Why Estrogen Balance is Critical for Aging Men

There's More to Pomegranate than Just the Fruit

New Blood Test Reveals Risk of Cardiac Death

Overlooked Benefits of N-Acetyl Cysteine

Lou FERRIGNO
Secrets to Ageless Strength
Achieve Multiple Health Benefits From Highly Absorbable Curcumin

Curcumin and other turmeric constituents are impressing scientists around the world with their remarkable health benefits, such as suppressing inflammatory factors, fighting free radicals, and promoting healthy DNA function. The problem is that curcumin is poorly absorbed into the bloodstream.

Super Bio-Curcumin® has been shown to absorb up to seven times better than conventional curcumin. This patent-pending formula thus represents the most cost-effective way to supplement with this critical nutrient.1,2

The remarkable absorption studies charted to the left reveal that just one 400 mg capsule a day of this turmeric compound can provide curcumin blood levels equivalent to ingesting 2,500–2,800 mg of commercial curcumin supplements.

Not only does this novel turmeric formulation provide far greater peak blood levels, but the curcumin also remains in the bloodstream almost twice as long compared with conventional supplements.

What’s more, this enhanced absorption delivery complex provides other beneficial turmeric compounds in addition to standardized curcumin.

To order Super Bio-Curcumin® with BCM-95®, call 1-800-544-4440 or visit www.LifeExtension.com

ITEM #00407

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.
MAY 2010  |  LIFE EXTENSION  |  1

CONTENTS

7  AS WE SEE IT—Why Estrogen Balance is Critical to Men’s Health

Life Extension® has long warned of the lethal dangers of estrogen imbalance in aging men. A new study in the *Journal of the American Medical Association* confirms a strong link to male mortality based on estrogen blood levels. Fortunately, most male Life Extension members test their estrogen blood levels annually and take steps to maintain optimal balance.

17  IN THE NEWS

Chocolate wards off stroke; Mediterranean diet protects the aging brain; low CoQ10 levels linked to chronic fatigue; vitamin D combats Crohn’s disease; men who drink tea have slimmer waistlines; green tea fights fibroid tumor growth.

22  HIDDEN EPIDEMIC OF CHRONIC KIDNEY DISEASE

Researchers have only recently uncovered the epidemic of chronic kidney disease striking aging Americans. In some cases, up to 60% of kidney function may be lost before standard testing reveals a problem. The encouraging news is that there are proven methods to diagnose kidney disease early, and natural interventions that protect against this widespread killer—including many nutrients Life Extension® members already take.

38  THERE’S MORE TO POMEGRANATE THAN JUST FRUIT

From heart disease and obesity to cancer prevention, the benefits of the pomegranate fruit have been thoroughly documented. Now scientists are discovering unique properties in the flower and seed of the pomegranate plant. These findings are of particular importance to those suffering chronic inflammatory conditions as well as excess glucose and lipid blood levels.

50  NEW BLOOD TEST REVEALS RISK OF CARDIAC DEATH

Imagine you could determine a significant measure of your risk of death from cardiac arrest with a simple, inexpensive blood test. In a major advance, this technology is now available for at-home use. The key lies in a previously unobtainable, scientifically validated blood marker called the omega-3 index. Learn how the Omega Score™ could save your life.

64  AN OVERLOOKED NUTRIENT THAT SAVES LIVES

Forty years of clinical research confirm the power of N-acetyl cysteine to protect against various forms of pulmonary disease. Unfortunately, pharmaceutical companies co-opted it years ago for use in patented drugs. Overlooked is the ability of this little-known nutrient to combat many of today’s leading causes of death.

78  ON THE COVER

LOU FERRIGNO: GREAT STRENGTH WITH ADVANCING AGE

World-class bodybuilder, star of the classic TV series *The Incredible Hulk* and the film *Hercules*, personal trainer to Chuck Norris and the late Michael Jackson—Lou Ferrigno’s achievements are truly “Herculean.” In this month’s cover story, he reveals the keys to ageless strength, from the Mediterranean diet to his supplement regimen.

78  ON THE COVER

LOU FERRIGNO: GREAT STRENGTH WITH ADVANCING AGE

World-class bodybuilder, star of the classic TV series *The Incredible Hulk* and the film *Hercules*, personal trainer to Chuck Norris and the late Michael Jackson—Lou Ferrigno’s achievements are truly “Herculean.” In this month’s cover story, he reveals the keys to ageless strength, from the Mediterranean diet to his supplement regimen.

87  PROFILE

Dr. Keith Black, author of *Brain Surgeon: A Doctor’s Inspiring Encounters with Mortality and Miracles*, discusses brain cancer’s causes and offers strategies for its prevention.
• Personal Consultation with
• Blood Testing and Analysis
• The Most Complete Line of Life Extension Supplements
• AND MUCH MORE!

Features to look for in the Life Extension Forum:
• Easy registration process
• Enhanced search engine
• Community calendar
• Multiple languages
• Email reply notification and Forum subscriptions
• Private messaging between registered members
• “Emoticons” in Forum postings
• Improved member profiles
• Quick message posting
• Printer-friendly
• AND MUCH MORE!

Log on to http://forum.lef.org/ and join the Life Extension Forum today!

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

1100 West Commercial Blvd., Ft. Lauderdale, FL 33309, Call 954-766-8144
Monday-Friday 9 am-8 pm, Saturday 9 am-5 pm, Sunday 12 pm-4 pm

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. 16, No. 5 ©2010 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., PO Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Mail subscriptions or address changes to: Life Extension, 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, Inc., 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 changes 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® 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.
Life Extension® was the first to introduce coenzyme Q10 to the United States way back in 1983. Since then, we have consistently introduced more potent and better absorbable forms of this critical nutrient.

The new Super Ubiquinol with Enhanced Mitochondrial Support™ contains an organic compound called PrimaVie® shilajit that research shows doubles levels of CoQ10 in the mitochondria.¹

Shilajit has been shown to help restore and sustain cellular energy. The latest studies reveal that when shilajit is combined with CoQ10, cellular energy gains substantially increase.

In a breakthrough preliminary study, the combination of CoQ10 and shilajit produced a 56% increase in cellular energy production in the brain—40% better than CoQ10 alone. In muscle there was a 144% increase, or 27% better than CoQ10 alone.²

Researchers have found that shilajit works to boost CoQ10’s beneficial effects by:

1. Stabilizing CoQ10 in its superior ubiquinol form, thereby prolonging its action at the cellular level.³,⁴

2. Facilitating more efficient delivery of CoQ10 into the mitochondria, resulting in greater cellular energy output.⁵-⁹

Scientific analysis shows that shilajit itself is rich in essential compounds that promote mitochondrial metabolism. Part of shilajit’s beneficial effects derives from its ability to help the mitochondria convert fats and sugars into adenosine triphosphate, or ATP—the body’s main source of energy.⁵-⁹

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

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

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

References:

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 former member of the Bahamian Parliament, he John Crisler, DO, a board-certified distinguished leader in the field of anti-aging medicine on the faculty of Medicine at the Benemerita of cardiovascular surgery at the Donetsk Regional. He is a board-certified plastic surgeon in New York City who current primary interests are anti-aging and biologic disorders. Dr. Dzugan’s specialty in anti-aging medicine. He is a medical director of the Life Extension Clinic in Caracas, Venezuela. Gustavo Tovar Baez, MD, operates the Life Extension Clinic in Caracas. He is the first physician in Caracas to specialize in anti-aging medicine.

Sam Baxas, MD, head of the Baxamed Medical Center for Youth Restoration in Basel, Switzerland, has developed cell therapy and growth hormone therapies for various diseases, including Parkinson’s disease and arthritis.

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 for his new, advanced testosterone replacement therapy protocols that have changed the way physicians all over the world treat their patients.

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.

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

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. He is a three-time chairman of the Executive Committee of the PanAmerican Health Organization in Washington, DC.

Mitchell J. Ghem, DO, PhD, holds a doctorate in holistic healing and anti-aging, and serves on the faculty of Medicine at the Benemera Universidad Autonoma De Puebla, Mexico, as a Professor of Cellular Hemapoetic Studies. He is the author of The Ghem and Rains Guide to Compounding Pharmaceuticals and The Advanced Guide to Longevity Medicine.

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. He specializes in natural approaches to aging and rejuvenation of the skin.

Miguelpangelo Gonzalez 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. His interests include the prevention of cardiovascular and metabolic diseases and the relationship between nutrition, inflammation, oxidative stress, aging, and degenerative diseases.

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. His practice is dedicated to anti-aging medicine, focusing on bioidentical natural hormone replacement, nutritional medicine, complex lipid disorders, and stress management. He is a diplomat of the American Board on Anti-Aging Medicine.

Michele G. Morrow, DO, FAAIM, is a board-certified family physician who merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches. Dr. Morrow is an accomplished clinician, medical researcher, author, and lecturer.

Herbert Pardell, DO, FAAIM, practices internal medicine at the Emerald Hills Medical Center in Hollywood, FL, and specializes in anti-aging, chelation, hormone replacement, and complementary medicine. 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. He has authored six books and teaches continuing education courses for health professionals on a wide variety of health topics.

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. He has written 15 books on health, including Beating Cancer with Nutrition.

Allan Rashford, MD, was formerly chief of Pulmonary Medicine in New York City. Upon completing medical training, he became Chief of Medicine at St. Francis Hospital in South Carolina, and 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, is a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, and 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. Dr. Rothenberg is an internationally recognized clinician, researcher, lecturer, and educator in preventive and anti-aging medicine.

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 Trinitas Center, and co-chair of the Complementary/Alternative Medicine Initiative for HFHS.

Ronald L. Shuler, BS, DDS, CCN, LN, is involved in immunonocology 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 Lauderdale, 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 specializing in the treatment of prostate cancer. He is co-founder and past medical director of the Prostate Cancer Research Institute. Currently, he directs a program 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 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, and a board member of the Vitamin C Foundation and the American Preventive Medical Association, among many other groups.
**SCIENTIFIC ADVISORY BOARD**

**Orn 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 anticancer drugs. He is currently a post doctoral fellow at Stanford University Department of Statistics.

**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 of 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 Eichorn, MD**, is a Urologist specializing in prostate cancer since 10 years. He has a private practice in Bad Reichenhall, Germany and is prostate cancer consultant at the Urologische Klinik Gastringius, Planegg, Munich. In his integrative approach to prostate cancer he is working together with a international network of experts to improve treatment outcome 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 groundbreaking hyperthermia, cryoablation, 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 1985. 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.

**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.
Scientists have identified specific extracts from cruciferous vegetables—such as broccoli, cauliflower, cabbage and Brussels sprouts—that help maintain healthy hormone levels. Maintaining optimal hormone balance is essential to any anti-aging strategy. Triple Action Cruciferous Vegetable Extract combines these plant extracts into the most comprehensive food-based, plant compilation for cell protection yet.

I3C (indole-3-carbinol) and DIM (di-indolyl-methane) favorably modulate estrogen metabolism and induce liver detoxification enzymes to help neutralize potentially harmful estrogen metabolites and xenoestrogens (potentially toxic, estrogen-like environmental chemicals).1-4

Extracts of broccoli, watercress, and rosemary provide glucosinolates, isothiocyanates, carnosic acid, and carnosol—bioactive compounds that have a multitude of favorable effects on estrogen metabolism and cell division.5-8 Apigenin, a powerful plant flavonoid found in plants such as parsley and celery, is also added to the formula to boost cell protection,9 while 25 mg of a natural source of benzyl isothiocyanate (BITC), are included to maintain cell health.10

For those weighing less than 160 pounds, just one capsule a day provides optimal potencies. Those weighing over 160 pounds should consider taking two capsules a day. A 60-capsule bottle of Triple Action Cruciferous Vegetable Extract retails for $24. If a member buys four bottles, the price is reduced to only $16.50 per bottle.

Those who want to obtain the benefits of resveratrol can order Triple Action Cruciferous Vegetable Extract with Resveratrol. Each capsule provides 20 mg of resveratrol in addition to the vegetable extracts and retails for $32 per 60-capsule bottle. When a member buys four bottles, the price is reduced to only $22.20 per bottle.

REFERENCES:

To order Triple Action Cruciferous Vegetable Extract, call 1-800-544-4440 or visit www.LifeExtension.com

Contains yeast and corn.
Why Estrogen Balance is Critical to Aging Men

BY WILLIAM FALOON

When we started offering comprehensive blood test panels back in 1996, men did not understand why we were checking their estrogen levels. Back in those days, estrogen was considered a hormone of importance only to women.

We tested estrogen based on published data indicating that when estrogen levels are unbalanced, the risk of degenerative disease in aging men skyrockets. Of concern to us 14 years ago were reports showing that excess estrogen contributes to the development of atherosclerosis. Human clinical studies conducted more than a decade later confirmed our suspicions. Men with even slightly elevated estrogen levels doubled their risk of stroke and had far higher incidences of coronary artery disease. Our early observations also revealed that men presenting with benign prostate enlargement or prostate cancer had higher blood estrogen levels (and often low free testosterone blood levels). Subsequent clinical studies help confirm our early observations.

Insufficient estrogen, on the other hand, predisposes men to osteoporosis and bone fracture.

The fact that 99% of men today have no idea what their blood estrogen levels are helps explain the epidemic of age-related disease that is bankrupting this nation’s medical system.
Conventional doctors tend to ignore hard science until it appears in their own medical journals.

A study published in the *Journal of the American Medical Association* measured blood estradiol (a dominant estrogen) in 501 men with chronic heart failure. Compared to men in the balanced estrogen quintile, men in the lowest estradiol quintile were 317% more likely to die during a 3-year follow-up, while men in the highest estradiol quintile were 133% more likely to die.24

The men in the balanced quintile—with the fewest deaths—had serum estradiol levels between 21.80 and 30.11 pg/mL. This is virtually the ideal range that Life Extension® has long recommended male members strive for.

The men in the highest quintile who suffered 133% increased death rates had serum estradiol levels of 37.40 pg/mL or above. The lowest estradiol group that suffered a 317% increased death rate had serum estradiol levels under 12.90 pg/mL.

The dramatic increase in mortality in men with unbalanced estrogen (i.e., estradiol levels either too high or too low) is nothing short of astounding. It uncovers a gaping hole in conventional cardiology practice that is easily correctable.

This study revealing the lethal dangers of estrogen imbalance was published in conventional medicine’s Bastille of knowledge—the *Journal of the American Medical Association*. Physicians no longer have a basis to question male Life Extension® members who take aggressive approaches to maintain their serum estradiol levels in optimal ranges.

Low Estradiol and Testosterone Predict Mortality in Aging Men

Sales of testosterone replacement drugs have surged more than 20-fold in response to studies linking low testosterone to a host of common maladies.

In a recent study of 3,014 men aged 69-80 years, serum levels of testosterone and estradiol were measured during a mean follow-up of 4.5 years. Men with low testosterone had 65% greater all-cause mortality, while men with low estradiol suffered 54% more deaths.25

Those men low in estradiol and testosterone were almost twice as likely to die (a 96% increase in mortality) compared to men in the optimal ranges.25

This large study of aged men corroborates prior published reports linking imbalances of testosterone and/or estradiol with greater incidences of degenerative disease and death.26-36

How Do Men Naturally Make Estrogen?

Women synthesize most of their estrogen in their ovaries and other reproductive tissues.

Since men lack this female anatomy, they need to produce estrogen through a process involving an enzyme called aromatase that transforms testosterone into estradiol.

Aging men sometimes have too much aromatase activity, which causes their testosterone to convert to excess estradiol. This results in depletion of vital testosterone while spiking estradiol to unsafe ranges.

Some men lack aromatase and suffer an estrogen deficit. Other men produce so little endogenous testosterone that there is not enough to convert into estrogen, which causes low levels of both free testosterone and estradiol.

Fortunately, no matter what the underlying cause, aging men can easily achieve optimal free testosterone and estradiol levels.

Free testosterone is the unbound form that is biologically available to cell receptor sites throughout the body. Measuring free testosterone blood levels is the most accurate way of assessing testosterone status in aging men.
How Aging Men Can Control Their Estrogen Levels

An epidemic problem we at Life Extension observe in aging male members is insufficient free testosterone, i.e., less than 15-20 pg/mL of serum. When accompanied by excess estradiol (over 30 pg/mL of serum), this can signal excess aromatase enzyme activity.

Excess aromatase robs men of their testosterone while exposing them to higher than desirable estradiol. Aromatase can be suppressed with absorbable forms of chrysin (a plant flavonoid) and/or lignans such as those extracted from the Norway spruce tree (HMRlignan™). If these nutrients fail to reduce estradiol adequately, then we suggest that men ask their doctor to prescribe an aromatase-inhibiting drug like Arimidex® in the very low dose of 0.5 mg twice a week.

When aromatase is properly suppressed, estradiol levels are reduced to safe ranges, while free testosterone often increases, since less testosterone is being aromatized into estradiol.

Why Some Men Need Topical Testosterone Creams

Most testosterone in a man’s body emanates from the testes. Aging results in a decline in testicular output, thus necessitating the topical application of a testosterone cream to restore this vital hormone to youthful levels. Ideal free serum testosterone levels for most aging men are between 20-25 pg/mL.

As you may surmise, a man who produces too little testosterone risks a lethal deficiency of both free testosterone and estradiol.

That’s because men need testosterone to synthesize estradiol in their bodies. In the presence of insufficient testosterone production, some aging men are vulnerable to low free testosterone and low estradiol that according to the latest study almost doubles their risk of dying over a 4.5 year period!25

Critical Importance of Blood Testing

Today’s conventional physicians prescribe blood tests to check glucose, cholesterol, and triglycerides, but rarely check their male patients’ free testosterone and estradiol levels.

When looking at the horrifically high mortality rates associated with imbalances of these critical hormones, it becomes strikingly apparent that a significant number of heart attacks, strokes, bone fractures, and other degenerative diseases are easily preventable.

One reason these hormone blood tests are not normally prescribed is their high retail cost, and the fact that many insurance companies refuse to pay for them.

As a member of the Life Extension Foundation®, you don’t have to be victimized by conventional medical ignorance, high prices, or insurance company indifference.

Annual Blood Test Super Sale

An all-inclusive blood test panel that includes free testosterone and estradiol can retail for $1,000 at commercial labs. During the annual Blood Test Super Sale, Life Extension members obtain these same tests for only $199.

If your blood test result reveals an imbalance of free testosterone and/or estradiol, you are in a position to initiate immediate corrective action. Not only can restoring youthful hormone balance save your life, but men (and women) often experience an enhancement in their quality of life after their hormones are adjusted to optimal ranges.
A complete description of the Male and Female Blood Test Panels appears on the next page.

As you’ll readily see, these panels contain many important tests (such as homocysteine, C-reactive protein, and DHEA) that mainstream doctors seldom check for.

When you order these tests, a requisition form is sent listing blood drawing stations in your local area. Appointments are usually not necessary, meaning you can have your blood drawn at your convenience.

To order a comprehensive Male and/or Female Blood Test Panel, just call 1-800-208-3444. It is the single most important step you can take to ensure your continued good health.

For longer life,

William Faloon

References


(References continue on following page.)
MALE AND FEMALE BLOOD TEST PANELS

Unlike commercial blood tests that evaluate only a narrow range of risk factors, Life Extension’s Male and Female Blood Test Panels measure a wide range of blood markers that predispose people to common age-related diseases. Just look at the huge numbers of parameters included in the Male and Female Blood Test Panels:

**MALE PANEL**

**LIPID PROFILE**
- Total Cholesterol
- LDL (low-density lipoprotein) calculated
- HDL (high-density lipoprotein)
- Triglycerides

**CARDIAC MARKERS**
- C-Reactive Protein (high sensitivity)
- Homocysteine

**HORMONES**
- DHEA-S
- Free Testosterone
- Total Testosterone
- Estradiol (an estrogen)
- *TSH* (thyroid function)

**METABOLIC PROFILE**
- Glucose
- Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
- Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
- Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
- Blood proteins: albumin, globulin, total protein, albumin/globulin ratio

**COMPLETE BLOOD COUNT (CBC)**
- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

**CANCER MARKER**
- PSA (Prostate Specific Antigen)

**FEMALE PANEL**

**LIPID PROFILE**
- Total Cholesterol
- LDL (low-density lipoprotein) calculated
- HDL (high-density lipoprotein)
- Triglycerides

**CARDIAC MARKERS**
- C-Reactive Protein (high sensitivity)
- Homocysteine

**HORMONES**
- Progesterone
- DHEA-S
- Free and Total Testosterone
- Estradiol (an estrogen)
- *TSH* (thyroid function)

**METABOLIC PROFILE**
- Glucose
- Kidney function tests: creatinine, BUN, uric acid, BUN/creatinine ratio
- Liver function tests: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase
- Blood minerals: calcium, potassium, phosphorus, sodium, chloride, iron
- Blood proteins: albumin, globulin, total protein, albumin/globulin ratio

**COMPLETE BLOOD COUNT (CBC)**
- Red Blood Cell count including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
- White Blood Cell count including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
- Platelet count

Non-member retail price: $400 • Everyday member price: $269
Blood Test Super Sale member price: $199 • Enjoy these savings until June 7, 2010
To obtain these comprehensive Male or Female Panels at these low prices, call 1-800-208-3444 to order your requisition forms.
Then—at your convenience—you can visit one of the blood-drawing facilities provided by LabCorp in your area.

*If you plan to use the results of these blood tests to assist in a medically supervised weight loss program, consider adding the Thyroid add-on panel for $36.
A TSH (thyroid stimulating hormone) test is now included in the comprehensive Male and Female Panels, but those with weight problems should know their precise levels of free T3 and free T4.
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 has been upgraded to provide higher doses of the most effective form of vitamin K known as menaquinone-7. 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 also 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.

- **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 now provides more MK-7 than ever before — 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.

**Just one softgel of Super Booster supplies:**

- Gamma tocopherol ..................... 230 mg
- Ginkgo extract ......................... 120 mg
- Chlorophyllin ............................ 100 mg
- Vitamin K2 (as menaquinone-7) .... 100 mcg
- Vitamin K2 (as menaquinone-4) ... 1000 mcg
- Vitamin K1 ............................... 100 mcg
- Sesame lignans .......................... 20 mg
- Lycopene .................................. 10 mg
- Lutein .................................... 2 mg
- Se-methylselenocysteine .............. 67 mcg
- Selenomethionine ...................... 67 mcg
- Sodium selenite ......................... 67 mcg
- Vitamin B12 .............................. 300 mcg
- Vitamin C ................................. 90 mg
- Ascorbyl palmitate ................. 50 mg
- Zinc .................................. 10 mg
- Mixed tocopherols ................. 130 mg

Contains soybeans, peanuts, and sesame.

Caution: Those individuals currently taking anticoagulants such as Coumadin® (warfarin) should consult their personal physician before taking supplemental vitamin K.

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

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
In 2003, the Life Extension Foundation® introduced a purified resveratrol supplement that was later documented to favorably alter some of the changes in gene expression that cause us to age.

In 2009, CBS News 60 Minutes featured an in-depth report on the multiple benefits that resveratrol may confer in slowing and even reversing certain aspects of aging.

What differentiates Life Extension®'s resveratrol: It provides 100% standardized trans-resveratrol plus a full spectrum of natural compounds from the grape that have demonstrated remarkable biological properties. Most products currently on the market contain varying quantities of trans- and cis-resveratrol, and fail to provide enough trans-resveratrol for optimal results. In addition, Life Extension has added pterostilbene, which researchers have found works in a synergistic fashion with resveratrol to activate one's “longevity genes.”

Research funded by Life Extension has shown that a combination of low-dose (20 mg) resveratrol plus grapeseed extract induced many of the favorable gene expression changes seen in calorie-restricted animals. Other studies, however, have indicated that higher doses may be needed to obtain all of resveratrol’s positive benefits including:

- Improved Insulin Sensitivity
- Enhanced Mitochondrial Function
- Reduced Expression of Inflammatory Factors
- Protection Against the Toxic Effects of a High-Fat Diet

Life Extension has meticulously evaluated published studies on resveratrol and pterostilbene to establish doses people might need to take to duplicate these remarkable laboratory findings. The results of Life Extension’s analysis yield a wide range of potentially effective doses of resveratrol and pterostilbene.

**Highest Potency Resveratrol**

The resveratrol potency you choose may be based on your current state of health and/or your desire to personally reach the upper limits of a healthy human life span. Life Extension offers a wide range of standardized trans-resveratrol potencies in combination with pterostilbene (which also favorably alters gene expression), quercetin, and other grape phytonutrients.

**Optimized Resveratrol with Pterostilbene** and the new Calorie Restriction Mimetic Formula provide the highest dosage of trans-resveratrol as well as a broad array of grape polyphenols, quercetin and pterostilbene.

All these Resveratrol Products are fortified with Pterostilbene!

**Resveratrol with Pterostilbene**

Provides 20 mg of trans-resveratrol plus 120 mg of quercetin to facilitate resveratrol absorption. Pterostilbene content (125 mcg) equivalent to over 5 cups of blueberries. Recommended dosage is 1 capsule daily with or without food. Each bottle contains 60 vegetarian capsules. Contains corn.

Retail Price: $24

**FOUR-BOTTLE MEMBER PRICE:** $16.50 PER BOTTLE

(See each product description for amount of pterostilbene.)

CBS News and its affiliates are not connected with Life Extension® in any way, and do not endorse or sponsor its products.

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.
To order these Resveratrol products or the new Calorie Restriction Mimetic Formula, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Vital Greens
Plant Foods
In a Convenient Powder Blend

We try to eat healthfully, but getting enough plant foods each day can be a challenge for many people.

The new Vital Greens Mix is a blend of organic whole plant foods that provide diverse benefits ranging from protecting DNA integrity and maintaining immune function to suppressing vascular risk factors and restoring healthy intestinal flora.

Some of the ingredients in the new Vital Greens Mix superfood include:

- **Chia**, a rich source of protein, fiber, vitamins, minerals, and alpha-linolenic acid (an omega-3 precursor). Recent research at the University of Toronto has shown that regular chia intake may help maintain healthy blood pressure and C-reactive protein levels, both of which are well-known markers of cardiovascular disease.1

- **Green Grasses and Sprouts** to provide a full array of chlorophyll-rich, nutrient-dense natural “green” foods that help detoxify and maintain youthful DNA integrity. In addition, clinical trials with chlorella supplements demonstrate that daily use of this green food may support healthy immunity and wound healing.2,3

- **Probiotics** to sustain healthy bacterial balance in the gut, which may support overall immune and digestive health.

- **A mushroom blend** combining maitake, shiitake and cordyceps extracts to support immune health and provide adaptogenic benefits for balance and resistance.

Life Extension’s Vital Greens Mix is a great way to start off a meal. It induces some immediate satiety while providing beneficial plant foods that help neutralize mutagenic components of modern diets.

