. Klesges. 2001. A meta-analysis of the effects of cigarette smoking on bone mineral density. *Calcif Tissue Int* May;68(5):259–70. PMID: 11683532.
41. Høidrup, S., E. Prescott, T. I. Sørensen, et al. 2000. Tobacco smoking and risk of hip fracture in men and women. *Int J Epidemiol* Apr;29(2):253–9. PMID: 10817121.
42. Seeman, E., L. J. Melton, 3rd, W. M. O'Fallon, et al. 1983. Risk factors for spinal osteoporosis in men. *Am J Med* Dec;75(6):977–83. PMID: 6650552.
43. Chakkalakal, D. A. 2005. Alcohol-induced bone loss and deficient bone repair. *Alcohol Clin Exp Res* Dec;29(12):2077–90. PMID: 16385177.
44. Broulik, P. D., J. Rosenkrancová, P. Ržika, et al. 2009. The effect of chronic alcohol administration on bone mineral content and bone strength in male rats. *Physiol Res* Nov 20. [Epub ahead of print] PMID: 19929136.
45. Wosje, K. S. and H. J. Kalkwarf. 2007. Bone density in relation to alcohol intake among men and women in the United States. *Osteoporos Int* Mar;18(3):391–400. PMID: 17091218.
46. Kanis, J. A., H. Johansson, O. Johnell, et al. 2005. Alcohol intake as a risk factor for fracture. *Osteoporos Int* Jul;16(7):737–42. PMID: 15455194.
47. Pedrera-Zamorano, J. D., J. M. Lavado-Garcia, R. Roncero-Martin, et al. 2009. Effect of beer drinking on ultrasound bone mass in women. *Nutrition* Oct;25(10):1057–63. Epub 2009 Jun 13. PMID: 19527924.
48. Tucker, K. L., 2009. Jugdaohsingh R, Powell JJ, et al. Effects of beer, wine, and liquor intakes on bone mineral density in older men and women. *Am J Clin Nutr* Apr;89(4):1188–96. Epub 2009 Feb 25. PMID: 19244365.
49. Liu, Z. P., W. X. Li, B. Yu, et al. 2005. Effects of trans-resveratrol from *Polygonum cuspidatum* on bone loss using the ovariectomized rat model. *J Med Food* Spring 8(1):14–9. PMID: 15857203.
50. King, R. E., J. A. Bomser and D. B. Min. Bioactivity of resveratrol. *Compr Rev Food Sci Food Saf* 5:65–70. DOI 10.1111/j.1541-4337.2006.00001.x, <http://www3.interscience.wiley.com/journal/118607162/abstract>.

Excerpted from *Your Bones, How You Can Prevent Osteoporosis & Have Strong Bones for Life – Naturally* by Lara Pizzorno, MA, LMT with Jonathan V. Wright, MD. Reprinted with permission from Praktikos Books.



SUPER BOOSTER

with the most effective form of Vitamin K2,
Gamma Tocopherol, Ginkgo, and much more!

Despite abundant scientific validation, many people still do not take vital nutrients because they don't want to swallow so many pills. This problem has been solved with a one-per-day softgel that includes multiple health-promoting nutrients in just one supplement.

The **Life Extension® Super Booster** contains critical oil-based nutrients that cannot be incorporated into dry-powder based formulas like the **Life Extension Mix™**.

The **Super Booster** provides the most effective form of **vitamin K**, known as **menaquinone-7**, along with other forms of this critical nutrient.

Just one **Super Booster** softgel provides:

- **Gamma Tocopherol** If one consumes only alpha tocopherol, the critically important gamma tocopherol is displaced from cells within the body. While alpha tocopherol vitamin E inhibits lipid peroxidation, the gamma tocopherol form quenches the dangerous peroxynitrite free radical. It is especially important for those who take vitamin E supplements to make sure they consume at least 200 mg a day of gamma tocopherol.

- **Sesame Lignans** Sesame lignans augment the antioxidant effects of both alpha- and gamma-tocopherol. In a human study conducted at Life Extension, gamma tocopherol plus sesame lignans was 25% more effective in suppressing measurements of free-radical damage than gamma tocopherol and tocotrienols.



Item #01590

- **Vitamin K2** Vitamin K1 from dietary plant sources is poorly absorbed and only a small fraction gets into the bloodstream. **Vitamin K2** is absorbed much more efficiently.

Scientific studies show **K2** provides superior benefits for the bones, arteries, and other tissues. The **MK-4** form of vitamin K2 is the most rapidly absorbed and is now routinely used in Japan to maintain healthy bone density. **MK-4**, however, only remains active in the blood for a few hours. The **MK-7** form of K2, on the other hand, remains bioavailable to the human body over a sustained **24-hour period**. Super Booster provides a potent dose of **MK-7** to keep calcium in the bone and out of the arteries.

- **Lycopene** Evidence suggests that people who ingest the carotenoid lycopene enjoy healthier prostate function. Lycopene also helps guard against LDL oxidation.

- **Lutein** The carotenoid lutein helps maintain healthy cell division, supports the macula of the eye, and protects the endothelial lining of the arteries.

- **Ginkgo** Hundreds of studies substantiate the multifaceted effects of *Ginkgo biloba* in promoting healthy circulatory and neurological function.

- **Chlorophyllin** Scientific studies indicate that chlorophyllin may protect against environmentally induced damage to DNA.

- **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. Selenium's effects in boosting glutathione are well-established.

A bottle of 60 Super Booster softgels retails for \$42. If a member buys four bottles, the price is reduced to just **\$28.50** per bottle.

The **Super Booster** saves consumers **huge dollars** by combining a wide variety of costly nutrients into one daily softgel. If you add up the price of the individual ingredients contained in the **Super Booster**, you would spend **two to three times more** for this potency if taken separately.

Contains corn and sesame.

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

Lyc-O-Mato® is a registered trademark of LycoRed Natural Products Limited.

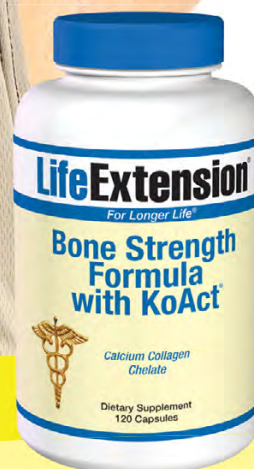


Just one softgel of Super Booster supplies:

Vitamin K2 (as menaquinone-7)	100 mcg
Vitamin K2 (as menaquinone-4)	1000 mcg
Vitamin K1 (as phytonadione)	1000 mcg
Gamma tocopherol	230 mg
Ginkgo extract	120 mg
Chlorophyllin	100 mg
Sesame lignans	20 mg
Lycopene	10 mg
Lutein	2 mg
Selenium (as Se-Methyl L-Selenocysteine)	67 mcg
Selenium (as L-Selenomethionine)	67 mcg
Selenium (as Sodium selenite)	67 mcg
Vitamin B12	300 mcg
Vitamin C	95 mg
Zinc	10 mg
Mixed tocopherols	359 mg

To order Super Booster,
call 1-800-544-4440 or
visit www.LifeExtension.com

STRONGER BONES, STRONGER YOU



Item # 01211

Weak, brittle bones increase the risk of injury for many aging humans. Bone injuries, such as fractures, splinters, and bruises, can be extraordinarily painful and may result in months of uncomfortable rehab or long-term disability. In order to protect yourself from potentially life-altering problems, Life Extension® has formulated an exciting product made with chelated **calcium** and **collagen** called **KoAct®** to maintain **bone strength** and **mineral density**.

KoAct® allows for greater flexibility...so your bones can absorb energy, **reducing the risk of age-related injuries**. Additional plant extracts are included for their bone-protective minerals and polyphenols.

A bottle of **Bone Strength Formula with KoAct®** retails for **\$42**. If a member buys four bottles, the price is reduced to **\$28.50** per bottle.

Contains corn.

To order Bone Strength Formula with KoAct®, call 1-800-544-4440 or visit www.LifeExtension.com

Four capsules of Bone Strength Formula with KoAct® provide:

Collagen (from 3,000 mg KoAct® Calcium Collagen Chelate)	2,700 mg
Calcium (from 3,000 mg KoAct® Calcium Collagen Chelate and calcium fructoborate)	300 mg
Vitamin D3 (as cholecalciferol)	1,000 IU
Magnesium (as magnesium citrate)	100 mg
Silica [from standardized Bamboo (<i>Bambusa vulgaris</i>) extract (stem)]	5 mg
Dried Plum (<i>Prunus domestica</i>) extract (fruit) [standardized to 50% polyphenols (50 mg)]	100 mg
Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®)	3 mg

If you need extra bone support, ask your healthcare professional how Bone Strength Formula with KoAct® can be part of a comprehensive nutritional program in conjunction with proper resistance exercise. Life Extension offers many mineral formulas that may complement Bone Strength Formula with KoAct® to ensure optimal mineral intake.

KoAct® is a registered trademark of AIDP, Inc. FruiteX B® and OsteoBoron® are registered trademarks of VDF FutureCeuticals, Inc., U.S. Patent #5,962,049.

All the K... One a Day

There are **three forms** of **vitamin K** that the human body can utilize to promote **arterial health** and **bone support**.¹⁻⁸

Life Extension®'s Super K with Advanced K2 Complex provides the *dynamic trio* of vitamin K forms in **one** softgel, including **vitamin K1**, **vitamin K2 (MK-4)**, and **vitamin K2 (MK-7)**.

Vitamin K1 is the form of vitamin K that is found in green vegetables. **K1** is tightly bound to plant fiber, so only a fraction is *absorbed* into the bloodstream. Supplementation ensures ample **K1** blood levels.

Vitamin K2 is usually found in meats, dairy, and egg yolks. Since you may be avoiding these foods for health reasons, ingesting a **K2** supplement is *essential*. **MK-4** is the most *rapidly absorbed* form of **K2**, and **MK-7** boasts a very *long half-life* in the body, making both forms the *perfect complement* to any **vitamin K** regimen.⁹

The retail price for a bottle containing **90 softgels** (three-month supply) is \$26. If a member buys four bottles, the price is reduced to just **\$17.25 per bottle**.

Super K formula provides in just one daily softgel:

Vitamin K1	1000 mcg
Vitamin K2 (MK-4)	1000 mcg
Vitamin K2 (MK-7)	100 mcg

Item #01224

The same **Super K** formula consisting of Vitamin K1, K2 (MK-4) and K2 (MK-7) can be found in the **Life Extension® Super Booster**. If you take the **Super Booster**, you do not need additional **Super K** softgels.

Contains tree nuts (coconut).

Warning to Coumadin® (warfarin) Drug Users

Patients prescribed vitamin K-antagonist anti-coagulant prescription drugs like warfarin should consult their physician before taking vitamin K supplements like Super K and Super Booster. There is evidence, however, that users of drugs like warfarin could benefit from a consistent low dose of supplemental vitamin K.

Ask your doctor if you can take a low dose (45 mcg a day) of vitamin K2 in the long-acting MK-7 form for the purpose of stabilizing your INR levels and also protecting your body against long-term vitamin K deficit. Do not initiate any form of vitamin K supplementation without full cooperation of your treating doctor, as your doctor may need to increase your dose of warfarin to compensate for the vitamin K you supplement with.

Life Extension provides several forms of low-dose vitamin K for physician consideration.

To order Super K or Super Booster, call 1-800-544-4440 or visit www.LifeExtension.com

References:

1. *Vitam Horm.* 2008;78:393-416.
2. *Nutrition.* 2006 Jul-Aug;22(7-8):845-52.
3. *Calcif Tissue Int.* 1996 Nov;59(5):352-6.
4. *Z Kardiol.* 2001;90 Suppl 3:57-63.
5. *Atherosclerosis.* 2008 Jul 19.
6. *J Bone Miner Metab.* 2008;26(3):260-4.
7. *Am J Clin Nutr.* 2008 Apr;87(4):985-92.
8. *J Biol Regul Homeost Agents.* 2008 Jan-Mar;22(1):35-44.
9. *Blood.* 2007 Apr 15;109(8):3279-83.

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.







The Little-Known Link Between Bone Health and Total Health

BY RON PEREZ

Scientists at the leading edge of **osteology** (bone research) are discovering that in addition to **immune strength, blood cell production, and nervous system function**, a healthy skeletal system is also essential to **insulin sensitivity, energy metabolism, and weight management**.¹⁻⁴

The common bone disease osteoporosis accounts for **2.6 million** doctors' office visits and **180,000** placements in nursing homes across the country each year. According to the Surgeon General, by 2020 this potentially life-changing condition will afflict nearly *half* of all Americans over 50.⁵

Behind this alarming trend lies an even greater threat to the public health most doctors don't know about. It turns out that strong, healthy bones play a far greater role in *overall* health than previously known.

In this article, the most recent data on these findings are detailed. You will also discover how **calcium, magnesium, and potassium**, along with **vitamins D3 and K**, act to *optimize* these functions for bone strength and system-wide health. > >



Until recently, the human skeleton was known to serve three basic functions.⁶ The first was its role in providing structural support for muscles and protection for internal organs.⁶ The second was its function as a reservoir for important mineral ions, especially calcium and magnesium, which are vital to nerve and muscle cell functioning and electrical conduction.⁶⁻⁸ Finally, the marrow space of many bones harbors all of the body's blood-producing tissues and a major part of the cellular immune system.⁶

Just five years ago, however, scientists discovered a fourth, unexpected function.¹ Bone-forming cells called **osteoblasts** were found to produce a hormone-like signaling protein called **osteocalcin**.⁹ It was further revealed that osteocalcin stimulates pancreatic insulin secretion and improves insulin sensitivity in tissues throughout the body.^{1,2,10-12}

Osteocalcin reduces fat tissue deposition,² while higher osteocalcin levels are associated with lower levels of **leptin**.¹³ As you read next, suppressing excess leptin is important in weight management.

Sometimes called the “hunger hormone,” **leptin** induces the feeling of being full after a meal. It plays a key role in regulating energy intake and energy expenditure, including appetite and metabolism. Higher leptin levels are paradoxically detrimental; as with insulin, you can develop **leptin resistance** that

keeps you from feeling full. Obese individuals exhibit this resistance.¹⁴ Pathologically elevated leptin levels are detrimental to multiple tissues in the body and correlate with **insulin resistance, inflammation, stroke, hypertension**, and other dangerous health conditions.^{2,15-17}

High leptin levels also exert an adverse effect over osteocalcin function:¹⁸ the more leptin your body's fatty tissue produces, the less osteocalcin your bone cells release, and the worse your insulin resistance becomes.³ And in a final unexpected discovery, leptin achieves that effect by *suppressing* your osteoblasts' activity, decreasing your ability to build new bone, and threatening your bone health.¹⁸

An additional indicator of how good bone health affects longevity is the now well-understood relationship between skeletal health and **atherosclerosis**.¹⁹ Via a variety of mechanisms, as calcium leaves the bones in the process of osteoporosis, it builds up instead in blood vessel walls, leading to dangerous calcified plaque deposits.^{20,21} Those deposits can rupture, causing an immediate arterial blockage and producing a sudden heart attack or catastrophic stroke.

It is this close interrelationship between bone health and total body health that has intensified scientific interest in identifying nutritional strategies to optimize bone health and strength.¹

Most doctors don't know about these new findings. And most Americans, including many health-conscious individuals, don't get enough of the nutrients they need to support healthy bones. Adequate bone nutrition hinges on the following group of nutrients that work *synergistically* to optimize skeletal health and ward off multiple diseases of aging.²²⁻²⁴

Calcium

Calcium accounts for 1-2% of adult human body weight, with more than 99% of total body calcium residing in the teeth and bones.²⁵ The remaining 1% is used in our electrically active tissues such as nerve and muscle, where it plays a vital signaling role. Thus the skeleton is the body's only storehouse of the calcium we need to sustain life itself, yet as we age we see a progressive decrease in the amount of calcium in our bones.²⁵ Consuming a readily-absorbed form of calcium, then, is essential for restocking that reservoir—but many people do not ingest adequate amounts of calcium.²⁵

The mainstream medical establishment has stubbornly denied the value of calcium supplementation for years, arguing that human studies under controlled conditions were inconclusive.²⁶ A more careful and detailed review of recent studies, however, reveals flaws in their conclusions. Most notably, in outpatient studies, patients' adherence to the supplementation regimen was generally poor—in other words, participants weren't actually taking the calcium doses that researchers thought they were.²⁶ A recent re-analysis of five of those flawed studies showed that patients who took the required doses of supplements indeed had significant reductions in osteoporosis fracture risk.²⁶ Studies designed to optimize patients' adherence to supplementation regimens have also demonstrated improved bone health and reduced risk of fracture.^{22,27,28}

Not all calcium is alike. Dicalcium malate is an especially rich source of elemental calcium since it is comprised of two calcium molecules attached to each malic acid molecule. In a study of calcium absorption in humans, dicalcium malate demonstrated the longest half-life and greatest bioavailability, compared to several other forms of calcium.²⁹ Calcium bis-glycinate consists of calcium chelated to the amino acid glycine, which allows it to be easily absorbed and utilized by the body. Both dicalcium malate and calcium bis-glycinate are easily assimilated, well tolerated, and effective at improving bone mineral density, an important measure of bone health.³⁰ These mineral formulations represent outstanding forms of calcium for those seeking to optimize their bone health.

The Link Between Bone Health and Total Health

- Nearly *half* of all Americans over 50 will suffer from osteoporosis by the year 2020.
- Osteoporosis is only one of the consequences of inadequate bone nutrition.
- Medical researchers have recently discovered conclusive links between bone health and system-wide health.
- The most recent research reveals that weak bones contribute to increased fat mass, decreased insulin sensitivity, inflammation, and greater risk of cardiovascular disease.
- While most maturing individuals know of calcium's importance for healthy bones, many remain unenlightened of the critical need for vitamin D3, vitamin K, magnesium, potassium, and boron.



Daily doses averaging **1,000 mg** are recommended for adults. For older women, the recommendation is **1,200 mg** daily.³¹ Higher doses don't provide additional benefit, and doses greater than **3,000 mg** per day may be associated with kidney stones and other undesirable outcomes.³²

Vitamin D3

In order to absorb calcium from the diet or from supplements, the human body requires vitamin D. For years, we believed that promoting calcium absorption from the intestinal tract was the chief function of vitamin D.³³ But over the past decade there has been an explosion of scientific discoveries about vitamin D's multiple roles throughout the body.³⁴ We now recognize that vitamin D functions as a hormone, with receptors located in at least 35 different tissue types.^{34,35} That means the body's overall requirement for vitamin D is much greater than we originally realized.^{33,36}

With regard to bone health, vitamin D not only promotes calcium absorption but also its proper deposition in bone tissue, where it helps maintain the skeleton's basic function as scaffold and protector of soft tissues.³⁷ Elsewhere in the body, vitamin D acts at its specific receptors to promote immune function, subdue inflammation, reduce arterial calcification, enhance cardiac function, improve brain and nerve tissue performance, and even prevent cancer by

regulating the cell replication cycle.^{34,38,39} Conversely, vitamin D deficiency is associated with not only bone diseases, but also cardiovascular disease, the metabolic syndrome, cancer, immune suppression, and autoimmune conditions such as multiple sclerosis, lupus, and inflammatory bowel disease.^{37,39-42}

Despite the renewed scientific interest in vitamin D's impact on human health, the prevalence of vitamin D deficiency remains high.⁴³ Vitamin D3 (*cholecalciferol*) is synthesized in the skin from sunlight exposure and then converted into the active form, 1,25-dihydroxyvitamin D (*calcitriol*), by the liver and kidneys.³⁷ But even in sunny Southern California, where one would expect most people to have sufficient vitamin D levels, almost **20%** of people in one study had low vitamin D3 levels in their blood.⁴⁴ In less sun-exposed regions, deficiency rates in excess of 50% have been documented.^{35,45}

And remember that "deficiency" means exceedingly low levels of vitamin D. In aging individuals who don't take at least 5,000 IU per day of vitamin D, approximately 85% have insufficient or "less-than-optimal" blood levels of vitamin D (measured as 25-hydroxyvitamin D).⁴⁶

The combination of our increased knowledge about the importance of vitamin D throughout the body, and the widespread lack of adequate levels, has resulted in a rapidly growing international call for increased vitamin D intake.^{33,45,47}

Many experts in the field recommend supplementing with doses of **2,000-10,000 IU** per day in order



Vitamin K2—Extra Nutrition for Optimal Bone Health

Attention to the importance of vitamin K2 in supporting bone health has grown over the past decade. It works alongside vitamin D3 to keep calcium in bones where it belongs and out of arterial walls where it does not.^{67,68} Vitamin K2 reduces production of bone-absorbing cells (*osteoclasts*) and promotes development of bone-forming cells (*osteoblasts*).^{69,70} Vitamin K2 is required for production of a small family of proteins that include the bone matrix proteins and the essential bone-produced hormone called osteocalcin.^{35,71}

Healthy bone matrix proteins hold tightly to calcium and maintain bone's integrity and strength, reducing your risk of osteoporosis. And ample supplies of osteocalcin directly improve insulin sensitivity, reduce fat accumulation, and are associated with lower levels of leptin, a fat-produced hormone that's implicated in the metabolic syndrome.^{13,18}

Vitamin K2 increases osteocalcin production and improves bone mineral density, and may protect against fracture risk.⁷²⁻⁷⁶

NOTE: If you are taking any form of the anticoagulant medication Coumadin® (*warfarin*), consult with your prescribing physician before increasing your vitamin K intake. While large quantities of vitamin K may reduce the medication's efficacy, low-dose vitamin K (100 mcg/day) may increase the stability of anticoagulant therapy, as measured by less fluctuation in international normalized ratio (INR) values.^{77,78}



to achieve optimal total-body vitamin D status for optimal skeletal, cardiovascular, neurological, immunological, and metabolic health.^{45,48-50}

Magnesium

While calcium and vitamin D have been considered the mainstays of bone nutrition and osteoporosis prevention, several other minerals are also essential to good bone health.^{51,52} Magnesium is an element that is involved in more than 300 essential metabolic reactions. Magnesium is also vital to human nerve and muscle cell function. Fully one-half

to two-thirds of the total body content of magnesium is stored in bone—another example of the skeleton's substantial role as reservoir for important minerals.^{53,54} While blood levels of magnesium remain virtually constant throughout life, the total body content diminishes with aging, leading to depletion of the skeletal stores.⁵⁵ Magnesium deficiency is therefore common among older adults, who typically consume inadequate amounts of magnesium-rich foods and whose physiology may contribute to increased losses of the element from the body.⁵⁵

Magnesium deficiency is a risk factor for osteoporosis and is also associated with a long list of other chronic ailments, many of which are themselves age-related. These include virtually all forms of cardiovascular disease, insulin resistance and diabetes, lipid disturbances, increased inflammation and oxidative stress, asthma, chronic fatigue, and depression.⁵⁵

Plentiful consumption of magnesium is an important part of good bone nutrition. Higher dietary intakes are associated with higher bone mineral density.^{53,54,56,57} While the mechanisms of this effect are not entirely clear, it is known that magnesium supports a more alkaline environment in bone and other tissues, which helps to reduce calcium losses in the urine.^{51,56} Magnesium also reduces markers of excessive bone turnover, helping bones retain their vital mineral mass.⁵⁸

Increasing magnesium intake improves bone mineral density and bone strength in both animal and human studies.^{57,59} Conversely, magnesium deficiency may impair the beneficial effects of calcium supplements. In magnesium-deficient rats, calcium supplements suppressed bone formation, a worrisome finding.⁶⁰ That study serves as an important reminder



of the importance of comprehensive bone nutrition that includes more than simply calcium and vitamin D.⁵¹ Simultaneously increasing calcium and magnesium intake helps promote a favorable change in cytokines that can promote bone formation.⁶¹

Potassium

Potassium is one of the predominant ions in the human body, and it is essential to maintaining health at the cellular level. Even apparently minor potassium disturbances can produce significant cardiovascular disorders. Americans consume an average of only 2,600 mg of potassium daily, compared with the 4,700 mg recommended by the USDA's Center for Nutrition Policy and Promotion.⁶² Older adults are at substantially increased risk for having low potassium levels, in part because of lower dietary consumption of potassium-rich fruits and vegetables and also because of the side effects of many common medications such as certain diuretics like **furosemide**, thiazides such as **hydrochlorothiazide**, asthma medications such as **albuterol** inhalers, and the cancer chemotherapy drug **cisplatin**.^{63,64}

Potassium helps maintain a more *alkaline* or non-acidic tissue environment, which benefits bone health by reducing calcium losses in urine. People with

higher potassium intake boast higher bone mineral density, reducing their risk of osteoporosis and potentially life-changing fractures.^{56,65} Animal studies show that increasing potassium intake in combination with exercise improves both bone density and bone mineral content.⁶⁶ A modest amount of potassium, therefore, is a wise addition to a bone-health regimen.