Each scoop of Life Extension’s Vital Greens Mix provides a daily dose of nutrient-dense foods and herbal extracts. The retail price of a 30-serving jar of this organic superfood is $48. When a member buys four jars, the price is reduced to only $33 per jar.

To order the new Vital Greens Mix, call 1-800-544-4440 or visit www.LifeExtension.com

**Each serving provides:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chia Seed (organic)</td>
<td>3000 mg</td>
</tr>
<tr>
<td>Chlorella (organic)</td>
<td>1000 mg</td>
</tr>
<tr>
<td>Spirulina (organic)</td>
<td>1000 mg</td>
</tr>
<tr>
<td>Acerola (organic)</td>
<td>750 mg</td>
</tr>
<tr>
<td>Wheat Grass (organic)</td>
<td>430 mg</td>
</tr>
<tr>
<td>Maitake Mushroom Extract (organic)</td>
<td>400 mg</td>
</tr>
<tr>
<td>Wheat Sprout (organic)</td>
<td>300 mg</td>
</tr>
<tr>
<td>Barley Malt (organic)</td>
<td>300 mg</td>
</tr>
<tr>
<td>Probiotic Blend (Lactobacillus acidophilus, Lactobacillus casei, Lactobacillus plantarum, Lactobacillus rhamnosus, Bifidobacterium breve, Bifidobacterium longum)</td>
<td>300 mg</td>
</tr>
<tr>
<td>Shiitake Mushroom (organic)</td>
<td>300 mg</td>
</tr>
<tr>
<td>Cordyceps Mushroom Extract (organic)</td>
<td>300 mg</td>
</tr>
<tr>
<td>Dulse (organic)</td>
<td>250 mg</td>
</tr>
<tr>
<td>Beet Juice (organic)</td>
<td>250 mg</td>
</tr>
<tr>
<td>Barley Grass (organic)</td>
<td>200 mg</td>
</tr>
<tr>
<td>Brown Rice Bran (organic)</td>
<td>200 mg</td>
</tr>
<tr>
<td>Cilantro (organic)</td>
<td>200 mg</td>
</tr>
<tr>
<td>Suma (organic)</td>
<td>150 mg</td>
</tr>
<tr>
<td>Flower Pollen Extract (organic)</td>
<td>120 mg</td>
</tr>
</tbody>
</table>

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.
Chocolate May Be Beneficial Against Strokes

Recent research done by St. Michael’s Hospital, University of Toronto points to the possibility that eating chocolate may reduce stroke risk. The author of the study, Gustavo Saposnik, says there is limited evidence, but after reviewing three previous studies, eating a bar of chocolate once a week can help cut the risk of stroke and lower the risk of death by stroke.*

One of the studies involving 44,489 people found that those who ingested one serving of chocolate a week were 22% less likely to have a stroke than those who didn’t eat chocolate. A separate study found that 1,169 people who ate 50 grams of chocolate once a week were 46% less likely to die following a stroke than people who didn’t eat chocolate.

While the evidence is compelling that chocolate may help against strokes, future research needs to be done to determine what particular element of chocolate is the most beneficial. “This is something that requires further investigation,” Saposnik says.

—Jon Finkel


Mediterranean Diet May Be Brain-protective

A presentation at the American Academy of Neurology’s 62nd Annual Meeting revealed the finding of Nicolaos Scarmeas, MD, MSc that consuming a Mediterranean diet may help preserve memory and learning ability by protecting against cerebrovascular disease.*

Dr. Scarmeas’ team performed magnetic resonance imaging (MRI) scans on the brains of 712 New York residents. Dietary assessments administered an average of 5.8 years earlier were evaluated for Mediterranean diet adherence.

Two hundred thirty-eight subjects had at least one infarct revealed by MRI. Men and women whose adherence to a Mediterranean diet was among the top one-third of participants had a 36.1% lower probability of infarct compared to those whose adherence was lowest, and those in the middle third had a 21% lower risk.

“In this study, not eating a Mediterranean-like diet had about the same effect on the brain as having high blood pressure,” Dr. Scarmeas stated.

Editor’s note: This is one of numerous studies to suggest that a Mediterranean diet is one of the healthiest eating patterns.

—Dayna Dye

IN THE NEWS

Coenzyme Q10 Levels Reduced in Chronic Fatigue Syndrome

In an article published in *Neuroendocrinology Letters*, researchers from Belgium and Poland report that plasma coenzyme Q10 levels are significantly lower in individuals with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), a chronic disease characterized by extreme fatigue and inflammatory, autonomic and neuropsychiatric symptoms.

The study compared plasma CoQ10 levels of 58 men and women diagnosed with ME/CFS to 22 healthy control patients. A significant reduction in CoQ10 levels was observed among ME/CFS patients compared with the control group. As many as 44.8% of these patients had levels that were less than the lowest CoQ10 value detected in healthy controls. Increased CoQ10 levels predicted a reduction in CFS symptoms.

“This is the first study which shows that ME/CFS is accompanied by significantly reduced plasma concentrations of CoQ10 and that lowered plasma CoQ10 is related to specific symptoms of ME/CFS, such as fatigue, autonomic and neurocognitive symptoms,” the authors announce.

**Editor’s note:** As coenzyme Q10 is involved in the production of energy, the finding is not surprising. *Life Extension* has long suggested CoQ10 supplements to those with CFS.

—Dayna Dye


Multinutrient Supplement Protects Age-related Decline in Activity

An article published in *Experimental Biology and Medicine* reveals that administering a combination of nutrients to mice delays the decline in activity that occurs with aging.

C. David Rollo and colleagues used a formula consisting of vitamins B1, B3, B6, B12, C, D, and E, folic acid, beta-carotene, acetyl-L-carnitine, alpha-lipoic acid, bioflavonoids, chromium picolinate, garlic, ginger root extract, *Ginkgo biloba*, ginseng, green tea extract, L-glutathione, magnesium, manganese, melatonin, N-acetyl cysteine, potassium, rutin, selenium, cod liver oil, CoQ10, and flax seed oil. While mice that did not receive the nutrients experienced a greater than 50% reduction in daily movement by 24 months of age, those that received the supplements maintained youthful levels of activity. Unsupplemented mice experienced increased declines in mitochondrial function and in brain signaling chemicals related to movement.

“Dietary cocktails can powerfully ameliorate biomarkers of aging and modulate mechanisms considered ultimate goals for aging interventions,” the authors conclude.

**Editor’s note:** Long time Life Extension members who use Life Extension Mix have been reaping the benefits of multinutrient supplementation for years. The formula is continually updated in light of new research findings, so that those who choose to use it have the best opportunity to attain optimal health and longevity.

—Dayna Dye


Vitamin D Supplements May Protect Against Crohn’s Disease

Research published in the January 22, 2010 issue of the *Journal of Biological Chemistry* describes how vitamin D could help protect against Crohn’s disease, an inflammatory bowel disease that is believed to be caused by defective innate immune regulation of intestinal bacteria.

Researchers at McGill University in Montreal discovered that vitamin D acts on the beta defensin gene, which encodes an antimicrobial peptide. The vitamin also affects the NOD2 gene, which informs cells of the presence of invading microorganisms. Defects in the NOD2 gene mean that the body cannot defend itself effectively against intestinal tract invaders.

“This discovery is exciting, since it shows how an over-the-counter supplement such as vitamin D could help people defend themselves against Crohn’s disease,” noted coauthor Marc J. Servant. “We have identified a new treatment avenue for people with Crohn’s disease or other inflammatory bowel diseases.”

**Editor’s note:** This study adds yet another disease to the growing list of conditions that could be prevented or treated with inexpensive vitamin D supplements.

—Dayna Dye

**Vitamin D May Combat Asthma**

A new study published in the *American Journal of Respiratory and Critical Care Medicine* claims that insufficient amounts of vitamin D may make asthma worse for those suffering from the lung condition. The study, which was performed at the Department of Medicine, National Jewish Health in Denver, Colorado, involved nonsmoking adult asthmatics and the relationship between asthma treatments and vitamin D levels.

Fifty four people were enrolled in the study and it showed that vitamin D levels were related to a person’s score on a standard breathing test. The relationship was consistent throughout the tests: the lower the vitamin D levels, the lower their performance.

In an interview with E. Rand Sutherland, MD, MPH, the chief of the pulmonary division at National Jewish Health, for WebMD Health News, Dr. Sutherland states, “Our findings suggest that vitamin D levels influence a number of important features of asthma, including lung function, bronchospasm, and therapeutic response to steroids.”

—Jon Finkel


---

**Men Who Drink Tea Have Trimmer Waistlines**

Men who drink more than two cups of tea daily have trimmer waistlines than men who drink coffee or no coffee or tea, according to a study presented at the First International Congress on Abdominal Obesity. Excess fat around the midsection has been linked with an increased risk of heart disease and diabetes.

Scientists examined the relationship between coffee and tea drinking in 3,823 participants in the 2003-2004 US National Health and Nutrition Examination Survey. Coffee consumption was not associated with abdominal obesity in men or women. In men, consuming sugar in tea was associated with a 1-inch smaller waistline, while artificial sweeteners were linked with a nearly 2-inch larger waistline. Women who used milk in tea had an average two-thirds of an inch smaller waistline. Women who used artificial sweeteners had an average 1-inch larger waistline.

—Elizabeth Wagner, ND


---

**Green Tea Compound Reduces Fibroid Growth in Laboratory Studies**

Researchers at Meharry Medical College report that epigallocatechin gallate (EGCG), a flavonol contained in green tea, helped reduce the growth of cultured fibroid tumor cells, as well as fibroid tumors in female mice.

A team led by Ayman Al-Hendy, MD, PhD administered varying concentrations of EGCG or no EGCG to rat leiomyoma (fibroid tumor) cells for up to 7 days. Cells treated with the highest concentrations grew more slowly and were less crowded than those treated with lower concentrations.

In another experiment, female mice implanted with fibroid tumor cells were given 1.25 milligrams EGCG per day or no EGCG for 8 weeks. Tumor weight was lower and tumor volume was smaller in the EGCG-treated mice compared with those that did not receive the compound.

“We conclude that EGCG and green tea extract may have potential as oral agents for the prevention or treatment of uterine leiomyoma,” the authors write.

**Editor's note:** Like vitamin D and omega-3 fatty acids, green tea has emerged as an effective preventive or treatment for a variety of conditions.

—Dayna Dye

LARGEST SELECTION OF VITAMIN D SUPPLEMENTS

More studies have been published over the past four years supporting the health benefits of vitamin D than possibly any other compound.

The good news for consumers is that vitamin D is a very low cost supplement.

The objective of taking a vitamin D supplement is to achieve 25-hydroxyvitamin D blood levels of 50 ng/mL (and higher).

Life Extension’s® exclusive analysis of over 13,000 vitamin D blood tests reveals that the minimum intake for most aging people should be around 7,000 IU a day. Some individuals need 10,000 IU of vitamin D daily.

You can choose the right dose of vitamin D3 for you from the large selection of vitamin D3 supplements below. Remember to factor in that you may be getting 1,000-3,000 IU of vitamin D in multi-nutrient formulas you already take.

<table>
<thead>
<tr>
<th>Vitamin D3 1,000 IU • 250 capsules</th>
<th>Retail: $12.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four bottle Member Price: $8.44</td>
<td></td>
</tr>
</tbody>
</table>

Commercial companies offered only 400 IU vitamin D products when Life Extension long ago introduced this 1,000 IU version. For most people, this 1000 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

Contains soybeans, corn, and rice.

<table>
<thead>
<tr>
<th>Vitamin D3 1,000 IU with Sea-Iodine* 250 vegetarian capsules</th>
<th>Retail: $22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four bottle Member Price: $15</td>
<td></td>
</tr>
</tbody>
</table>

Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining vitamin D3 and iodine into one capsule makes taking these two nutrients economical and convenient. Item# 01371

Due to the source of the kelp, this product may contain fish and shellfish. Contains rice and corn.

<table>
<thead>
<tr>
<th>Vitamin D3 5,000 IU • 60 capsules</th>
<th>Retail: $11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four bottle Member Price: $7.43</td>
<td></td>
</tr>
</tbody>
</table>

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

Contains rice.

<table>
<thead>
<tr>
<th>Vitamin D3 5,000 IU with Sea-Iodine* 60 vegetarian capsules</th>
<th>Retail: $14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four bottle Member Price: $9.38</td>
<td></td>
</tr>
</tbody>
</table>

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 make taking these two nutrients economical and convenient. Item# 01372

Due to the source of the kelp, this product may contain fish and shellfish. Contains rice and corn.

<table>
<thead>
<tr>
<th>Vitamin D3 7,000 IU • 60 capsules</th>
<th>Retail: $14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four bottle Member Price: $9.45</td>
<td></td>
</tr>
</tbody>
</table>

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

Contains corn and rice.

<table>
<thead>
<tr>
<th>Vitamin D3 Liquid Emulsion 2,000 IU • 1 ounce</th>
<th>Retail: $28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four bottle Member Price: $18.75</td>
<td></td>
</tr>
</tbody>
</table>

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

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 medical 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.

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

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

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

Contains rice.

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.
Innovative Strategies to Combat Kidney Disease

You may be surprised to learn that until 2002, no standard definition for chronic kidney disease (CKD) existed within the medical community. Before then, conflicting classifications had created a state of confusion as to how many Americans were afflicted with this progressive, life-threatening condition.

Once proper categorization of the various phases of CKD was established, the stark and daunting scale of this modern epidemic emerged.

We now know that as many as 26 million Americans currently suffer from some form of chronic kidney disease. Aging individuals are especially vulnerable.

Yet public awareness of the threat remains low. When you consider that the risk of cardiovascular mortality in CKD sufferers is 30 times that of the general population, the steady increase in kidney disease rates seen today amounts to a public health disaster hidden in plain sight.

Life Extension® has long emphasized the need for vigilance through regular testing (at least once a year) to monitor kidney health. In addition to the standard tests for creatinine, albumin, and BUN/creatinine ratio, certain individuals should insist their doctor test for cystatin-C, a largely overlooked blood marker which provides a far more precise measure of renal function. Optimal levels are less than .91 mg/L.

Individuals should also keep a record of their test results. Once any sign of disease is detected (such as an increase in creatinine), it is imperative that immediate steps be taken to halt its progress, as kidney function can decline precipitously and may be irreversible. Fortunately, many Life Extension® members are already taking a variety of nutrients that support kidney health.

In this article, you will discover the most recent scientific advances in our understanding of how CKD unfolds, the specific risk factors that contribute to its progress, and how you can bring them under control.

You will also learn of safe, low-cost, natural interventions that have been shown to stop CKD in its tracks, long before end-stage renal disease (ESRD) renders dialysis or kidney transplant the only option. > >
INNOVATIVE STRATEGIES TO COMBAT KIDNEY DISEASE

Since the formation of advanced glycation end-products (AGEs) is such a well-established factor in the onset and progression of kidney disease, nutrients that have been conclusively shown to mitigate the effects of these lethal agents constitute a front line, low-cost intervention.

A formidable AGE antagonist is the vitamin B6 compound pyridoxamine. A plethora of research confirms its power to halt formation of AGEs. Evidence has also emerged that pyridoxamine drastically limits formation of equally deadly advanced lipoxidation end products (ALEs)—another deadly catalyst for kidney disease.

A team of biochemists at the University of South Carolina were able to show that pyridoxamine traps the reactive molecules formed during lipid (fat) peroxidation and helps to “chaperone” them harmlessly into the urine.

Their colleagues subsequently found that neutralizing AGES and ALES can prevent kidney disease and lipid profile abnormalities in diabetic rats. They found that rats supplemented with pyridoxamine had lower levels of albumin (protein) in their urine, lower plasma levels of the waste product creatinine, and less dramatically elevated blood lipids than the placebo treated animals, all directly related to the reduction of AGES.

They subsequently examined whether similar results could be obtained in obese animals that had not yet developed diabetes. Three groups of animals were studied:

1. lean (healthy) rats
2. obese rats without treatment
3. obese rats treated with pyridoxamine.

As expected, AGE and ALE formation underwent a two- to threefold increase in obese untreated rats compared to lean animals. Conversely, those increases were entirely absent in obese animals treated with pyridoxamine. Treated animals also experienced a smaller increase in plasma triglycerides, cholesterol, and creatinine levels, compared with the obese untreated rats.

In an equally compelling development, hypertension in animals treated with pyridoxamine also resolved, as did thickening of blood vessel walls. Untreated animals displayed urinary evidence of renal disease (albuminuria) that in contrast had been nearly normalized in supplemented animals. This provides powerful evidence of pyridoxamine’s multi-targeted protective effect against CKD.

In 2004, the same research team made a landmark discovery: while studying the relative effects of pyridoxamine along with a variety of additional natural antioxidants on the progression of kidney disease in diabetic rats, they decided to examine how these natural compounds stacked up against enalapril, a standard pharmaceutical intervention used to prevent CKD. Enalapril is an ACE inhibitor, one of a class of drugs commonly used to control blood pressure and kidney disease.

They found that pyridoxamine therapy was the most effective at preventing progression of kidney disease, followed by vitamin E and lipoic acid. Enalapril, the prescription drug, proved to be the least effective intervention. Pyridoxamine also limited lipid profile abnormalities and formation of AGES and ALES, offering a far broader spectrum of preventive effects than enalapril.

Researchers at the University of Miami advanced these findings by treating diabetic mice with both pyridoxamine and enalapril. Again they found that pyridoxamine alone provided substantial benefit, cutting albuminuria and damage to the glomeruli. Combining enalapril with pyridoxamine reduced kidney disease mortality in these animals as well, leading the researchers to suggest that the ACE-inhibitor (enalapril)/pyridoxamine combination might be useful.
A convincing body of research on pyridoxamine therapy in *humans* with CKD has also emerged in recent years. In 2007, a team of researchers at Harvard set out to determine optimal interventions to halt the progression of kidney disease in diabetics. They conducted two 24-week multicenter placebo-controlled trials in patients with known *diabetic nephropathy*—treatment of which is known to delay the onset of end-stage renal disease in diabetics. Doses of pyridoxamine ranged from 50 to 250 mg twice daily.

Pyridoxamine significantly inhibited the rise in blood levels of the waste product creatinine, one of the key biomarkers of kidney dysfunction and a predictor of kidney failure. Urinary levels of inflammatory cytokines were also significantly lower in the treated group compared to controls.

Pyridoxamine has been firmly established as a front line, safe, low-cost intervention in CKD caused or exacerbated by AGEs and ALEs. Further, this natural vitamin B6 compound has been shown to significantly improve outcomes of experimental kidney transplants and other forms of kidney disease.

It therefore borders on the *criminal* that in January of 2009, the FDA classified this potent, entirely safe CKD therapeutic as a drug, putting it out of reach for many Americans suffering from this deadly condition. No one should be forced to bear the *outrageous* burden of costly pharmaceuticals and their toxic side effects when a perfectly safe alternative exists.

Fortunately, there is another equally safe option available—another form of vitamin B6 known as *pyridoxal-5-phosphate* (P5P) that also exerts potent anti-AGE effects. It has been shown to prevent the progression of diabetic kidney disease in pre-clinical models. In fact, as far back as 1988, P5P was used by a German research group to reduce blood lipids in humans with chronic kidney disease.

**Four Complementary Kidney Protectors**

**Coenzyme Q10**

Because of the tremendous blood flow and high concentration of metabolic toxins continuously circulating through the kidneys, they are the site of extraordinary oxidative stress, which is known to contribute to progressive kidney damage and its complications, such as high LDL and increased cardiovascular disease risk.

*Coenzyme Q10* (CoQ10) fortifies the body’s natural antioxidant capacity and reduces levels of oxygen free radicals, indicating its important defense against CKD. As it happens, CoQ10 has been used experimentally to control hypertension and kidney disease in laboratory animals *since the early 1970s*.

**Strategies to Combat Kidney Disease**

- It is imperative that aging individuals receive regular blood tests to monitor kidney health. In addition to standard *creatinine, albumin*, and *BUN/creatinine ratio* testing, *cystatin-C* levels should also be measured, as this constitutes a far more *accurate* biomarker of renal function.

- The high-pressure and toxin-rich environment involved in renal function renders these delicate, highly complex organs especially vulnerable to damage, dysfunction, and disease.

- **High blood pressure, elevated blood sugar, NSAIDs, certain medications, and high-protein diets** are the most common threats to kidney health.

- Nutrients such as *pyridoxal-5-phosphate* (P5P) fight AGEs and ALEs.

- *CoQ10, silymarin, resveratrol, and lipoic acid* are also clinically supported, potent interventions.

- Omega-3 fatty acids help quell inflammation, contributing to enhanced kidney health.

- A host of additional nutrients complement these actions, including folic acid (folate) and vitamins C and E.
Human studies have shown that CoQ10 levels substantially decline, while markers of oxidation such as malondialdehyde are dramatically elevated, in kidney disease patients with even mild renal dysfunction. These decreased CoQ10 levels also make circulating lipoproteins (such as LDL) more vulnerable to oxidative damage, which in turn increases risk for further cardiovascular damage, adding to the renal burden and substantially increasing the risk of kidney disease.

A team of European researchers published compelling evidence in 2001 of how effective such a nutritional intervention can be, studying a group of patients with established kidney disease. Subjects received antioxidant therapy with vitamin C, E, and riboflavin (vitamin B2) for one month before the addition of 2 months of CoQ10 therapy. Prior to supplementation, CoQ10 values in blood were just one-quarter of normal levels; they increased to nearly four times the reference level following supplementation. The study was too brief to demonstrate any change in kidney function, but evidence from animal trials that same year showed that when CoQ10 levels were increased in tissues of diabetic rats, a reversal of markers of oxidative stress in kidney, heart, and liver resulted.

By 2004, definitive demonstration of CoQ10 in human kidney disease patients was demonstrated by researchers working with transplant recipients. Such individuals undergo tremendous oxidative stress and typically have marked disturbances in lipid profiles as a result. The European group provided their patients with CoQ10 supplements of 30 mg three times per day for four weeks, and monitored levels of oxidation factors (such as malondialdehyde), levels of natural antioxidant enzymes in the body, and lipid profiles.

Significant improvements were seen after just four weeks, with reduction in LDL, increase in beneficial HDL, and a decrease in presence of inflammatory cells. These results suggest a potentially dramatic improvement in both quality of life and survival rates for patients whose disease has progressed to the point of kidney failure requiring transplantation or dialysis. They also bode well for those with early-stage kidney disease.

Understanding Kidney Disease

The kidney ranks among the most complex and delicately evolved of all the major organs, making it particularly vulnerable to damage and dysfunction. As the body’s primary filtration system, it must “process” roughly 200 quarts of blood per day, rendering about 2 quarts of waste products and water.

The fundamental structural unit of the kidney is the nephron. These high-pressure filtering mechanisms govern the removal of waste products and toxins, control blood pressure and volume, and regulate levels of electrolytes and metabolites in the blood. A healthy kidney contains approximately 800,000 to 1 million nephrons.

Housed within each nephron is a front-line filtration element called the glomerulus, a miniscule capillary coil. (The two together resemble an incandescent light bulb containing a convoluted filament.) The endothelial cells of the glomerular capillaries act as the direct physical exchange between the kidney and the bloodstream. Waste products and water are combined to form urine, while blood cells and protein remain in the circulatory system.

The kidney’s tight control of water and mineral flow, and its role in maintaining healthy blood pressure and mineral balance, rely on the optimal functioning of nephrons and glomeruli. For this reason, one of the primary markers of kidney function is the glomerular filtration rate (GFR), a measure of the volume of fluid the kidney is able to process at any given time.

The glomerular filtration rate; plasma concentrations of the waste substances creatinine, urea, and nitrogen (blood urea nitrogen or BUN); and levels of protein in the blood and urine are the most commonly used measures to determine the presence of CKD. Rapidly rising creatinine usually signals imminent kidney failure. There should be no protein in the urine if your kidneys are functioning optimally.

It should be noted that BUN and creatinine may not increase above the normal range until 60% of total kidney function is lost. This is why certain aging individuals should ask their doctors to test for cystatin-C in the blood. Cystatin-C is a protein produced by virtually all cells and tissues in the body. Because it is formed freely and at a near-constant rate—as opposed to albumin, which may fluctuate with dietary protein intake—plasma cystatin-C serves as a more accurate biomarker of renal function.

CKD may be categorized in one of 5 stages. Stage 1, the mildest, is defined only by the persistent presence of protein in urine (GFR may be normal); in each successively higher stage, GFR declines, until Stage 5 is reached, defining end-stage renal disease (ESRD), or kidney failure. ESRD is irreversible and results in death without dialysis or kidney transplant.
Animal studies have also shown that CoQ10 can protect kidney tissue from numerous nephrotoxic drugs, including gentamicin, a powerful antibiotic with a notorious propensity for causing kidney damage. These findings are significant both because they offer protection in patients who might be exposed to such drugs, and because of what they teach us about CoQ10’s potent ability to combat the extreme oxidant stress that the kidney faces as it deals with a variety of foreign chemicals.

**Silymarin**

Silymarin is extracted from milk thistle (*Silybum marianum*), a plant rich in the flavonolignans silychristin, silydianin, silybin A, silybin B, isosilybin A and isosilybin B, which are collectively known as the silymarin complex.

This safe, natural compound has a long history as a traditional therapy for liver and kidney conditions. It has been used in Western medical practice for more than a quarter of a century as the treatment of choice for the serious kidney injury resulting from severe mushroom poisoning, owing to its potent antioxidant and nephron-protective effects. In fact, we’ve known since 1979 that kidney injury by mushroom poisoning in animals pre-treated with silymarin can be almost entirely prevented. These effects make it a natural choice for protection against drug-induced kidney damage, since so many drugs can act like poisons, exerting extreme oxidant stress on kidney tissue.

Mushroom poisons (mycotoxins) are among the most deadly natural toxins known. Their kidney toxicity is surpassed only by some of the most aggressive chemotherapy agents. Physicians have therefore looked to silymarin as a potential “renoprotective” agent for patients undergoing chemotherapy.

Silymarin is also protective against several classes of nephrotoxic drugs, in particular cisplatin and Adriamycin®, two of the most potent chemotherapeutic drugs—but also two of the most damaging to the kidney owing to oxidative damage and severe inflammation. Researchers around the world have found that silymarin and its components reduce and often entirely prevent the kidney damage caused by these drugs.

Silymarin’s ability to protect against the oxidative stress produced by potent drugs suggests that it may be useful in protecting against more subtle, chronic injury by free radicals, particularly those generated by chronic blood glucose elevations. German researchers,
for instance, have found that silymarin could entirely prevent injury to renal cells incubated with elevated glucose concentrations while blocking production of oxidative stress markers.46

Silymarin’s protective power also extends to ischemia/reperfusion injury (restoration of blood supply following restriction of blood flow). Turkish researchers demonstrated that they could completely prevent visible and functional damage to kidney structures exposed to this kind of injury by pre-treating animals with silymarin.47,48 Studies such as these have huge implications for the general population, because they suggest that by maintaining optimal antioxidant function through supplementation, we may be able to prevent much (if not most) of the chronic oxidative damage to which our kidneys are exposed daily.

Resveratrol

The considerable advance in our understanding of the cyclical relationships between oxidative stress, endothelial dysfunction, inflammation, atherosclerosis, and chronic kidney disease points to resveratrol as an intervention in the chain of events that ultimately lead to renal failure.49

Italian researchers are among the leaders in resveratrol research, and early in this century one group published remarkable research demonstrating the impact of resveratrol on preserving kidney structure and function in rats exposed to ischemia/reperfusion injury.50,51

Japanese and Indian urologists followed that up in 2005 and 2006 with reports detailing the mechanisms by which resveratrol combats oxidative damage following reperfusion, markedly reducing kidney dysfunction.52-56 Overwhelming bacterial infections (sepsis) are a common cause of kidney failure in the intensive care unit and following surgery or trauma. Turkish physiologists demonstrated that resveratrol can reduce or prevent both kidney and lung injury in septic rats.57

Resveratrol’s unmatched antioxidant and anti-inflammatory potential has been tapped in studies of its ability to prevent drug-induced kidney damage as well. Nephrotoxicity in rats exposed to the antibiotic gentamicin was significantly reduced and more rapid healing of injured kidney tissue was attained using resveratrol, with dramatic reduction in markers of oxidant injury.58 A team of toxicologists in Brazil demonstrated its kidney protective power against cisplatin, the powerful chemotherapy agent responsible for so much drug-induced kidney damage.59 Finally, Indian pharmacologists were successful in protecting animal kidneys from damage caused by another common chemotherapy and immune suppressant drug cyclosporine A by pre-treating the animals with resveratrol.56

Since diabetes is the leading cause of kidney disease—and because the damage it inflicts is largely mediated by free radical production resulting from destructive alteration of proteins by glucose (glycation)—researchers have explored resveratrol as a preventive in diabetic kidney damage. Promising work has come from Indian pharmacologists, who’ve shown that they could significantly attenuate kidney damage in rats with experimentally induced diabetes—even 4 weeks after the diabetes was induced.60 In the researchers’ own words, “The present study reinforces the important role of oxidative stress in diabetic kidney disease and points towards the possible antioxidative mechanism being responsible for the renoprotective action of resveratrol.”
Given the toxic, high-pressure conditions involved in renal function and the delicacy of the kidney’s structural components, it comes as no surprise that an array of near-constant internal and external insults may take a severe toll on the glomeruli and other parts of the kidney. Their incremental damage and destruction leads to the progressive decline in renal function seen in aging humans.

These internal and external insults include:

- **Hypertension.** Over time, chronic high blood pressure inflicts damage to the endothelial cells lining the kidney’s blood vessels, including those within the glomeruli. The result is a familiar cascade of events that leads to the thickening of blood vessel walls and reduction in blood flow seen in atherosclerosis. Reduced blood flow is in turn directly translated into lower GFR. Pressure damage to the glomeruli also diminishes their filtration capacity, permitting large protein molecules such as albumin to pass into urine instead of remaining in circulation. (This is why urine albumin levels are used to detect kidney disease.)

- **Elevated serum glucose.** Diabetes is now the leading cause of CKD. Experts predict even greater increases in CKD if rates of diabetes incidence continue to rise steeply. It should be noted, however, that high blood sugar poses a threat to kidney health even in non-diabetic individuals. Chronic exposure to glucose degrades and destroys kidney cells through the formation of advanced glycation end products (AGEs)—molecules generated through the pathologic binding of glucose to proteins in the body. AGEs cause primary structural proteins in the cells to cross-link and become non-functional, increasing oxidative stress, inflammation, and directly damaging kidney tissue. It has been established that even early-stage insulin resistance is associated with CKD.

- **Excess fatty tissue.** Body fat contributes to the development of CKD through production of inflammatory cytokines specific to adipose (fatty) tissue called adipokines. Along with AGEs and oxidative stress, adipokines exacerbate the inflammation commonly found in people with CKD. For this reason, metabolic syndrome—co-occurring insulin resistance, hypertension, and abdominal obesity—represents a perfect storm for the development of CKD. A 2007 study found that metabolic syndrome occurs in 30.5% of individuals with stage 4 or stage 5 chronic kidney disease. Metabolic syndrome increases the risk of chronic kidney disease, even before diabetes manifests.

- **Protein over-consumption.** Ingesting an excessive amount of protein, particularly meat, may tax the kidneys to the point of distress. The extraordinary increase in individuals adhering misguidedly to high-protein diets in order to lose weight has had the unintended consequence of boosting rates of kidney damage and disease. Meat consumption also results in high AGE production and the consequent inflammatory injury to kidney tissue. A prudent approach to dietary protein is thus encouraged by most experts, particularly in people who already have some degree of CKD.

- **Drugs.** The nephrotoxic side effects of many commonly used medications comprise another significant causative factor in CKD. Chief among the mechanisms by which drugs cause kidney damage are oxidative stress and adverse alterations in cellular energy management. So-called “analgesic nephropathy” involves destruction of the active regions of the kidney by over-use of pain relievers, usually used in combinations of two or more, including the common over-the-counter medication acetaminophen (Tylenol®) as well as non-steroidal anti-inflammatory medications (NSAIDs) including high-dose aspirin, and ibuprofen (Advil®, Motrin®). Chemotherapy agents have also been shown to significantly impair renal function. Please note that acetaminophen inflicts kidney damage via a different mechanism than pain relieving drugs like ibuprofen.
**Lipoic Acid**

Like resveratrol, lipoic acid is a powerful antioxidant with few known side effects. Lipoic acid has been successfully employed in the laboratory to block the oxidative damage caused by ischemia/reperfusion injury, thereby opening the door to another effective treatment for this common cause of acute kidney failure. For example, in 2008 researchers showed that they could reverse all adverse effects on renal function and lab abnormalities produced following experimental ischemia/reperfusion injury in animals.

Lipoic acid has been comprehensively studied worldwide for its power to prevent or mitigate drug-induced kidney damage. We know that lipoic acid is an effective kidney-protective agent against damage inflicted by Adriamycin, the immunosuppressive drug cyclosporine A, and even against acute toxic doses of the pain reliever acetaminophen. In studies of protection against cyclosporine toxicity, lipoic acid also helped to normalize blood lipid abnormalities.

Nephrologists at Georgetown University are examining lipoic acid in the context of diabetic kidney disease. Their results show it can improve renal function in diabetes by lowering sugar levels. They have also recently demonstrated that lipoic acid lowers protein loss in urine and improves kidney structure and function in diabetic laboratory animals by reducing oxidative stress.

In yet another compelling study, Korean researchers recently showed that they could improve kidney patients’ responses to the vasodilator (blood vessel relaxer) nitric oxide (NO) by supplementing them with lipoic acid. Loss of endothelial responsiveness to NO is a cause of vascular disease in diabetics, and a chemical called asymmetric dimethylarginine (ADMA) is a sensitive marker and predictor of cardiovascular outcome in patients with end-stage renal disease. Fifty patients on hemodialysis were treated with lipoic acid 600 mg per day for 12 weeks. Levels of the marker ADMA remained unchanged in the control group, but fell significantly in the lipoic acid group, suggesting that lipoic acid may reduce the risk of cardiovascular complications in this group of patients.

**Overcoming CKD-Induced Fatigue**

L-carnitine, an amino acid-derived nutrient crucial to cellular energy management, can play a vital role in kidney disease prevention and management. Carnitine deficiency is itself a known causative factor in the development of kidney disease. Conversely, patients with kidney disease frequently develop carnitine deficiency, especially those on dialysis. Carnitine therapy is known to lead to improvements in many kidney-disease-associated complications including cardiovascular disease, anemia, decreased exercise tolerance, weakness, and fatigue.

As noted earlier, CKD sufferers are at very high risk for developing cardiovascular complications, including heart attacks and heart failure. This is thought to be in part related to massive oxidative stress induced by kidney disease, and partly to inadequate energy management in cardiac tissues induced by carnitine deficiency. The frequent result of these interrelated factors is a massive deterioration in energy, exercise tolerance, quality of life—and perhaps even longevity.

As early as 1998 scientists in Kentucky discovered that supplementation with L-carnitine could improve patient-reported general health, vitality, and physical function in people on dialysis. In 2001, research by clinicians at Los Angeles Medical Center showed that L-carnitine, given intravenously to dialysis patients, could reduce fatigue and preserve exercise capacity. A literature review by nephrologists at Vanderbilt University in 2003 indicated that L-carnitine supplementation should be used to improve red blood cell count in dialysis patients whose anemia doesn’t
INNOVATIVE STRATEGIES TO COMBAT KIDNEY DISEASE

 (**Summary**)  

Chronic kidney disease (CKD) is rapidly approaching epidemic proportions, with up to 26 million Americans suffering from some form of kidney disease. Kidneys must filter 200 quarts of blood every day. The high-pressure and toxin-rich environment surrounding renal function renders these delicate, highly complex organs especially vulnerable to damage, dysfunction, and disease.  

**High blood pressure, elevated blood sugar, NSAIDs (such as ibuprofen), certain medications, and high-protein diets** are the most common threats to kidney health. The potentially lethal insults they inflict include oxidative stress, production of advanced glycation and lipoxidation end products (AGEs and ALEs), inflammation, and an excessive filtration burden that taxes renal function over time.  

Nutrients such as pyridoxal-5-phosphate (P5P) fight AGEs and ALEs. CoQ10, silymarin, resveratrol, and lipoic acid are also clinically supported, potent interventions. Omega-3 fatty acids help quell inflammation, contributing to enhanced kidney health. A host of additional nutrients complement these actions, including folic acid (folate) and vitamins C and E.  

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**  


respond to therapy with the hormone erythropoietin.92 Finally, more data from Italy demonstrate that L-carnitine supplements can help suppress levels of the inflammatory marker C-reactive protein, potentially reducing cardiovascular risk in dialysis patients.93  

**Additional Nutrients that May Benefit CKD**  

**Folic acid** is well known for its capacity to reduce levels of the metabolite homocysteine, which is strongly associated with cardiovascular disease and dramatically elevated in individuals with kidney disease or kidney failure.94-97  

**Omega-3 fatty acids** have been shown to help correct cardiovascular risk factors98-100 and to improve kidney function in patients with established kidney disease.101,102 Research published in 2009 suggests that diets rich in omega-3s may actually prevent kidney disease.103,104 Through powerful antioxidant effects, **vitamin E** may help prevent CKD onset, and **vitamins E and C** may mitigate development of cardiovascular and other complications in patients with chronic kidney disease.105-110


Dedicated research and development has produced a form of R-lipoic acid that is being hailed as the “next-generation” antioxidant powerhouse.

Life Extension’s Super R-Lipoic Acid has demonstrated superior bioavailability, stability, and potency for a variety of health benefits. This breakthrough converts the biologically active “R” form of lipoic acid to sodium-R-lipoic acid, which in a recent human study achieved 10–30 times higher peak blood levels than pure R-lipoic acid.1

Not only does this lipoic acid formulation reach higher peak blood levels,2 it also achieves them sooner, up to 12 times faster than R-lipoic acid, ensuring rapid uptake from the plasma into the tissues.1 A recent study showed that oral ingestion of Super R-Lipoic Acid reached peak plasma concentrations within just 10–20 minutes of supplementation.2

What’s more, unlike other forms of lipoic acid, Super R-Lipoic Acid is more stable in the body. The increased stability of this enhanced formulation is the reason for its greater absorption and bioavailability compared with R-lipoic acid.

The superior antioxidant effects of R-lipoic acid are already well known for supporting healthy mitochondrial function. Super R-Lipoic Acid provides more potent benefits for preserving youthful cellular energy levels.

A bottle of Super R-Lipoic Acid containing 60 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® sodium-R-lipoic acid supplying 210 mg of R-lipoic acid.

References:

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.
2. Ingest six grams of soluble fiber before each meal. Studies show that pre-meal fiber intake helps induce early satiety. One or more of the following low-cost fiber supplements can be used:

- **Fiber Food** is a natural bulk-producing soluble fiber consisting of psyllium, guar gum, and apple pectin that is available both in capsule and powder forms. A bottle of 200 capsules of Fiber Food Capsules retails for $15. If a member buys four bottles, the price is reduced to $9.38 per bottle. Contains corn. Item # 00229

- A bottle of 300 grams of Fiber Food Powder retails for $15. If a member buys four bottles, the price is reduced to $9.38 per bottle. Contains corn. Item # 00228

- **CocoaGold™ with Beta-Glucan** This combination powder provides standardized cocoa extract plus oat beta-glucans. The CocoaGold™ polyphenols support healthy insulin sensitivity, while beta-glucan fiber delays carbohydrate absorption. Beta-glucans have a slower and more sustained effect on blood glucose and energy. A jar of 180 grams of CocoaGold™ with Beta-Glucan retails for $20. If a member buys four jars, the price is reduced to $13.50 per jar. Contains tree nuts (cocoa beans), gluten, and corn. Item # 01285

To order the new CALORIE RESTRICTION MIMETIC FORMULA or any of the other supplements that help protect against chronically bloated bloodstream, call 1-800-544-4440 or visit www.LifeExtension.com

1. EAT LESS

Controlled studies in primates reveal that modest calorie reduction (only 30%) yields a huge reduction in the risk of issues associated with aging. For example, a recent study in *Science* showed that modest calorie restriction in primates provided a 50% improvement in cardiovascular support. Studies on humans show that a calorie reduction of only 20% dramatically improves biomarkers associated with longevity.

For those who find it difficult to ingest 20-30% fewer calories, consider one or more of the following natural approaches:

1. **Pinolenic acid** is a polyunsaturated fatty acid derived from pine nuts. It stimulates secretion of the hunger-suppressing hormones cholecystokinin (CCK) and glucagon-like peptide-1 (GLP-1). Human studies showed that participants taking pinolenic acid reduced their food intake by 36%...more than enough to accomplish modest calorie restriction. Pinolenic acid is the active ingredient in a supplement called Natural Appetite Control. Those seeking to reduce daily calorie intake should take three capsules of Natural Appetite Control before most meals.

   Natural Appetite Control was developed for adults seeking to lower their calorie intake and maintain a successful, long-term weight management program. Each softgel of Natural Appetite Control provides 1,000 mg of standardized extract of Korean pine nuts containing the highest concentration of pinolenic acid found in any pine nut species, which stimulate the release of two of the body’s most powerful hunger-suppressing hormones.

   A bottle of 90 softgels of Natural Appetite Control retails for $28. If a member buys four bottles, the price is reduced to $18.90 per bottle. Contains soybeans and tree nuts. Item # 00891

   **NOTE:** Supplements should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.
REDUCE THE EFFECT OF EXCESS CALORIES

Famine prevailed throughout most of mankind’s evolutionary history. Those who efficiently absorbed and stored scarce calories are our direct ancestors. With abundant quantities of calorie-dense foods, it is no wonder that problems associated with excess food intake are so prevalent in modern-day societies.

Excess consumption of dietary fat and carbohydrate results in rapid spikes in levels of fat (triglyceride) and sugar (glucose) in the blood. Regrettably, many people are not aware of the age-accelerating consequences of postprandial overload. Elevated levels of post-meal blood fat (triglycerides) and blood sugar (glucose) accelerate the aging process in our cardiovascular system.

Ingested foods are broken down by digestive enzymes before they are absorbed into the bloodstream. Green and black tea polyphenols target the fat-digesting enzyme lipase. *Theaflavins* from tea polyphenols have been shown in experimental studies to help reduce the post-meal impact of ingested fat calories in a dose-dependent manner. Most of us eat too many refined carbohydrates that add to the calorie burden. The enzymes *amylase*, *glucosidase*, and *sucrase* break down ingested carbohydrates to smaller starch and sugar particles. Nutrients such as *white kidney bean* (targets amylase activity), *InSea™* (targets amylose and glucosidase activity), *Irvingia* (targets amylose activity) and *L-arabinose* (targets sucrase activity) have been shown in published scientific studies to help reduce the metabolic impact of ingested carbohydrate calories from dietary starch and/or sugar. These nutrients are all contained in the new Optimized Irvingia formula.

**Optimized Irvingia with Phase 3™ Calorie Control Complex** contains *Green Tea Phytosome Extract* to slow down the breakdown and absorption of dietary fat, *Phase 2™ White Kidney Bean* extract to moderate alpha-amylase activity, *InSea™* seaweed extract, which can help support a *slowing* of the rate of carbohydrate absorption from the intestines, *Irvingia gabonensis* extract for *leptin sensitivity* support, and *Phase 3™ Sucrase Modulator* to reduce the number of absorbed calories from sugar. Directions are to take two capsules before the two heaviest meals of the day. A bottle of 120 capsules of Optimized Irvingia with Phase 3™ Calorie Control Complex retails for $78. If a member buys four bottles, the price is reduced to $54 per bottle. Contains soybeans, tree nuts, yeast, and corn. Item # 01492

CONTROL YOUR GENE EXPRESSION

Restricting the amount of calories allowed into your blood stream increases healthy life span via several mechanisms. Cardiovascular support can be maintained by blunting the post-meal surge of glucose, insulin, triglycerides, and inflammatory-inducing compounds that engorge the bloodstream following eating binges.

Scientists, however, are focused on an even more important mechanism to explain how *calorie restriction* so radically extends life span. They have uncovered favorable alterations in *gene expression* in response to reduced calorie intake. It turns out that caloric restriction slows aging by *activating* beneficial “youth” genes while disabling detrimental “senescence” genes.

The incredible news is that a select group of nutrients has been discovered that trigger many of the favorable mechanisms (including more youthful *gene expression* patterns) as *caloric restriction*.

Among the most promising of these *caloric restriction mimics* and enhancers are *resveratrol, pterostilbene, quercetin*, and *grape seed polyphenols*, along with *black tea extract*. These nutrients have been shown to generate many of the same effects in the body as caloric restriction, without significant dietary modification.

Genes have the capacity to directly affect life span by regulating a broad spectrum of aging factors. Calorie restriction exerts a beneficial effect on the activity of *gene expression*, supporting healthy cellular function through numerous physiological pathways. Compounds that mimic caloric restriction bring about favorable changes in *gene expression* and improve the primary biomarkers of aging.

Those taking high-dose vitamin D, along with coenzyme Q10 and fish oil are already favorably altering many of their gene expression patterns. A new *Calorie Restriction Mimetic Formula* includes *resveratrol, pterostilbene, quercetin, grape seed polyphenols, and black tea extract* to provide even broader-spectrum gene expression support in one nutritional compound. Two capsules of the new *Calorie Restriction Mimetic Formula* provides:

- Trans-Resveratrol 250 mg
- Trans-Pterostilbene 3 mg
- Quercetin 150 mg
- Black tea extract 300 mg
- Grape seed polyphenols 50 mg

A bottle containing 60 vegetarian capsules of the new *Calorie Restriction Mimetic Formula* retails for $36. If a member buys four bottles, the cost per bottle is reduced to $24.75. Item # 01419

While the new *Calorie Restriction Mimetic Formula* can enable aging individuals to *simulate* many of the beneficial *gene expression* effects associated with caloric restriction, *Life Extension* members are still urged to reduce their pathologic calorie burden by following steps #1 and #2 as outlined herein.

Item #01492

Item #01419

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.
An abundance of clinical data has established pomegranate as a broad-spectrum, multi-modal defense against the leading causes of death in the Western world, from atherosclerosis to cancer and diabetes.¹

In the last decade alone, more than seven times as many studies have been published validating pomegranate than in all the preceding years combined.²

The bulk of this research has focused on the benefits of pomegranate juice and fruit extracts. Now scientists are discovering a novel source of pomegranate’s myriad benefits: the various botanical components of the pomegranate tree, particularly its seeds and flowers.

The latest scientific evidence indicates that pomegranate flower extract and seed oil uniquely complement conventional pomegranate fruit extract’s capacity to combat multiple diseases of aging.¹

For example, a 2009 pre-clinical model found that extracts from pomegranate flowers reduced hardening of the arteries by 70%, while juice alone reduced it by only 40% compared to controls.³ In addition, flower extracts were found to significantly decrease blood lipid and glucose levels.

In this article, you will learn the latest scientific evidence of pomegranate’s life-saving effects, along with new studies exploring various constituents of the plant and their power to combat a host of degenerative diseases through distinct physiological pathways. >>

Is Conventional POMEGRANATE EXTRACT Enough?

BY JULIUS GOEPP, MD
Conventional Pomegranate Extracts: Polyphenols Provide Degenerative Disease Defense

The polyphenolic content of pomegranate juice and pulp have historically aroused the greatest scientific interest. In particular, the formidable antioxidant capacity of their ellagitannin content has been credited with much of pomegranate’s health-promoting power.4,5

Recent analysis has further clarified pomegranate’s underlying mechanisms of action, most notably in the area of beneficial gene expression—inhibiting pro-inflammatory nuclear factor-kappaB (NF-kB)4 and downregulating production of cancer-stimulating androgen receptors in prostate cells.5 Pomegranate’s unique role in upregulating expression of paraoxonase-1 (PON-1), an enzyme required for artery-cleansing high-density lipoprotein (HDL) to function optimally, has also generated substantial scientific interest.6,7 (See sidebar on page 30.)

Pomegranate’s clinically validated cardioprotective effects have prompted some to label it the “heart-healthy” juice.8 Its flavonoid content inhibits oxidative damage to low-density lipoprotein (LDL), helping to protect blood vessels against atherosclerosis.9 Pomegranate polyphenols exert anti-inflammatory effects that further protect blood vessels from damage, reduce the size and number of atherosclerotic lesions, prevent thickening of arterial walls, and lower blood pressure.8

Polyphenols and other components in pomegranate juice exert beneficial effects that extend beyond the cardiovascular system. Numerous phytochemicals in pomegranate juice—ellagic acid in particular—have been shown to disrupt cancer development at multiple stages.2,10,11 Another polyphenol unique to pomegranate is punicalagin, which converts into molecules known to slow prostate cancer cell growth.4 These act by inhibiting pro-inflammatory NF-kB, a cytokine implicated in the development of numerous forms of cancer.4,12-14

Scientists have also focused on pomegranate’s antimicrobial potential. Polyphenols contained in the juice inhibit the growth of a number of pathogenic (disease-causing) bacteria, fungi, and parasites.15-17

Pomegranate Flower Extract: Preventing Metabolic Syndrome

The global epidemic of metabolic syndrome and its associated pathologies—obesity, type 2 diabetes, and cardiovascular disease—has lent new urgency to the discovery of anti-diabetic agents with low toxicity suitable for long-term use.18 New research points to extract of the pomegranate flower as an attractive, safe, low-cost intervention.

In 2006, Chinese scientists discovered a previously unknown polyphenol in pomegranate flower extract that combats weight gain, impaired glucose control, and systemic inflammation. They gave it the name pomegranatate.19
Indian researchers have demonstrated the capability of flowers from male pomegranate plants to influence blood sugar in normal and experimentally diabetic rats.²⁰

In 2005, researchers in Australia demonstrated that 6 weeks of supplementing obese diabetic rats with pomegranate flower extracts prevented blood sugar increases following a glucose-laden meal—but had no such effect in normal rats.²¹

Yet another profound anti-diabetic activity emerged: pomegranate flower extract enhanced gene expression of the vital transcription factor PPAR-gamma, which regulates cellular responses to energy intake. (See sidebar on page 30.) It also normalized expression of a glucose-transporting protein in heart muscle, enabling the diabetic animals’ hearts to better utilize energy from sugar.²¹ Together these effects suggest a viable molecular pathway for improved insulin sensitivity—an important step in preventing diabetic complications (and slowing aging).

The same researchers convincingly demonstrated that extracts of pomegranate flower reduce cardiac muscle triglyceride content in diabetic rats, simultaneously lowering triglyceride and total cholesterol levels in the blood.²² Normalization of these vital lipid parameters occurred through upregulated expression of PPAR-alpha, the gene transcription factor that controls how cells take up and utilize fatty acids. These twin findings have profound implications: drug companies have spent millions in the effort to find a pharmaceutical that could induce these effects. As a dual PPAR-alpha and PPAR–gamma activator, pomegranate flower extract offers potential realization of that effort through a safe, low-cost, natural intervention.²³

The same team of researchers reported that pomegranate flower extract significantly reduced heart muscle fibrosis (thickening and stiffening) in obese diabetic rats.²⁴ Cardiac fibrosis ranks among the more deadly complications of diabetes, resulting in gradually diminishing cardiac output and heart failure. Six weeks of oral treatment with the flower extract reduced the amount of inflexible collagen protein in the animals’ left ventricles and around their coronary arteries.

These results were attained via alterations in gene expression, in this case through downregulation of genes that produce the stiffening proteins collagen and fibronectin. Pomegranate flower extract also reduced heart muscle signaling of endothelin-1, a vasoconstrictor (blood vessel-narrowing) peptide implicated in cardiac fibrosis. Additionally, the extract reduced gene expression of the inflammatory regulatory molecule NF-kB,²⁴ which plays an important role in controlling the inflammation and metabolic alterations associated with obesity.²⁵

Pomegranate’s Multi-Modal Effects

- The comprehensive health benefits of pomegranate juice and pulp have been well documented in combating a range of degenerative diseases.
- Less well known are the significant benefits conferred by other botanical components of the pomegranate plant. The synergistic action of pomegranate’s constituents may be superior to that of its juice/pulp alone.
- Extracts of pomegranate flowers provide unparalleled protection against type 2 diabetes and many of the metabolic consequences of obesity.
- Pomegranate seed oil offers potent chemoprevention against breast, prostate, and other common human cancers.
- All three components of the pomegranate plant have multi-modal effects, and there is evidence that these effects synergize to produce final results more potent than the sum of their parts.
- Whole-fruit, flower, and seed oil extracts of pomegranate offer unrivalled protection against the three top killers of American adults: cardiovascular disease, type 2 diabetes, and cancer.
Inflammation is the target of another newly discovered component of pomegranate flowers—punicanolic acid, a member of the triterpene family of beneficial essential oil molecules. In laboratory studies, punicanolic acid inhibits production of the potent inflammatory mediator TNF-alpha, which is found at increased levels in overweight and obese people and contributes to insulin resistance.

The inflammation observed in obese and overweight people not only adds to insulin resistance. It also underlies the increased risk of cardiovascular disease seen in obese individuals and in animal models of type 2 diabetes. The condition is characterized by substantially elevated blood sugar levels, LDL, very low-density lipoprotein (VLDL), triglycerides, and oxidized fats. At the same time, beneficial HDL and cellular antioxidant systems are found to be depressed in such individuals.