Boron

Boron is a trace mineral that is essential to healthy bones since it supports the functions of calcium, magnesium, and vitamin D.⁷⁹⁻⁸² In a revealing study, postmenopausal women consumed a boron-deficient diet for 17 weeks, followed by 7 weeks of boron consumption. While on the boron-deficient diet, the women showed increased urinary loss of calcium and magnesium. When boron was re-introduced to their diet, urinary loss of calcium and magnesium declined, and hormones linked with healthy bone mass increased. These findings suggest that boron is crucial in helping maintain the body's optimal stores of bone-building calcium and magnesium.⁸¹

Modern eating habits make it difficult to obtain adequate amounts of boron from the typical diet. Scientists have discovered a plant-based form of boron called **calcium fructoborate**. Naturally found in fruits, vegetables, and other foods, this form of boron is highly stable and bioavailable and may provide antioxidant capabilities in addition to bone-building benefits.^{83,84}

Summary

If current health trends continue, nearly half of all Americans over 50 will suffer from osteoporosis by the year 2020. Osteoporosis is just one of the consequences of inadequate bone nutrition. New research reveals that weak bones contribute to increased fat mass, decreased insulin sensitivity, inflammation, and greater risk of cardiovascular disease, among other conditions. While most maturing individuals know they need calcium for healthy bones, many remain unenlightened of the critical need for vitamin D3, vitamin K, magnesium, potassium, and boron.

As a result, nearly half of older Americans do not get enough bone health-promoting nutrients. ●

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

References

- Clemens TL, Karsenty G. The osteoblast: An insulin target cell controlling glucose homeostasis. *J Bone Miner Res*. 2011 Apr;26(4):677-80.
- Kim YS, Paik IY, Rhie YJ, Suh SH. Integrative physiology: defined novel metabolic roles of osteocalcin. *J Korean Med Sci*. 2010 Jul;25(7):985-91.
- Confavreux CB. Bone: from a reservoir of minerals to a regulator of energy metabolism. *Kidney Int Suppl*. 2011 Apr (121):S14-9.
- Available at: <http://emedicine.medscape.com/article/1254517-overview>. Accessed May 13, 2011.
- US Department of Health and Human Services. Office of the Surgeon General. "Bone Health and Osteoporosis: A Report of the Surgeon General." October 14, 2004.
- Grabowski P. Physiology of bone. *Endocr Dev*. 2009;16:32-48.
- Simon LS. Osteoporosis. *Clin Geriatr Med*. 2005 Aug;21(3):603-29, viii.
- London G, Coyne D, Hruska K, Malluche HH, Martin KJ. The new kidney disease: improving global outcomes (KDIGO) guidelines - expert clinical focus on bone and vascular calcification. *Clin Nephrol*. 2010 Dec;74(6):423-32.
- Hinoi E. Control of bone remodeling by nervous system. Regulation of glucose metabolism by skeleton. Tangent point with nervous system. *Clin Calcium*. 2010 Dec;20(12):1814-9.
- Wolf G. Energy regulation by the skeleton. *Nutr Rev*. 2008 Apr;66(4):229-33.
- Ferron M, Wei J, Yoshizawa T, et al. Insulin signaling in osteoblasts integrates bone remodeling and energy metabolism. *Cell*. 2010 Jul 23;142(2):296-308.
- Ferron M, McKee MD, Levine RL, Ducy P, Karsenty G. Intermittent injections of osteocalcin improve glucose metabolism and prevent type 2 diabetes in mice. *Bone*. 2011 Apr 29.
- Gravstein KS, Napora JK, Short RG, et al. Cross-sectional evidence of a signaling pathway from bone homeostasis to glucose metabolism. *J Clin Endocrinol Metab*. 2011 Mar 9.
- Enriori PJ, Evans AE, Sinnayah P, Cowley MA. Leptin resistance and obesity. *Obesity (Silver Spring)*. 2006 Aug;14 Suppl 5:254S-258S.
- Wannamethee SG, Tchernova J, Whincup P, et al. Plasma leptin: associations with metabolic, inflammatory and haemostatic risk factors for cardiovascular disease. *Atherosclerosis*. 2007 Apr;191(2):418-26.
- Henriksen JH, Holst JJ, Moller S, Andersen UB, Bendtsen F, Jensen G. Elevated circulating leptin levels in arterial hypertension: relationship to arteriovenous overflow and extraction of leptin. *Clin Sci (Lond)*. 2000 Dec;99(6):527-34.
- Soderberg S, Stegmayr B, Ahlbeck-Glader C, Slunga-Birgander L, Ahren B, Olsson T. High leptin levels are associated with stroke. *Cerebrovasc Dis*. 2003;15(1-2):63-9.
- Ducy P. The role of osteocalcin in the endocrine cross-talk between bone remodelling and energy metabolism. *Diabetologia*. 2011 Jun;54(6):1291-7.
- Vermeer C, Theuvsen E. Vitamin K, osteoporosis and degenerative diseases of ageing. *Menopause Int*. 2011 Mar;17(1):19-23.
- Demer LL, Tintut Y. Mechanisms linking osteoporosis with cardiovascular calcification. *Curr Osteoporos Rep*. 2009 Jul;7(2):42-6.
- Hjortnaes J, Butcher J, Figueiredo JL, et al. Arterial and aortic valve calcification inversely correlates with osteoporotic bone remodelling: a role for inflammation. *Eur Heart J*. 2010 Aug;31(16):1975-84.
- Kaats GR, Preuss HG, Croft HA, Keith SC, Keith PL. A comparative effectiveness study of bone density changes in women over 40 following three bone health plans containing variations of the same novel plant-sourced calcium. *Int J Med Sci*. 2011;8(3):180-91.
- Kim MH, Yeon JY, Choi MK, Bae YJ. Evaluation of magnesium intake and its relation with bone quality in healthy young Korean women. *Biol Trace Elem Res*. 2011 Apr 5.
- Palacios C. The role of nutrients in bone health, from A to Z. *Crit Rev Food Sci Nutr*. 2006;46(8):621-8.
- Cashman KD. Calcium intake, calcium bioavailability and bone health. *Br J Nutr*. 2002 May;87 Suppl 2:S169-77.
- Spangler M, Phillips BB, Ross MB, Moores KG. Calcium supplementation in postmenopausal women to reduce the risk of osteoporotic fractures. *Am J Health Syst Pharm*. 2011 Feb 15;68(4):309-18.
- Lips P, Bouillon R, van Schoor NM, et al. Reducing fracture risk with calcium and vitamin D. *Clin Endocrinol (Oxf)*. 2010 Sep;73(3):277-85.
- Ferrar L, van der Hee RM, Berry M, et al. Effects of calcium-fortified ice cream on markers of bone health. *Osteoporos Int*. 2010 Dec 18.
- Chaturvedi P, Mukherjee R, McCorquodale M, Crawley D, Ashmead S, Guthrie N. Comparison of calcium absorption from various calcium-containing products in healthy human adults: a bioavailability study. *FASEB J*. 2006 Mar;20(Meeting Abstract Supplement):A1063.
- Patrick L. Comparative absorption of calcium sources and calcium citrate malate for the prevention of osteoporosis. *Altern Med Rev*. 1999 Apr;4(2):74-85.
- Available at: <http://lpi.oregonstate.edu/infocenter/minerals/calcium/>. Accessed May 12, 2011.
- Ross AC, Manson JE, Abrams SA, et al. The 2011 dietary reference intakes for calcium and vitamin D: what dietetics practitioners need to know. *J Am Diet Assoc*. 2011 Apr;111(4):524-7.
- Norman AW, Bouillon R. Vitamin D nutritional policy needs a vision for the future. *Exp Biol Med (Maywood)*. 2010 Sep;235(9):1034-45.
- Bacchetta J, Ranchin B, Dubourg L, Cochat P. Vitamin D revisited: a cornerstone of health? *Arch Pediatr*. 2010 Dec;17(12):1687-95.
- Kidd PM. Vitamins D and K as pleiotropic nutrients: clinical importance to the skeletal and cardiovascular systems and preliminary evidence for synergy. *Altern Med Rev*. 2010 Sep;15(3):199-222.
- Verhave G, Siebert CE. Role of vitamin D in cardiovascular disease. *Neth J Med*. 2010 Mar;68(3):113-8.
- Querales MI, Cruces ME, Rojas S, Sanchez L. Association between vitamin D deficiency and metabolic syndrome. *Rev Med Chil*. 2010 Oct;138(10):1312-8.
- Petchey WG, Hickman IJ, Duncan E, et al. The role of 25-hydroxyvitamin D deficiency in promoting insulin resistance and inflammation in patients with chronic kidney disease: a randomised controlled trial. *BMC Nephrol*. 2009;10:41.
- Guillot X, Semerano L, Saidenberg-Kermanac'h N, Falgarone G, Boissier MC. Vitamin D and inflammation. *Joint Bone Spine*. 2010 Dec;77(6):552-7.



40. Edlich RF, Mason SS, Reddig JS, Gubler K, Long III WB. Revolutionary advances in the diagnosis of vitamin D deficiency. *J Environ Pathol Toxicol Oncol*. 2010;29(2):85-9.
41. Grant WB, Schwalfenberg GK, Genuis SJ, Whiting SJ. An estimate of the economic burden and premature deaths due to vitamin D deficiency in Canada. *Mol Nutr Food Res*. 2010 Aug;54(8):1172-81.
42. Jorde R, Sneve M, Hutchinson M, Emaus N, Figenschau Y, Grimnes G. Tracking of serum 25-hydroxyvitamin D levels during 14 years in a population-based study and during 12 months in an intervention study. *Am J Epidemiol*. 2010 Apr 15;171(8):903-8.
43. Pilz S, Tomaschitz A, Drechsler C, Dekker JM, Marz W. Vitamin D deficiency and myocardial diseases. *Mol Nutr Food Res*. 2010 Aug;54(8):1103-13.
44. Horani M, Dror A, Holland D, Caporaso F, Sumida KD, Frisch F. Prevalence of Vitamin D(3) Deficiency in Orange County Residents. *J Community Health*. 2011 Feb 13.
45. Holick MF. Vitamin D: evolutionary, physiological and health perspectives. *Curr Drug Targets*. 2011 Jan;12(1):4-18.
46. Faloon W. Startling findings about vitamin D levels in Life Extension® members. *Life Extension Magazine®*. 2010 Jan;16(1):7-14.
47. Wei MY, Giovannucci EL. Vitamin D and multiple health outcomes in the Harvard cohorts. *Mol Nutr Food Res*. 2010 Aug;54(8):1114-26.
48. Vieth R. Vitamin D supplementation, 25-hydroxyvitamin D concentrations, and safety. *Am J Clin Nutr*. 1999 May;69(5):842-56.
49. Vieth R. Vitamin D toxicity, policy, and science. *J Bone Miner Res*. 2007 Dec;22 Suppl 2:V64-8.
50. Garland CF, French CB, Baggerly LL, Heaney RP. Vitamin D supplement doses and serum 25-hydroxyvitamin D in the range associated with cancer prevention. *Anticancer Res*. 2011 Feb;31(2):607-11.
51. Kitchin B, Morgan SL. Not just calcium and vitamin D: other nutritional considerations in osteoporosis. *Curr Rheumatol Rep*. 2007 Apr;9(1):85-92.
52. Tucker KL. Osteoporosis prevention and nutrition. *Curr Osteoporosis Rep*. 2009 Dec;7(4):111-7.
53. Martini LA. Magnesium supplementation and bone turnover. *Nutr Rev*. 1999 Jul;57(7):227-9.
54. Matsuzaki H. Prevention of osteoporosis by foods and dietary supplements. Magnesium and bone metabolism. *Clin Calcium*. 2006 Oct;16(10):1655-60.
55. Barbagallo M, Belvedere M, Dominguez LJ. Magnesium homeostasis and aging. *Magn Res*. 2009 Dec;22(4):235-46.
56. Tucker KL, Hannan MT, Chen H, Cupples LA, Wilson PW, Kiel DP. Potassium, magnesium, and fruit and vegetable intakes are associated with greater bone mineral density in elderly men and women. *Am J Clin Nutr*. 1999 Apr;69(4):727-36.
57. Ryder KM, Shorr RI, Bush AJ, et al. Magnesium intake from food and supplements is associated with bone mineral density in healthy older white subjects. *J Am Geriatr Soc*. 2005 Nov;53(11):1875-80.
58. Aydin H, Deyneli O, Yavuz D, et al. Short-term oral magnesium supplementation suppresses bone turnover in postmenopausal osteoporotic women. *Biol Trace Elem Res*. 2010 Feb;133(2):136-43.
59. Toba Y, Kajita Y, Masuyama R, Takada Y, Suzuki K, Aoe S. Dietary magnesium supplementation affects bone metabolism and dynamic strength of bone in ovariectomized rats. *J Nutr*. 2000 Feb;130(2):216-20.
60. Matsuzaki H, Miwa M. Dietary calcium supplementation suppresses bone formation in magnesium-deficient rats. *Int J Vitam Nutr Res*. 2006 May;76(3):111-6.
61. Bae YJ, Kim MH. Calcium and Magnesium Supplementation Improves Serum OPG/RANKL in Calcium-Deficient Ovariectomized Rats. *Calcif Tissue Int*. 2010 Oct;87(4):365-72.
62. Available at: <http://www.therapeuticsdaily.com/news/article.cfm?contenttype=sentryarticle&contentvalue=1989790&channelID=26>. Accessed May 13, 2011.
63. Luckey AE, Parsa CJ. Fluid and electrolytes in the aged. *Arch Surg*. 2003 Oct;138(10):1055-60.
64. Passare G, Viitanen M, Torring O, Winblad B, Fastbom J. Sodium and potassium disturbances in the elderly : prevalence and association with drug use. *Clin Drug Investig*. 2004;24(9):535-44.
65. McCarty MF. Rationale for a novel nutraceutical complex 'K-water': potassium taurine bicarbonate (PTB). *Med Hypotheses*. 2006;67(1):65-70.
66. Rico H, Aznar L, Hernandez ER, et al. Effects of potassium bicarbonate supplementation on axial and peripheral bone mass in rats on strenuous treadmill training exercise. *Calcif Tissue Int*. 1999 Sep;65(3):242-5.
67. Wallin R, Schurgers L, Wajih N. Effects of the blood coagulation vitamin K as an inhibitor of arterial calcification. *Thromb Res*. 2008;122(3):411-7.
68. Fodor D, Albu A, Poanta L, Porojan M. Vitamin K and vascular calcifications. *Acta Physiol Hung*. 2010 Sep;97(3):256-66.
69. Yamaguchi M, Uchiyama S, Tsukamoto Y. Inhibitory effect of menaquinone-7 (vitamin K2) on the bone-resorbing factors-induced bone resorption in elderly female rat femoral tissues in vitro. *Mol Cell Biochem*. 2003 Mar;245(1-2):115-20.
70. Yamaguchi M, Weitzmann MN. Vitamin K2 stimulates osteoblastogenesis and suppresses osteoclastogenesis by suppressing NF-kappaB activation. *Int J Mol Med*. 2011 Jan;27(1):3-14.
71. Takemura H. Prevention of osteoporosis by foods and dietary supplements. "Kinnotsubu honegenki": a fermented soybean (natto) with reinforced vitamin K2 (menaquinone-7). *Clin Calcium*. 2006 Oct;16(10):1715-22.
72. Tsukamoto Y. Studies on action of menaquinone-7 in regulation of bone metabolism and its preventive role of osteoporosis. *Biofactors*. 2004;22(1-4):5-19.
73. van Summeren MJ, Braam LA, Lilien MR, Schurgers LJ, Kuis W, Vermeer C. The effect of menaquinone-7 (vitamin K2) supplementation on osteocalcin carboxylation in healthy prepubertal children. *Br J Nutr*. 2009 Oct;102(8):1171-8.
74. Forli L, Bollerslev J, Simonsen S, et al. Dietary vitamin K2 supplement improves bone status after lung and heart transplantation. *Transplantation*. 2010 Feb 27;89(4):458-64.
75. Inoue T, Fujita T, Kishimoto H, et al. Randomized controlled study on the prevention of osteoporotic fractures (OF study): a phase IV clinical study of 15-mg menatetrenone capsules. *J Bone Miner Metab*. 2009;27(1):66-75.
76. Shea MK, Booth SL. Update on the role of vitamin K in skeletal health. *Nutr Rev*. 2008 Oct;66(10):549-57.
77. Reese AM, Farnett LE, Lyons RM, Patel B, Morgan L, Bussey HI. Low-dose vitamin K to augment anticoagulation control. *Pharmacotherapy*. 2005 Dec;25(12):1746-51.
78. Lurie Y, Loebstein R, Kurnik D, Almog S, Halkin H. Warfarin and vitamin K intake in the era of pharmacogenetics. *Br J Clin Pharmacol*. 2010 Aug;70(2):164-70.
79. Schaafsma A, de Vries PJ, Saris WH. Delay of natural bone loss by higher intakes of specific minerals and vitamins. *Crit Rev Food Sci Nutr*. 2001 May;41(4):225-49.
80. Miggiano GA, Gagliardi L. Diet, nutrition and bone health. *Clin Ter*. 2005 Jan-Apr;156(1-2):47-56.
81. Nielsen FH, Hunt CD, Mullen LM, Hunt JR. Effect of dietary boron on mineral, estrogen, and testosterone metabolism in postmenopausal women. *FASEB J*. 1987 Nov;1(5):394-7.
82. Hegsted M, Keenan MJ, Siver F, Wozniak P. Effect of boron on vitamin D deficient rats. *Biol Trace Elem Res*. 1991 Mar;28(3):243-55.
83. Palacios C. The role of nutrients in bone health, from A to Z. *Crit Rev Food Sci Nutr*. 2006;46(8):621-8.
84. Scorei R, Cimpoiasu VM, Iordachescu D. In vitro evaluation of the antioxidant activity of calcium fructoborate. *Biol Trace Elem Res*. 2005 Nov;107(2):127-34.

HUGE SAVINGS ON GENERIC DRUGS



LifeExtensionRx[®]

High-cost prescription drugs are bankrupting the United States, but you can fight back by switching to equivalent generic drugs.

The Life Extension Pharmacy[®] charges such LOW prices for generics that they are often less than what your co-pay would be if you went through your own insurance.

To find out how much you can save on your prescription medications, call the courteous staff at the Life Extension Pharmacy today at:

1-877-877-9700

HISTORIC BRAND PRICE:

Glucophage[®] 500 mg • 30 tablets \$37.06

LOW-COST GENERIC EQUIVALENT:

Metformin 500 mg • 30 tablets \$9.01

HISTORIC BRAND PRICE:

Zocor[®] 20 mg • 30 tablets \$162.49

LOW-COST GENERIC EQUIVALENT:

Simvastatin 20 mg • 30 tablets \$6.91

HISTORIC BRAND PRICE:

Arimidex[®] 1 mg • 30 tablets \$417.37

LOW-COST GENERIC EQUIVALENT:

Anastrozole 1 mg • 30 tablets \$59.99

HISTORIC BRAND PRICE:

Cozaar[®] 50 mg • 30 tablets \$80.61

LOW-COST GENERIC EQUIVALENT:

Losartan 50 mg • 30 tablets \$15.83

THE POWER OF MAGNESIUM



**MOST AMERICANS DO NOT OBTAIN
SUFFICIENT MAGNESIUM FROM THEIR DIET.**

According to the National Institutes of Health, magnesium is required for more than 300 biochemical reactions in the body. Magnesium “helps maintain normal muscle and nerve function, keeps heart rhythm steady, supports a healthy immune system, and keeps bones strong. Magnesium also helps maintain blood sugar levels already within normal range, promotes normal blood pressure, and is known to be involved in energy metabolism and protein synthesis.”^{1,2}

With so many of our body’s critical functions dependent upon magnesium, supplementation can help ensure that you obtain healthy levels of this vital mineral. The recommended intake of magnesium to maintain vascular health is 500 mg or more a day. With Life Extension®’s **Magnesium Capsules** you can easily obtain 500 mg of elemental magnesium in each capsule.

The retail price of a bottle containing 100 500 mg **Magnesium Capsules** is **\$10**. If a member buys four bottles, the price is reduced to just **\$6.75** per bottle.

Caution: If taken in high doses, magnesium may have a laxative effect. If this occurs, divide dosing, reduce intake, or discontinue product.



Item #01369

**To order Magnesium Capsules,
call 1-800-544-4440 or
visit www.LifeExtension.com**

References:

1. *Am J Clin Nutr.* 1987;45:1305-12.
2. *Clinica Chimica Acta.* 2000;294:1-26.

Rock Solid BONES

Feeble bones severely hamper quality of life and put aging humans *at risk for injury* due to possible *breaks or fractures*.

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

Bone Restore includes highly **absorbable** forms of **calcium**, a *bioavailable form* of **boron**, along with **vitamin D3**, **magnesium**, **zinc**, **manganese**, and **silicon**.

Bone Restore comes in fast-release capsules, making the minerals and other nutrients immediately available for absorption into the bloodstream.

The retail price for 150 capsules of **Bone Restore** is \$22.50. If a member buys four bottles, the price is reduced to just **\$14.63** per bottle.

**To order Bone Restore,
call 1-800-544-4440 or
visit www.LifeExtension.com**

Contains corn.

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.



Item #00811

Just five capsules of Bone Restore provide:

Highly-Absorbable Calcium (as DimaCal® dicalcium malate, TRAACS® calcium glycinate chelate, calcium fructoborate)	1,200 mg
Vitamin D3	1,000 IU
Magnesium	340 mg
Boron (calcium fructoborate as patented FruiteX B® OsteoBoron®)	3 mg
Zinc	2 mg
Manganese	1 mg
Silicon	5 mg

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.



***DELAY* Skin Aging
with Cutting-Edge Topical
DNA Technology**



BY GARY GOLDFADEN, MD, AND ROBERT GOLDFADEN

There's an on/off switch located within the nuclear DNA of every cell in your body—including your skin cells. It controls how long they live and when they die.

Most dermatologists have never heard of it.

Known as the *telomere*, its role as a master regulator of cellular aging now lies at the forefront of skin rejuvenation research.^{1,2}

In this article, the importance of the telomere's activity in skin aging and appearance is discussed. You will learn of a key nutrient that may favorably modulate this cellular mechanism to slow and even *reverse* skin aging. You will also find supportive data on its ability to preserve youthful appearance by extending the life span of skin cells.³

In a clinical study involving a group of mature women suffering from age-related cosmetic problems, this novel DNA technology induced a **35%** increase in skin firmness, **45%** improvement in skin tone, with restoration of natural skin moisture observed in all study participants.³ > >

Telomeres: Timekeepers of Cell Death

Your genetic code is composed of a set of long strands of DNA called chromosomes. Each chromosome is sealed at the ends with a special molecular sequence, called a telomere, that acts like the plastic cap at the tips of your shoelaces, preventing them from unraveling.

Each telomere is made of linked pairs of four different chemical tags called bases. Telomeres provide stability for chromosomes and are composed of a string of about 10,000 base pairs.^{30,31}

Although 10,000 base pairs sounds enormous, biologically speaking it's quite small. By comparison, a single chromosome can measure up to 80 million base pairs long—and most human cells have 46 chromosomes, organized as 23 pairs of different DNA strands.^{32,33}

Telomeres play a vital role in cell life and aging. Telomeres keep each chromosome distinct, preventing any one strand from fusing into a ring or binding with other DNA. Telomeres help govern the life-sustaining process of cell division and the process that limits the number of cell divisions.³⁴

Throughout life, all of your body's trillions of cells are constantly dividing and creating duplicates of themselves. This ongoing process not only enables growth—it's the way that wounds heal and cells with a limited life span (such as skin cells) can be replaced.

Before this happens, however, each cell must first make an exact duplicate of its genetic code. This information is stored in the nucleus of every cell by 23 pairs of chromosomes. Together these represent a total of approximately three billion nucleotides.³⁵

All of this information must be faithfully recreated. Incredibly, the error ratio of reproducing this massive amount of data is typically less than one in a billion—a feat roughly equivalent to copying a 1,000 page dictionary 100 times, word for word, comma for comma, with just a single mistake.³⁵

Because of the way replication occurs, it's impossible to copy both strands of parental DNA right down to the end. In order to reconnect after each division, each strand must sacrifice a tiny bit of non-functional DNA at its telomere ends.¹ This loss of telomere length (about 50-100 base pairs per division)³⁶ helps to keep the cell's vital genetic code intact. After about 30-50 divisions, however, the cell reaches a "critical length" and is no longer able to replicate.³⁶ At this point (called the Hayflick limit after the scientist who discovered it) the cell enters a *senescent* state.³⁷ Its metabolism begins to slow down. Pre-programmed cell death, known as apoptosis, begins. And the visible effects of aging start to appear.

Genetically Programmed Skin Degradation

Skin cells are among the fastest-dividing cells in the human body. They have to be in order to offset the wear-and-tear of constant environmental insults.