Oral administration of pomegranate flower extract reversed all of these conditions in a laboratory rat model of type 2 diabetes, highlighting its potential utility for aging individuals at risk for diabetes and its cardiovascular complications. The extract also helps ameliorate fatty liver disease, the most common cause of liver function abnormalities in people with obesity and type 2 diabetes.

Pomegranate flower extract is a potent inhibitor of the digestive enzyme alpha-glucosidase. Alpha-glucosidase breaks complex carbohydrates into their simple sugar components for absorption into the bloodstream. In inhibiting its action slows the rate at which free sugar is absorbed into the bloodstream.

The practical effect of this beneficial action was apparent in an animal model: in diabetic rats fed a carbohydrate-rich meal, oral administration of the flower extract markedly lowered plasma glucose levels during the postprandial (after-meal) period. This is a vitally important finding, because postprandial blood sugar elevations contribute greatly to the tissue damage caused by high glucose levels (glycation).

Postprandial sugar spikes are also responsible for excessive insulin release that can cause a subsequent drop in glucose levels, triggering inappropriate hunger and further eating.

Natural Lipid and Glucose Control: PON and PPAR Activators

Polyphenols in pomegranate juice increase the activity of the vital paraoxonase (PON) enzymes PON-1 and PON-2. PON-1 supports artery-cleansing HDL by stabilizing its molecular complex against oxidation and breakdown and helping cellular scavengers (macrophages) remove oxidized cholesterol from tissue. PON-2 exerts similar antioxidant protection at the cellular level rather than in the blood.

Pomegranate juice polyphenols work by increasing gene expression of both PON enzymes, while also preventing PON-1 inactivation and increasing the stability of its binding to HDL cholesterol. Other components of the pomegranate tree, including its flowers and seeds, have displayed similar effects, particularly on PON-2.

These additional botanical constituents also affect another set of intracellular protein complexes: peroxisome proliferator-activated receptors (PPAR) alpha and gamma. Both are transcription factors that regulate how and when genes become activated. Between them they tightly regulate fatty acid uptake and storage, glucose metabolism, and inflammation.

Drugs in the family of fibrates (gemfibrozil, fenofibrate, and others) are synthetic PPAR-alpha activators that can help improve lipid profiles, while drugs in the thiazolidinedione family (such as rosiglitazone) are synthetic PPAR-gamma activators that help lower blood glucose. Both categories of drugs, however, cause significant adverse side effects. To date, efforts to develop a drug that activates both PPARs (a clearly desirable action) have failed. A recent explosion of data on the pomegranate flower suggests that this component of the pomegranate tree possesses these dual PPAR-alpha/gamma activator properties, a finding with profound implications for treatment of diabetes and its complications.
Additional multi-targeted effects of pomegranate flower extract are emerging rapidly: phenolic compounds from the flowers exhibit numerous anti-atherosclerotic effects even in non-diabetic animal models, reducing the size and number of atherosclerotic plaques by up to 70%.3

Pomegranate Seed Oil: A Potent Cancer Fighter

Cutting-edge research has uncovered numerous life-saving modes of action for pomegranate seed oil, most notably in the area of chemoprevention.2 Other roles for pomegranate seed oil include facilitating repair of aging skin, immune function modulation, and inflammation reduction.2,31-33

The data on pomegranate seed oil's cancer fighting potential is most compelling in tissues of the male and female reproductive systems. Pomegranate seed oil is a potent inhibitor of aromatase, the enzyme that produces estrogen from testosterone, and 17-beta-hydroxysteroid dehydrogenase type 1, which is responsible for the conversion of estrone to potent estradiol. This enzymatic blockade contributes to pomegranate seed oil's ability to inhibit growth of estrogen-dependent breast cancer cells in culture. It also reduces the cancer cells' invasiveness (ability to cross barriers). A separate mechanism is also clearly at work here, because the oil also increases cellular suicide (apoptosis) even in cancer cells that lack estrogen receptors.34

Cancer cells need to grow new blood vessels to support their rapid growth and tissue invasion (angiogenesis). They typically do this by ramping up production of a variety of growth factors, including vascular endothelial growth factor (VEGF) and inflammatory interleukins.

Pomegranate seed oil powerfully inhibits production of VEGF while upregulating production of migratory inhibitory factor (MIF) in breast cancer cells. In a laboratory model of vessel growth, these modulations translated into a significant decrease in new blood vessel formation.35 Pomegranate seed oil's capacity to block breast cancer development was also demonstrated in an organ culture model of mouse breast cancer.36 Treating the glands with the oil prior to exposure to a powerful carcinogen resulted in an astonishing 87% reduction in the number of cancerous lesions compared with controls—substantially greater protection than has been previously reported for derivatives of pomegranate juice.

As with flower extracts, pomegranate seed oil contains a number of unique chemical constituents with potent biological effects. Punicic acid is an omega-5 polyunsaturated fatty acid that inhibits both estrogen-dependent and estrogen-independent breast cancer cell proliferation in lab cultures.37 Punicic acid also induced apoptosis at rates up to 91% higher than those in untreated cell cultures—effects which appear to be related to fundamental regulation of cancer cell signaling pathways.37
Another common malignancy that often depends on sex hormones for its growth is prostate cancer, a leading cause of cancer-related mortality in American men, accounting for more than 29,000 deaths each year. Because of its slow rate of growth and appearance later in life, prostate cancer has been identified as an ideal target for nutritional chemoprevention. Pomegranate seed oil sharply inhibits proliferation of a number of human prostate cancer lines through changes in the cell growth cycle and also by inducing apoptosis (cell death). At the same time, it has been shown to powerfully suppress cancer cell invasion. Pomegranate oil also acts in synergy with other pomegranate components, suppressing prostate cancer proliferation and metastatic potential more effectively than each component individually.

Summary

An abundance of data supports the power of pomegranate extract as a broad-spectrum, multimodal defense against multiple diseases of aging. It has been shown to inhibit pro-inflammatory nuclear factor-kappaB (NF-kB), downregulate production of certain cancer-stimulating androgens, and upregulate expression for the paraoxonase molecular complex associated with artery-cleansing HDL.

The most recent research suggests that the various botanical components of the fruit tree may be required to obtain pomegranate’s full protective benefit, in particular its flowers and seeds.

Extracts from pomegranate flower have been shown to suppress signaling of endothelin-1, a blood vessel-narrowing peptide implicated in cardiac fibrosis (abnormal thickening of the heart valves) and to help arrest the onset of metabolic syndrome as well as its associated pathologies of obesity, type 2 diabetes, and heart disease.

Pomegranate seed oil offers further promise as a powerful anti-cancer agent, with particular potential in combating breast and prostate cancers.

There is now solid published data to support the value of supplementing with pomegranate fruit extract, along with pomegranate flower and seed oil extracts.

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

Aging is Characterized by Inflammation, Glycation, and Mitochondrial Decay

The loss of cellular vitality is caused by a number of factors, including mitochondrial problems, glycation, and free-radical reactions. Life Extension members have access to a state-of-the-art nutritional formula called MITOCHONDRIAL ENERGY OPTIMIZER that helps protect delicate cellular structures and enables cells to perform life-sustaining metabolic processes.

MITOCHONDRIAL ENERGY OPTIMIZER is designed to counteract age-related structural and functional changes by providing the following unique ingredients:

- **CARNOSINE** As humans age, proteins in their bodies become irreversibly damaged by glycation reactions. Glycation is the cross-linking of proteins and sugar to form non-functioning structures (Advanced Glycation End-Products or “AGEs”) in the body, which can lead to alterations of normal cell function. Carnosine is not only a powerful anti-glycating agent, but it also protects neurons against reactive and cytotoxic protein carbonyl species associated with normal aging.1-5

- **LUTEO LIN** Systemic inflammation is involved in most undesirable consequences of aging. Culprits behind chronic inflammatory reactions are pro-inflammatory cytokines, such as interleukin-1 and tumor necrosis factor alpha. Luteolin is a super-potent plant extract that has been shown to modulate these dangerous inflammatory cytokines.6-11

- **BENFOTIAMINE** Effectively modulates multiple destructive biochemical pathways, including AGES’ formation pathway, which are induced by higher than desirable blood glucose levels. Human mortality studies indicate that ideal fasting glucose levels are between 74-85 mg/dL. Yet many aging people have fasting glucose above 90 mg/dL, which is less than optimal.12-14 Benfotiamine protects endothelial cell integrity from the effects of high glucose levels. In addition, benfotiamine exhibits direct antioxidative capacity and prevents induction of DNA damage.15

- **PYRIDOXAL 5'-PHOSPHATE** Aging results in the formation of advanced glycation end-products throughout the body. Pyridoxal 5'-phosphate is the active form of vitamin B6 that has been shown to protect against both lipid and protein glycation reactions.16-19

- **R-LIPOIC ACID** Destructive free-radical activity in the mitochondria plays a major role in the loss of cellular vitality. A microencapsulated Bio-Enhanced® R-lipoic acid facilitates youthful mitochondrial energy output while guarding against free radicals. Two forms of lipoic acid are sold on the supplement market, but R-lipoic acid is far more potent.20-23

- **ACETYL-L-CARNITINE ARGINATE** The amino acid L-carnitine is required to transport fats into the mitochondria to be burned for cellular energy. Acetyl-L-carnitine arginate is a patented form of carnitine that also supports neurites in the brain.24

Taking all of the individual ingredients in the Mitochondrial Energy Optimizer separately would be prohibitively expensive, but Life Extension members obtain this comprehensive formula at substantial savings.

A bottle of Mitochondrial Energy Optimizer containing 120 capsules retails for $86. If a member buys four bottles, the price is reduced to $58.50 per bottle.

Just four capsules of the Mitochondrial Energy Optimizer provide:

- Carnosine .......................................... 1000 mg
- Acetyl-L-carnitine arginate DiHCl .......... 700 mg
- Bio-Enhanced® R-Lipoic acid ........... (microencapsulated) 150 mg
- Benfotiamine .................................. 150 mg
- Pyridoxal 5'-Phosphate .................... 100 mg
- Luteolin ............................................ 8 mg

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

To order Mitochondrial Energy Optimizer, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
To order the new Optimized Cran-Max® with UTIRose™, call 1-800-544-4440 or visit www.LifeExtension.com

Cran-Max® registered trademark of BDM Technologies, LLC. UTIRose™ is a trademark of Burgundy Botanical Extract. Bio-Shield® is a registered trademark of Bio-Nutra Technologies, LLC.

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.

To order the new Optimized Cran-Max® with UTIRose™, call 1-800-544-4440 or visit www.LifeExtension.com

Cran-Max® registered trademark of BDM Technologies, LLC. UTIRose™ is a trademark of Burgundy Botanical Extract. Bio-Shield® is a registered trademark of Bio-Nutra Technologies, LLC.

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.
NEW ENHANCED

Few nutritional sources have gained as much scientific validation as pomegranate. The vast majority of research has focused on extracts from the fruit. Only recently have scientists identified the synergistic action of compounds specific to other parts of the pomegranate—most notably its seeds and flowers.

The Next-Generation Pomegranate Formula

Life Extension® introduces an advanced, cutting-edge pomegranate formula that brings together novel phytonutrients for the first time in a unique, high-potency blend.

Full-Spectrum Pomegranate™ combines standardized extracts from the whole fruit and flower, along with pomegranate seed oil, to support system-wide health.

In addition to the highly absorbable antioxidant powerhouses found in pomegranate fruit, Full-Spectrum Pomegranate™ augments these polyphenols with newly discovered biologically active compounds from other parts of the pomegranate plant. These little-known nutrients include: punicanolic acid, a member of the triterpene family of essential oils that provides cellular support to help with inflammation; and pomegranatate, to combat age-related metabolic changes.

This superior formula supplies the complete nutritional profile of the pomegranate plant. Just one softgel of Full-Spectrum Pomegranate™ provides polyphenols equivalent to 12.3 ounces of pomegranate juice (or 24 pomegranates) plus a proprietary blend of seed oil and flower extract.

One softgel of Full-Spectrum Pomegranate™ contains:

POMELLA® Pomegranate (Punica granatum) Extract (fruit) [std. to 30% punicalagins (120 mg)]

PomComplete™ Pomegranate (Punica granatum) Blend [flower extract and seed oil (standardized to 22% (30 mg) punicic acid)]

ENDOTHELIAL DEFENSE™ with Full-Spectrum Pomegranate™

The endothelium is the inner lining of the blood vessel that regulates arterial health. Maintaining its youthful integrity supports overall cardiovascular health as humans age.

In 2007, Life Extension® introduced Endothelial Defense™ with GliSODin®. This formula supplied two potent nutrients to support endothelial health: standardized pomegranate and an orally active form of superoxide dismutase.

A year later, Endothelial Defense™ was improved with the addition of standardized cocoa polyphenols. All three of these components (pomegranate, SOD, cocoa) have been clinically shown to help with blood flow and age-related changes in endothelial function.

Life Extension now introduces an additional option for individuals seeking nutritional support for aging arteries. The new Endothelial Defense™ with Full-Spectrum Pomegranate™ provides the added benefit of Life Extension's next-generation pomegranate flower extract and seed oil blend.

Endothelial Defense™ with Full-Spectrum Pomegranate™

A bottle containing 60 softgels of Endothelial Defense™ with Full-Spectrum Pomegranate™ retails for $58. If a member buys four bottles, the price is reduced to just $40.50 per bottle.

Contains soybeans, tree nuts (cocoa beans), and wheat. Contains gluten.
Scientific Studies Reveal These Vascular Benefits...

1. Pomegranate Supports Healthy Blood Flow
   In a group of aging humans with risk factors for cardiovascular events, pomegranate or placebo was ingested on a daily basis. After twelve months, blood flow through the carotid arteries improved 44% in the pomegranate group, whereas carotid blood flow worsened by 9% in the placebo group.7 (Both groups continued taking conventionally prescribed medications.)
   In another similar group, pomegranate or placebo was ingested daily. After only three months, coronary artery blood flow improved by 18% in the pomegranate group, but worsened by 17% in the placebo group.8 A standardized pomegranate extract is one of the three active components of Endothelial Defense™.

2. Cocoa Helps with Endothelial Function
   Endothelial function can be evaluated by using a sensitive ultrasound test to assess blood flow velocity. In a controlled human study, arterial blood flow improved by 37% following ingestion of standardized cocoa polyphenols and this persisted about eight hours. This same study showed a 36% decrease in undesirable platelet activation in the cocoa polyphenol groups.9
   The cocoa polyphenols appear to exert their beneficial effect by enhancing endothelial nitric oxide. The age-related depletion of nitric oxide is considered a major impediment to healthy arterial blood flow. A standardized cocoa polyphenol extract is the second active component of Endothelial Defense™.

3. SOD Protects Against Nitric Oxide Degradation
   Aging results in a reduction of our body’s production of the critical antioxidant called superoxide dismutase (SOD). One consequence of SOD depletion is excess degradation of endothelial nitric oxide.
   An orally active superoxide dismutase (SOD) called GliSODin® has been clinically proven to support healthy arterial function and structure while boosting levels of the body’s most powerful antioxidant enzymes (SOD and catalase).10-11
   Studies show that carotid artery thickness increases by 0.04 mm every 10 years. However, a 2007 GliSODin® study suggested that 2.8 years of supplementation may turn back the clock on 10 years of age-related changes due to carotid artery wall thickening.12 The third ingredient of Endothelial Defense™ formula is the patented GliSODin® in the identical dose used in the successful human study.

References

POMELLA® Extract is covered under U.S. Patent 7,638,640.
POMELLA® Extract is a registered trademark of Verdure Sciences, Inc.
Isocell SA, France is the owner of US Patents Nos. 6,045,809 and 6,426,068 and trademark of GliSODin®.

TO ORDER
Full-Spectrum Pomegranate™
or Endothelial Defense™
with Full-Spectrum Pomegranate™,
call 1-800-544-4440 or visit
www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Suppose you could assess with precision your personal risk for *sudden cardiac death*—then reduce it substantially in a matter of weeks.

You would be able to take immediate steps to lower your risk of sudden heart attack, *without* the need for drugs. You would even be able to determine whether the steps you’ve taken to induce favorable physiological alterations in your body have been effective *and adjust them accordingly*.

Thanks to a team of pioneering scientists, this improbable medical scenario is now a reality.

Just as *hemoglobin A1c* provides a snapshot of long-term glucose intake to assess diabetes risk, a revolutionary *omega-3 index* now provides a clear picture of the percentage of EPA/DHA omega-3 fatty acids in your blood to estimate your risk of a major cardiac event, including sudden cardiac death, heart attack, and fatal ischemic heart disease.

In this article, you will learn about *Omega Score™*, a novel analytic technology that assesses multiple markers of cardiovascular disease risk. You will discover how a revolutionary, low-cost at-home blood test may furnish you with a *tailored* assessment of how much omega-3 is in your whole blood, serum, and red blood cells. You also will find out how to adjust your omega-3 supplementation for optimal cardiovascular protection.
Optimal Cardiac Defense

No cardioprotective dietary interventions have received more clinical validation than EPA and DHA. These widely recognized essential omega-3 fatty acids (derived from marine sources, primarily algae and fish) have been shown to safely suppress pro-inflammatory cellular signaling molecules and enzymes implicated in virtually all facets of cardiovascular disease and mortality, including:

- **Interleukin 1-beta (IL-1β):** Docosahexaenoic acid (DHA) targets IL-1β, a pro-inflammatory cytokine known to upregulate expression of adhesion factors in endothelial cells, which in turn contributes to atherosclerosis. (In cytokine blood panel readings, the optimal reference range for IL-1β is <2.9 pg/mL.)

- **Cyclooxygenase-2 (COX):** Eicosapentaenoic acid (EPA) and DHA quench gene expression of cyclooxygenase, an enzyme involved in the production of various prostaglandins that contribute to chronic inflammation and cardiovascular disease.

- **Leukotriene B4 (LTB4):** A cytokine synthesized from the pro-inflammatory omega-6 arachidonic acid and 5-lipoxygenase. DHA displaces arachidonic acid from cells, inhibiting LTB4-induced vascular adhesion and inflammation of arterial and cardiac tissues.

- **Tumor necrosis factor-alpha (TNF-α):** A cytokine known to contribute to system-wide inflammation. It stimulates production of vasoconstricting (vessel-narrowing) endothelin-1, a protein that can induce high blood pressure and long-term cardiovascular damage. EPA and DHA blunt the body’s inflammatory response to TNF-α. (The healthy reference range for TNF-α is <8.1 pg/mL.)

- **Thromboxane (TxB2):** A potent hypertensive lipid synthesized from omega-6 fatty acids. In addition to boosting blood pressure, TxB2 plays a central role in potentially lethal blood clot formation. Its activity is suppressed in the presence of EPA/DHA.

Through these and other multi-targeted mechanisms of action, EPA and DHA provide virtually unrivalled heart health defense. They can prevent and even reverse cardiovascular disease by increasing levels of artery-cleansing HDL in the blood. They reduce harmful triglyceride and very-low density lipoprotein (VLDL) cholesterol levels. They have also been shown to slow disease progression and reduce mortality in aging humans already afflicted with cardiovascular disease, and to prevent sudden cardiac death in people previously without symptoms.

While sufficient dietary intake of these essential fatty acids is crucial, researchers have further established that it is the ratio of omega-3 to less desirable omega-6 fatty acids—not their total concentration in the red blood cell membrane—that correlates with
cardiovascular disease risk. The higher the amount of omega-3 relative to omega-6 in an aging individual's total fatty acid composition, the greater the benefit, and vice versa.18

But not everyone metabolizes essential fatty acids in a reliable fashion. A host of factors may affect the actual levels of these important nutrients in whole blood and red blood cell membranes, resulting in widespread variation in those levels. In other words, simply eating a healthy diet, or even supplementing with health-promoting nutrients, often may not confer the benefits you are hoping for if your body isn’t processing the nutrients efficiently. Some people may require more, while others might get by with less supplementation.

This may be one reason why, despite the widely publicized benefits of EPA and DHA, nearly 100,000 Americans died from omega-3 deficiency in 2009.19,20 In fact, a study published in 2009 ranked omega-3 dietary deficiency among the top ten preventable causes of death.19 Many times that number will likely suffer debilitating heart attacks, strokes, and neurological or cognitive damage as a result of sub-optimal omega-3 status.21-24

**Determining Individualized Cardiovascular Disease Risk: The Omega Score™**

Increasing EPA and DHA intake may increase omega-3 in cell membranes and circulating lipids, while simultaneously lowering the concentration of less beneficial omega-6 fats.1,25 However, there has been no simple way for aging individuals to determine with precision whether they have actually attained an optimal omega-3 to omega-6 ratio in their own bodies. Until now.

The Omega Score™ was developed by Bruce Holub, PhD, and his colleagues in the Department of Human Health and Nutritional Sciences at the University of Guelph, Ontario. It combines cutting-edge analytic technology with clinically validated measures that correlate established risk factors for cardiovascular disease to the lipid composition of human blood. The results are obtained from a simple finger stick blood sample you do at home, then simply send in your sample to the lab.

Omega Score™ results provide a complete profile of an individual's whole-blood fatty acid composition. This is known as the omega-3 index. Using these results, specific scores and ratios are calculated automatically. They are then correlated with known risk factors for various kinds of cardiovascular disease, based on the most recent scientific research. As you
may know, recent research suggests that omega-3 levels may be among the best predictors of future coronary heart disease, providing stronger correlations to the risk of sudden cardiac death than traditional indicators.

With this information in hand, you can estimate your own cardiovascular risk profile and monitor changes in your risk status as you adjust your omega-3 intake along with other lifestyle changes.

Dr. Holub's breakthrough technology began with the simple insight that measurements of omega-3s in the blood correlate with cardiovascular risk in a number of striking ways. He knew from the scientific literature that it is the relative contribution of each fatty acid (as a percent of total fats) that is vital in cardiovascular disease risk calculation, as opposed to the absolute concentration of any one fatty acid. Holub realized he could use this information to construct customized risk profiles that would be specific to each individual—without the need for time-consuming and expensive blood draws and lab analysis.

For example, Holub knew that the risk of coronary heart disease was 34% lower in men who had DHA percentages significantly greater than the population mean, and 31% lower for those whose total omega-3 percentages were significantly greater than the mean. Older adults whose total EPA plus DHA percentages were significantly higher than the population mean had a 70% reduction in risk of fatal heart attacks. Studies in the scientific literature had validated the idea that measurement of serum fatty acid composition could be used in assessing both intake of omega-3s and overall cardiac risk.

In late 2009, Dr. Holub and colleagues published their own study, demonstrating that they could accurately assess cardiovascular disease risk based on the ratios of various omega-6 and omega-3 fatty acids in a very large sample of subjects. The strong correlation between these ratios and cardiovascular risk provided them with another valuable tool for assessing an individual’s cardiovascular status.

Dr. Holub and his colleagues realized that their own work as well as that of other researchers now provided sufficient information to develop a comprehensive cardiovascular risk assessment tool.
The following test parameters are included in the Omega Score™ blood test.

**Risk of Sudden Cardiac Death**

Your risk of sudden cardiac death can be estimated from the Omega-3 Whole Blood Score, which measures omega-3 fatty acid content as a percentage of your total whole-blood fatty acid composition. This marker is based in part on the groundbreaking work of a team of Harvard researchers. They found that people with total omega-3 levels above 6.1% in their blood had a compelling 90% reduction in risk of sudden cardiac death compared with those whose omega-3s were 4.3% or less of their total fatty acids. Users of the Omega Score™ will see their own Omega-3 Whole Blood Scores plotted on a graph that places them in the appropriate risk category for sudden cardiac death: Very High, High, Moderate, or Low, corresponding to the risk reductions identified by the Harvard researchers.

Based on work by researchers at the Department of Veteran Affairs Medical Center in San Francisco, this score provides a simple two-way assessment of an individual’s overall risk for heart disease. They used the total omega-3 content of serum (blood without the cellular components) to determine a risk cut-off for the development of heart disease, and found that a value of greater than 7.2% omega-3s resulted in a risk reduction of 32% compared with those whose value was 5.0% or lower.

Users of the Omega Score™ will see their own Omega-3 Serum Equivalence Score plotted on a graph that places them in the appropriate risk category for development of heart disease: Risk (5.0 or lower), or Low Risk (7.2 or higher), corresponding to the values determined by the VA researchers.

**Risk of Fatal Ischemic Heart Disease**

Your risk of dying from ischemic heart disease (heart attack) can be estimated from the EPA+DHA Serum Equivalence Score, which represents the total percent of fatty acids comprised of EPA and DHA in serum. This score is based on research from the Cardiovascular Health Research Unit at the University of Washington in Seattle. They found a 70% reduction in the risk of death from ischemic heart disease (heart attack) for people with total EPA and DHA values of 4.6% or greater, when compared with those whose total values were less than 3.5%.

Users of the Omega Score™ test will see their own EPA + DHA Serum Equivalence Score plotted on a graph that places them in the appropriate risk category for fatal ischemic heart disease: Risk (less than 3.5) or Low Risk (greater than 4.6), corresponding to the values determined by the Washington research group.

**Risk of Sudden Heart Attack**

Your risk for having a sudden myocardial infarction (MI, or heart attack) can be estimated from the Omega-3 Index Red Blood Cell Equivalence Score. Based on research from the Lipid and Diabetes Research Center, Mid America Heart Institute at the

**Risk for Developing Heart Disease**

Your overall risk for developing heart disease can be estimated from the Omega-3 Serum Equivalence Score.
University of Missouri Kansas City School of Medicine, this test takes into account the fact that red blood cell fatty acid composition reflects intake of EPA + DHA over time (analogous to the way that hemoglobin A1c reflects long-term blood sugar levels). These researchers found that people whose total EPA + DHA in red blood cells (the Omega-3 Index) was greater than or equal to 8% had the greatest degree of protection against sudden cardiac death, whereas an index of less than or equal to 4% was associated with the least.

Users of the Omega Score™ will see their own Omega-3 Index plotted on a graph that places them in the appropriate risk category for sudden myocardial infarction: Very High Risk (less than 4), High (4-6), Moderate (6-8), and Low Risk (greater than 8), corresponding to values determined by the Kansas City researchers.

Critical Ratios

Dr. Holub's own work demonstrated that the omega-6: omega-3 ratio is closely and inversely correlated with total omega-3 levels. That is, the lower the omega-6:omega-3 ratio, the higher the total proportion of fatty acids represented by beneficial omega-3s. Holub's group found that an omega-6:omega-3 ratio of less than 4.5 corresponded with total omega-3s of greater than 7.2%, at which level significant protection against developing heart disease results. Your Omega Score™ report will include this vital ratio calculated from your own fatty acid composition.

The arachidonic acid (AA) to EPA ratio is another important measurement of risk for atherosclerosis and its consequences. AA is an omega-6 fatty acid that is metabolized into dangerous mediators of inflammation, including leukotrienes and prostaglandins, while EPA tips the scale in the direction of anti-inflammatory activity, so EPA helps downregulate these pro-inflammatory agents. A lower AA:EPA ratio is correlated with reduced risk for cardiovascular diseases.

The average American male has a dangerously high ratio of 16.2, whereas the maximum recommended AA:EPA ratio is 5. By contrast, Japanese men, whose diets are rich in omega-3s through fish consumption, generally possess AA:EPA ratios of 1.7, reflecting a substantially lower risk of chronic inflammation.

Supplementation with EPA can have a powerful effect on the important AA:EPA ratio, in one study dropping it from a concerning 23.7 at baseline in people with coronary artery disease to a remarkable 4.9. And a falling AA:EPA ratio was strongly correlated in reduction in gene expression of the inflammatory mediator IL-1β in patients with coronary artery disease. Finally, supplementation with EPA suppressed triglyceride synthesis in liver cells and reduced liver fat accumulations in lab animals on a high-fat high-sugar diet. Together these results compellingly demonstrate the importance of knowing (and responding to) the AA:EPA ratio.

Your Omega Score™ report will include your own AA:EPA ratio, allowing you to determine and track your risk for systemic inflammation, a primary cardiovascular disease risk marker.

Convenient At-Home Blood Sampling

This novel, convenient technology does not require a trip to a blood-drawing lab. You obtain the blood specimen yourself by finger stick at home, then send the sample in to the lab for testing. Your result, complete
It is by now widely recognized that the typical North American diet is replete with omega-6 fats (most commonly in the form of vegetable oil) and sorely lacking in omega-3s.\textsuperscript{43,44} The Canadian government’s department of public health, typically more forward-thinking than organized medicine in this country, has taken the step of recommending a ratio of omega-6 to omega-3 not greater than 4:1 for optimal cardiovascular health. Yet the typical American diet hovers at a ratio of roughly 8:1.\textsuperscript{1}

EPA and DHA may reverse the potentially deadly effects of this egregious dietary imbalance in as little as three weeks. In fact, individuals ingesting 2,000-4,000 mg for that interval have experienced significant improvements across a range of key cardiovascular risk factors, including platelet aggregation (clotting potential), lower triglycerides, improved endothelial function, and reduced blood viscosity (“thickness”).\textsuperscript{1,2,45} Research indicates that in some patients on lipid-lowering statin drugs, the addition of omega-3 may reduce levels of LDL and VLDL cholesterol while maintaining a better safety profile than adding additional drugs.\textsuperscript{1,46} By favorably influencing electrical conduction in heart tissue, EPA and DHA supplements can also reduce cardiovascular disease mortality, especially sudden cardiac death.\textsuperscript{1,3,47}

You may think of a regular heart rate as a sign of good health, but in healthy humans, heart rates should undergo slight variations. For this reason, low variability in heart rate is predictive of increased risk for coronary heart disease, death, and arrhythmias (irregular heart beat).\textsuperscript{48} In adult heart attack survivors, 4 grams of combined EPA and DHA per day was able to restore heart rate variability to normal levels.\textsuperscript{49} And endothelial dysfunction, the complex result of years of elevated cholesterol, inflammation, and structural remodeling of tissue, is improved in large arteries by 3-4 grams/day of combined omega-3 supplements.\textsuperscript{50}

These benefits save lives. For example, in people with established coronary artery disease, ingestion of fish oil concentrate containing 55% EPA/DHA (6 grams/day for 3 months, followed by 3 grams/day for 21 months) substantially slowed progression of cardiovascular disease. These individuals also had fewer heart attacks and strokes compared to controls.\textsuperscript{15}

Finally, in one of the largest of its kind, a European prevention study of 2,836 subjects showed that supplementation of less than 1 gram/day of EPA and DHA over 3.5 years in patients who’d already suffered one heart attack reduced the mortality rate from cardiovascular disease by an average of 30%.\textsuperscript{16}
How to Obtain Your Omega Score™

To order the Omega Score™ test, just call 1-800-208-3444. You will receive a test kit in the mail. Simply collect a sample and return it in the pre-paid envelope. You will receive your test results by mail. The retail price is $175. As an introductory offer for Life Extension® members only, the price is being reduced to $98 until June 7, 2010.

Summary

Omega-3 fatty acids combat cardiovascular disease through a host of interrelated mechanisms, including the suppression of pro-inflammatory cytokines, elevation of beneficial HDL, and reduction of triglycerides and VLDL. The ratio of omega-3 to omega-6 fatty acids in blood and cell membranes strongly influences cardiovascular disease risk factors. Until recently there was no good way of knowing your omega-3 status and the risk that it represents. A new at-home test called the Omega Score™ allows for convenient determination of your individual omega-3 status and your risk of developing or dying from cardiovascular disease. This breakthrough technology enables you to establish several critical threats to your health, including risk of sudden cardiac death, risk for developing heart disease, risk of fatal ischemic heart disease, and risk of sudden heart attack. With this revolutionary analytic technology, aging individuals can optimize their omega-3 status and minimize their risk of cardiovascular disease.

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


A Multi-Faceted Approach to
HEALTHY BODY Weight

It’s not your fault! Public health agencies blame gluttonous behavior and lack of physical activity as the sole reasons for today’s obesity epidemic. Ignored are a plethora of age-related metabolic changes that predispose us to weight gain, even when we try to cut back on caloric intake.

The good news is that you don’t have to do it alone. Scientists have identified natural compounds that function via multiple mechanisms to combat the underlying factors involved in excess accumulation of body fat.

**Phase 3™ Sucrase Modulator**
A recent study in the journal *Science* concluded that in primates a calorie-restricted diet can delay disease onset and age-related mortality.1 While *Life Extension*® readers understand the benefits of calorie restriction, that doesn’t make it any easier to cut back on one of the major calorie culprits in the American diet: refined sugar.

Sucrase is an enzyme that breaks down sucrose in the digestive tract for absorption into the bloodstream. **Phase 3™** is a new, patented compound that functions as a beneficial modulator of sucrase. By delaying the rapid absorption of sucrose, **Phase 3™** can help support the healthy release of insulin and sugar into the bloodstream in response to sucrose ingestion that so readily converts to body fat. **Phase 3™** contains a natural substance found in plants called L-Arabinose that provides an important new weapon in the battle to reduce the number of absorbed calories from sugar.

**Green Tea Phytosome Cellular Energy Enhancer**
The ability of green tea extracts to inhibit the breakdown and absorption of dietary fat has been the subject of research studies across the globe. Mounting scientific research has documented the metabolic effects of green tea polyphenols. A proprietary phytosome complex has shown an ability to increase the absorption of green tea polyphenols into the bloodstream better than conventional tea extracts — resulting in peak plasma levels of the critical green tea polyphenol epigallocatechin-3-gallate.2

Participants in a human clinical trial showed an average weight loss of 30 pounds and a 10% reduction in waist circumference in 90 days when 300 mg/day of this new green tea phytosome was taken in conjunction with a reduced-calorie diet.2 The placebo group that followed the same reduced-calorie diet lost only 9.9 pounds and only 5% of their waist size.

**The Alpha-Amylase Enzyme**
Aging reduces our ability to utilize the carbohydrates (and fats) that constitute what most would consider part of a healthy diet. The result is that as we grow older, our bloodstreams become chronically bloated with glucose and triglycerides in direct contrast to the youthful metabolic profile we have in our younger years. Emerging scientific research suggests that the alpha-amylase enzyme plays an undesirable role in the digestion of dietary carbohydrates and subsequent absorption of calories from starch and sugar.

A natural bean extract (Phaseolus vulgaris) moderates alpha-amylase activity. In a human trial in which all overweight participants were placed on a 2,000–2,200-calorie, carbohydrate-rich diet, those taking Phaseolus vulgaris lost 6.5 pounds and 1.2 inches in waist size in only 30 days compared with 0.8 pounds and 0.2 inches in the placebo group.3

**The Alpha-Glucosidase Enzyme**
Another intestinal enzyme that enables carbohydrate absorption is alpha-glucosidase. A patented seaweed extract (InSea™) has demonstrated the ability to help maintain healthy levels of both alpha-glucosidase and alpha-amylase. When given to laboratory animals, this seaweed extract reduced after-meal (postprandial) glucose elevations by up to 90% compared with non-supplemented animals.4

Remember, young healthy individuals rapidly convert ingested fats-sugars into energy. Age-related changes decrease our metabolic capacity to efficiently utilize dietary fats-sugars. It is thus paramount for aging people to reduce their absorption of excess calories. By taking nutrients before each meal that reduce the activity of carbohydrate-fat digesting enzymes, the calorie burden is significantly reduced.

To order Optimized Irvingia with Phase 3™ Calorie Control Complex, call 1-800-544-4440 or visit www.LifeExtension.com
Leptin Sensitivity

Fat cells (adipocytes) secrete a hormone called leptin that tells our brain we have eaten enough. Leptin can also facilitate the breakdown of stored triglycerides in our adipocytes via the process of lipolysis. Heavy individuals have startlingly high blood levels of leptin, indicating that their cells have become resistant to the leptin that is supposed to prevent them from putting on so many fat pounds.

An extract from a West African food called Irvingia gabonensis has been shown to help support leptin sensitivity in overweight people. In a recently published study, Irvingia demonstrated beneficial effects upon leptin blood levels, followed by weight loss and inches off the waistline.5 In addition to supporting healthy leptin sensitivity, Irvingia has demonstrated the following beneficial effects on key aspects of metabolism:

- **Glycerol-3-phosphate dehydrogenase** is an enzyme involved in the complex biochemical process that converts ingested starch and sugar calories to stored body fat. Irvingia has been shown in studies involving fat cells to reduce the activity of glycerol-3-phosphate dehydrogenase,6 which may help reduce the impact of starch and sugar calories on body fat.

- Scientific research on fat cells suggests that Irvingia has **alpha-amylase-inhibiting** properties (like InSea™ and Phaseolus vulgaris), which can help support a slowing of the rate of carbohydrate absorption from the intestines and a reduction of the caloric impact of starchy and sugary foods.8

- **Adiponectin** is a hormone involved in helping to maintain insulin sensitivity on the membranes of energy-producing cells. Big fat cells produce less adiponectin, and overweight people need to be especially concerned about maintaining healthy levels of adiponectin to support insulin sensitivity and metabolic fitness. Scientific data suggests that Irvingia helps support healthy adiponectin levels.6

**Optimized Irvingia with Phase 3™ Calorie Control Complex**

In reviewing the remarkable effects demonstrated by these natural compounds, one might think that any one of them might be a solution to their weight problem. The reality is that aging individuals often fall victim to many molecular factors that can sabotage the best weight-loss programs.

**Optimized Irvingia** formula provides a combination of nutrients that combat age-related fat accumulation via the following eight distinct mechanisms:

1. Delaying digestion and absorption of sucrose.
2. Enhancing resting energy expenditure at the cellular level.
3. Slowing the absorption of dietary fat from the intestines.
4. Moderating alpha-amylase enzyme activity to reduce carbohydrate absorption in the bloodstream.
5. Reducing alpha-glucosidase enzyme activity to further slow the absorption of starches and sugars into the bloodstream.
6. Supporting leptin sensitivity to reduce hunger and stimulate lipolysis.
7. Supporting youthful levels of adiponectin to help maintain healthy insulin sensitivity.
8. Moderating glycerol-3-phosphate dehydrogenase enzyme activity to reduce the amount of ingested starches that are converted to triglycerides and stored as fat.

**Summary of Human Studies with Optimized Irvingia Ingredients**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Study</th>
<th>Treatment vs Placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Tea Phytosome Extract</td>
<td>100 overweight subjects placed on a hypocaloric diet (men: 1,850 calories; women: 1,350 calories) randomized to receive 300 mg/day of green tea phytosome extract or placebo for 90 days5</td>
<td>Weight loss 30.1 pounds vs. 9.9 pounds, Waist size reduction 10% vs. 5% (14% vs. 7% in men)</td>
</tr>
<tr>
<td>Phase 2™ White Kidney Bean Extract</td>
<td>60 overweight subjects placed on a 2,000-2,200 calorie, carbohydrate-rich diet and randomized to either 445 mg/day of white kidney bean extract or placebo for 30 days</td>
<td>Weight loss 6.5 pounds vs. 0.8 pounds, Waist size reduction 1.2 inches vs. 0.2 inches</td>
</tr>
<tr>
<td>Integra-Lean® Irvingia Gabonensis Extract</td>
<td>102 overweight subjects randomized to either 150 mg of Irvingia twice daily or placebo for 10 weeks5</td>
<td>Weight loss 28 pounds vs. 1.5 pounds, Waist size reduction 6.4 inches vs. 2.1 inches</td>
</tr>
<tr>
<td>Phase 3™ Irvingia Gabonensis Extract</td>
<td>50 non-diabetic subjects were used to study the suppression effects of L-Arabinose and chromium on capillary glucose</td>
<td>Consuming LA-Chr simultaneously with a 70 gram sucrose challenge suppressed the glucose response an average of 20% compared to control over four different time periods.</td>
</tr>
</tbody>
</table>

**Note:** Supplements should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.

**Directions:** Directions are to take two capsules before the two heaviest meals of the day. A bottle of 120 capsules of Optimized Irvingia with Phase 3™ Calorie Control Complex retails for $78. If a member buys four bottles, the price is reduced to $54 per bottle.

**InSea™** is a trademark of Innovactiv, Inc. Integra-Lean® Irvingia is protected by U.S. Patent No. 7,537,790. Other patents pending. Phase 2™ and Phase 3™ are used under license.

**Caution:** This product is 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 post-meal blood sugar and serum triglyceride levels, or 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 effects in clinical studies.

**References:**
5. Lipids Health Dis. 2008 Nov 11;7:44.

Contains soybeans, tree nuts, yeast, and corn.

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.
An abundance of scientific research substantiates the wide-ranging health benefits, including promoting a healthy heart, of omega-3 fatty acids in fish oil and monounsaturated fatty acids-polyphenols in olive fruit.1-9

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.

Sesame Lignans Enhance Fish Oil’s In Vivo Effects

The unstable nature of fatty acids like fish oil limits their biological efficacy in the body. Scientific studies show that when sesame lignans are supplemented with fish oil, the beneficial effects are augmented.10

Sesame lignans help guard against lipid peroxidation, thereby extending the stability of DHA in the body. These lignans also direct fatty acids toward pathways which can help with inflammatory reactions. Super Omega-3 provides standardized sesame lignans to enhance the overall benefits of the improved EPA/DHA fish oil blend.

New Higher Potency Standardized Olive Fruit

To emulate a Mediterranean diet, Super Omega-3 provides a standardized olive fruit extract to deliver the polyphenol hydroxytyrosol, a powerful antioxidant that protects normal LDL from oxidation and counters dangerous free radicals.11-14 Research shows that a combination of olive oil and fish oil supplements helps with inflammation better than a placebo or fish oil alone.15 Therefore, Super Omega-3 provides the equivalent polyphenol content of 6 ounces of Extra Virgin Olive Oil.

Super Omega-3 provides a new, higher concentration olive fruit extract standardized for hydroxytyrosol, tyrosol and oleuropein polyphenols. Research shows the value of oleuropein in favorably altering gene expression, delaying senescence in specialized skin cells, and helping maintain normal platelet activation.

Life Extension’s Super Omega-3 is a fish oil concentrate that contains a full-spectrum blend of synergistic nutrients, providing a product of the utmost quality to produce optimal effects.

Heart Healthy

Super Omega

Fish Oil Blend with Sesame Lignans and a MORE Concentrated Olive Fruit Extract

A Comprehensive Essential Fatty Acid Formula

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.
Two softgels should be taken twice daily with meals. A bottle of 120 softgels of SUPER OMEGA-3 EPA/DHA with Sesame Lignans and Olive Fruit Extract retails for $32. If a member buys four bottles, the price is reduced to $21 per bottle. If 10 bottles are purchased, the price per bottle is reduced to only $18.68. Item# 01482

For those with a sensitive stomach, Super Omega-3 is now also available with enteric coating and retails for $34. If a member buys four bottles, the price is reduced to $23.25 per bottle. If 10 bottles are purchased, the price per bottle is reduced to only $21. Item# 01484

To order the most advanced fish oil supplement, Super Omega-3 EPA/DHA with Sesame Lignans and MORE Olive Fruit Extract with or without enteric coating call 1-800-544-4440 or visit www.LifeExtension.com

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

CAUTION: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Contains fish (anchovy, sardine, mackerel), soybeans, and sesame.
The OVERLOOKED COMPOUND THAT SAVES LIVES

BY JULIUS GOEPP, MD
For more than three decades, a safe, low-cost compound has provided millions of people relief from the coughing, wheezing, and thick phlegm associated with cold and flu. Of course, pharmaceutical companies long ago co-opted it for profit by incorporating it into various patented drugs.

The sad consequence is that most aging individuals have never heard of it. Even many doctors remain unaware of its potential role as a frontline defense against some of today’s most deadly public health threats, including:

- **Acetaminophen toxicity and acute liver failure**: the number one cause of acute liver failure in the United States.¹
- **Influenza**: whose victims are primarily aging individuals—three quarters of all flu-related deaths occur in the elderly.²
- **Chronic obstructive pulmonary disease**: the fourth-leading cause of death in the United States (includes emphysema and chronic bronchitis).³
- **Helicobacter pylori**: the bacterial culprit behind stomach ulcers, and a potentially lethal pathogen closely linked to malignant gastric cancer, the second most frequent cause of cancer death worldwide.³

Fortunately, renewed clinical interest in its broad-spectrum benefits is yielding fresh data on promising interventions for this safe, effective compound.

In this article, you will discover the latest research on **N-acetyl cysteine** (NAC), a readily available, inexpensive amino-acid derivative with four decades of scientific validation. You will learn of its role in restoring intracellular levels of one of the body’s most powerful antioxidant defenses, **glutathione** (GSH). You will also find out how 600-1,800 mg of NAC daily may act as an effective intervention against a constellation of chronic, degenerative diseases, including impaired glucose control and cancer. > >
THE OVERLOOKED COMPOUND THAT SAVES LIVES

An Underutilized Intervention

NAC is a slightly modified version of the sulfur-containing amino acid cysteine. When taken internally, NAC replenishes intracellular levels of the natural antioxidant glutathione (GSH), helping to restore cells’ ability to fight damage from reactive oxygen species (ROS).

NAC has been used in conventional medicine for more than 30 years, primarily as a mucolytic (mucous-thinner) inhaled to manage conditions such as cystic fibrosis, in which mucous is abnormally thick and tenacious. While there is little in the scientific literature to support its use as an inhalant, NAC administered in this form remains highly popular among experienced pulmonary specialists.

NAC given intravenously or orally, on the other hand, saves lives every year as a treatment for acute poisoning with acetaminophen-containing pain-relieving drugs. Acetaminophen is sold as Tylenol® and combined with other drugs to create analgesic compounds, including Vicodin® and Percocet®. Overdoses with acetaminophen are the number one cause of acute liver failure in the United States. Too much acetaminophen overwhelms the body's glutathione reserves, which creates widespread and irreversible liver damage. NAC quickly restores protective levels of glutathione, averting catastrophe.

Beyond this particular application, NAC has remained a relatively obscure and poorly understood compound until quite recently. Scientists all over the world are now beginning to understand just how vital glutathione metabolism really is, and how many disease states involve glutathione deficiency. According to Stanford University's Dr. Kondala R. Atkuri, “NAC has been used successfully to treat glutathione deficiency in a wide range of infections, genetic defects and metabolic disorders, including HIV infection and COPD. Over two-thirds of 46 placebo-controlled clinical trials with orally administered NAC have indicated beneficial effects of NAC measured either as trial endpoints or as general measures of improvement in quality of life and well-being of the patients.”

Multitargeted Regulation of Gene Expression

Much of NAC’s beneficial activity derives from its capacity to modulate expression of genes for myriad signaling molecules in the inflammatory response. NAC inhibits expression of pro-inflammatory cytokines following exposure to bacterial cell components and infection with influenza A virus. NAC suppresses the “master signaling molecule” nuclear factor-kappaB (NF-kB), which in turn prevents activation of multiple inflammatory mediators. NAC also regulates the gene for COX-2, the enzyme that produces pain- and inflammation-inducing prostaglandins in a wide array of chronic conditions.

NAC’s ability to replenish the intracellular glutathione supply and mitigate oxidative damage is a separate and equally powerful mechanism that affords protection against DNA damage and cancer development, even in smokers. NAC’s inhibition of inflammatory cytokine production is another mechanism credited with cancer reduction in various body tissues.

Gene expression modifications induced by NAC may also help reduce the acute oxidant-provoked inflammatory response following exercise, making vigorous activity safer and even more beneficial. Finally, obesity-associated insulin resistance, which arises from production of inflammatory signaling molecules in fat cells, can be sharply mitigated by NAC through regulation of their genes.

The recent explosion of scientific evidence for NAC’s multi-targeted health benefits is matched only by the willful ignorance of the mainstream medical community. Some even question its safety, despite nearly 40 years of use in a variety of clinical conditions, which have established the safety of this compound, even at very high doses and for long-term treatments. One study demonstrated the safety of 1,800 mg per day for 142 days, while another study demonstrated the safety of 2,800 mg per day for 3 months.
Here is a selection of the most compelling information about NAC from the global scientific community—information that should convince even skeptical mainstream physicians.

**Potent Influenza Protection**

H5N1 influenza, or bird flu, is a lethal and potentially pandemic infection that produces the massive release of inflammatory mediators aptly called the “cytokine storm.”

Other more common forms of influenza also act by triggering massive cytokine releases that inflame vulnerable lung tissue. In early 2010, it was discovered that NAC offers dual protection against bird flu. It inhibits both virus replication and expression of pro-inflammatory molecules in cells infected with H5N1 virus, holding out the promise of effective protection in the event of a global avian flu pandemic.

NAC has also proven effective against seasonal influenza and flu-like illnesses. In a large study of older adults who took 600 mg twice daily for 6 months, only 25% of those experienced influenza-like episodes, compared with 79% in the placebo group.

Even those with flu symptoms experienced a significant reduction in illness severity and length of time confined to bed. All subjects tolerated the treatment well. The study’s lead author, Dr. Silvio de Flora, commented that “Administration of N-acetyl cysteine during the winter, thus, appears to provide a significant attenuation of influenza and influenza-like episodes, especially in elderly high-risk individuals.”

Influenza is a complex disease with multiple targets, most notably inflicting damage to lung tissue through extreme oxidative stress and inducing genes for a large variety of inflammatory mediators. At the microscopic level the destruction is vivid. The influenza virus causes such intracellular turmoil that the term “cell boiling” has been used to describe the devastation. But pretreatment of cells with NAC significantly offsets these effects, reducing the oxidative and inflammatory burden within lung tissue through multiple mechanisms.

NAC has now been shown to protect laboratory mice from lethal influenza infection, synergistically enhancing the effects of several common antiviral medications. And a nutrient mixture containing NAC, green tea extract, certain amino acids and micro-nutrients had powerful antiviral effects in cultured cells, rivaling those of prescription flu drugs such as amantadine and oseltamivir (Tamiflu). The NAC-based mixture actually affected viral replication for a longer period than did the drugs.

**N-Acetyl Cysteine’s Broad-Spectrum Benefits**

- Long relegated to infrequent use in unusual circumstances, the amino acid-derived compound N-acetyl cysteine (NAC) has drawn increased scientific attention.
- NAC replenishes levels of the intracellular antioxidant glutathione (GSH), which is often deficient with advancing age and in chronic illness.
- NAC also regulates expression of scores of genes in the pathways that link oxidative stress to inflammation.
- These dual effects give NAC a unique role in the prevention and treatment of many common diseases, both acute and chronic.
- NAC can protect against avian influenza and more common seasonal flu symptoms.
- NAC reduces the frequency and duration of attacks of chronic obstructive pulmonary disease (COPD) and may slow the clinical course of idiopathic pulmonary fibrosis (IPF).
- NAC protects tissues from the effects of exercise-induced oxidative stress, adding value and safety to your workout.
- NAC improves insulin sensitivity in people with some of the most difficult-to-treat metabolic disorders.
- NAC blocks cancer development at virtually every step in the process, and through multiple mechanisms, making it an important cancer chemopreventive agent.
- NAC fights the stomach infection Helicobacter pylori on two fronts, inhibiting the organism’s growth while reducing production of inflammatory cytokines that can lead to gastritis and cancer.
- Though most individuals gain benefits from 600-1,800 mg/day, clinical studies have found that doses of up to 2,000 mg/day are safe and effective. A recent study demonstrated the safety of 2,800 mg/day for 3 months in patients with COPD.
NAC AND PULMONARY ARTERIAL HYPERTENSION: A REAL RISK?

N-acetyl cysteine (NAC) produces numerous beneficial effects in many human tissues both by supporting natural antioxidant systems and by favorably affecting expression of genes involved in the inflammatory response. A 2007 study in laboratory mice, however, has raised a theoretical concern that chronic NAC administration in those animals might produce a condition called pulmonary arterial hypertension. Here is a review of that study and some reassuring facts:

The Issue

Pulmonary arterial hypertension (PAH) is an elevation in blood pressure in the arteries leading from the heart to the lungs. It is one of the consequences of chronic hypoxia (lack of sufficient oxygen) that occurs in a number of chronic cardiovascular and pulmonary (lung) diseases. It also arises in people with obstructive sleep apnea. It is a rare condition, but when it occurs it can be difficult to detect and may be fatal if untreated. Its causes remain unclear, but they seem to involve signaling molecules produced during hypoxia; some of those molecules include those involved in detecting and responding to oxidative stress.

The Concern

Scientists at the University of Virginia School of Medicine were studying the molecular signaling involved in hypoxia-related development of PAH when they observed what seemed to be a concerning finding: mice treated with NAC over periods of 3 weeks were developing PAH that mimicked the effects of chronic hypoxia. The scientists were not studying the effects of NAC itself; they were simply using it to measure other nitrogen-related transfer reactions in blood. And the doses they used correspond to a human dose of about 20 grams (20,000 mg) per day—far above any known supplement recommendation. Nevertheless, parts of their report were cited in one commentary as raising “the concern that chronic NAC therapy may induce similar vascular pathology in patients.”

Is this a realistic concern, or is it a laboratory anomaly? Here’s the evidence to date.