The problem is that, as with all cells, the rate at which skin cells divide and replenish is *predetermined*.^{1,2} After age 30, programmed declines of up to **50%**⁴ in the rate of skin cell division are triggered automatically.

As you age, these older, *non-dividing* skin cells begin to outnumber their robust, rapidly dividing counterparts, setting a host of unsightly age-related changes in motion. With the incremental loss of youthfully dividing cells, your skin becomes thinner and tears more easily. The underlying layer of supportive fat, once plentiful in youth, slowly thins out. Less collagen and elastin are produced, reducing your skin's elasticity and causing it to sag.

Because it is more difficult under these conditions for your skin to produce and retain moisture, dryness sets in and fine lines and wrinkles appear.⁵

For most of its history, dermatology's approach to reversing the unsightly effects of this inevitable process—sunspots, blemishes, flaking—have understandably focused on the skin's *surface*. And there is no question that a number of topical interventions are needed to combat skin aging.

Thanks to cutting-edge cellular aging research, we can now surmise that the visible hallmarks of skin aging are largely the result of a change in nuclear DNA: the shortening of the telomeres at the ends of chromosomes, the underlying nuclear mechanism that accelerates the aging of skin cells. (See sidebar above.)

A Novel Intervention to Repair DNA

Years of scientific research have culminated in a cutting-edge approach that can change the way skin cells age. A combination of two key ingredients, **teprenone** and **caprylic acid**, has been clinically demonstrated to extend skin cell life span and maintain moisture to promote youthful looking skin.^{3,6}

These ingredients help support more youthful skin cell telomeres and skin cell DNA repair mechanisms while retaining precious moisture in the skin.^{3,6} The combination can lessen the appearance of fine lines and wrinkles and reduce age spots and large pores. Along with preventing signs of aging, this formula improves skin health by increasing natural moisture content, restoring its texture and strengthening the skin's barrier function. In response to these agents, skin displays enhanced firmness, tone, and elasticity. It's not only protected from age-related damage, but also regains much of its youthful function and appearance.

At the molecular level, **teprenone** (*geranylgeranylacetone*) closely resembles **vitamin K2**.⁷ It is responsible for supporting cell survival and improving skin tone and appearance. Topical use of teprenone acts to prevent and/or limit the formation of reactive oxygen species (ROS), the peroxidation of **cutaneous lipids** (a component of youthful, healthy skin), and the oxidation of support proteins in the skin cells.³

Teprenone favorably modulates biological stress markers in skin cells. It also actively inhibits or limits the programmed cellular **senescence** (aging) and **apoptosis** (programmed death) of skin cells following replication.^{8,9}

Teprenone may stabilize telomeres by activating genes involved in their regulation and elongation.¹⁰ By protecting your DNA from free radical stress, teprenone also helps maintain healthy skin cell division. In addition, rebalancing cell functions also helps improve cellular metabolism. *In vivo* studies show it can prevent the loss of cell function by as much as **60%**.³

Caprylic acid is a fatty acid naturally found in **palm** and **coconut oils**, as well as the milk of humans, cows, and goats.¹¹ It is a well-known skin-conditioning agent that is absorbed through your skin **100 times faster** than compounds with similar effects, such as oleic acid from olive oil.¹² It makes an excellent emollient and barrier agent that helps bind water in the skin.⁶ But perhaps most importantly, caprylic acid also creates a lower pH that helps reduce surface tension and allows the skin to absorb nutrients more efficiently.¹³

In a clinical study of older women, the natural agents teprenone and caprylic acid produced visible improvement in both functional and structural signs

Topical Skin Cell DNA Repair

- The unsightly effects of skin aging result not only from environmental insults, but also from genetically programmed, age-related declines in youthful skin cell reproduction.
- Two key ingredients, teprenone and caprylic acid, have been demonstrated to extend skin cell life span and support a more youthful skin appearance.
- These two topical ingredients correct the visible signs of aging by promoting the skin's natural protection and repair factors *at the cellular level*.
- Teprenone helps maintain optimal telomere length to slow or even reverse signs of aging, while caprylic acid helps maintain the skin's youthful moisture and barrier function.
- In combination with moisturizing and rejuvenating agents like hyaluronic acid and squalane, and potent antioxidants from tea extracts, these ingredients lessen the appearance of fine lines and wrinkles and reduce age spots, large pores, and skin redness.





of aging. Skin firmness increased by **35%** in just one month.³ Skin tone improved by **45%** in the same amount of time.³ Pigmented spots were reduced by **56%** after six months.³

Sun spots and skin moisture improved in **100%** of the women tested; **90%** of the participants showed reduced pore size; and **75%** exhibited improved skin roughness, fine lines, and barrier function.³ Greater skin firmness, tone, and elasticity were also observed in the majority—a full **75%** of the study volunteers.³

The combination of teprenone with caprylic acid provides advanced DNA and telomere support technology, along with soothing moisture and protective barrier function that can help maintain a more youthful skin appearance.¹⁴

Other Natural Ingredients for Youthful Skin

Another important nutrient for younger-looking skin is *hyaluronic acid*. Found in virtually every tissue of your body, it is a key component of connective and epithelial tissue. Its ability to attract 1,000 times its own weight in water is unmatched by any other substance in nature. This makes it crucial for maintaining the skin's barrier function as well as its

moisture and softness. Hyaluronic acid has a volumizing or “plumping” effect on the skin's extracellular matrix, which adds fullness and minimizes the appearance of facial wrinkles.^{15,16}

Although hyaluronic acid is abundant in younger skin, the damage caused by free radicals over time drastically depletes the skin's reserves. Hyaluronic acid increases cell renewal and helps restore healthy texture, color, and moisture to aging skin.¹⁷⁻²⁰

Squalane is another vital nutrient for skin health. This natural hydrocarbon accounts for approximately 12% of the total fat content of the skin's sebum.²¹ The best squalane for dermatological use is obtained from natural olive oil and resembles vitamin A in its chemical structure.

A natural emollient, squalane is quickly absorbed into the skin, leaving it soft and supple with no greasy or oily residue. This unsaturated hydrocarbon penetrates deeply, stimulating the skin's natural ability to regenerate, nourish, and hydrate tissue.²² It also discourages the growth of harmful microorganisms by forming a protective antibacterial coating on your skin.²³

Red tea extract further boosts the skin's ability to ward off and reverse skin aging.²⁴⁻²⁸ Red tea extract is particularly effective at quenching age-causing free radicals due to its powerful antioxidant activity.²⁹ Antioxidant-rich tea extracts reduce the appearance of skin imperfections, including fine lines and wrinkles, to reveal fresher, healthier, younger-looking skin.

Combining **teprenone** and **caprylic acid** with other natural, clinically proven anti-aging compounds produces a formula that can help enhance cell function, improve skin tissue quality, and extend the youthful life span of your skin.

Summary

Scientists have discovered that a more youthful appearance of aging skin can be achieved through novel technologies focused upon skin cell DNA repair. By supporting more youthful structure and function, skin cells can live longer, resulting in healthier, younger-looking skin. A combination of two key ingredients, **teprenone** and **caprylic acid**, has been demonstrated to extend skin cells' youthful life span and appearance.^{3,6} A synergistic combination of these and other skin-soothing ingredients may visibly improve the health and appearance of your skin. ●

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. Harley CB, Futcher AB, Greider CW. Telomeres shorten during ageing of human fibroblasts. *Nature*. 1990 May 31;345(6274):458-60.
2. Available at: <http://www.senescence.info/cells.html>. Accessed May 4, 2011.
3. Monograph. Patent-pending Renovage™. Sederma. Data on file. 2007.
4. Saxon SV, Etten MJ, Perkins EA. *Physical change and aging: a guide for the helping professions*. New York, NY: Springer Publishing; 2010:26.
5. Fenske NA, Lober CW. Structural and functional changes of normal aging skin. *J Am Acad Dermatol*. 1986 Oct;15(4 Pt 1):571-85.
6. Available at: http://www.cosmeticsinfo.org/ingredient_details.php?ingredient_id=429. Accessed May 9, 2011.
7. Nanke Y, Kotake S, Ninomiya T, Furuya T, Ozawa H, Kamatani N. Geranylgeranylacetone inhibits formation and function of human osteoclasts and prevents bone loss in tail-suspended rats and ovariectomized rats. *Calcif Tissue Int*. 2005 Dec; 77(6):376-85.
8. Available at: <http://www.naturalhealthinformer.com/ironing-out-the-wrinkles-with-teprenone.html>. Accessed May 9, 2011.
9. Available at: <http://www.wipo.int/pctdb/en/wo.jsp?amp%3BIA=W02006120646&%3BDISPLAY=DESC&wo=2006120646&IA=IB2006051497&DISPLAY=DESC>. Accessed May 9, 2011.
10. Available at: <http://www.wipo.int/pctdb/en/wo.jsp?amp%3BIA=W02006120646&%3BDISPLAY=DESC&wo=2006120646&IA=IB2006051497&DISPLAY=DESC>. Accessed June 6, 2011.
11. Available at: <http://www.ewg.org/skindeep/ingredient.php?ingred06=701053>. Accessed May 9, 2011.
12. Available at: <http://www.freepatentsonline.com/5175190.html>. Accessed May 9, 2011.
13. Available at: <http://www.naturelandfarm.com/>. Accessed May 26, 2011.
14. Clinical study conducted by Gary Goldfaden, MD. Data on file. 2011.
15. Gu H, Huang L, Wong YP, Burd A. HA modulation of epidermal morphogenesis in an organotypic keratinocyte-fibroblast co-culture model. *Exp Dermatol*. 2010 Aug;19(8):e336-9.
16. John HE, Price RD. Perspectives in the selection of hyaluronic acid fillers for facial wrinkles and aging skin. *Patient Prefer Adherence*. 2009 Nov 3;3:225-30.
17. Manuskiatti W, Maibach HI. Hyaluronic acid and skin: wound healing and aging. *Int J Dermatol*. 1996 Aug;35(8):539-44.
18. Sakai S, Yasuda R, Sayo T, Ishikawa O, Inoue S. Hyaluronan exists in the normal stratum corneum. *J Invest Dermatol*. 2000 Jun;114(6):1184-7.
19. Bourguignon LY, Ramez M, Gilad E, et al. Hyaluronan-CD44 interaction stimulates keratinocytes differentiation, lamellar body formation/secretion, and permeability barrier homeostasis. *J Invest Dermatol*. 2006 Jun; 126(6):1356-65.
20. Carruthers J, Carruthers A. Hyaluronic acid gel in skin rejuvenation. *J Drugs Dermatol*. 2006 Nov-Dec;5(10):959-64.
21. Botek AA, Lookingbill DP. The structure and function of the sebaceous glands. In: Freinkel RK, Woodley DT, eds. *The Biology of the Skin*. New York, NY: Parthenon Publishing Group, Inc.; 2001:94.
22. Wille JJ, Kydonieus A. Palmitoleic acid isomer (C16:1delta6) in human skin sebum is effective against gram-positive bacteria. *Skin Pharmacol Appl Skin Physiol*. 2003 May-Jun;16(3):176-87.
23. Kelly GS. Squalene and its potential clinical uses. *Altern Med Rev*. 1999 Feb;4(1):29-36.
24. du Toit R, Volsteadt Y, Apostolides Z. Comparison of the antioxidant content of fruits, vegetables and teas measured as vitamin C equivalents. *Toxicology*. 2001 Sep 14;166(1-2):63-9.
25. Benzie IF, Szeto YT. Total antioxidant capacity of teas by the ferric reducing/antioxidant power assay. *J Agric Food Chem*. 1999 Feb;47(2):633-6.
26. Suzuki Y, Shioi Y. Identification of chlorophylls and carotenoids in major teas by high-performance liquid chromatography with photodiode array detection. *J Agric Food Chem*. 2003 Aug 27;51(18):5307-14.
27. Craig WJ. Health-promoting properties of common herbs. *Am J Clin Nutr*. 1999 Sep;70(3 Suppl):491S-9S.
28. Yen GC, Chen HY. Relationship between antimutagenic activity and major components of various teas. *Mutagenesis*. 1996 Jan;11(1):37-41.
29. McKay DL, Blumberg JB. A review of the bioactivity of South African herbal teas: rooibos (*Aspalathus linearis*) and honeybush (*Cyclopia intermedia*). *Phytother Res*. 2007 Jan;21(1):1-16.
30. Meyne J, Ratliff RL, Moyzis RK. Conservation of the human telomere sequence (TTAGGG)_n among vertebrates. *Proc Natl Acad Sci U S A*. 1989 Sep;86(18):7049-53.
31. Available at: <http://www.examiner.com/health-and-science-in-hartford/telomeres-and-longevity-the-long-and-short-of-it>. Accessed May 4, 2011.
32. Moyzis RK et al. A highly conserved repetitive DNA sequence, (TTAGGG)_n, present at the telomeres of human chromosomes. *Proc Natl Acad Sci U S A*. 1988 Sep;85(18):6622-6.
33. Sadava D, Heller HC, Hillis DM, Berenbaum M. *Life: The Science of Biology, Volume 1*. 9th ed. W. H. Freeman; 2009.
34. Available at: http://www.medscape.com/viewarticle/472094_2. Accessed May 4, 2011.
35. Available at: http://www.contexto.info/DNA_Basics/DNA%20Replication.htm. Accessed May 4, 2011.
36. Available at: <http://www.mskcc.org/mskcc/html/55556.cfm>. Accessed May 9, 2011.
37. Hayflick L. The cell biology of aging. *Clin Geriatr Med*. 1985 Feb;1(1):15-27.



Shield Your Precious Eyesight... at fantastically discounted prices!



ITEM #00657 SolarShield®



ITEM #00747 OveRxCast

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.

Foundation members can now choose between **SolarShield®** sunglasses or **OveRxCast** polarized lenses that provide the same eye protection, plus improved vision under difficult weather conditions.

Life Extension's **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, Life Extension's **OveRxCast** sunglasses come with **polarized gray lenses** that provide natural color definition with

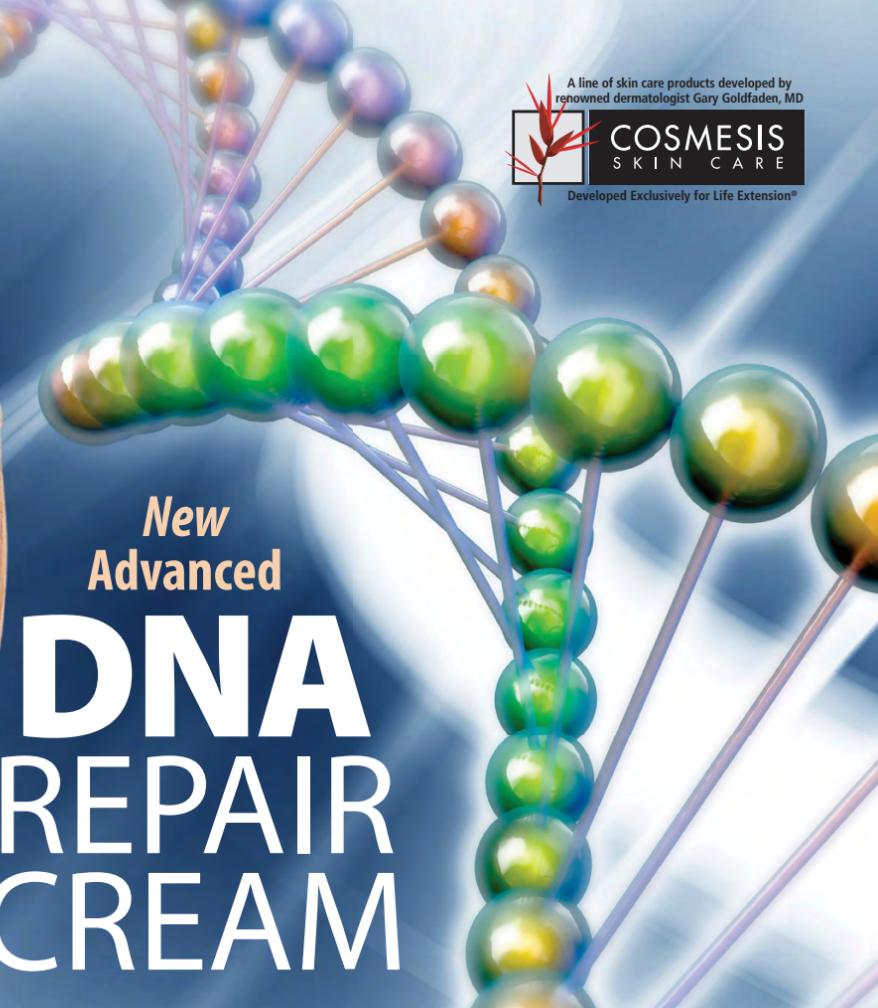
100% UV protection. Like the **SolarShield®** sunglasses, **OveRxCast** **polarized** sunglasses are designed to be worn over your prescription eyeglasses.

The **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 **OveRxCast** 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.

To order SolarShield® or OveRxCast sunglasses, call 1-800-544-4440 or visit www.LifeExtension.com

SolarShield® is a registered trademark Dioptrics, Inc.



New
Advanced
**DNA
REPAIR
CREAM**

FOR ULTIMATE SKIN REJUVENATION

Whether you're a man or a woman, the visible effects of aging on your appearance are always the same.

Skin tone eventually loses its luster. The firm, supple look of your younger years begins to fade. Face and neck become noticeably dry and wrinkled instead of refreshed and vibrant.

Now you can combat these unsightly changes with new **DNA Repair Cream** by **Cosmesis**®.

An innovation in skin care, this new formula features **teprenone** and **caprylic acid**, two key ingredients that help restore your skin's youthful glow.

Teprenone has a molecular structure similar to **vitamin K**, while caprylic acid occurs naturally in **palm** and **coconut oils**—topical ingredients dermatologists have relied on for years to help men and women *enhance* their skin's appearance.

A Clinically Studied Beautifier

Teprenone is more than just a moisturizer.

It has been shown to improve a host of visible age-related changes most maturing individuals face with the passage of time.

A group of women aged **52-64** applying **teprenone** twice daily experienced a **45%** improvement in skin tone, **56%** improvement in the appearance of spots and blemishes—and visibly more moist-looking skin in all the women tested after just one month.*

Plus ...

The new **DNA Repair Cream** also features **hyaluronic acid**, a compound found in high concentrations in your skin when you're young whose levels inevitably decline over time.

Abundant in olive oil and similar to vitamin A in molecular structure, the moisturizer **squalane** also occurs in your skin naturally and gradually diminishes over the years.

The quenching action of **red tea extract** in **DNA Repair Cream** also lends your skin a fresher look.

Together, this novel combination of beautifiers works to replenish youthful skin appearance—and helps you stay young-looking as you grow older.

A 1 oz jar of **DNA Repair Cream** retails for \$49. If a member buys two jars, the price is reduced to only **\$31.50** per jar.

Reference:* Sederma. Data on file. 2007.



Item # 80141

To order **Cosmesis DNA Repair Cream**
call 1-800-544-4440 or
visit www.LifeExtension.com

Complete Skin Protection *From Inside Out*

Scientists are realizing that skin needs to be protected against external factors such as sunlight, and also against internal damage caused by emotional stress. This is because our emotions, particularly stressful ones, release a wave of stress hormones such as cortisol that prematurely age the skin.

Fortunately, emerging research suggests that a natural herb called **ashwagandha** can protect and enhance psychological health as seen in a recent human trial.¹ In this study, just 125 mg of a patented ashwagandha extract once a day led to a **14.5%** reduction in cortisol levels in 98 chronically stressed individuals. This dose also resulted in a **13.2%** increase in levels of the anti-aging hormone DHEA, which helps maintain the youthfulness of skin cells. Overall, the ashwagandha-treated subjects experienced up to **62%** reduction in anxiety levels compared with virtually no change in the placebo group.

The impressive results from this trial have led to the incorporation of **ashwagandha** into a new skin-protection formula called **Enhanced FernBlock® with Sendara®**. As the name suggests, this formula also contains **FernBlock®**, the revolutionary oral supplement introduced by Life Extension® in July 2008 that acts as an internal sunscreen against damaging solar radiation.

FernBlock® is a natural extract derived from the fern plant *Polypodium leucotomos*. Extensive clinical studies document its ability to provide remarkable skin protection by inhibiting the absorption of harmful ultraviolet (UV) rays and quenching DNA-corrupting free radicals. **FernBlock®** also diminishes the consequences of excessive UV radiation by favorably altering a number of changes in skin cells that cause premature skin aging.

Enhanced FernBlock® with Sendara® is complemented with a powerful antioxidant called *Phyllanthus emblica*. This natural extract blocks a chemical reaction that generates several types of skin-damaging free radicals, thus shielding the skin against the destruction of collagen and other dermal matrix proteins. An *in vitro* study² using a patented extract of both **ashwagandha** and *Phyllanthus emblica* demonstrated an impressive **54%** inhibition of collagen-degrading enzymes and an **86%** inhibition of those that break down hyaluronic acid—the skin's natural moisturizer.

The unique combination of natural ingredients in **Enhanced FernBlock® with Sendara®** has been scientifically proven to help skin look and feel good from the inside out. This formula is designed to complement topical sunscreens for complete skin protection.

A bottle containing **30** vegetarian capsules of **Enhanced FernBlock® with Sendara®** retails for \$39. If a member buys four bottles, the cost is only **\$26.25 per bottle**.

Contains corn and rice.

References

1. JANA; 2008;11(1):50-6.
2. NutraGenesis LLC. Data on file. 2008.

Patent Pending Sendara® is a registered trademark of NutraGenesis LLC. FernBlock® is a registered trademark of Industrial Farmaceutica Cantabria, S.A.



Item #01311

TO ORDER
Enhanced FernBlock®
with Sendara®,

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.



WELLNESS PROFILE

BY PHILIP SMITH

Lisa Oz

The Power of Healthy Transformation



LISA OZ

Despite being born into a family of esteemed physicians, Lisa Oz initially set her sights on a life in the entertainment field. After graduating from Bryn Mawr and studying theology at Columbia University, Lisa pursued her dream of becoming an actress. For over a decade, she lived the life of the theatre by performing, auditioning, and learning her craft.

"What really intrigued me about acting was the idea of changing people's lives through storytelling," she says.

Over time, her fascination with telling stories evolved from acting in front of the camera to the behind-the-scenes work of writing scripts, producing television shows, and creating books. During this period, she also fell in love with and married the man who

was destined to become not only her partner in the best sense of the word but also the most famous and beloved surgeon in the world, Dr. Mehmet Oz of "Dr. Oz" fame.

In her book and in her personal life, Lisa takes a holistic view of the importance of the mind and body working in harmony for health.

WELLNESS PROFILE

At the time, Dr. Oz was spending the majority of his time saving lives as a cardiac surgeon at Columbia Presbyterian Hospital in New York. She recognized in Dr. Oz another passionate storyteller who was impressive at delivering medical information to his patients and helping them develop a heart-healthy lifestyle. Lisa also felt that if Dr. Oz could reach a larger audience, perhaps patients would be better informed and equipped with the information necessary to make proactive health choices. Being married to a physician is never easy, but being married to a heart surgeon whose life is about answering emergency calls made Lisa want to find a way that they could spend more time together. She began to realize that by combining their talents, they could actually create meaningful change not only in people's lives but possibly in the way medical care is delivered.

FORMING A POWERFUL TEAM

"When Mehmet and I work together on projects, our main goal is to empower the patient, to give them the tools they need to achieve a better outcome in terms of their health care," she says. "One of Mehmet's favorite analogies is that all too often the patient sees themselves as the football being tossed around from one caregiver to another. This is not a good situation to be in because the patient needs to be the quarterback. It's sad, but more often than not the patient is the passive observer in their care and they totally abdicate all decisions and responsibilities to their physicians. We want to provide them with the education and the motivation to be a key player in

their own wellness." This concept of patient empowerment is at the heart of the Dr. Oz health philosophy, which Dr. Oz himself credits his wife for envisioning.

"The entire journey in books and television was Lisa's brainchild," says Dr. Oz. "Ten years ago, after hearing one too many stories of my frustration with the disease-focused care that I was trained to deliver, Lisa challenged me to write about my experiences. The resulting book, *Healing from the Heart*, was a catharsis and opened my eyes to the opportunity to teach in the public forum. Lisa then created and executive-produced *Second Opinion*, a Discovery Channel TV show that brought health education to families around the world. Ms. Oprah Winfrey agreed to participate as a guest on the inaugural show, and when her show

kindly reciprocated, she and her team educated me about the subtle aspects of sharing information with an audience. Lisa even predicted the creation of *The Dr. Oz Show*, which arose from this experience, years before it even crossed my mind."

For Lisa, the idea for *Second Opinion* occurred from listening to Dr. Oz's concern that he was having the same conversations over and over again with his patients about how to take care of their heart. "I thought if Mehmet could have a television show where he could discuss health and medicine to a large audience, we could really make a difference," she says. "This show was the beginning of the Dr. Oz phenomenon. What we did on that show was the precursor for Mehmet's appearance on Oprah. When *Second Opinion* didn't get



picked up for a second season, we thought that we could take all this vital information and put it in a book format to continue reaching a broad audience. This was the start of the *YOU* book series with Dr. Michael Roizen. The tone in all the *YOU* books, such as *You: The Owner's Manual* and *You: Staying Young*, is a bit irreverent because we want people to feel comfortable and not scared of their bodies."

BRANCHING OUT

After years of developing new ways to package vital medical information featuring Dr. Oz for an eager public, Lisa felt it was time to begin focusing on her own projects. One night, while backstage at a lecture that she and Dr. Oz were giving, the organizer asked Lisa if she was going to write her own book. This was the inspiration she needed, and Lisa immediately began work on an outline of what was to become her own book, *Us, Transforming Ourselves and the Relationships That Matter Most*. With impressive endorsements from Dr. Dean Ornish and other key figures in the medical prevention field, *Us* quickly took off as a *New York Times* bestseller.

As a coauthor on the wildly successful *YOU* book series by Dr. Oz and Dr. Roizen, Lisa helped create the formula for conveying life-changing medical and health information in a concise and humorous fashion meant to get people involved in their own health care. The only message left out of the *YOU* books was the crucial interaction of our emotional relationships with the complexities of our physical health. It is this message that Lisa delivers in her remarkably intimate and candid fashion. She quickly brings the

reader into the book's experience as a close friend to share her wisdom on how to lead a healthier and more satisfying life.

In her book and in her personal life, Lisa takes a holistic view of the importance of the mind and body working in harmony for health. "Specific diseases are not isolated to a particular organ but are symptomatic of a broader imbalance throughout the body," she says. "Sadly, modern medicine is still mired in its mechanistic/chemical based paradigm and fails to recognize the body as an energetic entity." With good humor and intimacy, Lisa takes the reader on a gentle but well-programmed makeover journey toward wellness. The reader is given a simple seven-day program to ease them into vital health. Without judging or scolding, Lisa lets the reader know that if they are not comfort-

able with her program, "you can go back to your old wicked ways." These "wicked ways" include overeating, lack of exercise, and emotional turmoil that prevent us from achieving our goals.

MAKING THE RIGHT CHANGES

Dr. Oz sees great value in the way his wife conveys information.

"The more I offer advice to patients, the more I realize that the most profound and influential information is delivered in ways described by Lisa," he says. "Today, people are better educated about their health but are not motivated to make meaningful changes in their lives. As a heart surgeon, I was trained to seek information when facing an intraoperative quandary. But throwing more

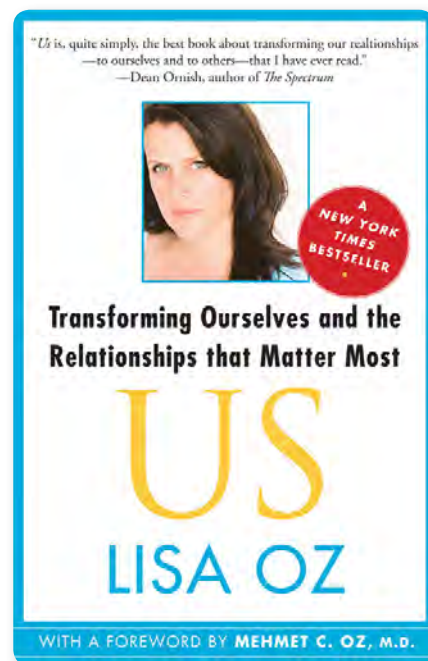


WELLNESS PROFILE

facts at a populace confused about how to move forward has failed repeatedly. Lisa has convinced me that 80 percent of change is based on emotional insights.”

As Dr. Oz points out, change in all aspects of our health starts with us. If we want to be healthier and live longer, reduce our cholesterol, our weight and our blood pressure, all of these goals require that our relationship with our body and our health needs to be in balance. Lisa clearly states that “it is your obligation and your privilege to care for your body. Keeping it strong, fit, and agile is one of the most important things you can do for yourself. You are inseparable from your body. We live in a society where more than 60 percent of us are overweight or obese and a large number of us are afflicted with chronic diseases. Whether suffering from high blood pressure, diabetes, congestive heart failure or arteriosclerosis, millions of Americans are physically and emotionally consumed by their illness.”

Lisa Oz lives the life plan that she lays out for readers in *Us*. She has travelled the path before us and shares the joys and difficulties of that journey. Unlike most people, Lisa started on the road to health very early on in her life. In part, it was Lisa’s upbringing in a family of innovative physicians that made her aware of the importance of preventive maintenance. By the time she was 15, Lisa was interested in all forms of alternative health and became a vegetarian. Her influence on the Oz family health program is impressive. With four children, an active media career, and one of the busiest husbands in medicine and show business, Lisa makes sure that her family stays healthy. “Our family meals tend to be organic with lots of grains, fruits, and vegetables. Just last night we had lentil soup, arugula salad, and brown rice.” In essence, the family follows a Mediterranean diet along with regular exercise and nutritional supplements. Lisa particularly enjoys yoga along with three-times-a-week cardio workouts.



In addition to working on her next book project, Lisa currently directs Pine Room Pictures, an entertainment company focused on family entertainment and hosts the Lisa Oz radio program on Oprah radio. Clearly, without her health, Lisa wouldn’t be where she is 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.

To obtain the book *Us, Transforming Ourselves and the Relationships that Matter Most*, visit www.amazon.com.

SAMe FOR BRAIN HEALTH

Life Extension® first introduced SAMe in 1997. Since then, researchers continue to discover impressive benefits of this versatile nutrient. Largely known for its effects on optimal mood, SAMe has also shown benefits for the liver, brain, and joints.

A recent study conducted at Harvard Medical School and Massachusetts General Hospital cited the impressive benefits of SAMe for mood elevation.¹

A report published in Germany indicates that SAMe may help maintain healthy neurological function.* The impressive results showed that:

- SAMe increased glutathione levels by 50% and glutathione enzyme activity by 115%.²
- SAMe decreased a measurement of free radical activity by 46%.²
- SAMe inhibited lipid peroxidation by 55% in culture.²

In addition to these findings, SAMe also improves brain cell **methylation**, thereby facilitating youthful **DNA enzymatic actions** (which may help account for SAMe's mood elevating properties). These enzymatic reactions are required for the healthy conversion of neurotransmitters such as **serotonin** and **dopamine**.



Item #00557

The good news is that **SAMe** prices continue to **plummet**. Compared to when SAMe was first introduced to the United States in 1997, Life Extension members can now obtain it for **78% less**. On an inflation-adjusted basis, the savings are even greater.

A box of 20 **400 mg** SAMe tablets retails for \$32. When a member buys six boxes, the price is reduced to only **\$18.75** a box—a **savings of 40%!**

(SAMe is also available in bottles containing 50 400 mg tablets. Retail price is \$72. If a member buys four bottles, the price is reduced to \$49.50 per bottle.) (Item #01055)

References

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

**To order your supply of premium-grade SAMe,
call 1-800-544-4440 or visit www.LifeExtension.com**

Opportunities

*If you had your life
to relive, what would
you do differently?*

**Imagine
actually
having the
opportunity.**



Cryopreservation is the science of using ultra-cold temperature to preserve human life with the intent of restoring good health when technology becomes available to do so. Call Alcor or visit our website today for your free information package.

(877) 462-5267 ext.101
www.alcor.org



SUPER FOODS

BY CARLEY EDER

WALNUTS

A Wealth of Health Found in Walnuts

"Eating a handful of walnuts contains almost twice as many antioxidants as an equivalent amount of any other commonly consumed nut."

More than ever before, researchers are convinced about the nutritional benefits of walnuts. Each walnut you crack open and eat contains loads of **vitamins**, **phenolic acids**, **tannins**, and **flavonoids**, as well as those hard-to-find **omega-3 fatty acids**, with almost 90% of the phenols being found in the skin. This array of compounds contributes to heart health, works to prevent cancer, helps fight diabetes, improves cognitive function, and may even help with a better night's sleep. While many nuts have proven to be extremely beneficial to your health, studies are showing that eating a handful of walnuts contains almost twice as many antioxidants as an equivalent amount of any other commonly consumed nut. Over the course of this article, we'll demonstrate through scientific studies how adding a few handfuls of walnuts to your daily diet can greatly improve your health.



SUPER FOODS

History

Walnuts are the edible seeds of any tree among the genus *Juglans*. Walnut trees have been cultivated for thousands of years, with the three main species consisting of the English (or Persian) walnut, the black walnut, and the white walnut. The English walnut is the most widely consumed type of walnut in the United States. It originated in India and the regions surrounding the Caspian Sea. Ancient Romans introduced the walnut to many European countries, where in turn they were brought to North America via English merchant ships, hence earning the moniker, "English walnuts." Presently, China is the largest producer of walnuts in the world, with the United States following close behind.¹

Benefits

Cognitive Function

The Doctrine of Signatures is an old-fashioned philosophy that states that a food's appearance can tell us what part of the body its nutrients are good for. While this is more of an old wives' tale in many instances, in the case of the walnut, it holds some water. For instance, a cracked whole walnut looks much like the human brain, and it so happens that walnuts can be used to treat brain injuries and enhance cognitive function, which is why it's referred to as a "brain food."² The reason they are so good for your brain health is the high concentration of omega-3 fatty acids. Your brain consists of more than 60% structural fat, and for the brain cells to function



All in the Family

While walnuts may be the healthiest nuts on the planet, many other nuts can be extremely beneficial to maintaining a healthy lifestyle.

Almonds • Almonds provide many health benefits and are most beneficial to keeping your heart healthy by reducing the risk of heart disease and lowering your cholesterol.¹²

Pecans • Pecans are loaded with antioxidants that contribute to lowering your blood pressure as well as helping to prevent the onset of breast and prostate cancer.¹³

Hazelnuts • The extremely high amount of vitamin E found in hazelnuts, one of the best natural sources, helps your body form red blood cells, muscles, and other tissues.¹⁴

Pistachios • Pistachios are a low-calorie nut promoting heart health. They contain two unique carotenoids not found in other nuts. These are protective antioxidants associated with eye health and reduction of the risk for developing age-related macular degeneration.¹⁵



properly, omega-3 fats need to be a primary component. The American diet is almost devoid of all omega-3s, with researchers finding that about two-thirds of Americans are deficient in omega-3 fatty acids.

A study done at Purdue University has shown that children with a lower concentration of omega-3 fatty acids have a higher risk of being hyperactive, having learning disorders, and displaying behavioral problems.³ There have been hundreds of scientific studies signifying a variety of problems linked to omega-3 deficiencies.

Cardiovascular Benefits

The most in-depth aspect of walnut nutritional research has been the benefits for the heart and circulatory system. They have had a very favorable impact on vascular reactivity, which is the ability of our blood vessels to respond to stimuli in a healthy way.¹ Walnuts contain high amounts of alpha-linolenic acid, or ALA, which is a major contributor to heart health by thinning the blood; reducing risks of clots or heart attacks.⁴ A study in the *American Journal of Clinical Nutrition* reviewed the heart health benefits of walnuts on 365 participants, who were monitored during control diets and diets supplemented with walnuts. Results showed a significantly greater decrease in total cholesterol and low-density lipoprotein (LDL).⁵

In a study conducted at the Lipid Clinic in Barcelona, Spain, 21 men and women with high cholesterol were given a regular low-calorie diet or one where one-third of the monounsaturated fats were replaced with walnuts. After 4 weeks, the participants switched to the other diet. Along with the reduced levels of cholesterol, the



walnuts were found to increase the elasticity of the arteries by 64% and to reduce levels of vascular cell adhesion, a key player in the development of atherosclerosis, or the hardening of arteries.⁵

Anti-Cancer Benefits

Seeing that there are such high amounts of antioxidants and nutrients found in walnuts, it's no surprise that research has shown that eating walnuts can help against cancer. A form of vitamin E called gamma-tocopherol, found in high abundance in walnuts, has been found to help fight breast, prostate, and lung cancer.⁶ Also, walnuts reduce the levels of endothelin, a compound that increases blood vessel inflammation. Men with prostate cancer are known to have higher levels of endothelin, prompting further research into the relationship between walnuts and prostate cancer.

A recent study at the University of California-Davis examined the effects of walnuts on prostate cancer in mice. Scientists fed a diet of walnuts to mice with prostate cancer, and after 18 weeks they found that the mice who consumed a human equivalent of 2.4 ounces a day had much smaller, slower-growing tumors, reducing cancer growth by 40%.⁷

The omega-3 fatty acids along with phytosterols in walnuts have been proven to help curb breast cancer tumor growth. According to researcher W. Elaine Hardman, PhD, from the Marshall University of Medicine, "Phytosterols bind to estrogen receptors, so they would be expected to slow the growth of breast cancers." In a study done by Hardman, one group of mice was fed a daily diet that included the equivalent of 2 ounces of walnuts in humans, while another

SUPER FOODS

group was fed a regular diet. The mice that ate the walnuts had a much lower incidence of breast tumors, slowing the growth by half.⁸

Diabetes

Consumption of walnuts has increasingly been found to help people with type 2 diabetes. Studies have shown that daily walnut intake provides significant benefits in different measurements of blood vessel functioning. A study at Yale University took 24 adults with type 2 diabetes and had each consume 2 ounces of walnuts to go along with their regular diet. After 8 weeks, blood flow and endothelial function, which is a powerful predictor of cardiovascular risk, significantly improved.⁹

Protecting Bone Health

Alpha-linolenic acid (ALA) is the omega-3 fat found in walnuts, and it has demonstrated a remarkable ability to promote bone health. In a study done by researchers at Penn State University, 23 participants were fed 4 different diets over 6-week periods, one of which was a high-ALA diet. After each segment of the study, the subjects were tested for levels of N-telopeptides, a marker of bone breakdown. Findings showed that in the diet consisting of high levels of ALA, the N-telopeptides count was much lower.¹⁰

Weight Management

Despite the variety of health benefits walnuts seem to offer, many people stay clear of them due to a fear of gaining weight. In fact, studies have shown that those fears are groundless and eating walnuts actually help as a great tool for weight management. In 2001, Loma Linda University conducted

a study which found that regular walnut consumption did not lead to weight gain amongst their participants. The study consisted of 10 men who suffered from high cholesterol. Over a six week period, the men whose diets included walnuts showed a 6% decrease in LDL cholesterol.¹¹ ●

CAUTION: While walnuts provide documented health benefits, they are very high in calories. This means you should incorporate walnuts into your normal meals and not use them as snacks. If one intentionally eats walnuts in the form of excess calories, it could sabotage a weight management program. The best way to benefit from walnuts is to substitute them for other calories so your total daily calorie intake is not increased.

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. Available at: <http://www.whfoods.com/genpage.php?tname=foodspice&dbid=99>. Accessed May 12, 2011. Accessed May 23, 2011
2. Wood R. *The New Whole Foods Encyclopedia*. Penguin (Non-classics); 1999
3. Available at: <http://walnutsweb.com/walnuts/Health+Benefits+of+Walnuts>. Accessed May 14, 2011.
4. Pratt S, Matthews K. *SuperFoods HealthStyle: Simple Changes to Get the Most Out of Life for the Rest of Your Life*. Harper Paperbacks; 2006.
5. Banel DK, Hu FB. Effects of walnut consumption on blood lipids and other cardiovascular risk factors: a meta-analysis and systematic review. *Am J Clin Nutr*. 2009 Jul;90(1):56-63.
6. Grotto D. *101 Foods That Could Save Your Life*. New York: Bantam Bell; 2008.
7. Available at: <http://health.universityof-california.edu/2010/03/22/walnuts-prostate-cancer/>. Accessed May 14, 2011.
8. Hardman WE, Ion G. Suppression of implanted MDA-MB 231 human breast cancer growth in nude mice by dietary walnut. *Nutr Cancer*. 2008;60(5):666-74.
9. Ma Y, Njike VY, Millet J, et al. Effects of walnut consumption on endothelial function in type 2 diabetic subjects: a randomized controlled crossover trial. *Diabetes Care*. 2010 Feb;33(2):227-32.
10. Available at: <http://www.medicalnewstoday.com/releases/63469.php>. Accessed May 14, 2011.
11. Muñoz S, Merlos M, Zambón D, et al. Walnut-enriched diet increases the association of LDL from hypercholesterolemic men with human HepG2 cells. *J Lipid Res*. 2001 Dec;42(12):2069-76.
12. Available at: <http://www.nutsforalmonds.com/nutrition.htm>. Accessed May 20, 2011.
13. Available at: <http://www.ilovepecans.org/nutrition.html>. Accessed May 20, 2011.
14. Available at: <http://www.hazelnutcouncil.org/health/nutritious.cfm>. Accessed: May 19, 2011.
15. Available at: <http://www.pistachiohealth.com/>. Accessed: May 19, 2011.





REGISTER NOW

September 9-11, 2011

Westin LAX Hotel, Los Angeles, California

Moderated by: Mark Moyad, MD

For up to date conference schedule, speaker list and travel info visit www.PCRI.org or call (310) 743-2117

The 11th Annual Prostate Cancer Conference will feature important information on quality of life issues for all prostate cancer patients, caregivers, medical professionals and advocates.

Hosted by The Prostate Cancer Research Institute

CONFERENCE HIGHLIGHTS

• Presentations on:

- Newly Diagnosed - Prostate Cancer 101
- Latest Treatment Options
- Rising PSA after local therapy
- Rising PSA - Castrate Resistant
- Failed Taxotere - now what?
- Erectile Dysfunction
- Incontinence
- What supplements work

• Round-Table Discussions: watch and hear speakers' multi-disciplinary approach to actual clinical cases

• 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 to allow attendees to interact with others who are in similar situations

• Saturday Night Gala: Dinner with Live Entertainment, and The Harry Pinchot Award and the Catalyst Award

NEW EXTENDED CONFERENCE

SCHEDULE THIS YEAR, WITH MORE

OPPORTUNITIES TO MEET WITH

TOP EXPERTS IN PROSTATE CANCER.



FACULTY*

KEYNOTE SPEAKERS INCLUDE: Thomas Ahlering, MD; Stephen Auerbach, MD; Jeffrey Demanes, MD; Charles Drake, MD, PhD; Reginald Dusing, MD; Steven Gange, MD; Laurence Klotz, MD; Eugene Kwon, MD; Mark Moyad, MD, MPH; Charles Myers, MD; and Mark Scholz, MD among others

ASK THE EXPERT SESSION LEADERS INCLUDE: Howard Sandler, MD; Mark Scholz, MD; Richard Lam, MD; Tanya Dorff, MD; Duke Bahn, MD; and Eugene Kwon, MD among others

SPONSORS*

Proudly produced by:



Helping Patients Know Their Options

*as of press time. Visit www.PCRI.org for up-to-date conference info.



Blood 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.
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 mailed 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 1100 West Commercial Blvd, Ft. Lauderdale, FL, 33309. We're located at Commercial Blvd and Powerline Road, just west of I-95. For more information or directions call 954-766-8144.

Blood Testing The Ultimate Information

MOST POPULAR PANELS

Life Extension Member Pricing

<p>○ COMPREHENSIVE PANELS</p> <p>MALE WEIGHT LOSS PANEL (LCWLM)* \$299</p> <p>CBC/Chemistry Profile DHEA-S Insulin PSA (prostate-specific antigen) Free Testosterone Total Testosterone Estradiol TSH Free T3 Free T4 C-Reactive Protein SHBG (high sensitivity)</p>	<p>○ THE CBC/CHEMISTRY PROFILE (LC381822) \$35</p> <p>OVER 40 PARAMETERS TESTED</p> <p>CARDIOVASCULAR RISK PROFILE</p> <p>Total Cholesterol Cholesterol/HDL Ratio HDL Cholesterol Estimated CHD Risk LDL Cholesterol Glucose Triglycerides Iron</p>
<p>○ FEMALE WEIGHT LOSS PANEL (LCWLF)* \$299</p> <p>CBC/Chemistry Profile DHEA-S Progesterone Insulin Free Testosterone Total Testosterone Estradiol TSH Free T3 Free T4 C-Reactive Protein SHBG (high sensitivity)</p>	<p>LIVER FUNCTION PANEL</p> <p>AST (SGOT) Total Bilirubin ALT (SGPT) Alkaline Phosphatase LDH</p> <p>KIDNEY FUNCTION PANEL</p> <p>BUN BUN/Creatinine Ratio Creatinine Uric Acid</p>
<p>○ MALE LIFE EXTENSION PANEL (LC322582) \$269</p> <p>CBC/Chemistry Profile DHEA-S Homocysteine TSH for thyroid function Free Testosterone Total Testosterone Estradiol SHBG PSA (prostate-specific antigen) C-Reactive Protein (high-sensitivity)</p>	<p>BLOOD PROTEIN LEVELS</p> <p>Total Protein Globulin Albumin Albumin/Globulin Ratio</p> <p>BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE</p> <p>Red Blood Cell Count Monocytes White Blood Cell Count Lymphocytes Eosinophils Platelet Count Basophils Hemoglobin Polys (Absolute) Hematocrit Lymphs (Absolute) MCV Monocytes (Absolute) MCH Eos (Absolute) MCHC Baso (Absolute) Polynucleated Cells RDW</p>
<p>○ MALE HORMONE ADD-ON PANEL (LCADDM)* \$155</p> <p>Pregnenolone and Dihydrotestosterone (DHT)</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>BLOOD MINERAL PANEL</p> <p>Calcium Sodium Potassium Chloride Phosphorus Iron</p> <p>NOTE: CBC/Chemistry profile is included in the Male and Female Life Extension panels and Weight Loss Panels.</p>
<p>○ FEMALE LIFE EXTENSION PANEL (LC322535) \$269</p> <p>CBC/Chemistry Profile DHEA-S Estradiol Homocysteine Progesterone TSH for thyroid function Free Testosterone Total Testosterone C-Reactive Protein SHBG (high sensitivity)</p>	<p>○ GENERAL HEALTH</p> <p>HEMOGLOBIN A1C (HBA1C) (LC001453) \$31</p> <p>Hemoglobin A1C evaluates long-term blood sugar control. Serum glucose sometimes reacts with important proteins in the body rendering them nonfunctional. Since this process, known as glycation is one of the leading theories of aging, Life Extension® believes everyone should check their A1C level.</p>
<p>○ FEMALE HORMONE ADD-ON PANEL (LCADDF)* \$125</p> <p>Pregnenolone and Total Estrogens</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>○ VITAMIN D (25OH) (LC081950) \$47</p> <p>This test is used to rule out vitamin D deficiency as a cause of bone disease. It can also be used to identify hypercalcemia.</p>
<p>○ LIFE EXTENSION THYROID PANEL (LC304131) \$75</p> <p>TSH, T4, Free T3, Free T4.</p>	<p>○ FOOD SAFE ALLERGY TEST (LCM73001) \$174</p> <p>This test measures delayed (IgG) food allergies for 95 common foods.</p>
<p>○ MALE HORMONE RE-TEST PROFILE (LCRTM)* \$275</p> <p>CBC/Chemistry Profile, DHEA-S, Dihydrotestosterone (DHT), Estradiol, PSA, Pregnenolone, Total and Free Testosterone, and TSH. Continual monitoring of hormone levels is necessary for men seeking to maintain optimal blood level values.</p>	<p>○ CYTOKINE PANEL (LCCT)* \$399</p> <p>Includes TNF-alpha, IL-6, IL-1 beta and IL-8. Cytokines are proteins that modulate the inflammatory response. This panel is used to identify elevated levels of specific cytokines.</p>
<p>○ FEMALE HORMONE RE-TEST PROFILE (LCRTF)* \$250</p> <p>CBC/Chemistry Profile, DHEA-S, Total Estrogen, Pregnenolone, Total and Free Testosterone, Progesterone, and TSH. Continual monitoring of hormone levels is necessary for women seeking to maintain optimal blood level values.</p>	<p>○ OMEGA SCORE™*** (LCOMEGA) \$131.25</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>○ COQ10* (COENZYME Q10) (LC120251) \$145</p> <p>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.</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.