The Evidence

The Virginia team’s mouse study was published in 2007. Now, nearly 3 years later, there has not been a single additional publication connecting NAC therapy with PAH in either animals or humans. In reality, a substantial amount of science both before and after the 2007 report suggests just the opposite—that NAC may be instrumental in reducing, not increasing, the oxidant-induced blood vessel changes that occur in PAH. Here are the highlights:

- In one of the original animal studies demonstrating that oxidative stress contributes to development of PAH induced by hypoxia, NAC actually reduced the heart and lung changes that lead to PAH, in part by reducing toxic peroxide molecules.
- NAC, given before and at the beginning of experimental hypoxia, was effective at preventing PAH, including deadly heart muscle changes, in laboratory rats.
- NAC protects experimental animals’ lungs from the acute lung injury caused by a variety of mechanisms involving hypoxia, oxidant stress, and inflammation, through its joint antioxidant and anti-inflammatory actions.
- A study of human volunteers revealed that NAC supplements at 1,800 mg/day increased the healthy respiratory response to hypoxia, which normally declines strongly with age and may contribute to PAH. Although this study was cited by the Virginia group as supporting their concern about NAC inducing PAH, no such evidence is presented in the human study, and in fact the authors conclude that NAC treatment “may be useful for elderly subjects and for patients who have other conditions with an oxidative shift… such as coronary heart disease and malignant diseases.”

The Recommendation

There have been no further publications supporting this one-time observation made in an animal model using doses 10-20 times those suggested for long-term human supplementation. No human study has uncovered any evidence for a similar effect in humans. By contrast, there have been numerous studies demonstrating human benefit from NAC supplementation at moderate doses (1,200-1,800 mg per day) over the course of nearly 4 decades. At this point the known benefits of NAC appear to outweigh any potential risks. As with all supplementation, people should communicate clearly with their healthcare providers about how supplements and medications might work jointly to influence their health.
In the words of prolific medical theorist Mark F. McCarty, "The most foolproof way to promote survival in epidemics of potentially lethal influenza is to target... intracellular signaling pathways which promote viral propagation or lung inflammation." McCarty goes on to cite NAC’s benefits as a multitargeted supplement with precisely those attributes. NAC at doses of 600 mg twice daily may significantly reduce the risk of a devastating bout of influenza.

**Lung Disease Defense**

Chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and chronic emphysema, is a rapidly growing problem with global impact. COPD is the result of years of oxidative damage to delicate lung tissue, with resultant chronic inflammatory changes. The disease is worsened by air pollution and cigarette smoking, but is by no means limited to people with those exposures. Over time, victims’ damaged airways may become colonized with dangerous bacteria, leading to chronic infection and still more inflammation in a vicious cycle. Current treatment consists mainly of anti-inflammatory steroids and lung-opening medications used in asthma, with the addition of antibiotics when infection threatens.

With its ability to reduce oxidative stress and simultaneously quash chronic inflammatory changes, NAC is emerging as a game-changing therapy in COPD. A randomized pilot study of adults with acute exacerbation of chronic bronchitis and positive bacterial culture in the sputum demonstrated that 600 mg of NAC twice daily led to a near doubling of the rate of bacterial eradication compared with standard therapy, while reducing the number and duration of acute exacerbations and improving quality of life. NAC treatment of patients with moderate-to-severe COPD improved their physical performance on lung function tests, especially after exercise.

Patients with advanced COPD frequently require low-dose oxygen therapy because of their lung damage. In many cases, however, oxidative stress induced by the disease has already rendered them glutathione deficient, so they have diminished protection against ongoing oxidation. NAC administration at doses of 1,200-1,800 mg/day along with low-dose oxygen powerfully counteracts this oxidative stress. At doses of 1,800 mg per day, it has been shown to completely prevent further protein oxidation. A dose of 600 mg twice daily over a 2-month period rapidly reduced exhaled hydrogen peroxide, a measure of oxidative burden in COPD sufferers.

In one study utilizing a dose of just 600 mg per day for 10 weeks, NAC disrupted the molecular relationship between oxidative stress and inflammation, protecting lung tissue. When NAC is added to inhaled corticosteroids, still further reductions in inflammatory parameters are found.

Emphysema can be the unfortunate endpoint of advanced COPD, with lung tissue breaking down and losing much of its ability to exchange oxygen and carbon dioxide. Animal studies show that NAC attenuates COPD-related lung damage and emphysema by
supporting expression of important protective genes in the cells lining the lung.41

Another devastating chronic lung condition called idiopathic pulmonary fibrosis (IPF) also involves increased oxidative burden and a deficiency of glutathione in lung tissue and fluids.42 This progressive disease has a poor prognosis, even when treated with standard corticosteroids and powerful prescription anti-inflammatory drugs.43,44 The median survival is only about 3 years regardless of therapy.45

Oral NAC supplements now offer a ray of hope for IPF sufferers. NAC significantly increases lung glutathione levels in both animal and human studies of IPF.42,46 Given as an aerosol treatment, NAC may delay disease progression, and at doses of 600 mg three times daily preserves lung vital capacity and gas exchange better than standard therapy alone.43,44

In summary, evidence suggests that NAC may offer benefits at doses of 600 mg 2-3 times daily for people who have, or are at risk for, chronic lung conditions such as COPD and IPF (idiopathic pulmonary fibrosis).

**Reduce Exercise-Induced Oxidative Stress**

Health-conscious people know that regular moderate exercise is vital to maintaining the integrity of the human body. Of course, everything has its price, and the rapid increase in metabolic activity during exercise produces some unwanted side effects.20 These include an increase in oxidative stress that can overwhelm the body's antioxidant defense mechanisms and lead to tissue damage and abnormal activity of certain immune system cells.47,48 Exercise also increases plasma levels of inflammatory cytokines such as TNF-alpha and various interleukins.49 The solution, of course, is not to reduce your exercise regimen, but rather to look for ways to optimize the way your body handles those metabolic challenges.

NAC, with its powerful antioxidant and gene-regulating powers, is an excellent means of maintaining good exercise performance and limiting the damage caused by oxidative stress in the process. Supplementation with NAC (2,000 mg daily for 3 days, followed by 800 mg prior to exercise) in strenuously exercising adults lowered key interleukin levels to undetectable amounts and abolished the exercise-induced TNF-alpha response.49 And in patients with severe COPD, NAC supplementation improved exercise endurance time by 25% compared with placebo, while significantly reducing levels of oxidative molecules released by stimulated immune cells.50 NAC supplementation also dramatically curtailed production of oxidized proteins in this group of highly oxidant-stressed chronically ill patients.

In vigorously exercising men, 1,800 mg per day of NAC prevented the expected decline in intracellular antioxidant levels and increased activity of the enzyme responsible for recycling and restoring glutathione to normal levels, protecting cells from oxidative stress.51 And in mice, NAC supplementation significantly protected brain tissue against exercise-induced oxidative changes.52 NAC also preserves normal levels of vital lymphocytes, which can decline after vigorous exercise.48,53-55

Regular supplementation with NAC at up to 1,800-2,000 mg per day may be an effective means of optimizing exercise performance while minimizing the effects of exercise-induced metabolic stress.

**Bring Glucose Levels Under Control**

Oxidative stress and inflammation are closely linked to insulin resistance and rising blood glucose levels. These effects are not limited to those with diabetes, but in fact are found even in obese, non-diabetic people and those with metabolic syndrome.56 There are multiple steps in the cascade of events leading from oxidation to damaged insulin receptors and insulin resistance, so it makes sense to seek a supplement that can target many of those steps independently.57,58 NAC is emerging as one such multi-targeted supplement.56

Over time, chronic high blood sugar initiates a downward spiral by helping generate advanced glycation end-products (AGEs) that then impair normal responses to insulin, perpetuating elevated sugar
levels. NAC reverses those effects in laboratory models. Increasing blood sugar levels in laboratory animals triggers a pro-inflammatory response in fat tissue—also effectively reduced by NAC. In an experiment that recreates a common human dietary trend, rats were given a diet high in the sweetener fructose, which produced increased blood pressure, plasma insulin levels, and triglyceride levels. Yet all of these dangerous physiological alterations were inhibited by NAC.

Human studies of NAC to improve insulin sensitivity have recently appeared, especially in a group of people typically very difficult to treat. Profound insulin resistance is seen in women with polycystic ovary syndrome (PCOS), along with a variety of other metabolic disturbances. One study showed that NAC at 1,200 mg per day along with 1,600 mg of the amino acid arginine promoted a trend toward normal ovulatory cycles and substantially improved insulin sensitivity. A short-term study showed that 1,800 mg of NAC daily helped improve insulin sensitivity in women with PCOS.

Virtually all Americans consume too many calories and are at risk for at least some degree of insulin resistance. Daily supplementation with NAC at 1,200 to 1,800 mg per day may help to reduce the impact and slow the damage wrought by AGEs.

Cancer Prevention

The strong and growing links between oxidative stress, inflammation, and cancer make NAC a natural go-to compound for cancer chemoprevention. True to form, NAC has multiple anti-cancer activities acting at multiple targets to provide layers of cancer protection against a large variety of cancer types. NAC induces programmed cell death (apoptosis) in multiple types of human cancer cells. In human gastric cancer cells, NAC not only induces apoptosis, but also stops DNA synthesis, preventing cancer the cells from replicating. In melanoma cells, NAC inhibits NF-kB, preventing expression of signaling molecules needed by the cancer for growth. NAC inactivates and promotes destruction of c-Src, a chemical control molecule that is overproduced in many human cancers, providing a completely unique means of slowing or stopping tumor development. Finally, NAC protects DNA from breakage induced by ionizing radiation, but does not prevent cell destruction by radiation. That’s a vital finding because it means that NAC might allow radiation therapy to effectively kill cancer cells while minimizing the risk of so-called secondary cancers that could otherwise arise as side effects of the radiation.

Animal studies strengthen the case for NAC still further. NAC protects mice from cigarette smoke-induced lung cancers and other lung changes, a finding with enormous implications not only for current smokers but for ex-smokers and people exposed to second-hand smoke. NAC protects rats from chemically-induced liver cancers immediately following tumor initiation. This early interference with cancer development bodes well for NAC as a chemopreventive agent in the many human toxin-related cancers.

Human studies are similarly encouraging, even in the most challenging patient groups such as smokers. A randomized, double-blind chemoprevention trial of NAC 600 mg twice daily for 6 months vs. placebo in otherwise healthy smokers showed a significant reduction in formation of damaged or oxidized DNA segments, telltale early markers of cancer development in lung fluid. The same study also demonstrated reductions in abnormal, pre-cancerous cell changes in the mouths of supplemented smokers. These effects support the scientists’ conclusion that NAC can reduce tobacco smoke carcinogenicity in humans. Colon cancer is another malignancy with strong links to oxidative stress and inflammation. Preliminary studies in humans show a 40% reduction in colorectal polyps in patients given 600 mg per day of NAC, compared with controls. In a group of people with a previous history of pre-cancerous colonic polyps, 800 mg per day of NAC for 12 weeks significantly reduced the proliferative index, indicating a decreased risk of colon cancer.

Supplementing with 600-1,200 mg per day of NAC appears to be an entirely appropriate means of adding to your general cancer-prevention strategy.
**Gastritis, Ulcers, Cancer, and *Helicobacter pylori***

*Helicobacter pylori* is a bacterium that colonizes various regions of the stomach and upper part of the small intestine. *H. pylori* infection produces major oxidative stress on tissues already vulnerable to extremes of pH and other chemical challenges, and the resulting inflammation produces pain and promotes development of gastric and esophageal cancers. NAC is an obvious candidate for fighting *H. pylori* infections, both because of its powerful ability to interfere with the oxidant-inflammation connection, and also because of its potential to break down some of the gastric mucous layer beneath which the organism hides.

NAC fights *H. pylori* in at least two ways. It markedly inhibits growth of *H. pylori* both in culture dishes and in live mice, helping to reduce the total load of organisms present. But NAC also powerfully regulates gene expression in stomach lining cells, reducing hydrogen peroxide production induced by *H. pylori*, and decreasing activation of NF-kB and subsequent release of inflammatory cytokines. In human trials NAC improves eradication rates of *H. pylori* produced by standard treatment with antacids and antibiotics, when given at doses of 1,200 mg per day.

People who have gastritis or gastroesophageal reflux disease (GERD) may be infected with *H. pylori* and may benefit from supplementation with 1,200 mg per day of NAC, especially during co-treatment with drugs to eradicate the organism.

**Summary**

N-acetyl cysteine is a broad-spectrum compound traditionally under-utilized in conventional medicine. A burst of new clinical research reveals that NAC exerts dual effects, functioning both as a powerful antioxidant that replenishes cellular antioxidant systems (glutathione in particular) and also as a potent modulator of gene expression, regulating inflammation at multiple, fundamental levels. It has been shown to be an effective intervention against influenza, chronic lung diseases, cancers, insulin resistance, and gastritis caused by *H. pylori*. NAC’s further value is shown in its ability to mitigate otherwise inevitable metabolic and immunological disturbances caused by exercise.

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**


Milk thistle extract has long been valued for its role in ensuring healthy liver function, and it is also a powerful antioxidant.1*

Milk thistle extract consists of silybinin and other similar compounds. Until recently, scientists focused their research on silybinin, as it was the most abundant and biologically active ingredient found in milk thistle extract.

Highly advanced extraction technology has now enabled scientists to isolate silymarin constituents and to test their efficacy against various cell lines. Among the compounds tested, a silymarin constituent called isosilybin B proved to be the most efficient in maintaining healthy cell division.2*

Mega Silymarin with Isosilybin B is the first milk thistle extract to contain standardized, high potencies of silymarin, silybinin, and isosilybin B—providing the full spectrum of milk thistle's liver and prostate protective compounds. Each capsule of this advanced formula provides:

Milk Thistle Extract (Silybum marianum) (seed) 900 mg
[standardized to 80% Silymarin by UV (720 mg), 30% Silybinin by HPLC (270 mg), and 4.5% Isosilybin B complex by HPLC (40.5 mg)]

A 100-capsule bottle of Mega Silymarin with Isosilybin B retails for $42. If a member buys four bottles, the cost is reduced to only $28.50 per bottle—a savings of nearly one third! Each bottle will last a healthy person for at least three months.

Compare the price of Mega Silymarin with Isosilybin B to commercial silymarin supplements, and members will see that this new formula is available at one of the lowest costs per milligram—with potent, standardized concentrations of silybinin and isosilybin B not found in other milk thistle extracts!

Reference

Contains rice.

*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.
Diminished levels of neurotransmitters and other brain compounds profoundly affect cognition and memory in aging adults. Cognitex was developed in 1982 to increase brain levels of acetylcholine — a neurotransmitter that enables neurons to communicate. Over the years, Cognitex has been improved with the addition of nutrients used in Europe to protect and enhance neurological function.

Cognitex with Pregnenolone & NeuroProtection Complex provides the following scientifically validated nutrients to provide broad-spectrum neurological support:

- **Uridine-5'-monophosphate (UMP)** is a phosphatide building block of RNA-DNA that is critical to optimal brain function and the health of neuronal cell membranes. Naturally found in the milk of nursing mothers, UMP is essential not only for the growth and development of infant brains, but also for healthy cognitive function in aging adults.

- **Sharp-PS® GOLD**, a rich phosphatidylserine compound bound to DHA, promotes already-normal neuronal cell membrane function and structure.

- **Alpha-glyceryl phosphoryl choline (A-GPC)** boosts acetylcholine, a critical neurotransmitter that declines with age.

- **Vinpocetine** enhances circulation and oxygenation to brain cells, improves neural electrical conductivity, and protects against neuron-destroying excitotoxicity.

- **Phospholipid-grape seed extract** bound together results in a compound that is better absorbed into the bloodstream where it improves blood vessel tone and elasticity, thus enhancing blood circulation and oxygen flow to the brain.

- **Wild blueberry extract** protects against free-radical damage in the brain and helps maintain fluid balances already within the normal range.

- **Sensoril® Ashwagandha Extract** helps alleviate mental fatigue by inhibiting an enzyme (acetylcholinesterase) that degrades acetylcholine in the aging brain.

- **Proprietary NeuroProtection Complex Blend** contains standardized extracts of hops, ginger, and rosemary — proven to help with inflammation.

- **Pregnenolone** is a hormone that may be especially beneficial to the brain.

The retail price for 90 softgels of Cognitex (with or without pregnenolone) is $74 (item #00922) and $72 (item #00921), respectively. If a member orders four bottles of either version, the price per bottle is reduced to just $49.95 and $48, respectively.

**Caution**: Cognitex is also available without pregnenolone for those with existing steroid hormone-sensitive cancer.

Perluxan® is used with permission. Sensoril® is protected under US Patents Nos. 6,153,198 and 6,713,092, and is a registered trademark of Natreon, Inc. Sharp-PS® GOLD is a registered trademark of Enzymotec Ltd.
TAP THE POWER OF N-Acetyl Cysteine

For more than forty years, the antioxidant compound N-acetyl cysteine or NAC has been recognized for its role in supporting bronchial and respiratory health.1-10 Today, a burst of renewed scientific interest has yielded fresh insights into its role in supporting overall health.

At the core of N-acetyl cysteine’s power is its ability to support healthy cellular levels of glutathione (GSH), a nutrient utilized by all cells for protection against free radical damage and insults from foreign compounds.

N-acetyl cysteine directly contributes to glutathione production and stimulates enzymes involved in maintaining glutathione, providing critical energy and support for cell function across multiple systems of the body. Over thirty placebo-controlled clinical trials involving cellular glutathione have indicated beneficial effects of oral N-acetyl cysteine on health, quality of life, and well-being.11

Aside from its role in glutathione synthesis, N-acetyl cysteine serves as a highly bioavailable nutrient in its own right. Upon ingestion, it is readily absorbed and promotes direct cellular protection throughout the body via multiple physiological pathways.12-21 It provides immune support, helps liver cells to efficiently metabolize lipids and neutralize free radicals,22 and has been shown to supply nutritional support to neurons in the presence of oxidative stress.23

Individuals seeking support for system-wide health with Life Extension® N-Acetyl Cysteine may choose to ingest between 600-1,800 mg per day.

The retail price for a bottle containing 60 600 mg capsules of N-Acetyl Cysteine is $14. If a member buys four bottles, the price is reduced to just $10.13 per bottle.

Caution: Those who supplement with NAC should drink six to eight glasses of water daily in order to prevent cysteine renal stones. Cysteine renal stones are rare but do occur.

References

To order N-Acetyl Cysteine, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
It’s been almost thirty years since the final episode of *The Incredible Hulk* television series aired, but the show’s star, Lou Ferrigno, 58, still has the presence of the iconic comic book hero—minus the green paint and wig, of course. In person however, Ferrigno more closely resembles another character he played on screen: Hercules. For the bodybuilder-turned-movie star, both roles marked what could be called “dream come true moments,” as he idolized the *Hulk* comic books as a child and credits actor Steve Reeves’ original portrayal of Hercules as a major reason he got into bodybuilding.

But after spending nearly forty years at the top of the fitness world, it’s questionable whether even Hercules himself could have maintained his Herculean physique for as long as Ferrigno has. Not to mention the fact that after nearly half a lifetime of playing action stars and super heroes, he’s reinvented himself in the comedy world with his recent co-starring turn in the 2009 hit comedy *I Love You, Man*. > >
What's at the core of Ferrigno's success? The answer is simple: a commitment to healthy living. Standing at 6'5'' and still weighing a rock solid 250 pounds, Ferrigno is a walking testament to a life spent devoted to nutrition and fitness.

"I have a tremendous passion for fitness," Ferrigno says. "And now as I age, I want to maintain what I have. I like being lean and light."

**TRIMMING DOWN**

For someone who competed against Arnold Schwarzenegger in the Mr. Olympia bodybuilding contest in 1974 at a staggering 285 pounds, being light is a relatively unique concept. However, like most people, Ferrigno has had to make various adjustments as he's aged, one of them is learning to control his appetite.

"The difficult thing for me now as I get older is to eat enough to satisfy my hunger without overeating," Ferrigno says. "I eat three times a day and maybe a snack at night."

This is a far cry from the 8,000 to 10,000 calories a day he would consume when he was competing for bodybuilding titles. Still, just as important as eating less is eating smart, and Ferrigno's personal eating regimen is based on his own version of the much publicized Mediterranean diet.

"Go back to the days of the Romans and Greeks," Ferrigno says. "They just had fruits and vegetables. They didn't have fried foods or heavy dressings. I eat the way they ate, focusing on fruits, vegetables, fish, and some meat. I avoid butter, salt, foods high in fat and sodium as well. Everybody wants the easy way out, but you need to have discipline. I probably eat half as much as I used to."

Ferrigno, who has been a personal trainer for some of the biggest stars in entertainment, including Chuck Norris, Mickey Rourke, and the late Michael Jackson, preaches discipline as well as balance when it comes to eating well to maintain a healthy lifestyle.

"You really need to eat balanced," Ferrigno says. "Too many people skip breakfast, have a quick lunch and then eat a big dinner. That's not the way to do it. You have to be consistent with your eating."

**CONSISTENCY IS KEY**

Consistency is a word you hear a lot when you talk to Ferrigno—consistent eating, consistent exercising, consistent living. It's no wonder then that while he may not be as strong as he was ten or twenty years ago, his commitment to healthy living has kept him in such tremendous condition that he can still go almost rep for rep in the weight room when he lifts with his son, Lou Jr., who is only two years removed from being a linebacker on the University of Southern California's football team.

In fact, as he approaches 60, nearly everyone Ferrigno works out with at the Gold's Gym in Venice Beach, California, a.k.a., the Mecca of Bodybuilding, is younger than he is, but that doesn't stop him from throwing around weights usually reserved for men half his age.
“Exercising as you get older becomes more and more about having proper form,” Ferrigno says. “I have no injuries in my upper body because I have always focused on perfect form. As I get older, I feel more comfortable and more efficient. I feel better than ever.”

Ferrigno also focuses more on cardio now because he acknowledges that as he’s gotten older, it takes a little longer to recuperate. “I make sure I get a full stretch, too,” he says. “And I don’t lift as many sets. You only need to do body parts two or three days a week to see the benefits of an exercise program. Personally, I like to challenge myself, so I’ll create different short term goals to try and meet. It keeps me focused.”

In addition to changing his workouts to fit his goals, Ferrigno has also beefed up his supplement regimen to reflect his current health strategy.

“My workouts have adapted to the change in my body and the change in my goals,” Ferrigno says, “but the supplements that I take haven’t changed that much over the years. I still take a multivitamin every day and I take vitamin E, calcium, and magnesium. One of the things that I’ve added is vitamin D to help prevent osteoporosis and to boost my immune system. The supplements are good for my heart, good for my skin, and they help prevent future health problems.”

Whether he’s winning Mr. America and Mr. Universe titles, playing for the Toronto Argonauts of the Canadian Football League, competing in the World’s Strongest Man contest, becoming a deputy for the Los Angeles Sheriff’s Department, or pursuing successful careers in television, film, and theater, Ferrigno has always managed to surpass expectations by keeping his core commitment to healthy living, which is why he’s not only the Incredible Hulk, he’s the seemingly Ageless Hulk as well.

Learn more about Lou Ferrigno at www.louferrigno.com
A huge percentage of men over age 50 suffer from prostate-induced discomforts.

Ultra Natural Prostate Formula contains the most scientifically substantiated nutrients to help protect the prostate gland and maintain its healthy function.

Now included in the formula is a standardized European pumpkin seed oil extract rich in delta-7 sterols and fatty acids to support a healthy prostate.¹ A supercritical CO₂ extraction technology supplies optimal amounts of these key phytonutrients to complement the fatty acid composition of saw palmetto. It is sourced from a unique variety of pumpkin cultivated specifically to yield higher ratios of these compounds than pumpkins grown for commercial use.

The nine additional active ingredients in Ultra Natural Prostate Formula are:

- **Saw palmetto extract.** A number of normal biological events in aging men affect the prostate gland. Saw palmetto has been shown to interfere with DHT activity in the prostate, inhibit alpha-adrenergic receptor activity (to support normal urinary flow), and help control inflammatory actions in the prostate gland.²⁻⁴ A novel DeepExtract™ extraction technology ensures the most desirable and complete profile of saw palmetto available.

- **HMRLignan™** Norway spruce and ActiFlax™ flax lignan extracts. Standardized lignans from Norway spruce and flax seeds convert to enterolactone that is then absorbed into the bloodstream where it provides significant biological effects. Enterolactone has demonstrated anti-estrogen and anti-DHT effects that are of particular importance for the aging prostate gland.⁵⁻⁷

- **5-LOXIN® boswellia extract.** Published studies show that normal aging and poor diet cause levels of a dangerous enzyme (5-lipoxygenase) to increase, which can affect prostate cells. 5-LOXIN® is a patented extract from the boswellia plant that has been shown to suppress 5-lipoxygenase in addition to other pro-inflammatory factors.⁸⁻¹⁰
• **Nettle root extract** (*Urtica dioica*). Testosterone converts to estrogen at higher rates as men age. Prostate cells are sensitive to estrogen’s growth stimulatory effects. Nettle root helps support prostate cells against excess estrogen levels.

• **Pygeum.** Normal aging results in levels of certain prostaglandins increasing in the prostate gland. *Pygeum africanum* extract helps suppress these prostaglandins, keeping the prostate gland placid and promoting prostate comfort.

• **Beta-sitosterol.** The most biologically active constituent of pygeum is beta-sitosterol. Beta-sitosterol from other plant sources is also included in this prostate support formula.

• **Cernitin.** This European pollen extract has been shown to relax smooth muscle tone of the urethra, counteract DHT, and help regulate inflammatory reactions.

• **Boron.** In addition to helping protect bones, this mineral has been shown to slow elevation of prostate-specific antigen (PSA)—a benefit seeming to occur as a result of boron’s positive effect on the presence of protein-degrading enzymes in the prostate gland.

• **Lycopene.** This carotenoid, associated with the tomato’s red color, helps maintain healthy DNA gene function in prostate cells.

The daily dose of two softgels of **Ultra Natural Prostate Formula** provides:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>USPlus® Saw Palmetto (C0 2 DeepExtract™)</td>
<td>320 mg</td>
</tr>
<tr>
<td>Cernitin</td>
<td>252 mg</td>
</tr>
<tr>
<td>5-LOXIN®</td>
<td>70 mg</td>
</tr>
<tr>
<td>Pumpkin seed oil (Cucurbita pepo) extract (standardized to 85% total fatty acids)</td>
<td>200 mg</td>
</tr>
<tr>
<td>Stinging nettle root extract (<em>Urtica dioica</em>)</td>
<td>240 mg</td>
</tr>
<tr>
<td>Pygeum extract</td>
<td>100 mg</td>
</tr>
<tr>
<td>Lycopene</td>
<td>10 mg</td>
</tr>
<tr>
<td>Phytosterol complex (standardized to 26.6% beta-sitosterol)</td>
<td>678 mg</td>
</tr>
<tr>
<td>HMRlignan™ Proprietary blend of Norway Spruce and ActiFlax™ Flax Lignan extracts</td>
<td>20.15 mg</td>
</tr>
<tr>
<td>Boron</td>
<td>3 mg</td>
</tr>
</tbody>
</table>

**Ultra Natural Prostate Formula** provides scientifically validated standardized plant extracts that have been shown to promote healthy prostate function. No other prostate protection formula provides such a broad array of nutrients to support the multiple factors involved in maintaining a healthy prostate gland. Contains soybeans.