MOST POPULAR SINGLE TESTS

Life Extension Member Pricing

<input type="radio"/> HORMONES	
<input type="radio"/> CORTISOL (LC004051)	\$39
This test is to measure adrenal function.	
<input type="radio"/> ADRENOCORTICOTROPIC HORMONE (ACTH)* (LC004440)	\$91.50
A pituitary function test useful in evaluating adrenocortical dysfunction.	
<input type="radio"/> DHEA-SULFATE (LC004697)	\$61
This test shows if you are taking the proper amount of DHEA. This test normally costs \$100 or more at commercial laboratories.	
<input type="radio"/> DIHYDROTESTOSTERONE (DHT)* (LC500142)	\$99
Measures serum concentrations of DHT.	
<input type="radio"/> ESTRADIOL (LC004515)	\$33
For men and women. Determines the proper amount in the body.	
<input type="radio"/> INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 3 (IGFBP3) (LC140152)	\$47
Elevated levels in hypertensive individuals have been associated with a nine-fold increase of carotid arteriosclerosis.	
<input type="radio"/> INSULIN FASTING* (LC004333)	\$42
Can predict those at risk of diabetes, obesity, and heart and other diseases.	
<input type="radio"/> PREGNENOLONE* (LC140707)	\$116
Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing's syndrome.	
<input type="radio"/> PROGESTERONE (LC004317)	\$55
Primarily for women. Determines the proper amount in the body.	
<input type="radio"/> 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.	
<input type="radio"/> SOMATOMEDIN C (IGF-1) (LC010363)	\$75
Indicates growth hormone secretion levels. Low levels have been associated with atherosclerosis as well as all-cause mortality.	
<input type="radio"/> TOTAL AND FREE TESTOSTERONE (LC140103)	\$99
Determines whether testosterone replacement should be considered as a therapy for depression, abdominal obesity, low energy, poor mental performance, or loss of libido.	
<input type="radio"/> CARDIAC RISK	
<input type="radio"/> Lp-PLA2 (PLAC TEST)* (LC141275)	\$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.	
<input type="radio"/> 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.	
<input type="radio"/> APOLIPOPROTEIN ASSESSMENT (APO A1 + APO B + RATIO) (LC216010)	\$55
This ratio correlates with risk of coronary artery disease and is useful in the presence of borderline elevations of cholesterol.	
<input type="radio"/> FIBRINOGEN* (LC001610)	\$31
High levels of this blood-clotting factor increase the risk of heart attack and stroke.	
<input type="radio"/> 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 and vitamin B6.	
<input type="radio"/> VAP™ TEST (LC804500)	\$90
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.	
<input type="radio"/> MALE HEALTH	
<input type="radio"/> PSA (PROSTATE-SPECIFIC ANTIGEN) (LC010322)	\$31
Can provide an early warning sign for prostate disorders and possible cancer.	
<input type="radio"/> FREE-PSA (INCLUDES TOTAL PSA)* (LC480780)	\$61
Recommended to determine if an elevated PSA is indicative of prostate cancer.	
<input type="radio"/> BONE HEALTH	
<input type="radio"/> 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.	
<input type="radio"/> 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.	

**For non-member prices
call 1-800-208-3444**

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

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.

1100 West Commercial Blvd.,
Ft. Lauderdale, FL 33309

Phone your order to: **1-800-208-3444**

Fax your order to: **1-866-728-1050**

Products

AMINO ACIDS

Acetyl-L-Carnitine
Acetyl-L-Carnitine-Arginate
Branched Chain Amino Acids
D, L-Phenylalanine Capsules
GABA Powder
Glycine Capsules

GLYCINE POWDER

Arginine Capsules
L-Arginine Free Base Powder
Arginine/L-Ornithine Capsules
L-Carnitine Capsules
L-Cysteine Capsules
L-Glutathione, L-Cysteine & C
L-Glutamine Capsules
L-Glutamine Powder
L-Lysine Capsules
L-Lysine Powder
L-Tyrosine Tablets
Mega L-Glutathione Capsules
N-Acetyl-L-Cysteine Capsules
Optimized Carnitine with GlycoCarn®
PharmaGABA
Super Carnosine Capsules
Taurine Capsules
Tryptopure® Tryptophan
(Optimized) Tryptopure® Plus

BONE & JOINT HEALTH

ArthroMax™ with Theaflavins
Bone-Up™
Bone Restore™
Bone Strength Formula w/KoAct™
Chondroitin Sulfate
Chondrox
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
DMAE-Ginkgo
Ginkgo Biloba Certified Extract™
Huperzine A
Lecithin with B5 and BHA
Lecithin Granules
Methylcobalamin Lozenges
Optimized Ashwagandha Extract
Phosphatidylserine Capsules
Rhodiola Extract
Super Ginkgo Extract
Vinpocetine

DIGESTIVE

Agave Digestive-Immune Support
Bromelain Powder
Carnosoothe w/PicroProtect
Digest RC™
Enhanced Super Digestive Enzymes
(also available with Probiotics)
Florastor
Intact Digest
Life Flora™
Natural EsophaGuard
N-Zimes™
Pancreatin
Primal Defense™
Regimint
Saccharomyces Boulardii+mos
Theralac Probiotics

DURK AND SANDY PRODUCTS

Blast™
Dual-C
Inner Power™
Memory Upgrade™

EYE CARE

Bilberry Extract
Blackcurrant Freeze Dried Extract
Brite Eyes III

Eye Pressure Support with Mirtogenol®
Overcast Polarized Sunglasses
Solarshield Sunglasses
Super Zeaxanthin with Lutein &
Meso-Zeaxanthin and C3G
(Plus Astaxanthin also available)
Vision Optimizer

FIBER

Apple Pectin Powder
Fiber Food
Hi-Lignan® Nutri-Flax®
WellBetX PGX® Soluble Fiber Blend

FOOD

Asian Cruciferous Vegetable Soup
Cruciferous Vegetable Soup

HAIR CARE

Dr. Proctor's Advanced Hair Formula
Dr. Proctor's Shampoo
Life Extension Shampoo and Conditioner
Super-Absorbable Tocotrienols

HEART HEALTH

Advanced Lipid Control
Aspirin (Enteric Coated)
Cho-Less™
D-Ribose Capsules
D-Ribose Powder
Endothelial Defense™ with
Full-Spectrum Pomegranate™
Fibrinogen Resist
Forskolin
Homocysteine Resist
Natural BP Management
Peak ATP® with GlycoCarn®
Policosanol
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 Enhanced
Mitochondrial™ Support
Sytrinol™
Theaflavin Standardized Extract
TMG Powder
TMG Tablets

HERBAL/PHYTO PRODUCTS

Artichoke Leaf Extract
Astaxanthin
Berry Complete
Blackcurrant Juice Concentrate
Blueberry Extract
Blueberry Extract w/Pomegranate
Butterbur Extract w/Standardized
Rosmarinic Acid
Calcium D-Glucarate
Cilantro Herbal Extract
Citrus Bioflavonoid
Enhanced Berry Complete with RZD™ Acai
Full-Spectrum Pomegranate™
Grapeseed Extract with Resveratrol &
Pterostilbene
Huperzine A with Natural Vitamin E
Kyolic® Garlic Formula 105
Kyolic® Reserve
Mega Green Tea Extract
Mega Green Tea Extract (Decaffeinated)
Mega Lycopene Extract
Nutrim
Optimized Ashwagandha Extract
Pomegranate Extract
Pomegranate Juice Concentrate
ProGreens®
Pure-Gar™
Pycnogenol
Optimized Quercetin
Resveratrol with Synergistic Grape-Berry Actives
Rhodiola Extract
Rosmarinic Acid Extract
Silymarin
SODzyme™ with GliSODin®
Stevia Extract
Super Bio-Curcumin®

Super Ginkgo Extract
Triple Action Cruciferous Vegetable Extract
Venotone
Whole Grape Extract

HORMONES

7-Keto® DHEA
DHEA
DHEA Complete
GH Pituitary Support Day Formula
GH Pituitary Support Night Formula
Melatonin
Melatonin Timed Release
Natural Estrogen with Pomegranate Extract
Pregnenolone
ProFem Cream
Pure IGF
Super Miraforte with Standardized Lignans

IMMUNE ENHANCEMENT

Agave Digestive-Immune Support
AHCC® (Active Hexose Correlated Compound)
Buffered Vitamin C Powder
Echinacea
Enhanced Life Extension Whey Protein
i26 Hyperimmune Egg
Immune Protect with PARACTIN®
Lactoferrin
Lifeshield® Immunity™
Maitake SX-Fraction
Norwegian Shark Liver Oil
Optimized Fucoidan w/Maritech® 926
Primal Defense™
ProBoost™ Thymic Protein A
Pure Gar™
Sambu® Guard
Thymic Immune Factors
Ultimate Flora Advanced Immunity
Vitamin C with Dihydroquercetin
Zinc Lozenges with Vitamin C

INFLAMMATORY REACTIONS

Arthro-Immune Joint Support
ArthroMax™ with Theaflavins
Barlean's Kids DHA
Boswellia
Boswellia™ Topical Cream
Bromelain (Specially-coated)
Coromega Kids Brain and Body (DHA)
DHA 240
Emulsified Norwegian Cod Liver Oil
Emulsified Super Twin EPA/DHA
Fast Acting Joint Formula
Ginger Force
Krill Oil
5-LOXIN®
Mega EPA/DHA
Mega GLA with Sesame Lignans
MSM
Natural Relief 1222™ Cream
Serraflazyme
SODzyme™ with GliSODin® and Wolfberry
Super Omega-3 EPA/DHA with Sesame
Lignans & Olive Fruit Extract
Tart Cherry
Udo's Choice Oil
Zyflamend Easy

LIVER HEALTH

Branch Chain Amino Acids
N-Acetyl Cysteine
Liver Force
Certified European Milk Thistle
PhosChol® (Nutrasal)
SAME
Silymarin

MINERALS

Biosil
Bone Restore
Bone Strength Formula w/KoAct®
Bone-Up™
Boron Capsules
Calcium Citrate with D3
Chromium Ultra
Copper
Dr. Strum's Intensive Bone Formula

Iodoral
Iron Protein Plus
Magnesium
Magnesium Citrate
Mineral Formula for Men
Mineral Formula for Women
Only Trace Minerals
Optimized Chromium w/Crominex® 3+
OptiZinc
Sea-Iodine™
Selenium
Se-Methyl L-Selenocysteine
Strontium
Vanadyl Sulfate
Zinc/Vitamin C Lozenges

MISCELLANEOUS

Blood Pressure Monitor Arm Cuff Medium
Cell Sensor Gauss Meter™
CR Way Edition Advanced Dietary Software
Empty Gelatin Capsules
The Capsule Filler Machine
The Pill Cutter and Grinder

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

Bioactive Milk Peptides
Holy Basil
L-Theanine
5 HTP
Enhanced Natural Sleep® w/ Melatonin
Enhanced Natural Sleep® w/o Melatonin
Natural Stress Relief
Optimized Tryptopure™ Plus
Stabilium® 200
SAME
St. John's Wort Extract
Tryptopure™ L-Tryptophan

MOUTH CARE

Advanced Oral Hygiene
Dr. Tung's Tongue Cleaner
Mist Oral III™ with CoQ10
Mouthwash w/Pomegranate
Toothpaste

MULTIVITAMIN

Children's Formula Life Extension Mix
Comprehensive Nutrient Pack
Life Extension Booster
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
Vital Greens Mix

PET CARE

Cat Mix
Dog Mix

PROSTATE & URINARY HEALTH

BetterWOMAN®
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
Cellulite Suppress™ Formula
Corrective Clearing Mask
DermaWhey
DNA Repair Cream
Dual-Action MicroDerm Abrasion
Elastin Collagen Body Firming Lotion
Essential Plant Lipids Reporative Serum
Face Master® Platinum
Face Rejuvenating Antioxidant Cream
Enhanced FernBlock® with Sendara™
Fine Line-Less
Hair Suppress Formula
Healing Formula All-in-One Cream
Healing Mask
Hyaluronic Facial Moisturizer
Hydrating Anti-oxidant Face Mist
Hydroderm®
Lavinil Underarm Deodorant
Lifting & Tightening Complex
Melatonin Cream
Mild Facial Cleanser
NaPCA w/Aloe Vera
Neck Rejuvenating Antioxidant Cream
New Face Solution
Peel Off Cleansing Mask
Pigment Correcting Cream
(Ultra) Rejuvenex®
Rejuvenex® Body Lotion
Rejuvenex® Factor
Rejuvenating Serum
Skin Lightening Serum
Skin Restoring Ceramides w/Lipowheat™
Skin Stem Cell Serum
Sun Protection Spray
Total Sun Protection Cream
Triple Action Under Eye Rejuvenator
Ultra Rejuvenex®
Ultra RejuveNight® w/ Progesterone
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 K Healing Cream

SOY

Natural Estrogen w/Pomegranate
Soy Protein Concentrate
Super Absorbable Soy Isoflavones
Ultra Soy Extract

SPECIAL PURPOSE FORMULA

Anti-Alcohol Antioxidants w/HepatoProtection Complex
Benfotiamine w/Thiamine
Breast Health Formula
Butterbur Extract w/Standardized Rosmarinic Acid
Chlorella
Chlorophyllin w/Zinc
Cleanse Smart
Coriolus Super Strength
CR Mimetic Longevity Formula
Derma-Vits™
Cinsulin® w/InSea™
and Crominex® 3+
EDTA
European Leg Solution Diosmin 95
Fem Dophilus
Femmenessence MacaPause®
Flush & Be Fit
GlucoFit™
Ideal Bowl Support 299
Lustre™

Maitake SX-Fraction™
Menopause Solutions
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
Rosmarinic Acid Extract

SPORTS PERFORMANCE

Creatine Capsules
Creatine Powder
Enhanced Life Extension Protein
DMG (N, N-dimethylglycine)
Inosine
L-Glutamine Capsules
L-Glutamine Powder
Octacosanol

VITAMINS

Ascorbic Acid Powder
Ascorbyl Palmitate Capsules
B1
B2
B12
Beta-Carotene
Biotin Capsules
Biotin Powder
Buffered Vitamin C Powder
Complete B Complex
Essential Fat-Soluble Nutrient
Folic Acid + B12
Gamma E Tocopherol w/Sesame Lignans
Gamma E Tocopherol/Tocotrienols
Inositol Capsules
Inositol Powder
Mega Lycopene Extract
Methylcobalamin
MK-7
No-Flush Niacin
Optimized Folate
PABA Capsules
Super Ascorbate C Capsules
Super Ascorbate C Powder
Super K w/Advanced K2 Complex
Tocotrienols w/Sesame Lignans
Vitamin A Nutrisorb
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®
Anti-Adipocyte Formula w/AdipoStat
Calorie Control Weight Management Formula
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
Stevia Liquid Extract
Super CLA Blend w/Guarana and Sesame Lignans
Super CLA Blend w/Sesame Lignans
Udo's Choice Wholesome Fast Food Blend
WellBetX PGX® Soluble Fiber Blend

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
A					
00449	ACETYL-L-CARNITINE - 500 mg, 100 caps	\$56.00	\$42.00		
	Buy 4 bottles, price each	46.66	35.00		
00788	ACETYL-L-CARNITINE ARGINATE - 100 caps	59.00	44.25		
	Buy 4 bottles, price each	50.99	38.24		
01308	ADVANCED LIPID CONTROL - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01300	ADVANCED ORAL HYGIENE - 60 veg. mint lozenges	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01417	AGAVE DIGESTIVE-IMMUNE SUPPORT - 360 grams powder	30.00	22.50		
	Buy 4 jars, price each	27.00	20.25		
00681	AHCC - 500 mg, 30 caps	59.98	44.99		
	Buy 4 bottles, price each	53.33	40.00		
*46925	ALLI® REFILL PACK - 120 caps	69.95	58.00		
00457	ALPHA-LIPOIC ACID w/BIOTIN (SUPER) - 250 mg, 60 caps	37.00	27.75		
	Buy 4 bottles, price each	32.00	24.00		
01440	ANTI-ALCOHOL ANTIOXIDANTS w/HEPATOPRO - 100 caps	26.00	19.50		
	Buy 4 bottles, price each	23.00	17.25		
01510	ANTI-ADIPOCYTE FORMULA w/ADIPOSTAT - 60 veg. caps	35.00	26.25		
	Buy 4 bottles, price each	32.00	24.00		
01509	ANTI-ADIPOCYTE FORMULA w/ADIPOSTAT & INTEGRA LEAN® (ADVANCED)	39.00	29.25		
	60 veg. caps • Buy 4 bottles, price each	36.00	27.00		
00105	APPLE PECTIN POWDER - 227 grams	14.75	11.06		
	Buy 4 bottles, price each	13.75	10.31		
01012	ARGININE CAPS - 800 mg, 200 caps	26.50	19.88		
	Buy 4 bottles, price each	23.25	17.44		
01039	ARGININE/ORNITHINE - 500/250, 100 caps	16.00	12.00		
	Buy 4 bottles, price each	14.50	10.88		
00038	ARGININE/ORNITHINE POWDER - 150 grams	22.95	17.21		
	Buy 4 bottles, price each	19.00	14.25		
01025	(L)-ARGININE FREE-FORM POWDER - 100 grams	15.98	11.99		
	Buy 4 bottles, price each	14.31	10.73		
01317	ARTHRONAX™ w/THEAFLAVINS - 120 veg. caps	44.00	33.00		
	Buy 4 bottles, price each	40.00	30.00		
01404	ARTHRO-IMMUNE JOINT SUPPORT - 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
00919	ARTICHOKE LEAF EXTRACT - 500 mg, 180 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.38	19.04		
00086	ASCORBATE C (SUPER) - 8 oz powder	26.99	20.24		
	Buy 4 bottles, price each	24.87	18.65		
00080	ASCORBIC ACID POWDER - 454 grams	38.00	28.50		
	Buy 4 bottles, price each	34.93	26.20		
00082	ASCORBYL PALMITATE - 500 mg, 100 caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
00888	ASHWAGANDHA EXTRACT (OPTIMIZED) - 60 veg. caps	10.00	7.50		
	Buy 4 bottles, price each	9.00	6.75		

SUB-TOTAL OF COLUMN 1

AUGUST 2011

No.		Retail Each	Member Each	Qty	Total
01066	ASPIRIN - 81 mg, 300 enteric coated tablets	\$6.00	\$4.50		
	Buy 4 bottles, price each	5.33	4.00		
00708	ASTAXANTHIN - 2 mg, 30 softgels	10.25	7.69		
B					
00920	BENFOTIAMINE w/ THIAMINE - 100 mg, 120 veg. caps	\$19.95	\$14.96		
	Buy 4 bottles, price each	18.60	13.95		
00925	BENFOTIAMINE (MEGA) - 250 mg, 120 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01206	BERRY COMPLETE - 30 veg. caps	21.00	15.75		
	Buy 4 bottles, price each	18.67	14.00		
01406	BERRY COMPLETE w/RZD™ ACAI (ENHANCED) - 60 veg. caps	29.00	21.75		
	Buy 4 bottles, price each	26.00	19.50		
00664	BETA-CAROTENE - 25,000 IU, 100 softgels	10.98	8.24		
	Buy 4 bottles, price each	9.83	7.37		
00653	BETTERWOMAN® - 40 caps	40.00	30.00		
	Buy 4 bottles, price each	38.00	28.50		
01073	BILBERRY EXTRACT - 100 mg, 100 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01512	BIOACTIVE MILK PEPTIDES - 30 caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
*01006	BIOSIL™ - 5 mg, 30 veg. caps	18.95	15.16		
*01007	BIOSIL™ - 1 fl oz	29.99	23.99		
00102	BIOTIN - 600 mcg, 100 caps	7.50	5.63		
	Buy 4 bottles, price each	6.50	4.88		
00145	BIOTIN POWDER - 30 grams	12.50	9.38		
	Buy 4 bottles, price each	11.00	8.25		
01037	BLACKCURRANT FREEZE DRIED EXTRACT - 60 veg. caps	21.95	16.46		
01034	BLACKCURRANT JUICE CONCENTRATE - 12 fl. oz	17.95	13.46		
01008	BLAST™ - 600 grams of powder	26.95	20.21		
70000	BLOOD PRESSURE MONITOR-ARM CUFF (medium)	99.95	64.97		
70001	BLOOD PRESSURE MONITOR-WRIST (travel size)	69.95	45.47		
01214	BLUEBERRY EXTRACT - 60 veg. caps	22.50	16.88		
	Buy 4 bottles, price each	20.00	15.00		
01438	BLUEBERRY EXTRACT w/ POMEGRANATE - 60 veg. caps	30.00	22.50		
	Buy 4 bottles, price each	27.00	20.25		
01506	BONE FORMULA (DR. STRUM'S INTENSIVE) - 300 veg. caps	56.00	42.00		
	Buy 4 bottles, price each	50.00	37.50		
00811	BONE RESTORE - 150 caps	22.50	16.88		
	Buy 4 bottles, price each	19.50	14.63		
01211	BONE STRENGTH FORMULA w/KOACT® - 120 caps	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
00313	BONE-UP® - 240 caps	24.95	18.71		
	Buy 4 bottles, price each	22.50	16.88		
01379	BOOSTER - 60 softgels	48.00	36.00		
	Buy 4 bottles, price each	44.00	33.00		
01590	BOOSTER w/ADVANCED K2 COMPLEX (SUPER) - 60 softgels	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
00621	BORON - 3 mg, 100 caps	5.95	4.46		
	Buy 4 bottles, price each	5.25	3.94		
00202	BOSWELLA - 100 caps	38.00	28.50		
	Buy 4 bottles, price each	30.00	22.50		
00258	BOSWELLA TOPICAL CREAM - 4 oz	15.00	11.25		
	Buy 4 jars, price each	13.00	9.75		

SUB-TOTAL OF COLUMN 2

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

To order online visit: www.lifeextension.com

Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01253	BRANCHED CHAIN AMINO ACIDS - 90 veg. caps	\$19.50	\$14.63		
	Buy 4 bottles, price each	17.00	12.75		
00999	BREAST HEALTH FORMULA - 60 veg. caps	34.00	25.50		
	Buy 4 bottles, price each	30.00	22.50		
00893	BRITE EYES III - 2 vials, 5 ml each	34.00	25.50		
	Buy 4 boxes, price each	32.00	24.00		
00136	BROMELAIN POWDER - 100 grams	21.00	15.75		
	Buy 4 bottles, price each	18.75	14.06		
01203	BROMELAIN (SPECIALLY-COATED) - 500 mg, 60 enteric coated tablets	21.00	15.75		
	Buy 4 bottles, price each	19.00	14.25		
00884	BUTTERBUR EXT. w/STANDARDIZED ROSMARINIC ACID - 60 softgels	44.00	33.00		
	Buy 4 bottles, price each	39.60	29.70		
C					
01015	CALCIUM CITRATE w/VITAMIN D - 300 caps	\$24.00	\$18.00		
	Buy 4 bottles, price each	21.25	15.94		
00535	CALCIUM D-GLUCARATE - 200 mg, 60 caps	18.00	13.50		
	Buy 4 bottles, price each	15.00	11.25		
01493	CALORIE CONTROL WEIGHT MANAGEMENT FORMULA BLUEBERRY-POMEGRANATE FLAVOR - 402 grams powder	50.00	37.50		
	Buy 4 jars, price each	44.00	33.00		
	Buy 8 jars, price each	40.00	30.00		
00118	CAPSULE FILLER MACHINE FOR "00" CAPSULES	17.95	13.46		
	Buy 4 machines, price each	17.25	12.94		
00613	CAPSULE FILLER MACHINE FOR "0" CAPSULES	17.95	13.46		
	Buy 4 machines, price each	17.25	12.94		
00916	CARNITINE w/GLYCOCARN® (OPTIMIZED) - 60 veg. caps	29.00	21.75		
	Buy 4 bottles, price each	26.10	19.58		
01041	L-CARNITINE - 500 mg, 30 caps	15.00	11.25		
	Buy 4 bottles, price each	13.20	9.90		
01258	CARNOSOOTHIE w/PICROPROTECT™ - 60 veg. caps	29.95	22.46		
	Buy 4 bottles, price each	27.00	20.25		
01287	CARNOSINE (SUPER) - 500 mg, 90 caps	66.00	49.50		
	Buy 4 bottles, price each	60.00	45.00		
01003	CAT MIX - 100 grams powder	15.00	11.25		
	Buy 4 bottles, price each	12.00	9.00		
00390	CDP CHOLINE CAPS - 250 mg, 60 caps	36.00	27.00		
	Buy 4 bottles, price each	34.00	25.50		
00998	CELL SENSOR-EMF DETECTION METER	39.95	29.95		
01370	CHILDREN'S FORMULA LIFE EXTENSION MIX™ - 100 chewable tablets	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00550	CHLORELLA - 500 mg, 200 tablets	23.50	17.63		
	Buy 4 bottles, price each	21.00	15.75		
01549	CHLOROPHYLLIN w/ZINC - 100 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	20.00	15.00		
*01359	CHO-LESS™ - 90 capsules	32.50	24.38		
00541	CHOLINE CHLORIDE - 16 oz liquid	14.95	11.21		
	Buy 4 bottles, price each	14.00	10.50		
00364	CHONDROITIN SULFATE CONCENTRATE - 400 mg, 60 tablets	19.95	14.96		
	Buy 4 bottles, price each	18.00	13.50		
01218	CHROMIUM ULTRA - 100 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	21.00	15.75		
01504	CHROMIUM W/CROMINEX® 3+ (OPTIMIZED) - 500 mcg, 60 veg. caps	9.00	6.75		
	Buy 4 bottles, price each	8.00	6.00		
00551	CILANTRO HERBAL EXTRACT - 1 oz	12.00	9.00		
	Buy 4 bottles, price each	11.00	8.25		

SUB-TOTAL OF COLUMN 3

No.		Retail Each	Member Each	Qty	Total
01503	CINSULIN® w/INSEA™ AND CROMINEX® 3+ - 90 veg. caps	\$38.00	\$28.50		
	Buy 4 bottles, price each	34.00	25.50		
00069	CITRUS BIOFLAVONOID - 100 caps	16.79	12.59		
	Buy 4 bottles, price each	15.56	11.67		
00818	CLA BLEND w/SESAME LIGNANS (SUPER) - 1000 mg, 120 softgels	36.00	27.00		
	Buy 4 bottles, price each	33.00	24.75		
	Buy 10 bottles, price each	26.33	19.75		
00819	CLA BLEND w/GUARANA & SESAME (SUPER) -1000 mg, 120 softgels	42.00	31.50		
	Buy 4 bottles, price each	38.33	28.75		
01078	CLEANSE SMART - 60 caps	31.99	23.99		
00050	COD LIVER OIL (EMULSIFIED) - 12 fl oz (355 ml)	10.97	8.23		
	Buy 4 bottles, price each	10.34	7.76		
00293	COD LIVER OIL (EMULSIFIED) - 100 softgels (Emulsified)	10.97	8.23		
	Buy 4 bottles, price each	10.34	7.76		
00922	COGNITEX w/PREGNENOLONE & NEUROPROTECTION COMPLEX - 90 softgels	74.00	55.50		
	Buy 4 bottles, price each	66.60	49.95		
	Buy 12 bottles, price each	64.00	48.00		
00921	COGNITEX w/o PREGNENOLONE w/NEUROPROTECTION COMPLEX - 90 softgels	72.00	54.00		
	Buy 4 bottles, price each	64.00	48.00		
	Buy 12 bottles, price each	62.00	46.50		
01421	COGNITEX BASICS - 60 softgels	38.00	28.50		
	Buy 4 bottles, price each	35.00	26.25		
	Buy 12 bottles, price each	32.00	24.00		
00110	COMPLETE B-COMPLEX - 180 caps	21.50	16.13		
	Buy 4 bottles, price each	18.00	13.50		
01575	COMPREHENSIVE NUTRIENT PACK - 30-day supply	189.00	141.75		
	Buy 4 bottles, price each	171.00	128.25		
00119	COPPER CAPSULES - 2 mg, 100 caps	9.91	7.43		
	Buy 4 bottles, price each	8.96	6.72		
00949	COQ10™ w/ d-LIMONENE (SUPER ABSORBABLE) - 50 mg, 60 softgels	25.00	18.75		
	Buy 4 bottles, price each	22.00	16.50		
	Buy 12 bottles, price each	20.00	15.00		
00950	COQ10™ w/ d-LIMONENE (SUPER ABSORBABLE) - 100 mg, 100 softgels	66.00	49.50		
	Buy 4 bottles, price each	60.00	45.00		
	Buy 12 bottles, price each	56.00	42.00		
01226	COQ10 (SUPER UBIQUINOL) - 100 mg, 60 softgels	56.00	42.00		
	Buy 4 bottles, price each	52.00	39.00		
	Buy 12 bottles, price each	48.00	36.00		
01426	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) -100 mg, 60 softgels	62.00	46.50		
	Buy 4 bottles, price each	56.00	42.00		
	Buy 12 bottles, price each	52.00	39.00		
01425	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) -50 mg, 100 softgels	58.00	43.50		
	Buy 4 bottles, price each	53.00	39.75		
	Buy 10 bottles, price each	50.00	37.50		
01427	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) -50 mg, 30 softgels	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01431	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (SUPER UBIQUINOL) -200 mg, 30 softgels	62.00	46.50		
	Buy 4 bottles, price each	56.00	42.00		
	Buy 10 bottles, price each	52.00	39.00		
01053	CORIOLUS SUPER STRENGTH - 600 mg, 150 veg. caps	99.95	74.96		
00857	COROMEGA CHILD BRAIN & BODY - (Lemon Lime) 30 packets	25.00	18.75		
	Buy 4 boxes, price each	22.50	16.75		

SUB-TOTAL OF COLUMN 4

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

AUGUST 2011

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
C CONTINUED					
80140	COSMESIS ADVANCED UNDER EYE SERUM w/STEM CELLS - 33 oz	\$49.00	\$36.75		
	Buy 2 bottles, price each	42.00	31.50		
80139	COSMESIS AMBER SELF MICRODERMABRASION - 2 oz	49.00	36.75		
	Buy 2 jars, price each	42.00	31.50		
80118	COSMESIS ANTI-AGING MASK - 2 oz	72.00	54.00		
	Buy 2 bottles, price each	63.36	47.52		
80134	COSMESIS ANTI-GLYCATION SERUM - 1 oz	33.00	24.75		
	W/BLUEBERRY & POMEGRANATE EXTRACTS				
	Buy 2 bottles, price each	31.35	23.51		
80133	COSMESIS ANTIOXIDANT FACIAL MIST - 2 oz	32.00	24.00		
	Buy 2 bottles, price each	30.40	22.80		
80127	COSMESIS ANTIOXIDANT REJUVENATING FOOT CREAM - 2 oz	45.00	33.75		
	Buy 2 jars, price each	42.80	32.10		
80128	COSMESIS ANTIOXIDANT REJUVENATING FOOT SCRUB - 2 oz	59.00	44.25		
	Buy 2 jars, price each	51.92	38.94		
80117	COSMESIS ANTIOXIDANT REJUVENATING HAND CREAM - 2 oz	64.00	48.00		
	Buy 2 jars, price each	57.49	43.12		
80121	COSMESIS ANTIOXIDANT REJUVENATING HAND SCRUB - 2 oz	58.00	43.50		
	Buy 2 jars, price each	51.04	38.28		
80105	COSMESIS ANTI-REDNESS & BLEMISH LOTION - 1 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80120	COSMESIS CORRECTIVE CLEARING MASK - 2 oz	64.50	48.38		
	Buy 2 jars, price each	56.76	42.57		
80141	COSMESIS DNA REPAIR CREAM - 1 oz jar	49.00	36.75		
	Buy 2 jars, price each	42.00	31.50		
80108	COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz	74.95	56.21		
	Buy 2 bottles, price each	65.95	49.46		
80123	COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2 oz	69.50	52.13		
	Buy 2 jars, price each	61.16	45.87		
80107	COSMESIS FINE LINE-LESS - 1 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80131	COSMESIS HAIR SUPPRESS FORMULA - 4 oz	59.00	44.25		
	Buy 2 bottles, price each	51.92	38.94		
80137	COSMESIS HEALING FORMULA ALL-IN-ONE CREAM - 1 oz	53.00	39.75		
	Buy 2 jars, price each	45.43	34.07		
80115	COSMESIS HEALING MASK - 2 oz	64.50	48.38		
	Buy 2 bottles, price each	56.76	42.57		
80109	COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz	58.00	43.50		
	Buy 2 bottles, price each	51.04	38.28		
80110	COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz	58.00	43.50		
	Buy 2 bottles, price each	51.04	38.28		
80138	COSMESIS HYDRATING ANTI-OXIDANT FACE MIST - 4 oz	39.95	29.96		
	Buy 2 bottles, price each	38.00	28.50		
80103	COSMESIS LIFTING & TIGHTENING COMPLEX - 1 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80135	COSMESIS MELATONIN CREAM - 1 oz	33.00	24.75		
	Buy 2 jars, price each	27.10	20.33		
80114	COSMESIS MILD FACIAL CLEANSER - 8 oz	59.00	44.25		
	Buy 2 bottles, price each	51.92	38.94		
80122	COSMESIS NECK REJUVENATING ANTIOXIDANT CREAM - 2 oz	64.00	48.00		
	Buy 2 jars, price each	56.32	42.24		
80111	COSMESIS PIGMENT CORRECTING CREAM - 1/2 oz	74.00	55.50		
	Buy 2 bottles, price each	65.12	48.84		
80106	COSMESIS REJUVENATING SERUM - 1 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		

SUB-TOTAL OF COLUMN 5

AUGUST 2011

No.		Retail Each	Member Each	Qty	Total
80112	COSMESIS SKIN LIGHTENING SERUM - 1/2 oz	\$85.00	\$63.75		
	Buy 2 bottles, price each	74.80	56.10		
80130	COSMESIS SKIN STEM CELL SERUM - 1 oz	74.00	55.50		
	Buy 2 bottles, price each	69.00	51.75		
80116	COSMESIS ULTRA LIP PLUMPER - 1/3 oz	64.00	48.00		
	Buy 2 bottles, price each	56.32	42.24		
80101	COSMESIS ULTRA WRINKLE RELAXER - 1 oz	89.95	67.46		
	Buy 2 bottles, price each	79.76	59.82		
80113	COSMESIS UNDER EYE REFINING SERUM - 1/2 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80104	COSMESIS UNDER EYE RESCUE CREAM - 1/2 oz	74.50	55.88		
	Buy 2 bottles, price each	65.56	49.17		
80129	COSMESIS VITAMIN C SERUM - 1 oz	85.00	63.75		
	Buy 2 bottles, price each	74.80	56.10		
80136	COSMESIS VITAMIN D LOTION - 4 oz	36.00	27.00		
	Buy 2 bottles, price each	33.66	25.25		
80102	COSMESIS VITAMIN K HEALING CREAM - 1 oz	79.50	59.63		
	Buy 2 bottles, price each	69.96	52.47		
00862	CRAN-MAX® - 500 mg, 60 veg. caps	17.50	13.13		
	Buy 4 bottles, price each	15.00	11.25		
01424	CRAN-MAX® with UTIROSE™ (OPTIMIZED) - 60 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00609	CREATINE CAPSULES - 120 caps	10.95	8.21		
	Buy 4 bottles, price each	9.25	6.94		
00610	CREATINE POWDER - 500 grams	29.00	21.75		
	Buy 4 bottles, price each	26.63	19.97		
01096	CREATINE WHEY GLUTAMINE POWDER - 1000 grams (vanilla)	45.00	33.75		
	Buy 4 bottles, price each	42.00	31.50		
~01089	CRUCIFEROUS VEGETABLE SOUP - 32 oz. pouch	11.95	8.96		
	Buy 6 pouches, price each	11.25	8.44		
~01090	(ASIAN) CRUCIFEROUS VEGETABLE SOUP - 32 oz. pouch	11.95	8.96		
	Buy 6 pouches, price each	11.25	8.44		
01429	CR MIMETIC LONGEVITY FORMULA - 60 veg. caps	39.00	29.25		
	Buy 4 bottles, price each	36.00	27.00		
***CRWAY	CR WAY OPTIMAL HEALTH PROGRAM SOFTWARE	195.00	195.00		
00407	CURCUMIN® (SUPER BIO) - 400 mg, 60 veg. caps	38.00	28.50		
	Buy 4 bottles, price each	35.00	26.25		
00064	(L) CYSTEINE - 500 mg, 60 caps	18.95	14.21		
	Buy 4 bottles, price each	16.31	12.23		
D					
01063	DERMA-VITS™ - 90 caps	\$14.99	\$11.24		
01313	DERMAWHEY - 400 mg, 60 caps	65.00	48.75		
	Buy 4 bottles, price each	59.00	44.25		
00856	DHA (BARLEAN'S KID'S) 8 fl. oz (Fruit Punch)	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
00995	DHA 240 - 240 mg, 60 softgels	19.00	14.25		
	Buy 4 bottles, price each	17.00	12.75		
00658	7-KETO® DHEA METABOLITE - 25 mg, 100 caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
01271	7-KETO® DHEA METABOLITE - 100 mg, 60 veg. caps	40.00	30.00		
	Buy 4 bottles, price each	36.00	27.00		
00607	DHEA - 25 mg, 100 tablets (dissolve in mouth)	14.00	10.50		
	Buy 4 bottles, price each	11.75	8.81		

SUB-TOTAL OF COLUMN 6

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

To order online visit: www.lifeextension.com

Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01250	DHEA COMPLETE - 60 veg. caps Buy 4 bottles, price each	\$48.00 43.20	\$36.00 32.40		
00335	DHEA - 25 mg, 100 caps Buy 4 bottles, price each	15.00 12.50	11.25 9.38		
00454	DHEA - 15 mg, 100 caps Buy 4 bottles, price each	12.00 10.00	9.00 7.50		
00882	DHEA - 50 mg, 60 caps Buy 4 bottles, price each	16.00 14.00	12.00 10.50		
00883	DHEA - 100 mg, 60 caps Buy 4 bottles, price each	22.50 19.00	16.88 14.25		
01358	DIGEST RC - 30 tablets Buy 4 boxes, price each	19.95 17.00	14.96 12.75		
01272	DIGESTIVE ENZYMES (ENHANCED SUPER) - 100 veg. caps Buy 4 bottles, price each	18.95 16.00	14.21 12.00		
01273	DIGESTIVE ENZYMES w/PROBIOTICS (ENHANCED SUPER) - 100 veg. caps Buy 4 bottles, price each	24.00 22.00	18.00 16.50		
00034	D,L-PHENYLALANINE CAPSULES - 500 mg, 100 caps Buy 4 bottles, price each	18.75 16.00	14.06 12.00		
00257	DMAE BITARTRATE - 150 mg, 200 caps Buy 4 bottles, price each	14.00 10.50	10.50 7.88		
00197	DMAE-GINKGO - 100 caps Buy 4 bottles, price each Buy 8 bottles, price each	36.00 30.00 27.50	27.00 22.50 20.63		
00059	DMG - 125 mg, 60 tablets Buy 4 boxes, price each	18.50 17.00	13.88 12.75		
01547	DNA PROTECTION FORMULA - 60 veg. caps Buy 4 bottles, price each	30.00 28.00	22.50 21.00		
00544	DOG MIX - 100 grams powder Buy 4 bottles, price each	19.50 16.00	14.63 12.00		
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA - 2 oz Buy 4 bottles, price each	39.95 32.00	29.96 24.00		
00320	DR. PROCTOR'S HAIR FORMULA SHAMPOO - 8 oz Buy 4 bottles, price each	24.95 22.00	18.71 16.50		
00376	DR. TUNG'S TONGUE CLEANER Buy 4 bottles, price each	8.45 8.05	6.34 6.04		
00899	DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 2.4 oz Buy 4 jars, price each	39.95 38.95	29.96 29.21		
00240	DUAL-C - 90 caps Buy 4 bottles, price each	12.00 10.50	9.00 7.88		
E					
00388	ECHINACEA EXTRACT - 250 mg, 60 caps Buy 4 bottles, price each	\$14.35 12.50	\$10.76 9.38		
01024	EDTA - 500 mg, 100 caps	17.50	13.13		
01321	ELASTIN & COLLAGEN BODY FIRING LOTION - 8 fl. oz.	10.00	7.50		
00048	EMULSIFIED SUPER TWIN EPA/DHA - 12 fl. oz.	22.45	16.84		
01498	ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 60 softgels Buy 4 bottles, price each	56.00 52.00	42.00 39.00		
00997	ENDOTHELIAL DEFENSE™ w/GLISODIN® - 60 veg. caps Buy 4 bottles, price each	52.00 46.00	39.00 34.50		
00625	EPA/DHA (MEGA) - 120 softgels Buy 4 bottles, price each	19.95 18.00	14.96 13.50		
01428	ESSENTIAL FAT-SOLUBLE NUTRIENTS - 30 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
*01042	EUROPEAN LEG SOLUTION DIOSMIN 95 - 600 mg, 30 veg. tabs Buy 4 bottles, price each	20.00 18.00	15.00 13.50		
01514	EYE PRESSURE SUPPORT w/MIRTOGENOL® - 30 veg. caps Buy 4 bottles, price each	38.00 34.00	28.50 25.50		

SUB-TOTAL OF COLUMN 7

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

No.		Retail Each	Member Each	Qty	Total
F					
***01054	FACE MASTER® PLATINUM	\$199.00	\$199.00		
00965	FAST-ACTING JOINT FORMULA - 30 caps Buy 4 bottles, price each	39.00 36.00	29.25 27.00		
20053	FEM DOPHILUS® - 30 caps	25.95	19.46		
20055	FEM DOPHILUS® - 60 caps	39.95	29.96		
01064	FEMMENESSENCE MACAPAUSE® - 120 veg. caps	34.99	26.24		
*01311	FERNBLOCK® w/SENDARA™ (ENHANCED) - 30 veg. caps Buy 4 bottles, price each	39.00 35.00	29.25 26.25		
00229	FIBER FOOD CAPS - 200 caps Buy 4 bottles, price each Buy 10 bottles, price each	15.00 12.50 11.90	11.25 9.38 8.93		
00718	FIBRINOGEN RESIST™ - 30 veg. caps Buy 4 bottles, price each	49.00 44.00	36.75 33.00		
00873	FLAXSEED POWDER (HI-LIGNAN® NUTRI-FLAX®) - 16 oz powder	9.95	7.46		
01200	FLORASTOR® - 250 mg, 50 caps	55.15	41.36		
01212	FLUSH + BE FIT - 2- week cleanse for women	29.99	22.49		
01439	FOLATE (OPTIMIZED) (L-METHYLFOLATE) 1000 mcg - 100 veg. caps Buy 4 bottles, price each	28.00 25.00	21.00 18.75		
00347	FOLIC ACID + B12 CAPSULES - 200 caps Buy 4 bottles, price each	10.50 9.50	7.88 7.13		
00300	FORSKOLIN - 10 mg, 60 caps Buy 4 bottles, price each	15.00 12.50	11.25 9.38		
01513	FUCOIDAN w/MARITECH® 926 (OPTIMIZED) - 60 veg. caps Buy 4 bottles, price each	36.00 33.00	27.00 24.75		
00993	FUCOXANTHIN-SLIM™ - 90 softgels Buy 4 bottles, price each	44.00 39.00	33.00 29.25		
G					
00127	GABA POWDER - 100 grams Buy 4 bottles, price each	\$23.75 22.50	\$17.81 16.88		
00559	GAMMA E TOCOPHEROL/TOCOTRIENOLS - 60 softgels Buy 4 bottles, price each	42.00 37.00	31.50 27.75		
00759	GAMMA E TOCOPHEROL w/SESAME LIGNANS - 60 softgels Buy 4 bottles, price each	32.00 29.00	24.00 21.75		
00117	GELATIN CAPSULES - 1000 empty caps size "00" Buy 4 bags, price each	19.00 18.00	14.25 13.50		
01301	GH PITUITARY SUPPORT DAY FORMULA - 120 vegetarian tabs Buy 4 bottles, price each	48.00 44.00	36.00 33.00		
01302	GH PITUITARY SUPPORT NIGHT FORMULA - 120 veg. caps Buy 4 bottles, price each	25.00 22.50	18.75 16.88		
01228	GINGER FORCE - 60 softgels	29.95	22.46		
00778	GINKGO BILOBA CERTIFIED EXTRACT™ - 120 mg, 365 caps Buy 2 bottles, price each	46.00 43.50	34.50 32.63		
00504	GINKGO EXTRACT (SUPER) - 120 mg, 100 caps Buy 4 bottles, price each	29.00 26.50	21.75 19.88		
01032	(PANAX RED) GINSENG - 60 veg. caps	29.99	22.49		
00756	GLA WITH SESAME LIGNANS (MEGA) - 60 softgels Buy 4 bottles, price each	19.50 18.00	14.63 13.50		
00345	(L) GLUTAMINE CAPSULES - 500 mg, 100 caps Buy 4 bottles, price each	14.95 13.50	11.21 10.13		
00141	(L)-GLUTAMINE POWDER - 100 grams Buy 4 bottles, price each	19.00 16.88	14.25 12.66		
00522	GLUCOSAMINE/CHONDROITIN CAPSULES - 100 caps Buy 4 bottles, price each	38.00 32.00	28.50 24.00		
00512	GLUCOFIT™ - 100 softgels Buy 4 bottles, price each	28.00 25.00	21.00 18.75		

SUB-TOTAL OF COLUMN 8

AUGUST 2011

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
G CONTINUED					
00113	GLUTATHIONE, CYSTEINE & C - 750 mg, 100 caps	\$18.00	\$13.50		
	Buy 4 bottles, price each	16.00	12.00		
00314	L-GLUTATHIONE (MEGA) - 250 mg, 60 caps	39.64	27.03		
	Buy 4 bottles, price each	35.68	26.76		
00795	GLYCINE - 1000 mg, 100 caps	12.00	9.00		
	Buy 4 bottles, price each	10.80	8.10		
00128	GLYCINE POWDER - 300 grams	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01091	GRAPE EXTRACT w/RESVERATROL (WHOLE) - 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	34.00	25.50		
01411	GRAPE SEED EXTRACT w/RESVERATROL & PTEROSTILBENE -100 mg, 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	34.00	25.50		
00953	GREEN TEA EXTRACT (MEGA) - lightly caffeinated - 100 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	26.50	19.88		
00954	GREEN TEA EXTRACT (MEGA) - decaffeinated - 100 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	26.50	19.88		
H					
01074	5 HTP - 100 mg, 60 caps	\$27.95	\$20.96		
00010	HAIR CONDITIONER - 16 oz	6.00	4.50		
	Buy 4 bottles, price each	4.50	3.38		
00230	HCA - 90 caps	18.00	13.50		
	Buy 4 bottles, price each	15.50	11.63		
01433	HOLY BASIL - 60 softgel caps	31.95	23.96		
01434	HOLY BASIL - 120 softgel caps	51.95	38.96		
01435	HOMOCYSTEINE RESIST - 100 caps	24.00	18.00		
	Buy 4 bottles, price each	21.60	16.20		
00067	HOODIA GORDONII - 60 caps	14.00	10.50		
00627	HUPERZINE A w/NATURAL VITAMIN E - 50 mcg, 60 caps	27.95	20.96		
	Buy 4 bottles, price each	24.00	18.00		
00661	HYDRODERM® - 1 oz	79.95	59.96		
	Buy 2 bottles, price each	65.33	49.00		
I					
^ 01060	i26 HYPERIMMUNE EGG - 140 grams powder	\$49.99	\$42.00		
^ 01319	i26 HYPERIMMUNE EGG - 135 capsules	31.99	25.59		
^ 01318	i26 HYPERIMMUNE EGG CHEWABLES - (vanilla) 45 tablets	31.99	25.59		
01065	IDEAL BOWEL SUPPORT 299V - 30 veg. caps	21.95	16.46		
00955	IMMUNE PROTECT w/PARACTIN® - 30 veg. caps	29.50	22.13		
	Buy 4 bottles, price each	26.55	19.91		
01049	INNERPOWER™ - 555 grams powder	42.00	31.50		
00155	INOSINE - 500 mg, 60 caps	22.95	17.21		
	Buy 4 bottles, price each	21.00	15.75		
00109	INOSITOL CAPSULES - 500 mg, 100 caps	16.53	12.40		
	Buy 4 bottles, price each	15.21	11.41		
00410	INOSITOL CAPSULES - 1000 mg, 360 caps	48.00	36.00		
	Buy 4 bottles, price each	43.75	32.81		
00108	INOSITOL POWDER - 100 grams	18.00	13.50		
	Buy 4 bottles, price each	16.88	12.66		
01021	INTACT DIGEST™ - 8 fl oz	35.00	26.25		
	Buy 4 bottles, price each	33.00	24.75		
01292	INTEGRA-LEAN® IRVINGIA - 150 mg, 60 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
01002	IODORAL® - 180 caps	50.00	37.50		
00563	IRON PROTEIN PLUS - 300 mg, 100 caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		