The retail price for one bottle of **Ultra Natural Prostate Formula** is $38. If a member buys four bottles, the price is reduced to **$26.25 per bottle**.

**References**


S-LOXIN® is a registered trademark of P.L. Thomas & Co., Inc. U.S. 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.

**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. These products are not intended to diagnose, treat, cure, or prevent any disease.
Many people striving for peak performance—or just concerned about heart health in general—are unaware that depletion of cellular energy in heart and muscle tissue can affect normal daily function.

The primary energy source for all cellular processes is a molecule known as ATP (adenosine triphosphate). Healthy, active cells constantly replenish their supply of ATP to produce vital cellular energy. However, under conditions of strenuous exercise, stress, injury, or aging, critical body tissues such as heart and skeletal muscles may not replenish ATP as quickly.

D-ribose, a carbohydrate molecule found in every living organism, facilitates the production of ATP. In studies of healthy athletes, as well as those who have suffered injury to the heart muscle, supplying fatigued muscle cells with D-ribose quickly restored ATP levels to normal.1-4

D-Ribose Caps and D-Ribose Powder can help speed energy recovery, increase energy reserves, and maintain youthful energy levels in heart and muscle tissue.

• For healthy adults seeking to optimize their physical performance or simply restore everyday energy and strength, the recommended daily dose of six capsules of D-Ribose Caps taken with food supplies 5,100 mg of patented Bioenergy RIBOSE®, a premium patented brand of ribose studied in many clinical trials and recommended by leading cardiologists.

• For adults seeking maximum energy support for heart and muscle tissues, the recommended dose is one scoop of D-Ribose Powder taken twice daily. Each one-scoop serving supplies 5,000 mg of Bioenergy RIBOSE®. D-Ribose Powder can also be taken in one 5,000 mg dose just before exercise and another 5,000 mg dose just after exercise.

“Managing my energy is crucial for my performance. When it’s go-time, products with Bioenergy Ribose® get me ready to go at top speed. Because it’s a natural ingredient, I feel good about using it.”

— Katherine Reutter, Olympic Speed Skater 2010 Silver Medalist
“Of all the products I've tried during my career, only those with Bioenergy Ribose® have allowed me to train this hard and recover this quickly.”
— Shannon Bahrke, Olympic Freestyle Mogul Skier 2010 Bronze Medalist

A bottle containing 120 capsules of 850 mg D-Ribose Caps retails for $32. If a member buys four bottles, the price is reduced to just $21.60 per bottle. A jar containing 30 servings of 5,000 mg D-Ribose Powder retails for $27.50. If a member buys four jars, the price is reduced to just $18.56 per jar.

To order D-Ribose Caps or Powder, call 1-800-544-4440 or visit www.LifeExtension.com

References

Caution: D-ribose can actually lower blood sugar levels. Therefore, people with insulin-dependent diabetes should check with their health care practitioner before taking it. D-ribose should be taken with meals, or mixed into juice, milk, or fruit, to offset the blood glucose-lowering effect.
It is a system that is under constant assault. Aging, stress, and exposure to synthetic chemicals and a host of unwanted microorganisms can all affect the GI tract. The results may be system-wide, ranging from joint discomfort to persistent inflammatory conditions.

While Immune Protect serves as an immune booster, and Agave Digestive-Immune Support nurtures beneficial bacteria in the gut, i26® may complement these effects in a number of synergistic ways, for youthful immune balance.

i26® is an all-natural powder produced from the eggs of hyper-immunized hens. It has been clinically shown over the past 20 years to support the immune system and help with gastrointestinal insults and digestive issues.

The serving size of 1 scoop (4.5 g) of i26® Hyperimmune Egg provides the ideal daily dose of egg immune components.

A bottle containing 140 grams of i26® Hyperimmune Egg powder (31 servings) retails for $49.99. Life Extension® members pay only $42 per jar.

This product may not need to be taken every day. Some people keep it on hand for special occasions when the need to support optimal immune health arises.

**References**

To order i26® Hyperimmune Egg
call 1-800-544-4440 or visit www.LifeExtension.com
According to Dr. Keith Black, Al Qaeda are not the only terrorists we need to be on the alert for. Black, a neurosurgeon at Cedars-Sinai Medical Center in Los Angeles, likens a brain tumor to a guerrilla fighter—attacking stealthily on several simultaneous fronts.

“It acts more like a terrorist organization than a biological adversary,” writes Black in his recent book, Brain Surgeon: A Doctor’s Inspiring Encounters with Mortality and Miracles (Wellness Central, 2009). A brain tumor is “constantly changing and constantly shifting its guerrilla strategies,” Black explains. “In response, we constantly adjust our own attacks, striving to outsmart the tumor, pushing back the survival frontier, winning for the patient whatever time we can.”

It’s a perpetual battle in a larger, more insidious war. Point of fact, brain tumors are on the rise, and each year more than 200,000 people in the United States are diagnosed with brain cancer. In an especially worrying trend, brain tumors are currently the leading cause of solid tumor cancer death in children and young adults under the age of 20. The survival rate for those with a malignant tumor is a scant 32%.
Black, who has appeared on the cover of *Time* magazine as one of America’s Heroes of Medicine, serves as chairman of the Department of Neurosurgery and Director of the Maxine Dunitz Neurosurgical Institute at Cedars-Sinai. He is foremost among a group of approximately 3,000 neurosurgeons at work in the US today. Unfortunately, only 50 of them specialize in brain tumors, which means Black typically undertakes a heavy schedule of more than 250 surgeries a year.

**Chemical Culprits**

Based on his observations and long experience with his own patients, Black believes a primary reason for the sharp increase in brain tumors can be found in our environment. “It’s very well known that the risk of onset and development of cancer is a combination of one’s genetics—the natural ability of one’s body to neutralize toxins in the environment—offset by the quantity of exposure to those toxins,” he explains. “A classic example is the guy who lives to 105 while smoking two packs of cigarettes and drinking every day.” Black says this man’s genetics have allowed him to detoxify the damage from smoke and alcohol, and still remain healthy. “On the flip side, you can have a patient who has had much less environmental exposure to toxins, and still gets cancer.”

Over the past decade, Black and his colleagues examined a number of such relationships and their correlations with occupational risks. In at least one area, their conclusions match the statistics: regardless of any predisposed genetic “protections,” people who work in plastics factories have a much higher incidence of brain cancer because of exposure to vinyl chloride, a known carcinogen used in manufacturing products such as pipes, wire coatings, car parts, and housewares. Manufacturing plants release vinyl chloride into the air or water, but it can also leak into the environment after improper disposal. People who work in these plants or live in close proximity are known to have an increased risk for brain cancer.

Textiles workers are also at risk because they may be exposed to acrylonitrile, which is used in the production of synthetic rubber and acrylic fibers. When burned during production, the material releases fumes of hydrogen cyanide and other chemicals. The Department of Health and Human Services recently determined that acrylonitrile may be a risk factor for cancer.

Of course, not everyone works in or lives near a plastics plant. Black believes the evidence is equally strong behind a number of other suspected environmental factors. “Studies have looked at people who live close to golf courses, and their increased brain cancer risk due to the nitrates in pesticides,” he says. Toxic waste dumps have also been implicated, as well as power lines. “There are definite correlations, particularly in neighborhoods near large transformers. You tend to see clusters of cancer in these communities.”

**Eating Hazards**

Consumption of foods high in nitrates and other preservatives can play a role in causing brain tumors as well. Preserved meats like hot dogs, bacon, and cured ham fall under this category. Nitrates were originally used to help prevent the growth of bacteria that cause botulism and other food-borne illnesses. These nitrates would break down, forming nitrites. Eventually, nitrites themselves were added directly to the meat to speed up the curing process. Nitrites continue to be used in cooked meats to maintain the traditional pink color and cured flavor.
Nitrites contribute to the formation of potentially dangerous carcinogens in the body which can result in malignant tumor growth. As far back as 1995, a citizen petition submitted to the FDA called for the government to "label hot dogs that contain nitrites with a cancer risk warning." The petition was based on "accumulating scientific information on excess risks of childhood brain tumors... from the consumption of hot dogs containing nitrite preservatives."

And it's not just the foods themselves. Black is equally concerned about people who microwave their food in plastic wrap. "That's extremely worrisome, because the plastic can go right into the food," he warns. Here again, the primary culprit is vinyl chloride—which, after being microwaved, breaks down and enters food directly.

Editor's comments: If you do consume foods containing preservatives such as nitrate or nitrite, taking several grams of vitamin C, about 100 mg of chlorophyllin, and/or cruciferous vegetable extracts might help neutralize the carcinogenic potential of these foods.

Bad Air

People can avoid or reduce nitrate intake by monitoring their diet, but it's not quite that simple when it comes to reducing exposure to air pollution. "We are specifically suspicious of air particulate matter, nanoparticles in air pollution that can cross directly into the brain and cause tumors," says Black, adding that firemen, for example, have a proven increased risk of brain cancer from breathing fire engine diesel fumes in the station.

For commuters, Black says the risk is equally great. "We speculated that nanoparticles in automobile exhaust have a causal relationship with brain tumors. In the lab, we then found that even the brain cells of laboratory mice undergo a transition to suggest preconditions to converting to cancer when subjected to the type of air found on and around freeways—after just a few short months of exposure."

In his book, Black describes firsthand experience with one of his own cancer patients battling a tumor likely caused by air pollution. That patient spent his childhood and young adult life in the 1960s in Riverside, California, 50 miles inland from Los Angeles. Prevailing winds blew all of LA's exhaust fumes and airborne waste toward Riverside, which at the time had some of the worst air quality in the country. "His description made me cringe," says Black, "but it was only one of many contributing factors in his history."

Cell Damage

Cell phone use is a more high-tech threat that has been implicated in causing brain tumors for the past decade. "Studies from Switzerland and Sweden show a clear correlation between use of cell phones and brain cancer," says Black, who points to one study showing that people exposed to over 2,000 hours of cell phone use—about an hour a day over ten years—have increased tumor risk of 250% from microwave radiation. "With cell phones, however, you have articles published on both sides," he counters. "Other studies don't support these claims."

Given the ubiquitous presence of cell phones, why isn't this better publicized? Black explains the problem is one of time—or lack thereof: cell phones have only been around for a decade. "Cancer typically takes 20-30 years between exposure to an environmental toxin and development of a tumor. In other areas this is well correlated: we know for a fact that if you start smoking cigarettes in your teens, we don't expect to find lung cancer when you're 25. We expect to find it when you're 45 or 55."

Black says children and teens are more at risk from a cell phone's microwave radiation. "Their skulls are thinner, and the radiation penetrates deeper and has higher impact because the brain is in a... children and teens are more at risk from a cell phone's microwave radiation."
much more dynamic state, with nerve cells dividing much faster than an adult’s.” Indeed, Black points out that in laboratory models the most effective way to induce brain cancer is to expose a pregnant rat to an environmental toxin. “The mother doesn’t get cancer, but the embryo does.”

We haven’t had enough time yet for a definitive 20-30 year study of people’s cell phone habits. “What will those studies ultimately show when kids who have been using cell phones begin to get evaluated?” Black wonders. “The evidence we have now paints a very worrying picture.”

Again, Black experienced this firsthand with the death of his close friend Johnny Cochrane, who was O.J. Simpson’s attorney. Black believes that Cochrane’s brain cancer, a malignant glioma—what he calls “the Osama bin Laden of tumor terrorists”—was the result of frequent cell phone use, based on the fact that the tumor developed on the side of the head against which Cochrane held his phone. Interviewed in May, 2008 on Larry King Live, Black summed up opinions on both sides of the fence: “I think if we look at the evidence that we have now, it’s difficult to say that cell phones have a direct link to brain cancer; but it’s also difficult to say that they’re safe.” His ultimate advice is to be informed. “If you elect to use a cell phone, precautions like earpieces are not unwise,” he urges.

**Editor’s comments:** All electronic devices emit dangerous electromagnetic fields (EMFs). If anyone questions this, just buy a Gauss meter and see how high the needle jumps (indicating greater EMF activity) when you are close to any electronic device. Be it a cell phone or a land line phone, distance is the key to avoiding EMF exposure. Just use the speaker phone option on your cell phone and land line, keep the phone about 12 inches from your head, and you will not suffer high EMF exposure.

**A Constant Battle**

At first, it would seem impossible to win a war against an enemy that fights on so many different fronts, but there is evidence that the tide is turning. “We are actually making advances in our ability to treat brain cancer,” Black says. One of the more promising recent studies at Cedars-Sinai involves enlisting our own immune system. “There is a theory that we are developing cancer all the time, but if our immune system is able to recognize that cancer, it can eradicate it. We’re currently working on a therapeutic vaccine, and have shown in clinical trials that we can teach the immune system to fight cancer.” Made with a key component of our immune system called dendritic cells, the vaccine “reveals” bad proteins to the body’s killer T-cells. White blood cells then attack the cancer once they’re given the “scent.”

Nutrition is another powerful ally. “The mechanism of cancer is consistent among different types of tumors, so antioxidants seem to be beneficial in brain cancer as well,” says Black. “If you have a strong healthy immune system, you’re probably more resistant to developing cancer in the first place. Supplements that boost the immune system are beneficial. Also, if you eat foods free of preservatives or nitrates, your body has to expend less energy detoxifying those agents. Try to eat a lot of fruit, vegetables, and fresh organic foods without added hormones.”

In addition to this, Black himself incorporates omega-3 fish oil and a general multivitamin. He also meditates and exercises regularly to reduce stress. It’s a multi-pronged approach. “But remember, cancer acts like a terrorist,” he points out. “You have to fight it on multiple fronts.”

To contact Dr. Keith Black, visit www.cedars-sinai.edu/1088.html.

**Avoiding Brain Tumors**

Brain tumors are on the rise. As with any cancer, you can take steps to reduce your risk. The first step is to understand what those risks are and how they apply to you.

Environmental factors can play a large part in determining your cancer risk. Living in a community with poor air quality, living near a toxic waste dump or living near power lines and transformers have been known to increase risk.

Be proactive! Commit to quitting smoking and exercising more. “Eat a lot of fruit, vegetables and fresh organic foods without added hormones,” advises Black. “Antioxidants and supplements that boost the immune system are beneficial.”

Restrict the amount of food toxins (e.g., nitrates, preservatives) that you put into your body. Use earpieces or hands-free kits for cell phones, avoid plastic wrap on food (particularly when microwaving), and limit use of pesticides, particularly around small children.

Lastly, stay on top of the latest medical developments: the more you know, the better prepared you will be if you develop brain cancer.
As we get older our eyes become vulnerable to a variety of insults that can cause irritation, dry eye, and structural dysfunctions. Applying lubricating eye drops can alleviate eye discomfort.

Life Extension®’s Brite Eyes formula provides the best daily eye drops without irritation. Brite Eyes contains two proven lubricants (hydroxy-methylcellulose and glycerin) that are FDA-approved for ophthalmic use. Unlike conventional eye drop formulas, these lubricants are preserved with potent antioxidants and anti-glycating agents.

The Brite Eyes formula is buffered in a way to make it soothing to the eye. The suggested use of Brite Eyes III is to apply 1 to 2 drops in each eye every day.

Each box of Brite Eyes III contains two individual vials that provide 5 ml each. The reason for putting Brite Eyes into individual vials is to reduce the risk of bacterial contamination. Having small vials also makes it convenient for consumers to keep Brite Eyes readily accessible at home, the office, in one’s purse or pocket, and other places where access to a soothing eye drop is needed.

The retail price for a box containing two 5-ml vials of Brite Eyes III is $34. If a member buys four boxes, the price is reduced to $24 per box.

To order Brite Eyes III today, call 1-800-544-4440 or visit www.LifeExtension.com
The use of diets high in collagen to improve bone health dates back to ancient cultures. Now, Life Extension® brings you an exciting patent-pending formulation of chelated calcium and collagen called KoAct™ to help 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 have also been added for their bone-protective minerals and polyphenols.

Four capsules of Bone Strength Formula with KoAct™ provide:

- **Collagen** (from 3000 mg KoAct™ Calcium Collagen Chelate)........2700 mg
- **Calcium** (from 3000 mg KoAct™ Calcium Collagen Chelate)........300 mg
- **Vitamin D3** (as cholecalciferol)........................................1000 IU
- **Magnesium** (as magnesium citrate).................................100 mg
- **Silica** [from standardized Bamboo (Bambusa vulgaris) extract (stem)]..........................5 mg
- **Dried Plum** (Prunus domestica) extract (fruit)......................100 mg [standardized to 50% polyphenols (50 mg)]
- **Boron** (calcium fructoborate as patented FruiteX B® OsteoBoron®)..........3 mg

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.

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

Contains corn.

* 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.
Join us in Los Angeles for the Prostate Cancer Conference. The 1 ½ day conference features an impressive line-up of clinicians and researchers who will tackle subjects ranging from diet and nutrition, sexual health, erectile dysfunction, active surveillance, hormone treatments, radiation, chemotherapy and much more!

**CONFERENCE HIGHLIGHTS**

- **Presentations on:**
  - Chemotherapy
  - Hormone Blockade
  - Active Surveillance
  - Diet and Nutrition
  - Erectile Dysfunction
  - Radiation Therapy
  - The Current State of Immunotherapy
  - 2010: What Works & What’s Worthless
  - 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 all throughout the conference – courtesy of US TOO and Women Against Prostate Cancer

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

**FACULTY**

William Aronson, Duke Bahn, Marc Botnick, Richard Lam, Mark Moyad, John Mulhall

Charles Myers, Mack Roach III, Mark Scholz, Stephen Strum and Nicholas Vogelzang

Proudly produced by:
For the past 30 years, the Life Extension Foundation has stated that the most important step one can take to prevent disease cannot be found in a bottle of pills. The true cornerstone of any preventive health care program is annual blood screening. Proactive blood screening can help you greatly reduce your risk of disorders such as heart and kidney disease, stroke, liver conditions, anemia, and diabetes. Plus it’s particularly valuable in helping you prevent and treat symptoms associated with hormone imbalance, such as fatigue, memory impairment, bone loss, weight gain, and depression. Blood testing remains one of the most important things you can do for yourself and your loved ones. More than any other measure, annual blood testing holds tremendous potential to protect both yourself and your loved ones.

**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.)
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.

---

**Most Popular Tests for Annual Blood Test Screening (Member Prices*)**

**MEN’S ANNUAL BLOOD TESTING**

- **MALE LIFE EXTENSION PANEL (LC322582)**
  - CBC/Chemistry Profile (description on next page)
  - DHEA-S
  - PSA (prostate-specific antigen)
  - Homocysteine
  - C-Reactive Protein (high-sensitivity)
  - Free Testosterone
  - Total Testosterone
  - Estradiol
  - TSH for thyroid function
  - NEW & IMPROVED NOW INCLUDES TSH!

  **$199**

- **MALE HORMONE ADD-ON PANEL (LCADDM)**
  - Pregnenolone and Dihydrotestosterone (DHT)
  - THYROID ADD-ON PANEL (LCCTHYROID)
  - Free T4 & T3, T4 LE strongly recommends adding these important thyroid tests to the Male or Female Life Extension Panels, especially for those interested in weight loss.

  **$36**

- **VITAMIN D (25-OH) (LCB81950)**
  - This test is used to assess vitamin D status in your body.

  **$35.25**

- **OMEGA SCORE™ (LCOMEGA)**
  - Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score™ also includes your AA:EP ratio, allowing you to determine and track a major factor in total body inflammation.

  **$98**

**WOMEN’S ANNUAL BLOOD TESTING**

- **FEMALE LIFE EXTENSION PANEL (LC322535)**
  - CBC/Chemistry Profile (description on next page)
  - Estradiol
  - Homocysteine
  - C-Reactive Protein (high-sensitivity)
  - Pregnenolone
  - Total Testosterone
  - TSH for thyroid function

  **$199**

- **FEMALE HORMONE ADD-ON PANEL (LCADDF)**
  - Pregnenolone and Total Estrogen

  **$92.50**

- **THYROID ADD-ON PANEL (LCCTHYROID)**
  - Free T3 & T4 LE strongly recommends adding these important thyroid tests to the Male or Female Life Extension Panels, especially for those interested in weight loss.

  **$36**

- **VITAMIN D (25-OH) (LCB81950)**
  - This test is used to assess vitamin D status in your body.

  **$35.25**

- **OMEGA SCORE™ (LCOMEGA)**
  - Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score™ also includes your AA:EP ratio, allowing you to determine and track a major factor in total body inflammation.

  **$98**

---

**SUGGESTED ADDITIONS TO ANNUAL BLOOD TESTING**

- **FIBRINOGEN™ (LC001610)**
  - High levels of this blood-clotting factor increase the risk of heart attack and stroke.

  **$23.25**

- **COENZYMES Q10** (LC120251)**
  - Research is revealing that maintaining higher blood levels of CoQ10 may offer greater health benefits. This test measures blood levels of CoQ10.

  **$108.75**

- **CORTISOL (LC004051)**
  - This test is used to help assess adrenal function.

  **$29.25**

- **LP-PLA2 (PLAC TEST) (LC141275)**
  - 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.

  **$93.75**

- **VAP™ TEST (LC084500)**
  - The VAP cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. This test includes measurements of LDL particle size and lipoprotein subclasses.

  **NEW LOW PRICE $67.50**

- **CELIAC DISEASE ANTIBODY SCREEN (LC3334971)**
  - This test measures deamidated gliadin IgA; tissue transglutaminase IgA; serum IgA quantitation.

  **$74.25**

- **FOOD SAFE ALLERGY TEST** (LCM73001)**
  - This test measures delayed (IgG) food allergies for 45 common foods.

  **$130.50**

- **FERRITIN (LC004598)**
  - Used to evaluate iron stores in the body and to determine iron deficiency anemia.

  **$21**

- **HEMOGLOBIN A1C (LC001453)**
  - Used to assess long-term glucose control.

  **$23.25**

- **VITAMIN B12/FOLATE (LC000810)**
  - This test measures the amount of vitamin B12 and folic acid in the blood.

  **$24.75**

- **INSULIN (Fasting) (LC004333)**
  - Can predict those at risk of diabetes, obesity, and heart and other diseases.

  **$31.50**

---

*For non-member pricing call 1-800-208-3444. **This test is packaged as a kit, requiring a finger stick performed at home.
<table>
<thead>
<tr>
<th><strong>CBC/CHEMISTRY PROFILE (LC381832)</strong></th>
<th>$26</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Note:</strong> This CBC/Chemistry profile is included in the Male and Female Life Extension panels.</td>
<td></td>
</tr>
<tr>
<td><strong>CARDIOVASCULAR RISK PROFILE</strong></td>
<td></td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>Cholesterol/HDL Ratio</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td>Estimated CHD Risk</td>
</tr>
<tr>
<td>LDL Cholesterol</td>
<td>Glucose</td>
</tr>
<tr>
<td>Triglycerides</td>
<td></td>
</tr>
<tr>
<td><strong>LIVER FUNCTION PANEL</strong></td>
<td></td>
</tr>
<tr>
<td>AST (SGOT)</td>
<td>Total Bilirubin</td>
</tr>
<tr>
<td>ALT (SGPT)</td>
<td>Alkaline phosphatase</td>
</tr>
<tr>
<td>LDH</td>
<td></td>
</tr>
<tr>
<td><strong>KIDNEY FUNCTION PANEL</strong></td>
<td></td>
</tr>
<tr>
<td>BUN</td>
<td>BUN/Creatinine Ratio</td>
</tr>
<tr>
<td>Creatinine</td>
<td>Uric Acid</td>
</tr>
<tr>
<td><strong>BLOOD PROTEIN LEVELS</strong></td>
<td></td>
</tr>
<tr>
<td>Total Protein</td>
<td>Globulin</td>
</tr>
<tr>
<td>Albumin</td>
<td>Albumin/Globulin Ratio</td>
</tr>
<tr>
<td><strong>BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE</strong></td>
<td></td>
</tr>
<tr>
<td>Red Blood Cell Count</td>
<td>Monocytes</td>
</tr>
<tr>
<td>White Blood Cell Count</td>
<td>Lymphocytes</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>Platelet Count</td>
</tr>
<tr>
<td>Basophils</td>
<td>Hemoglobin</td>
</tr>
<tr>
<td>Polys (Absolute)</td>
<td>Hematocrit</td>
</tr>
<tr>
<td>Lymphs (Absolute)</td>
<td>MCV</td>
</tr>
<tr>
<td>Monocytes (Absolute)</td>
<td>MCH</td>
</tr>
<tr>
<td>Eos (Absolute)</td>
<td>MCHC</td>
</tr>
<tr>
<td>Baso (Absolute)</td>
<td>Polynucleated Cells</td>
</tr>
<tr>
<td>RDW</td>
<td></td>
</tr>
<tr>
<td><strong>BLOOD MINERAL PANEL</strong></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>Sodium</td>
</tr>
<tr>
<td>Potassium</td>
<td>Chloride</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Iron</td>
</tr>
<tr>
<td><strong>LIFE EXTENSION THYROID PANEL (LC304131)</strong></td>
<td>$56.25</td>
</tr>
<tr>
<td>TSH, T4, Free T3, Free T4</td>
<td></td>
</tr>
<tr>
<td><strong>FEMALE HORMONE RE-TEST PROFILE</strong> (LCRTF)</td>
<td>$187.50</td>
</tr>
<tr>
<td>CBC/Chemistry Profile, DHEA-S, Total Estrogen, Pregnenolone, Total and Free Testosterone, Progesterone, and TSH.</td>
<td></td>
</tr>
<tr>
<td><strong>MALE HORMONE RE-TEST PROFILE</strong> (LCRTM)</td>
<td>$206.25</td>
</tr>
<tr>
<td>CBC/Chemistry Profile, DHEA-S, DHT, Estradiol, PSA, Pregnenolone, Total and Free Testosterone, and TSH.</td>
<td></td>
</tr>
<tr>
<td><strong>DR. LICHTEN COMPREHENSIVE THYROID PANEL</strong> (LCR020042)</td>
<td>$283.50</td>
</tr>
<tr>
<td>TSH, T4, Free T3, Reverse T3, Thyroid antibodies, Thyroid peroxidase antibodies, Red cell magnesium, vitamin D(25-DH).</td>
<td></td>
</tr>
<tr>
<td><strong>DR. LICHTEN CARDIAC RISK FACTORS</strong> (LCR05005)</td>
<td>$147</td>
</tr>
<tr>
<td>Homocysteine, C-Reactive Protein, Ferritin, Fibrinogen, ABO, and Rh blood typing.</td>
<td></td>
</tr>
<tr>
<td><strong>DR. LICHTEN COMPREHENSIVE MALE PANEL</strong> (LCR01001M)</td>
<td>$501</td>
</tr>
<tr>
<td>Male Life Extension Panel PLUS: IGF-1, FSH, LH, TSH, Free T4, Cortisol, Fasting Insulin, Sex Hormone Binding Globulin, and Hemoglobin A1C.</td>
<td></td>
</tr>
<tr>
<td><strong>DR. LICHTEN COMPREHENSIVE FEMALE PANEL</strong> (LCR01001)</td>
<td>$501</td>
</tr>
<tr>
<td>Female Life Extension Panel PLUS: IGF-1, FSH, LH, TSH, Free T4, Cortisol, Fasting Insulin, Sex Hormone Binding Globulin, and Hemoglobin A1C.</td>
<td></td>
</tr>
</tbody>
</table>