SUB-TOTAL OF COLUMN 9

AUGUST 2011

No.		Retail Each	Member Each	Qty	Total
01492	IRVINGIA w/PHASE 3™ - 120 veg. caps CALORIE CONTROL COMPLEX (OPTIMIZED)	\$56.00	\$42.00		
	Buy 4 bottles, price each	48.00	36.00		
J, K					
00056	JARRO-DOPHILUS EPS™ - 60 veg. caps	\$21.95	\$16.46		
01224	K w/ADVANCED K2 COMPLEX (SUPER) - 90 softgels	26.00	19.50		
	Buy 4 bottles, price each	23.00	17.25		
01050	(NKO) KRILL OIL - 60 softgels	33.95	25.46		
00316	KYOLIC® GARLIC FORMULA 102 - 350 mg, 200 caps	23.95	17.96		
	Buy 4 bottles, price each	20.50	15.38		
00214	KYOLIC® GARLIC FORMULA 105 - 200 caps	22.95	17.21		
	Buy 4 bottles, price each	18.25	13.69		
00789	KYOLIC® RESERVE - 600 mg, 120 caps	24.75	18.56		
	Buy 4 bottles, price each	21.45	16.09		
L					
00513	LACTOFERRIN (APOLACTOFERRIN) CAPS - 60 caps	\$40.00	\$30.00		
	Buy 4 bottles, price each	36.00	27.00		
00017	LAVILIN UNDERARM DEODORANT - 12.5 grams cream	15.00	11.25		
	Buy 4 jars, price each	13.75	10.31		
00020	LECITHIN - 16 oz. granules	15.00	11.25		
	Buy 4 jars, price each	12.50	9.38		
01538	LIFE EXTENSION MIX™ - 315 veg. tablets	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	69.50	52.13		
01555	LIFE EXTENSION MIX™ - 315 tablets	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	69.50	52.13		
01557	LIFE EXTENSION MIX™ w/EXTRA NIACIN - 315 tablets	98.00	73.50		
	Buy 4 bottles, price each	86.00	64.50		
	Buy 10 bottles, price each	69.50	52.13		
01554	LIFE EXTENSION MIX™ - 490 caps	110.00	82.50		
	Buy 4 bottles, price each	98.00	73.50		
	Buy 10 bottles, price each	85.00	63.75		
01556	LIFE EXTENSION MIX™ POWDER - 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		
01565	LIFE EXTENSION MIX™ - 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		
01567	LIFE EXTENSION MIX™ w/EXTRA NIACIN 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		
01564	LIFE EXTENSION MIX™ - 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		
01566	LIFE EXTENSION MIX™ POWDER - 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	LIFE FLORA™ - 300 mg, 120 caps	20.50	15.38		
	Buy 4 bottles, price each	18.75	14.06		
01314	LIFESHIELD® IMMUNITY™ - 60 veg. caps	39.95	29.96		

SUB-TOTAL OF COLUMN 10

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

To order online visit: www.lifeextension.com

Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
01227	LIVER FORCE - 30 veg. caps	\$34.95	\$26.21		
00939	5-LOXIN® - 75 mg, 100 veg. caps	19.50	14.63		
	Buy 4 bottles, price each	17.25	12.94		
01013	L-LYSINE - 620 mg, 100 caps	9.00	6.75		
	Buy 4 bottles, price each	8.00	6.00		
00129	L-LYSINE POWDER - 300 grams	16.00	12.00		
	Buy 4 bottles, price each	13.75	10.31		
01470	LURALEAN® CAPS SPECIAL PROPOLMANNAN PARTICLE SIZE - 120 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01017	LUSTRE™ - 90 tablets	17.50	13.13		
	Buy 4 bottles, price each	15.50	11.63		
00455	LYCOPENE EXTRACT (MEGA) - 15 mg, 90 softgels	35.00	26.25		
	Buy 4 bottles, price each	30.00	22.50		
M					
01369	MAGNESIUM CAPS - 500 mg, 100 veg. caps	\$10.00	\$7.50		
	Buy 4 bottles, price each	9.00	6.75		
00502	MAGNESIUM CITRATE - 160 mg, 100 caps	9.00	6.75		
	Buy 4 bottles, price each	7.50	5.63		
00704	MAITAKE™ SX-FRACTION - 90 veg. tablets	49.95	37.46		
00547	MELATONIN - 300 mcg, 100 caps	5.75	4.31		
	Buy 4 bottles, price each	5.00	3.75		
01083	MELATONIN - 500 mcg, 200 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00329	MELATONIN - 1 mg, 60 caps	5.00	3.75		
	Buy 4 bottles, price each	4.63	3.47		
00330	MELATONIN - 3 mg, 60 caps	8.00	6.00		
	Buy 4 bottles, price each	6.88	5.16		
01086	MELATONIN - 3 mg, 60 time-release veg. caps	10.50	7.88		
	Buy 4 bottles, price each	9.38	7.04		
00331	MELATONIN - 10 mg, 60 caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
00332	MELATONIN - 3 mg, 60 lozenges	8.00	6.00		
	Buy 4 bottles, price each	6.88	5.16		
01087	MELATONIN TIME RELEASE - 300 mcg, 100 veg. caps	6.25	4.69		
	Buy 4 bottles, price each	5.63	4.22		
01088	MELATONIN TIME RELEASE - 750 mcg, 60 veg. caps	5.75	4.31		
	Buy 4 bottles, price each	5.00	3.75		
01009	MEMORY UPGRADE™ - 600 grams powder	26.95	20.21		
01047	MENOPAUSE SOLUTIONS - 120 tablets	49.95	37.46		
00536	METHYLCOBALAMIN - 1 mg, 60 lozenges (vanilla)	9.95	7.46		
	Buy 4 bottles, price each	8.00	6.00		
00537	METHYLCOBALAMIN - 5 mg, 60 lozenges (vanilla)	32.00	24.00		
	Buy 4 bottles, price each	25.00	18.75		
	Buy 10 bottles, price each	23.00	17.25		
00709	MIGRA-EEZE™ (BUTTERBUR) - 60 softgels	29.50	22.13		
	Buy 4 bottles, price each	26.33	19.75		

SUB-TOTAL OF COLUMN 11

No.		Retail Each	Member Each	Qty	Total
01517	MILK THISTLE (CERTIFIED EUROPEAN) - 120 veg. caps	\$42.00	\$31.50		
	Buy 4 bottles, price each	38.00	28.50		
00623	MINERAL FORMULA FOR MEN - 100 caps	15.00	11.25		
	Buy 4 bottles, price each	12.50	9.38		
	Buy 12 bottles, price each	10.83	8.13		
00624	MINERAL FORMULA FOR WOMEN - 100 caps	15.00	11.25		
	Buy 4 bottles, price each	12.50	9.38		
	Buy 12 bottles, price each	10.83	8.13		
01315	MIRAFORTE w/STANDARDIZED LIGNANS (SUPER) - 120 caps	62.00	46.50		
	Buy 4 bottles, price each	56.00	42.00		
01569	MITOCHONDRIAL BASICS w/BIOPOQ™ - 30 caps	52.00	39.00		
	Buy 4 bottles, price each	46.00	34.50		
01568	MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPOQ™ - 120 caps	94.00	70.50		
	Buy 4 bottles, price each	84.00	63.00		
00803	MIST ORAL III w/COQ10 - 2 fl oz	28.00	21.00		
	Buy 4 bottles, price each	25.33	19.00		
00065	MK-7 - 90 mcg, 60 softgels	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01279	MOUTHWASH W/POMEGRANATE - 16 oz	18.50	13.88		
	Buy 4 bottles, price each	17.00	12.75		
00451	MSM (METHYLSULFONYLMETHANE) - 1000 mg, 100 caps	14.00	10.50		
	Buy 4 bottles, price each	11.95	8.96		
N					
00215	N-ACETYL-L-CYSTEINE - 600 mg, 60 caps	\$14.00	\$10.50		
	Buy 4 bottles, price each	13.50	10.13		
00168	NAPCA W/ALOE VERA - 8 fl oz	10.50	7.88		
	Buy 4 bottles, price each	9.61	7.21		
00066	NATTOKINASE - 60 softgels	24.98	18.74		
00891	NATURAL APPETITE CONTROL - 90 softgels	28.00	21.00		
	Buy 4 bottles, price each	25.20	18.90		
00984	NATURAL BP MANAGEMENT - 60 tablets	42.00	31.50		
	Buy 4 bottles, price each	37.80	28.35		
00913	NATURAL ESOPHAGUARD - 10 softgels	19.95	14.96		
	Buy 2 boxes, price each	19.00	14.25		
00712	NATURAL ESTROGEN w/POMEGRANATE EXTRACT - 60 caplets	38.00	28.50		
	Buy 4 bottles, price each	33.00	24.75		
01221	NATURAL FEMALE SUPPORT - 30 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
01471	NATURAL GLUCOSE ABSORPTION CONTROL - 60 veg. caps	39.00	29.25		
	Buy 4 bottles, price each	36.00	27.00		
00698	NATURAL RELIEF 1222™ - 2 oz	28.00	21.00		
	Buy 4 tubes, price each	25.00	18.75		
01084	NATURAL SLEEP® - 3 mg, 60 veg. caps	12.99	9.74		
	Buy 4 bottles, price each	10.00	7.50		
01507	NATURAL SLEEP® (ENHANCED) W/ MELATONIN - 30 caps	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
01511	NATURAL SLEEP® (ENHANCED) W/O MELATONIN - 30 caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		

SUB-TOTAL OF COLUMN 12

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

AUGUST 2011

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
N CONTINUED					
01085	NATURAL SLEEP MELATONIN® - 5 mg, 60 veg. caps	\$18.00	\$13.50		
	Buy 4 bottles, price each	16.00	12.00		
00987	NATURAL STRESS RELIEF - 30 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
01076	NEW FACE SOLUTION - 1.7 oz bottle	54.00	40.50		
	Buy 4 bottles, price each	49.00	36.75		
00373	NO-FLUSH NIACIN - 800 mg, 100 caps	19.00	14.25		
	Buy 4 bottles, price each	17.00	12.75		
01035	NUTRIM - 170 grams powder	25.95	19.46		
00523	N-ZIMES™ - 270 caps	23.90	17.93		
	Buy 4 bottles, price each	22.00	16.50		
O					
00104	OCTACOSANOL - 8000 mcg, 60 caps	\$19.83	\$14.87		
	Buy 4 bottles, price each	17.35	13.01		
01483	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) - 60 softgels	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
01482	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) - 120 softgels	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
	Buy 10 bottles, price each	24.90	18.68		
01484	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE FRUIT EXTRACT (SUPER) - 120 enteric coated softgels	34.00	25.50		
	Buy 4 bottles, price each	31.00	23.25		
	Buy 10 bottles, price each	28.00	21.00		
01501	ONE-PER-DAY - 60 veg. tablets	19.95	14.96		
	Buy 4 bottles, price each	18.00	13.50		
00717	ONLY TRACE MINERALS - 90 caps	15.00	11.25		
	Buy 4 bottles, price each	12.50	9.38		
00915	OPTIZINC® - 30 mg, 90 veg. caps	5.95	4.46		
	Buy 4 bottles, price each	5.00	3.75		
01070	ORGANIC TOTAL BODY CLEANSE™ - 14-day supply	34.99	26.24		
00043	L-ORNITHINE - 500 mg, 100 caps	24.95	18.71		
	Buy 4 bottles, price each	20.00	15.00		
P					
00107	PABA CAPS - 500 mg, 100 caps	\$15.42	\$11.57		
	Buy 4 bottles, price each	13.59	10.19		
00073	PANCREATIN - 500 mg, 50 caps	13.22	9.92		
	Buy 4 bottles, price each	12.12	9.09		
01323	PEAK ATP® WITH GLYCOCARN® - 60 veg. caps	59.00	44.25		
	Buy 4 bottles, price each	56.00	42.00		
00342	PECTA SOL-C® MODIFIED CITRUS PECTIN - 454 grams powder	99.95	74.96		
	Buy 4 jars, price each	95.70	71.78		
01080	PECTA SOL-C® MODIFIED CITRUS PECTIN - 270 veg. caps	69.95	52.46		
00673	PGX™ SOLUBLE FIBER BLEND (WELLBETX®) -180 caps	34.95	26.21		
00865	PHARMAGABA™ - 60 chewable tablets	29.95	22.46		
	Buy 4 bottles, price each	27.00	20.25		
01320	PHOSCHOL® - 900 mg, 100 softgels	69.45	52.09		
00368	PHOSPHATIDYLSERINE CAPS - 100 mg, 100 caps	54.00	40.50		
	Buy 4 bottles, price each	48.00	36.00		
00614	PILL CUTTER/GRINDER	11.95	8.96		
00561	POLICOSANOL - 10 mg, 60 tablets	24.00	18.00		
	Buy 6 bottles, price each	18.00	13.50		

SUB-TOTAL OF COLUMN 13

No.		Retail Each	Member Each	Qty	Total
01423	POMEGRANATE™ (FULL-SPECTRUM) - 30 softgels	\$24.00	\$18.00		
	Buy 4 bottles, price each	21.00	15.75		
00956	POMEGRANATE EXTRACT - 30 veg. caps	19.50	14.63		
	Buy 4 bottles, price each	17.55	13.16		
00957	POMEGRANATE JUICE CONCENTRATE - 16 oz. liquid	25.95	19.46		
	Buy 4 bottles, price each	24.00	18.00		
00577	POTASSIUM IODIDE - 1 box, 14 tablets	6.95	5.21		
	Buy 4 boxes, price each	5.25	3.94		
01500	PQQ CAPS w/BIOPOQQ™ - 10 mg, 30 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
00302	PREGNENOLONE - 50 mg, 100 caps	24.00	18.00		
	Buy 4 bottles, price each	19.00	14.25		
00700	PREGNENOLONE - 100 mg, 100 caps	26.00	19.50		
	Buy 4 bottles, price each	22.50	16.88		
†01373	PRELOX® NATURAL SEX FOR MEN® - 60 tablets	50.00	37.50		
	Buy 4 bottles, price each	45.00	33.75		
00571	PRIMAL DEFENSE™ - 90 caplets	49.95	37.46		
	Buy 4 bottles, price each	48.50	36.38		
01019	PRIMAL DEFENSE™ - 180 caplets	78.95	59.21		
00525	PROBOOST THYMIC PROTEIN A™ - 4 mcg, 30 packets	72.00	54.00		
	Buy 4 boxes, price each	70.00	52.50		
00869	PRO FEM CREAM - 2 fl oz (Progesterone Cream)	32.00	24.00		
	Buy 4 bottles, price each	29.00	21.75		
01020	PROGREENS® - 15 stick pack	22.50	16.88		
01072	PRO M INTERNAL DEODORIZER - 500 mg, 100 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
††01495	PROSTATE FORMULA W/ 5-LOXIN® STAND. LIGNANS (ULTRA NAT) -60 softgels	38.00	28.50		
	Buy 4 bottles, price each	35.00	26.25		
	Buy 12 bottles, price each	32.00	24.00		
01092	PROTEIN - VANILLA - (Enhanced Life Extension) -1000 grams powder	38.00	28.50		
	Buy 4 bottles, price each	36.00	27.00		
01093	PROTEIN - CHOCOLATE - (Enhanced Life Extension) -1000 grams powder	38.00	28.50		
	Buy 4 bottles, price each	36.00	27.00		
01094	PROTEIN - NATURAL - (Enhanced Life Extension) -1000 grams powder	38.00	28.50		
	Buy 4 bottles, price each	36.00	27.00		
01095	PROTEIN - BERRY - (Enhanced Life Extension) -1000 grams powder	38.00	28.50		
	Buy 4 bottles, price each	36.00	27.00		
00290	PROTEIN - VANILLA - (Designer Whey) 2 lbs powder	42.49	31.87		
	Buy 4 bottles, price each	38.50	28.88		
00282	PROTEIN - CHOCOLATE - (Designer Whey) 2 lbs powder	42.49	31.87		
	Buy 4 bottles, price each	38.50	28.88		
00283	PROTEIN - NATURAL - (Designer Whey) 2 lbs powder	42.49	31.87		
	Buy 4 bottles, price each	38.50	28.88		
01508	PTEROPURE™ - 50 mg Pterostilbene 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	30.00	22.50		
01056	PURE-GAR® - 200 caps	24.95	18.71		
	Buy 4 bottles, price each	21.00	15.75		
01075	PURE PLANT PROTEIN - Natural Vanilla 450 grams powder	36.00	27.00		
	Buy 4 jars, price each	33.00	24.75		
01209	PUMPKIN SEED EXTRACT (WATER-SOLUBLE) - 60 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
01210	PUMPKIN SEED EXT w/SOY ISOFLAVONES (WATER-SOLUBLE) - 60 veg. caps	22.00	16.50		
	Buy 4 bottles, price each	20.00	15.00		
01031	PYCNOGENOL® - 60 veg. caps	89.95	67.46		

SUB-TOTAL OF COLUMN 14

To order online visit: www.lifeextension.com

Buyers Club Order Form

No.		Retail Each	Member Each	Qty	Total
P CONTINUED					
01217	PYRIDOXAL 5'-PHOSPHATE - 100 mg, 60 veg. caps	\$22.00	\$16.50		
	Buy 4 bottles, price each	19.80	14.85		
Q, R					
01309	QUERCETIN (OPTIMIZED) - 250 mg, 60 veg. caps	\$18.00	\$13.50		
	Buy 4 bottles, price each	17.00	12.75		
01030	RED YEAST RICE (Bluebonnet)- 600 mg, 60 veg. caps	17.50	13.13		
00979	RED YEAST RICE (Nature's Plus)- 600 mg, 60 veg. caps	23.95	17.96		
00060	RED YEAST RICE EXTENDED RELEASE - 30 veg. tablets	21.50	16.13		
00605	REGIMINT - 60 enteric-coated caps	19.95	14.96		
	Buy 4 bottles, price each	18.67	14.00		
00448	REJUVENEX® BODY LOTION - 6 oz	24.00	18.00		
	Buy 4 tubes, price each	19.80	14.85		
	Buy 8 tubes, price each	17.00	12.75		
00918	REJUVENEX® FACTOR - 1.7 oz airless pump	65.00	48.75		
	Buy 2 bottles, price each	60.00	45.00		
	Buy 4 bottles, price each	55.00	41.25		
	Buy 8 bottles, price each	49.91	37.43		
01220	REJUVENEX® (ULTRA) - 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	REJUVENIGHT (ULTRA) - 2 oz	39.95	29.96		
	Buy 4 jars, price each	36.00	27.00		
00706	REJUVENIGHT w/PROGESTERONE (ULTRA) - 2 oz	42.00	31.50		
	Buy 4 jars, price each	38.00	28.50		
01413	RESVERATROL W/PTEROSTILBENE - 20 mg, 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01410	RESVERATROL W/PTEROSTILBENE - 100 mg, 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
01430	RESVERATROL w/SYNERGISTIC GRAPE-BERRY ACTIVES (OPTIMIZED) - 250 mg, 60 veg. caps	46.00	34.50		
	Buy 4 bottles, price each	41.33	31.00		
00889	RHODIOLA EXTRACT - 250 mg, 60 veg. caps	11.75	8.81		
	Buy 4 bottles, price each	10.58	7.94		
00972	(D) RIBOSE POWDER - 150 grams	27.50	20.63		
	Buy 4 jars, price each	24.75	18.56		
01473	(D) RIBOSE TABLETS - 100 veg. tabs	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
01208	R-LIPOIC ACID (SUPER) - 300 mg, 60 veg. caps	49.00	36.75		
	Buy 4 bottles, price each	45.00	33.75		
00070	RNA CAPSULES - 500 mg, 100 caps	17.95	13.46		
	Buy 4 bottles, price each	16.16	12.12		
00917	ROSMARINIC ACID EXTRACT - 60 veg. caps	59.00	44.25		
	Buy 4 bottles, price each	53.00	39.75		
S					
01082	SACCHAROMYCES BOULARDII+ MOS - 30 veg. caps	\$9.95	\$7.46		
01067	SACCHAROMYCES BOULARDII+ MOS - 90 veg. caps	21.95	16.46		
01432	SAFFRON w/SATIEREAL (OPTIMIZED) - 60 veg. caps	36.00	27.00		
	Buy 4 bottles, price each	32.00	24.00		
*00573	SAMBU® GUARD - 175 ml	17.49	13.99		
00358	SAME (S-ADENOSYL-METHIONINE) - 200 mg, 20 enteric coated tablets	17.00	12.75		
	Buy 8 boxes, price each	15.00	11.25		

SUB-TOTAL OF COLUMN 15

No.		Retail Each	Member Each	Qty	Total
00453	SAME (S-ADENOSYL-METHIONINE) - 200 mg, 50 enteric coated tablets	\$40.00	\$30.00		
	Buy 4 bottles, price each	35.00	26.25		
00557	SAME (S-ADENOSYL-METHIONINE) - 400 mg, 20 enteric coated tablets	32.00	24.00		
	Buy 6 boxes, price each	25.00	18.75		
01055	SAME (S-ADENOSYL-METHIONINE) - 400 mg, 50 enteric coated tablets	72.00	54.00		
	Buy 4 bottles, price each	66.00	49.50		
01043	SEA-IODINE™ - 1000 mcg, 60 veg. caps	8.00	6.00		
	Buy 4 bottles, price each	7.20	5.40		
00046	SELENIUM - 2 oz dropper bottle	9.95	7.46		
	Buy 4 bottles, price each	9.45	7.09		
00567	SE-METHYL L-SELENOCYSTEINE - 200 mcg, 100 caps	12.00	9.00		
	Buy 4 bottles, price each	11.00	8.25		
00318	SERRAFLAZYME - 100 tablets	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00011	SHAMPOO - 16 fl oz	6.00	4.50		
	Buy 4 bottles, price each	4.75	3.56		
00284	SHARK LIVER OIL (NORWEGIAN) - 1000 mg, 30 softgels	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00184	SILYMARIN - 100 mg, 50 caps	9.25	6.94		
	Buy 4 bottles, price each	8.25	6.19		
01502	SKIN RESTORING CERAMIDES w/LIPOWHEAT™ - 30 liquid caps	25.00	18.75		
	Buy 4 bottles, price each	23.00	17.25		
00961	SODZYME® w/GLISODIN® AND WOLFBERRY - 90 veg. caps	28.00	21.00		
	Buy 4 bottles, price each	24.00	18.00		
00657	SOLARSHIELD SUNGLASSES - 1 pair smoke color	12.99	9.74		
	Buy 2 pairs, price each	11.50	8.63		
01097	SOY EXTRACT (ULTRA) - 150 veg. caps	87.00	65.25		
	Buy 4 bottles, price each	78.00	58.50		
00286	SOY PROTEIN CONCENTRATE - 16 oz of powder	12.00	9.00		
	Buy 4 jars, price each	10.63	7.97		
01099	STABILUM® 200 - 30 caps	30.00	22.50		
00432	STEVIA EXTRACT - 100 packets, 1 gram each	9.95	7.46		
	Buy 4 boxes, price each	9.00	6.75		
00351	ST. JOHN'S WORT EXTRACT - 300 mg, 60 caps	10.98	8.24		
	Buy 4 bottles, price each	10.00	7.50		
00327	ST. JOHN'S WORT EXTRACT (PLANETARY) - 600 mg, 60 tablets	16.75	12.56		
	Buy 4 bottles, price each	13.85	10.39		
01476	STRONTIUM - 750 mg, 90 veg. caps	20.00	15.00		
	Buy 4 bottles, price each	18.00	13.50		
00971	SUN PROTECTION SPRAY W/BETA GLUCAN - SPF30 - 6 oz	14.95	11.21		
	Buy 4 bottles, price each	13.50	10.13		
00747	SUNGLASSES (OVERXCASST POLARIZED) - gray color, large	27.00	20.25		
	Buy 2 pairs, price each	21.00	15.75		
00748	SUNGLASSES (OVERXCASST POLARIZED) - gray color, medium	27.00	20.25		
	Buy 2 pairs, price each	21.00	15.75		
00758	SUPER ABSORBABLE SOY ISOFLAVONES - 60 caps	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
01408	SUPER SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL 60 softgels	28.00	21.00		
	Buy 4 bottles, price each	26.00	19.50		
	Buy 12 bottles, price each	24.00	18.00		

SUB-TOTAL OF COLUMN 16

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

AUGUST 2011

Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail Each	Member Each	Qty	Total
S CONTINUED					
01407	SUPER SAW PALMETTO W/BETA-SITOSTEROL - 30 softgels	\$15.00	\$11.25		
	Buy 12 bottles, price each	12.00	9.00		
00578	SUPER SELENIUM COMPLEX - 200 mcg, 100 caps	12.00	9.00		
	Buy 4 bottles, price each	10.00	7.50		
	Buy 12 bottles, price each	9.00	6.75		
00674	SYTRINOL™ - 60 softgels	32.00	24.00		
	Buy 4 bottles, price each	28.00	21.00		
T					
	TAL•SHI™ COSMETICS • For information please call 1-800-544-4440 or visit www.lifeextension.com				
01062	TART CHERRY - 600 mg, 60 caps	\$18.95	\$14.21		
00199	TAURINE - 1000 mg, 50 caps	8.95	6.71		
	Buy 4 bottles, price each	8.00	6.00		
00133	TAURINE POWDER - 300 grams	20.00	15.00		
	Buy 4 bottles, price each	16.88	12.66		
01304	THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps	18.00	13.50		
	Buy 4 bottles, price each	16.00	12.00		
00555	(L) THEANINE - 100 mg, 60 caps	24.00	18.00		
	Buy 4 bottles, price each	20.50	15.38		
01038	THERALAC PROBIOTICS - 30 caps	44.95	33.71		
00224	THYMIC IMMUNE FACTORS - 100 caps	18.00	13.50		
	Buy 4 bottles, price each	14.00	10.50		
00668	THYROID FORMULA™ (METABOLIC ADVANTAGE) - 100 caps	21.95	16.46		
00349	TMG POWDER - 50 grams	14.00	10.50		
	Buy 4 bottles, price each	11.00	8.25		
00359	TMG - 500 mg, 180 tablets	18.00	13.50		
	Buy 4 bottles, price each	15.50	11.63		
00366	TOCOTRIENOLS - (Rice) 50 mg, 60 softgel caps	39.95	29.96		
	Buy 4 bottles, price each	36.00	27.00		
00781	TOCOTRIENOLS WITH SESAME LIGNANS - 60 softgels	38.00	28.50		
	Buy 4 bottles, price each	36.00	27.00		
01400	TOCOTRIENOLS (SUPER-ABSORBABLE) - 60 softgels	30.00	22.50		
	Buy 4 bottles, price each	28.00	21.00		
01278	TOOTHPASTE - 4 oz (Mint)	9.50	7.13		
	Buy 4 tubes, price each	8.67	6.50		
01274	TOTAL SUN PROTECTION CREAM W/BETA GLUCAN - 4 oz	28.00	21.00		
	Buy 4 tubes, price each	25.20	18.90		
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL - 60 veg. caps	32.00	24.00		
	Buy 4 bottles, price each	29.60	22.20		
00866	TRYPTOPURE® L-TRYPTOPHAN - 500 mg, 90 veg. caps	38.00	28.50		
	Buy 4 bottles, price each	34.00	25.50		
01202	TRYPTOPURE® PLUS (OPTIMIZED) - 90 veg. caps	40.00	30.00		
	Buy 4 bottles, price each	36.00	27.00		
01516	TWO-PER-DAY - 60 veg. tablets	9.95	7.46		
	Buy 4 bottles, price each	9.00	6.75		
01515	TWO-PER-DAY - 120 veg. tablets	18.95	14.21		
	Buy 4 bottles, price each	17.00	12.75		
00326	L-TYROSINE - 500 mg, 100 tablets	12.50	9.38		
	Buy 4 bottles, price each	11.42	8.57		

SUB-TOTAL OF COLUMN 17

No.		Retail Each	Member Each	Qty	Total
U					
* 00310	UDO'S OIL 3-6-9 BLEND - 17 fl oz	\$27.49	\$21.99		
* 00311	UDO'S 3-6-9 OIL BLEND - 180 caps	33.79	27.03		
* 00322	UDO'S CHOICE® WHOLESOME FAST FOOD - 16 oz bottle	27.49	21.99		
01061	ULTIMATE FLORA ADVANCED IMMUNITY PROBIOTICS - 30 caps	29.99	22.49		
V					
00213	VANADYL SULFATE - 7.5 mg, 100 tablets	\$15.00	\$11.25		
	Buy 4 bottles, price each	12.50	9.38		
00252	VELVET DEER ANTLER - 250 mg, 30 caps	36.00	27.00		
	Buy 4 bottles, price each	34.00	25.50		
00408	VENOTONE - 60 caps	18.95	14.21		
	Buy 4 bottles, price each	16.00	12.00		
01327	VINPOCETINE - 10 mg, 100 tablets	18.00	13.50		
	Buy 4 bottles, price each	14.00	10.50		
01033	VISION OPTIMIZER - 90 caps	29.95	22.46		
01098	VITAL GREENS MIX - 319.5 grams powder	48.00	36.00		
	Buy 4 jars, price each	44.00	33.00		
01219	VITAMIN A NUTRISORB - 0.6 fl oz	27.00	20.25		
00091	VITAMIN B1 CAPS - 500 mg, 100 caps	17.84	13.38		
	Buy 4 bottles, price each	15.93	11.95		
00093	VITAMIN B2 CAPS - 100 mg, 100 caps	12.99	9.74		
	Buy 4 bottles, price each	11.88	8.91		
00096	VITAMIN B3 NIACIN - 1000 mg, 100 caps	12.75	9.56		
	Buy 4 bottles, price each	12.00	9.00		
00372	VITAMIN B3 NIACIN - 500 mg, 100 caps	7.65	5.74		
	Buy 4 bottles, price each	6.65	4.99		
00098	VITAMIN B5 - 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88		
	Buy 4 bottles, price each	9.38	7.04		
00556	VITAMIN B6 - 250 mg, 100 caps	12.50	9.38		
	Buy 4 bottles, price each	11.00	8.25		
00361	VITAMIN B12 - 500 mcg, 100 lozenges	8.75	6.56		
	Buy 4 bottles, price each	7.25	5.44		
00927	VITAMIN C WITH DIHYDROQUERCETIN - 1000 mg, 250 tablets	25.50	19.13		
	Buy 4 bottles, price each	23.25	17.44		
00084	VITAMIN C (BUFFERED) POWDER - 454.6 grams	23.95	17.96		
	Buy 4 bottles, price each	22.00	16.50		
00864	VITAMIN D3 - 2000 IU, 1 fl oz	28.00	21.00		
	Buy 4 bottles, price each	25.00	18.75		
00251	VITAMIN D3 - 1000 IU, 250 caps	12.50	9.38		
	Buy 4 bottles, price each	11.25	8.44		
00713	VITAMIN D3 - 5000 IU, 60 caps	11.00	8.25		
	Buy 4 bottles, price each	9.90	7.43		
01418	VITAMIN D3 - 7000 IU, 60 caps	14.00	10.50		
	Buy 4 bottles, price each	12.60	9.45		
01372	VITAMIN D3 w/SEA-IODINE™ - 5000 IU, 60 veg. caps	14.00	10.50		
	Buy 4 bottles, price each	12.50	9.38		
01472	VITAMINS D AND K w/SEA-IODINE™ - 60 veg. caps	24.00	18.00		
	Buy 4 bottles, price each	22.00	16.50		
00063	VITAMIN E (PURE NATURAL) - 400 IU, 100 caps	18.75	14.06		
	Buy 4 bottles, price each	17.25	12.94		
	Buy 10 bottles, price each	15.00	11.25		

SUB-TOTAL OF COLUMN 18

To order online visit: www.lifeextension.com

No.		Retail Each	Member Each	Qty	Total
01225	VITAMIN K2 (LOW-DOSE) - 45 mcg, 90 softgels	\$18.00	\$13.50		
	Buy 4 bottles, price each	16.00	12.00		
Z					
01585	ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN AND C3G (SUPER) - 60 softgels	\$22.00	\$16.50		
	Buy 4 bottles, price each	19.80	14.85		
01586	ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN PLUS ASTAXANTHIN AND C3G (SUPER) - 60 softgels	42.00	31.50		
	Buy 4 bottles, price each	38.00	28.50		
00061	ZINC LOZENGES - 75 lozenges	9.50	7.13		
	Buy 4 bottles, price each	6.75	5.06		
01051	ZYFLAMEND - 120 softgels	60.95	45.71		
01029	ZYFLAMEND EASYCAPS - 180 softgels	31.95	23.96		

SUB-TOTAL OF COLUMN 19

* These products are not 25% off retail price.

**Not for sale to wholesalers or retail stores.

***Not eligible for member discount or member renewal product credit.

[†]Due to license restrictions, this product is not for sale to wholesalers outside of the USA or Canada.

^{††}Can only be sold in the USA.

^{†††}Member pricing not valid on this item.

^{††††}Due to license restrictions, this product is not for sale in Canada.

^ These products are not 25% off retail price. These products are not for sale to wholesalers or retail stores.

^^Can only be sold in USA and Canada.

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 30-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 1,666-page *Disease Prevention and Treatment* protocol book that contains novel therapies to treat 133 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** 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	
SUB-TOTAL COLUMN 19	

ORDER TOTALS

Sub-Total A (Sub-total of Columns 1 through 19)	
Postage And Handling (Any size order, continental U.S.)	\$5.50
C.O.D.s (Add \$7 for C.O.D. orders)	
Shipping	
<small>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.</small>	
GRAND TOTAL (Must be in U.S. dollars)	

BILL TO ADDRESS

NAME	E-MAIL
ADDRESS	
CITY/STATE/ZIP-POSTAL CODE	COUNTRY
PHONE	FAX
VISA/MASTERCARD/AMEX/DISCOVER #	
EXP. DATE	
SIGNATURE	

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

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)

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

Buyers Club Order Form

No.	LIFE EXTENSION MEDIA		Retail	Member Price	Qty	Total
33833	THE LIFE PLAN • by Jeffrey S. Life, MD, PhD	2011	\$26.00	\$19.50		
33832	YOUR BONES • by Lara Pizzorno, MA, LMT	2011	\$12.00	\$9.00		
33830	SEXY FOREVER: HOW TO FIGHT FAT AFTER FORTY • by Suzanne Somers	2011	\$25.99	\$19.49		
33829	THE IMMORTALITY EDGE • by Michael Fossel, MD, PhD, Greta Blackburn, David Woynarowski, MD	2011	\$25.95	\$18.17		
33827	FOREVER YOUNG • by Nicholas Perricone, MD	2010	\$26.00	\$18.20		
33825	THE EMPOWERED PATIENT • by Elizabeth Cohen	2010	\$15.00	\$10.50		
33824	VITAMIN D SOLUTION • by Michael F. Holick, PhD, MD	2010	\$25.95	\$18.17		
33822	BREAKTHROUGH: EIGHT STEPS TO WELLNESS • by Suzanne Somers (paperback)	2010	\$15.00	\$10.50		
33823	WEIGHT LOSS GUIDE • by Steven V. Joyal, MD and William Faloan (hardcover)	2010	\$29.95	\$8.99		
33820	YOUR BLOOD DOESN'T LIE! • by Sergey Dzugan, MD, PhD	2010	\$24.95	\$17.47		
33819	BRAIN SURGEON • by Keith Black, MD	2010	\$24.99	\$18.74		
33816	FDA: FAILURE, DECEPTION, ABUSE • by Life Extension Foundation	2010	\$20.00	\$15.00		
33818	STAY YOUNG & SEXY WITH BIO-IDENTICAL HORMONE REPLACEMENT • by Jonathan Wright, MD	2010	\$19.95	\$14.96		
33815	KNOCKOUT • by Suzanne Somers	2009	\$25.99	\$17.00		
33814	CHEATING DEATH • by Sanjay Gupta, MD	2009	\$24.99	\$17.49		
33813	TIMESHIP • by Stephen Valentine	2009	\$45.00	\$33.75		
33812	LIFE OVER CANCER • by Keith Block, MD (hardcover)	2009	\$25.00	\$17.50		
33811	THE GREAT AMERICAN HEART HOAX • by Michael Ozner, MD, FACC, FAHA	2009	\$24.95	\$17.47		
33810	THE ULTRAMIND SOLUTION • by Mark Hyman, MD	2009	\$27.50	\$19.25		
33809	TESTOSTERONE FOR LIFE • by Abraham Morgentaler, MD	2008	\$16.95	\$11.87		
33808	BREAKTHROUGH: EIGHT STEPS TO WELLNESS • by Suzanne Somers	2008	\$25.95	\$18.17		
33599	YOUNGER YOU • by Eric Braverman, MD	—	\$24.95	\$15.75		
33598	AGELESS • by Suzanne Somers	2006	\$25.00	\$17.50		
33666	ULTRAMETABOLISM: THE SIMPLE PLAN FOR AUTOMATIC WEIGHT LOSS • by Mark Hyman, MD	2006	\$25.00	\$15.35		
33422	BRAIN LONGEVITY • by Dharma Singh Khalsa, MD, with Cameron Stauth	1997	\$14.95	\$11.21		
33677	DANGEROUS DOSES • by Katherine Eban	2005	\$25.00	\$16.25		
33600	DISEASE PREVENTION AND TREATMENT, EXPANDED FOURTH EDITION (hardcover)	2003	\$49.95	\$37.46		
	Price per book when 4 books purchased	—	\$44.00	\$33.00		
33594	THE EDGE EFFECT • by Eric Braverman, MD (paperback)	2004	\$12.95	\$9.71		
33700	ENDING AGING • by Aubrey DeGrey with Michael Rae	2007	\$28.94	\$17.75		
33488	FEMALE AND FORGETFUL • by Elisa Lottor, PhD, ND, and Nancy P Bruning	2002	\$18.99	\$14.24		
33696	LIFE EXTENSION REVOLUTION • by Philip Lee Miller, MD (paperback)	—	\$16.00	\$12.00		
33387	MAXIMIZE YOUR VITALITY & POTENCY • by Jonathan Wright, MD	1999	\$14.95	\$11.00		
33010	MELATONIN • by Russ Reiter, PhD and Jo Robinson, MD	1996	\$22.95	\$15.00		
33637	THE METABOLIC PLAN • by Stephen Cherniske, MS	—	\$14.95	\$11.21		
33805	MIAMI MEDITERRANEAN DIET WITH 300 RECIPES • by Michael D. Ozner, MD, FACC, FAHA (hardcover)	2008	\$24.95	\$16.25		
33906	THE MIGRAINE CURE • by Sergey Dzugan, MD, PhD	2006	\$24.00	\$15.60		
33026	MIND FOOD & SMART PILLS • by Ross Pelton, PhD	1989	\$13.95	\$11.95		
33680	PRESCRIPTION FOR DISASTER DVD • by Gary Null	2005	\$18.00	\$12.00		
33670	A PRIMER ON PROSTATE CANCER (2nd edition) • by Stephen B. Strum, MD, and Donna Pogliano	2005	\$28.95	\$21.71		
33262	SAVE YOUR SIGHT • by Marc Rose, MD/Michael Rose, MD	—	\$13.99	\$8.35		
33804	STAYING YOUNG: THE OWNER'S MANUAL FOR EXTENDING YOUR WARRANTY • by Mehmet Oz, MD	2008	\$26.00	\$18.20		
33806	THE CR WAY • by Paul McGlothlin and Meredith Averill	—	\$15.95	\$11.25		
33595	THE SEXY YEARS • by Suzanne Somers (hardcover)	2004	\$25.00	\$17.00		
33828	THE SEXY YEARS • by Suzanne Somers (paperback)	2004	\$15.00	\$10.50		
33676	THE SIDE EFFECTS BIBLE • by Frederic Vagnini, MD and Barry Fox, PhD	—	\$16.95	\$11.53		
33399	VOCAL EXCERPTS FROM SCIENTIFIC STUDIES • Audio Tape	—	\$6.00	\$3.50		
33695	WE BECOME SILENT • DVD by Kevin Miller	—	\$24.98	\$18.74		
33803	WHAT YOUR DOCTOR MAY NOT TELL YOU ABOUT DIABETES • by Steven V. Joyal, MD	2008	\$14.99	\$10.49		
33703	JOHN ABDO'S NO EXCUSES WORKOUT DVD	2008	\$13.30	\$9.98		
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						TOTAL

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 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 - \$19.95
Member Price - \$14.96

Ideal Bowel Support™
299v™ Item #01065
Retail Price - \$21.95
Member Price - \$16.46

Superior Probiotics from Jarrow Formulas®

The proper balance of microflora in the intestines is crucial for health and well-being. **Jarrow Formulas®** probiotic dietary supplements are designed to maintain a healthy balance of these microflora to maximize your digestive and immune system.*

Jarrow Formulas® is a probiotic pioneer and has a complete line of probiotic products, including the #1 seller in the U.S.† – **Jarro-Dophilus EPS®**, and the new **Ideal Bowel Support™ 299v™**, which reduces bloating, gas and intestinal discomfort.*

† #1 in both Dollar Sales and 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 2/20/10).

www.Jarrow.com

To order call 1-800-544-4440 or visit **www.LifeExtension.com**

Jarrow
F O R M U L A S®

* 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.

© 2011 Jarrow FORMULAS®

Breakthrough probiotic: Theralac® now available to Life Extension Members.

**THERALAC® IS SO EFFECTIVE
MAINTENANCE DOSE IS ONLY
2 CAPSULES PER WEEK!**

Theralac's breakthrough technology **guarantees 100% LIVE DELIVERY** of its probiotics into the intestinal tract, something other probiotics can't do. Once in the gut, Theralac's **CLINICALLY PROVEN STRAINS** are stimulated into action by LactoStim® – a patented prebiotic that feeds probiotics. Rapid colonization of intestinal surfaces follows and intestinal comfort is restored.

It's all about competitive exclusion.

Probiotics work by competitively excluding harmful microorganisms from gut surfaces. When Theralac's probiotics are present the "bad bugs" can't occupy the same space. Probiotics make lactic acid, a food acid that bacteria like Salmonella and E. coli hate – each lot of Theralac is pre-tested for lactic acid production which, along with CFU* and purity, is published by lot# at theralac.com.

* CFU = colony forming units – a measure of live strength.

Theralac delivers 30 billion CFU into the gut.

Big CFU numbers on a probiotic bottle mean nothing if they are killed in the stomach. At a pH below 2.0 (typical in stomach), > 99% of Lactobacillus and Bifidobacterium

probiotics are killed. **Theralac's probiotics survive!** A patented gel formulation utilizes sodium alginate from seaweed and grape skin extract to protect Theralac's strains – a powerful dose of **30 billion CFU is delivered ALIVE** into the gut. Theralac is guaranteed through expiration and protected by US patents 7,122,370 and 7,229,818.

Clinically proven strains in Theralac:

- ▶ *L. acidophilus* LA-1 (NCFM)
- ▶ *L. paracasei* F-19
- ▶ *L. rhamnosus* LR-44
- ▶ *Bifidobacterium lactis* BL-34 (BI-04)
- ▶ *Bifidobacterium lactis* Bi-07

Lactobacilli work in the small intestine, Bifidobacteria in the colon. **ONE BOTTLE LASTS 10 WEEKS!**

To order, call **800-544-4440** or visit lifeextension.com. For more information visit theralac.com.



Clinically proven strains

For references, go to:
www.theralac.com/tscs.aspx

Theralac, 30 capsules
Item# 01038

Retail price: \$44.95
Call for LEF Member Pricing



Take the Theralac® challenge.

Try a bottle of Theralac® and if you do not believe it is the fastest-acting probiotic available, return the bottle and Life Extension will refund your money...no questions asked.

Recommended
5 separate times
in The Blaylock
Wellness Report



Master Supplements
INCORPORATED
theralac.com

LifeExtension® Call **800-544-4440**

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.

A Partnership in Heart Health

New Chapter Zyflamend & LifeExtension Super Omega-3

Multiple Synergistic Components, Whole Body Benefits

Many people think that only joints are affected by inflammation. The truth is that the body's natural inflammatory response affects everyone and every major organ system. Given the link between a healthy inflammation response and whole body health – a source of extensive and ongoing research – a supplement strategy geared toward promoting a healthy inflammation response is as fundamental as a daily multivitamin.* Research at leading medical institutions, including human clinical trials, has demonstrated a unique herbal formulation's ability to promote a safe, natural and healthy response to inflammation.*

Zyflamend® is the #1-selling herbal in the U.S.† for healthy inflammation response.* It contains hundreds of bioactive constituents from ten of the most researched botanicals that promote a healthy inflammatory response and provide multiple health benefits: heart health, healthy aging, joint health, and bone health.*

Zyflamend for Heart Health

Recent research suggests that the key factor in predicting heart health is gauging the amount of inflammation in the arteries. C-reactive protein is a blood marker used to assess inflammation and heart health.

Early data from a human clinical study conducted at Columbia University suggests that daily supplementation with Zyflamend promotes healthy levels of C-reactive protein.*

In data presented at the 2008 meeting for the Society for Integrative Oncology, researchers reported the following analysis of data from a Zyflamend human clinical study: "A statistically significant reduction in serum C-reactive protein was... observed after 18 months."

Maintaining a healthy cardiovascular system is strongly linked to a healthy inflammation response – Zyflamend is the first choice for promoting heart health.*

Zyflamend
120 Softgels
Item number 01051
Retail Price: ~~\$60.95~~
Member Price: \$45.71

Super Omega-3
120 Softgels
Item number 01482
Retail Price: ~~\$32.00~~
Member Price: \$24.00



Omega-3 Is Important for Cardiovascular Health

The body needs fatty acids to survive and is able to make all but two of them: linoleic acid (LA) in the omega-6 family, and alpha-linolenic acid (ALA) in the omega-3 family. These two fatty acids must be supplied by the diet and are therefore considered essential fatty acids (EFAs).

Omega-3 fatty acids, found in cold-water fish (and fish oil), perilla oil, and flaxseed oil, are essential elements of a healthy diet. While the polyunsaturated fats known as omega-6 fatty acids are essential to life, most Americans and citizens of other Western nations consume far too many omega-6 polyunsaturated fatty acids and not enough omega-3 polyunsaturated fatty acids. In fact, some Western diets consist of 20 parts of omega-6 to only one part of omega-3. For optimum health, the ratio of omega-6 to omega-3 fatty acids should be between 1:1 and 4:1.¹ The severe imbalance that occurs with most people contributes to the development of long-term health problems.

Life Extension's Super Omega-3 is a premium, scientifically-validated fish oil concentrate, derived from sustainable sources, that contains a proprietary, full-spectrum blend of synergistic nutrients to provide scientifically-validated cardioprotective health benefits.

Super Omega-3 from Life Extension® uses a patented EPA/DHA extraction process that results in a pure, stable, and easy-to-tolerate fish oil extract. While most fish oil is distilled to decrease contaminants such as mercury and PCBs, the Pure+™ fish oil used in Super Omega-3 is produced with a patented method that purifies the oil with a highly advanced distillation process to reduce pollutants to virtually undetectable levels. The result is an improved fish oil that exceeds the standards set by international rating agencies.

1. *Minerva Pediatr.* 2008 Apr;60(2):219-33

To order Zyflamend or Super Omega-3, call
1-800-544-4440 or visit www.LifeExtension.com

© 2010 New Chapter, Inc.

† According to 2010 SPINS Data

 **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.

ULTRA NATURAL PROSTATE FORMULA PROVIDES ULTRA PROTECTION

For a large percentage of men over the age of 50, having a healthy prostate is the key to living a normal life. Dietary supplementation for urinary and prostate health helps men maintain a normal hormonal balance, which promotes normal urinary flow and prostate health. Choosing to support a healthy prostate through supplementation is one of the smartest choices an aging man can make.

Ultra Natural Prostate Formula combines eleven cutting-edge *natural* ingredients that have been scientifically substantiated to protect the prostate gland and maintain its healthy function.* One of the newest additions to the formula is **European pumpkin seed oil extract**, which is rich in **delta-7 sterols** and **fatty acids**.

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 has been added to the formula to help maintain healthy DNA gene function in prostate cells.

In order to boost its anti-estrogen capabilities, **Ultra Natural Prostate Formula** 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.

Ultra Natural Prostate Formula also contains **5-LOXIN® boswellia extract** to protect against the dangerous enzyme *5-lipoxygenase* and the mineral **boron** to help slow elevation of prostate-specific antigen (PSA).

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

Contains soybeans and corn.



Item #01495

The daily dose of two softgels of Ultra Natural Prostate Formula provides:

USPlus® Saw Palmetto (C ₀ DeepExtract™) (std to 85%-95% total fatty acids and sterols)	320 mg
Graminex Flower Pollen Extract™	252 mg
5-LOXIN®	70 mg
Pumpkin seed oil (<i>Cucurbita pepo</i>) extract (standardized to 85% total fatty acids)	200 mg
Stinging nettle root extract (<i>Urtica dioica</i>)	240 mg
Pygeum extract	100 mg
Lycopene	10 mg
Phytosterol complex (standardized to 26.6% free beta-sitosterol)	678 mg
Proprietary blend of HMRlignan™ Norway Spruce and ActiFlax™ Flax Lignan extracts	20.15 mg
Boron	3 mg

5-LOXIN® is used under license by PL Thomas - Laila Nutra, LLC and is registered in the United States and other countries. 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.

To order Ultra Natural Prostate Formula, 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.

WHAT'S INSIDE

Visit us at www.LifeExtension.com

LifeExtension® Magazine



7 FDA SAYS WALNUTS ARE ILLEGAL DRUGS

According to the FDA, health claims about walnuts turn them into illegal drugs. Find out what you can do to support a bill in Congress that prohibits this kind of police state censorship.



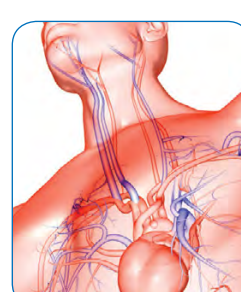
30 EXCLUSIVE INTERVIEW WITH DR. BRUCE AMES

Dr. Bruce Ames is devoted to finding strategies that control biological aging processes. In this exclusive interview, the UC Berkeley professor emeritus discusses his innovative *Triage Theory of Aging*.



62 STARTLING LINK BETWEEN BONE HEALTH AND TOTAL HEALTH

Strong bones do more than prevent fractures. A healthy skeletal system is *also* essential to **insulin sensitivity, energy metabolism, and weight management.**



38 LIPOIC ACID REVERSES MITOCHONDRIAL DECAY

Mitochondrial decay lies at the core of most degenerative diseases. **Lipoic acid** helps regenerate mitochondria and thus protects against common age-related disorders.

PLUS—

TOPICAL COMPOUNDS REPAIR DNA AND *DELAY* SKIN AGING
GREEN TEA POLYPHENOLS PROTECT SKIN
METABOLIC SYNDROME IMPAIRS MEMORY