### POPULAR SINGLE TESTS

| **OSTEDOCALCIN** (LC010249) | $68.25 |
| A valuable aid in identifying risk of developing osteoporosis. | |
| **DPD CROSS LINK TEST** (LC511105) | $59.25 |
| A urine test used as a tool to assess the true rate of bone turnover. | |
| **IGF-1** (LC010363) | $56.25 |
| Indicates growth hormone secretion levels. Low levels have been associated with atherosclerosis as well as all-cause mortality. | |
| **INSULIN-LIKE GROWTH FACTOR BINDING PROTEIN 3 (IGFBP3)** (LC140152) | $35.25 |
| Elevated levels in hypertensive individuals have been associated with nine-fold increase of carotid atherosclerosis. | |
| **DHEA-SULFATE** (LC004697) | $45.75 |
| This test shows if you are taking the proper amount of DHEA. | |
| **DIHYDROTESTOSTERONE (DHT)** (LC500142) | $74.25 |
| Measures serum concentrations of DHT. | |
| **ESTRADIOL** (LC004515) | $24.75 |
| For men and women. Determines the proper amount in the body. | |
| **FREE-PSA (INCLUDES TOTAL PSA)** (LC480780) | $45.75 |
| Recommended to determine if an elevated PSA is indicative of prostate cancer. | |
| **FREE AND TOTAL TESTOSTERONE** (LC140103) | $74.25 |
| Determines whether testosterone replacement should be considered as a therapy for depression, abdominal obesity, low energy, poor mental performance, or loss of libido. | |
| **PREGNENOLONE** (LC140707) | $87 |
| Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing’s syndrome. | |
| **SEX HORMONE BINDING GLOBULIN (SHBG)** (LC082016) | $24.75 |
| This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens. | |
| **URINARY 2/16 ESTROGEN METABOLITE RATIO** (LC73000) | $128 |
| The ratio is relevant as a risk factor for estrogen-sensitive diseases including breast and cervical cancers and osteoporosis. | |

### ORDER LIFESAVING 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**

<table>
<thead>
<tr>
<th><strong>MEMBER NO.</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Male</strong></td>
<td><strong>Female</strong></td>
</tr>
<tr>
<td>Name</td>
<td></td>
</tr>
<tr>
<td>Date of Birth (required)</td>
<td>/</td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td></td>
</tr>
<tr>
<td>State</td>
<td>Zip</td>
</tr>
<tr>
<td>Phone</td>
<td></td>
</tr>
<tr>
<td>Credit Card No.</td>
<td></td>
</tr>
<tr>
<td>Expiration Date</td>
<td>/</td>
</tr>
</tbody>
</table>

**Mail your order form to:**

**Mail your order form to:**

**Life Extension 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

**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.
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-Carnitine Powder
L-Cysteine Capsules
L-Glutathione, L-Cysteine & C
L-Glutamine Capsules
L-Glutamine Powder
L-Lysine Capsules
L-Lysine Powder
L-Methionine Powder
L-Tyrosine Powder
L-Tyrosine Tablets
Mega L-Glutathione Capsules
N-Acetyl Cysteine Capsules
Optimized Carnitine with GlycoCarn®
PharmaGABA
Super Carnosine Capsules
Taurine Capsules
Tryptopure® Tryptophan
[Optimized] Tryptopure® Plus
Acetyl-L-Acetyl-L-Carnitine
Acetyl-L-ArthroMax™ with Theaflavins
Vinpocetine
Optimized Carnitine with GlycoCarn®
Super Absorbable CoQ10™ with Limonene
Homocysteine Resist
Forskolin
Homocysteine Resist
Low Dose Aspirin (Enteric Coated)
Natural BP Management
Peak ATP® with GlycoCarn®
Policosanol
Red Yeast Rice
Super Absorbable CoQ10™ with d-Limonene
Super Omega-3 EPA/DHA with Sesame Lignanes & Olive Fruit Extract
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support
Sytrinol™
Theaflavin Standardized Extract
TMG Powder
TMG Tablets
Vascular Protect
HERBAL/PHYTO PRODUCTS
Artichoke Leaf Extract
Astragalus Extract
Blackcurrant Juice Concentrate
Blueberry Extract
Blueberry Extract w/Pomegranate and CocoaGold™
Butterbur Extract w/Standardized
Rosmarinic Acid
Calcium D-Glucarate
Silymarin
Chloroperoxidase
Cilantro Herbal Extract
Citrus Bioflavonoid
CocoaGold™
Grapeseed Extract w/Resveratrol & Pterostilbene
Green Tea Leaves
Hesperidin Complex Powder
Huperzine A with Natural Vitamin E
Kyoic® Garlic Formula 105
Kyoic® Reserve
Lycopene
Mega Green Tea Extract
Mega Green Tea Extract (Decaffeinated)
Mega Lycopene
Mega Silymarin with boswellic acid B
Nutrin
Optimized Ashwagandha Extract
Phyto-Food
EYE CARE
Bilberry Extract
Blackcurrant Freeze Dried Extract
Biloxide III
Lutein Plus Powder
Overcast Polarized Sunglasses
Solarshield Sunglasses
Super Zeaxanthin with Lutein & Meso-Zeaxanthin
(Plus Astaxanthin also available)
Vision Optimizer
FIBER
Apple Pectin Powder
Chitosan
Enhanced Fiber Food Powder
Hi-Lignan® Nutri-Flax™
SlimStyle® PGX™ WellBetX PGX® Soluble Fiber Blend
HAIR CARE
Dr. Proctor’s Advanced Hair Formula
Dr. Proctor’s Shampoo
Healthy Hair Spray
Life Extension Shampoo and Conditioner
Super-Absorbable Tocotrienols
HEART HEALTH
Advanced Lipid Control
Cholesterol Lowering
D-Ribose Capsules
D-Ribose Powder
Endothelial Defense™ w/Full-Spectrum Pomegranate™
Enhanced CoQ10 with Brewer’s Yeast
Fibrinogen Resist
Forskolin
Homocysteine Resist
Low Dose Aspirin (Enteric Coated)
Natural BP Management
Peak ATP® with GlycoCarn®
Policosanol
Red Yeast Rice
Super Absorbable CoQ10™ with d-Limonene
Super Omega-3 EPA/DHA with Sesame Lignanes & Olive Fruit Extract
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support
Sytrinol™
Theaflavin Standardized Extract
TMG Powder
TMG Tablets
Vascular Protect
HERALD/HYOTY PRODUCTS
Artichoke Leaf Extract
Astragalus Extract
Blackcurrant Juice Concentrate
Blueberry Extract
Blueberry Extract w/Pomegranate and CocoaGold™
Butterbur Extract w/Standardized
Rosmarinic Acid
Calcium D-Glucarate
Silymarin
Chloroperoxidase
Cilantro Herbal Extract
Citrus Bioflavonoid
CocoaGold™
Grapeseed Extract w/Resveratrol & Pterostilbene
Green Tea Leaves
Hesperidin Complex Powder
Huperzine A with Natural Vitamin E
Kyoic® Garlic Formula 105
Kyoic® Reserve
Lycopene
Mega Green Tea Extract
Mega Green Tea Extract (Decaffeinated)
Mega Lycopene
Mega Silymarin with boswellic acid B
Nutrin
Optimized Ashwagandha Extract
Phyto-Food
Pomegranate Extract
Pomegranate Extract with CocoaGold™ (Full-Spectrum) Pomegranate™
Pomegranate Juice Concentrate
ProGreens®
Pure-Gar™
Pycnocerol
Optimized Quercetin
Resveratrol with Pterostilbene
Rhodiola Extract
Rosmarinic Acid Extract
Rutin Powder
Silymarin
SDOzyme™ with GliSODin®
Stevia Extract
Super Bio-Curcumin®
Super Curcumin with Bioperine®
Super Polyphenol Extracts w/CocoaGold™
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
26 Hyperimmune Egg
Immune Protect with PARACTIN®
Lactoferrin
Maitake SX-Fraction
Norwegian Shark Liver Oil
Primal Defense™
ProBoost™ Thymic Protein A
Pure Gar™
SambuGuard
Theralac Capsules
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
Korean Angelica
5-LOXIN®
Mega EPA/DHA
Mega GLA with Sesame Lignans
MSM
Natural Relief 1222™ Cream
PhosphoOmega™ Krill Oil
Perilla Oil
Serraflyzyme
Shark Cartilage
SDOzyme™ with GliSODin® and Wolfberry
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract
Udo’s Choice Oil
Zyflamend Easy
Buyers Club Order Form

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A049</td>
<td>ACETYL-L-CARNITINE - 500 mg, 100 caps</td>
<td>$56.00</td>
<td>$42.00</td>
<td></td>
</tr>
<tr>
<td>A0798</td>
<td>ACETYL-L-CARNITINE - 4 bottles of 100 caps</td>
<td>186.64</td>
<td>139.98</td>
<td></td>
</tr>
<tr>
<td>01038</td>
<td>ADVANCED LIPID CONTROL - 60 veg. caps</td>
<td>30.00</td>
<td>22.50</td>
<td></td>
</tr>
<tr>
<td>01300</td>
<td>ADVANCED ORAL HYGIENE - 60 veg. mint lozenges</td>
<td>20.00</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td>01417</td>
<td>AGAVE DIGESTIVE IMMUNE SUPPORT - 360 grams of powder</td>
<td>30.00</td>
<td>22.50</td>
<td></td>
</tr>
<tr>
<td>00681</td>
<td>AHNC - 500 mg, 30 caps</td>
<td>48.98</td>
<td>36.74</td>
<td></td>
</tr>
<tr>
<td>46925</td>
<td>ALL* REFILL PACK - 60 mg, 120 caps</td>
<td>69.95</td>
<td>58.00</td>
<td></td>
</tr>
<tr>
<td>00261</td>
<td>ALL-IN-ONE WEIGHT LOSS FORMULA - 300 caps</td>
<td>59.95</td>
<td>49.96</td>
<td></td>
</tr>
<tr>
<td>00399</td>
<td>ARGinine/ORNIThINE CAPS - 500/250 mg, 100 caps</td>
<td>16.00</td>
<td>12.00</td>
<td></td>
</tr>
<tr>
<td>00399</td>
<td>ARGinine/ORNIThINE CAPS - 500/250 mg, 100 caps</td>
<td>58.00</td>
<td>46.40</td>
<td></td>
</tr>
<tr>
<td>01025</td>
<td>L-ARGININE FREE-FORM POWDER - 100 grams of powder</td>
<td>15.98</td>
<td>11.99</td>
<td></td>
</tr>
<tr>
<td>00400</td>
<td>L-ARGININE HCL - 1 kilogram of powder</td>
<td>118.00</td>
<td>88.50</td>
<td></td>
</tr>
<tr>
<td>01303</td>
<td>ARThrimAX™ w/THEAfLAVINs - 120 veg. caps</td>
<td>44.00</td>
<td>33.00</td>
<td></td>
</tr>
<tr>
<td>01404</td>
<td>ARThrimAX™ w/THEAfLAVINs - 4 bottles of 60 veg. caps</td>
<td>160.00</td>
<td>120.00</td>
<td></td>
</tr>
<tr>
<td>00919</td>
<td>ARTichoke LEAF EXTRACT - 500 mg, 180 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td></td>
</tr>
<tr>
<td>00266</td>
<td>ASCORBATE C POWDER - 8 oz of powder</td>
<td>26.99</td>
<td>20.24</td>
<td></td>
</tr>
<tr>
<td>00330</td>
<td>ASCORBIC ACID POWDER - 16 oz of powder vitamin C</td>
<td>99.48</td>
<td>79.58</td>
<td></td>
</tr>
<tr>
<td>00882</td>
<td>ASCORBIL PALMITE CAPSULES - 500 mg, 100 caps</td>
<td>22.50</td>
<td>16.88</td>
<td></td>
</tr>
<tr>
<td>00882</td>
<td>ASCORBIL PALMITE CAPSULES - 4 bottles of 100 caps</td>
<td>80.00</td>
<td>60.00</td>
<td></td>
</tr>
<tr>
<td>00892</td>
<td>(OPTIMIZED) ASHWAGANDHA EXTRACT - 60 veg. caps</td>
<td>10.00</td>
<td>7.50</td>
<td></td>
</tr>
<tr>
<td>00892</td>
<td>(OPTIMIZED) ASHWAGANDHA EXTRACT - 4 bottles of 60 veg. caps</td>
<td>36.00</td>
<td>27.00</td>
<td></td>
</tr>
<tr>
<td>00708</td>
<td>ASTAXANThIN - 2 mg, 30 softgels</td>
<td>10.25</td>
<td>7.69</td>
<td></td>
</tr>
</tbody>
</table>

SUB-TOTAL OF COLUMN 1

| B1040 | BELLY SLIM & TONE - 6 fl oz | $42.00 | $31.50 |
| B0920 | BENfOTAMINE w/ THAMINE - 100 mg, 120 caps | 19.95 | 15.96 |
| B0925 | BENfOTAMINE w/ THAMINE - 4 bottles of 120 caps | 74.40 | 59.52 |
| B1061 | BERRY COMPLETE - 30 veg. caps | 21.00 | 15.75 |
| B1061 | BERRY COMPLETE - 4 bottles of veg. caps | 74.68 | 56.00 |
| B0664 | BETa-CAROTENe POWDER - 25,000 IU, 100 softgels | 10.96 | 8.24 |
| B1088 | BETa-CAROTENe POWDER - 4 bottles of 100 softgels | 39.32 | 29.49 |
| B0063 | BETTERWOMAN - 40 caps | 40.00 | 30.00 |
| B0047 | BILbERRY EXTRACT - 100 mg, 100 caps | 28.00 | 21.00 |
| B0047 | BILbERRY EXTRACT - 4 bottles of 100 caps | 100.00 | 75.00 |
| B0106 | BOSIL™ - 5 mg, 30 veg. caps | 18.95 | 15.16 |
| B1007 | BOSIL™ - 30 ml | 29.99 | 23.99 |
| B0102 | BIOTIN CAPSULES - 600 mcg, 100 caps | 7.50 | 5.63 |
| B0145 | BIOTIN POWDER - 30 grams of powder | 12.50 | 9.38 |
| B0138 | BLUEBERRY EXTRACT w/POMEgranATE & COCOAGOLD™ - 60 veg. caps | 30.00 | 22.50 |
| B0138 | BLUEBERRY EXTRACT w/POMEgranATE & COCOAGOLD™ - 4 bottles of 60 veg. caps | 108.00 | 81.00 |
| B0051 | BONE RESTORE - 150 caps | 22.50 | 16.88 |
| B0051 | BONE RESTORE - 4 bottles of 150 caps | 78.00 | 58.50 |
| B0121 | BONE STRENGTH FORMULA w/KOACT™ - 120 caps | 42.00 | 31.50 |
| B0031 | BONE UP™ - 240 caps (hydroxyapatite complex) | 24.95 | 18.71 |
| B0031 | BONE UP™ - 4 bottles of 240 caps | 90.00 | 67.50 |
| B0109 | BOOSTER - 60 softgels | 48.00 | 36.00 |
| B0109 | BOOSTER - 4 bottles of 60 softgels | 176.00 | 132.00 |
| B0180 | (SUPER) BOOSTER w/ADVANCED K2 COMPLEX - 60 softgels | 42.00 | 31.50 |
| B0180 | (SUPER) BOOSTER w/ADVANCED K2 COMPLEX - 4 bottles of 60 softgels | 152.00 | 114.00 |
| B0021 | BORON CAPs - 3 mg, 100 caps | 5.95 | 4.46 |
| B0021 | BORON CAPs - 4 bottles of 100 caps | 21.00 | 15.75 |
| B0020 | BOSWELLIA - 100 caps | 38.00 | 28.50 |
| B0020 | BOSWELLIA - 4 bottles of 100 caps | 120.00 | 90.00 |
| B0058 | BOSWELLIA TOPICAL CREAM - 4 oz jar | 15.00 | 11.25 |
| B0058 | BOSWELLIA TOPICAL CREAM - 4 jars | 52.00 | 39.00 |
| B0253 | BRANCHeD CHAIN AMINO ACIDS - 90 caps | 19.50 | 14.63 |
| B0253 | BRANCHeD CHAIN AMINO ACIDS - 4 bottles of 90 caps | 68.00 | 51.00 |
| B0099 | BREAsT HEALTH FORMULA - 60 veg. caps | 34.00 | 25.50 |
| B0099 | BREAsT HEALTH FORMULA - 4 bottles of 60 veg. caps | 120.00 | 90.00 |
| B0093 | BRITe EYES III - 2 vials, 5 ml each | 34.00 | 25.50 |
| B0093 | BRITe EYES III - 4 boxes | 128.00 | 96.00 |

SUB-TOTAL OF COLUMN 2

MAY 2010

* These products are not 25% off retail price.

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

To order call: 1.954.766.8433 or 1.800.544.4440
**Buyers Club Order Form**

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail Price</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00136</td>
<td>$21.00</td>
<td>$15.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01027</td>
<td>$75.00</td>
<td>$56.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01032</td>
<td>$21.00</td>
<td>$15.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00058</td>
<td>$13.95</td>
<td>$10.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00150</td>
<td>$52.00</td>
<td>$39.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00055</td>
<td>$24.00</td>
<td>$18.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00157</td>
<td>$88.00</td>
<td>$66.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01015</td>
<td>$24.00</td>
<td>$18.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00062</td>
<td>$85.00</td>
<td>$63.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00335</td>
<td>$18.00</td>
<td>$13.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00149</td>
<td>$21.00</td>
<td>$15.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01419</td>
<td>$36.00</td>
<td>$27.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00118</td>
<td>$12.00</td>
<td>$9.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00613</td>
<td>$45.00</td>
<td>$33.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00916</td>
<td>$29.00</td>
<td>$21.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01041</td>
<td>$15.00</td>
<td>$11.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01258</td>
<td>$29.95</td>
<td>$22.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01287</td>
<td>$108.00</td>
<td>$81.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01011</td>
<td>$104.40</td>
<td>$78.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00390</td>
<td>$36.00</td>
<td>$27.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00928</td>
<td>$136.00</td>
<td>$102.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01370</td>
<td>$29.95</td>
<td>$22.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02016</td>
<td>$66.00</td>
<td>$49.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>03069</td>
<td>$100.00</td>
<td>$75.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00550</td>
<td>$200.00</td>
<td>$150.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01048</td>
<td>$23.50</td>
<td>$17.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01045</td>
<td>$84.00</td>
<td>$63.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01359</td>
<td>$23.50</td>
<td>$17.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00142</td>
<td>$55.00</td>
<td>$41.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00050</td>
<td>$24.00</td>
<td>$18.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01046</td>
<td>$80.00</td>
<td>$60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01359</td>
<td>$23.50</td>
<td>$17.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00142</td>
<td>$64.00</td>
<td>$48.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 3**

**SUB-TOTAL OF COLUMN 4**
<table>
<thead>
<tr>
<th>No.</th>
<th>Retail No.</th>
<th>Retail Price</th>
<th>Qty</th>
<th>Member Price</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. CONTINUED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01226</td>
<td>(SUPER UBIQUINOL) COD10 - 100 mg, 60 softgels</td>
<td>$56.00</td>
<td>2</td>
<td>$42.00</td>
<td>$104.00</td>
</tr>
<tr>
<td>01226</td>
<td>(SUPER UBIQUINOL) COD10 - 4 bit of 60 softgels</td>
<td>208.00</td>
<td>2</td>
<td>156.00</td>
<td>364.00</td>
</tr>
<tr>
<td>01226</td>
<td>(SUPER UBIQUINOL) COD10 - 10 bit of 60 softgels</td>
<td>480.00</td>
<td></td>
<td></td>
<td>480.00</td>
</tr>
<tr>
<td>01426</td>
<td>(SUPER UBIQUINOL) COD10 w/ENH MITOCHONDRIAL SUPPORT™ - 100 mg, 60 softgels</td>
<td>62.00</td>
<td>2</td>
<td>46.50</td>
<td>93.00</td>
</tr>
<tr>
<td>01426</td>
<td>(SUPER UBIQUINOL) COD10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bit of 60 softgels</td>
<td>224.00</td>
<td>2</td>
<td>168.00</td>
<td>396.00</td>
</tr>
<tr>
<td>01426</td>
<td>(SUPER UBIQUINOL) COD10 w/ENH MITOCHONDRIAL SUPPORT™ - 10 bit of 60 softgels</td>
<td>520.00</td>
<td></td>
<td></td>
<td>520.00</td>
</tr>
<tr>
<td>01425</td>
<td>(SUPER UBIQUINOL) COD10 w/ENH MITOCHONDRIAL SUPPORT™ - 50 mg, 60 softgels</td>
<td>58.00</td>
<td>2</td>
<td>43.50</td>
<td>97.00</td>
</tr>
<tr>
<td>01425</td>
<td>(SUPER UBIQUINOL) COD10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bit of 30 softgels</td>
<td>212.00</td>
<td>2</td>
<td>159.00</td>
<td>370.00</td>
</tr>
<tr>
<td>01427</td>
<td>(SUPER UBIQUINOL) COD10 w/ENH MITOCHONDRIAL SUPPORT™ - 50 mg, 30 softgels</td>
<td>20.00</td>
<td>2</td>
<td>15.00</td>
<td>37.00</td>
</tr>
<tr>
<td>01427</td>
<td>(SUPER UBIQUINOL) COD10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bit of 30 softgels</td>
<td>72.00</td>
<td></td>
<td></td>
<td>72.00</td>
</tr>
<tr>
<td>01053</td>
<td>COROLUS VERSICOLOR SUPER STRENGTH - 600 mg, 150 veg. caps</td>
<td>99.95</td>
<td>2</td>
<td>79.96</td>
<td>179.90</td>
</tr>
<tr>
<td>00857</td>
<td>COROMEGA CHILD BRAIN &amp; BODY - (Lemon Lime) 30 packets</td>
<td>25.00</td>
<td>2</td>
<td>18.75</td>
<td>37.50</td>
</tr>
<tr>
<td>00857</td>
<td>COROMEGA CHILD BRAIN &amp; BODY - (Lemon Lime) 4 boxes of 30 packets</td>
<td>90.00</td>
<td></td>
<td>67.00</td>
<td></td>
</tr>
<tr>
<td>80118</td>
<td>COSMESIS ANTI-AGING MASK - 2 oz bottle</td>
<td>66.60</td>
<td>2</td>
<td>49.95</td>
<td>99.80</td>
</tr>
<tr>
<td>80118</td>
<td>COSMESIS ANTI-AGING MASK - 2-2 oz bottles</td>
<td>117.22</td>
<td></td>
<td></td>
<td>117.22</td>
</tr>
<tr>
<td>80134</td>
<td>COSMESIS ANTI-GLYcation SERUM - 1 oz bottle w/BLUEBERRY &amp; POMEGRANATE EXTRACTS</td>
<td>24.00</td>
<td></td>
<td>18.00</td>
<td></td>
</tr>
<tr>
<td>80134</td>
<td>COSMESIS ANTI-GLYcation SERUM - 2-1 oz bottles w/BLUEBERRY &amp; POMEGRANATE EXTRACTS</td>
<td>45.60</td>
<td></td>
<td>34.20</td>
<td></td>
</tr>
<tr>
<td>80133</td>
<td>COSMESIS ANTIoxidANT FACIAL MIST - 2 oz bottle</td>
<td>29.95</td>
<td></td>
<td>22.46</td>
<td></td>
</tr>
<tr>
<td>80133</td>
<td>COSMESIS ANTIoxidANT FACIAL MIST - 2-2 oz bottles</td>
<td>56.90</td>
<td></td>
<td>42.68</td>
<td></td>
</tr>
<tr>
<td>80132</td>
<td>COSMESIS ANTIoxidANT FACIAL MIST - 4 oz bottle</td>
<td>39.95</td>
<td></td>
<td>29.96</td>
<td></td>
</tr>
<tr>
<td>80132</td>
<td>COSMESIS ANTIoxidANT FACIAL MIST - 2-4 oz bottles</td>
<td>76.00</td>
<td></td>
<td>57.00</td>
<td></td>
</tr>
<tr>
<td>80127</td>
<td>COSMESIS ANTIoxidANT REJUVENATING FOOT CREAM - 2 oz jar</td>
<td>39.95</td>
<td>2</td>
<td>29.96</td>
<td>59.90</td>
</tr>
<tr>
<td>80127</td>
<td>COSMESIS ANTIoxidANT REJUVENATING FOOT CREAM - 2-2 oz jars</td>
<td>76.00</td>
<td></td>
<td>57.00</td>
<td></td>
</tr>
<tr>
<td>80128</td>
<td>COSMESIS ANTIoxidANT REJUVENATING FOOT SCRUB - 2 oz jar</td>
<td>52.95</td>
<td></td>
<td>39.71</td>
<td></td>
</tr>
<tr>
<td>80128</td>
<td>COSMESIS ANTIoxidANT REJUVENATING FOOT SCRUB - 2-2 oz jars</td>
<td>93.20</td>
<td></td>
<td>69.90</td>
<td></td>
</tr>
<tr>
<td>80117</td>
<td>COSMESIS ANTIoxidANT REJUVENATING HAND CREAM - 2 oz jar</td>
<td>50.80</td>
<td>2</td>
<td>37.44</td>
<td>74.88</td>
</tr>
<tr>
<td>80117</td>
<td>COSMESIS ANTIoxidANT REJUVENATING HAND CREAM - 2-2 oz jars</td>
<td>106.00</td>
<td></td>
<td>79.50</td>
<td></td>
</tr>
<tr>
<td>80121</td>
<td>COSMESIS ANTIoxidANT REJUVENATING HAND SCRUB - 2 oz jar</td>
<td>52.95</td>
<td></td>
<td>39.71</td>
<td></td>
</tr>
<tr>
<td>80121</td>
<td>COSMESIS ANTIoxidANT REJUVENATING HAND SCRUB - 2-2 oz jars</td>
<td>93.20</td>
<td></td>
<td>69.90</td>
<td></td>
</tr>
<tr>
<td>80105</td>
<td>COSMESIS ANTI-REDNESS &amp; BLEMISH LOTION - 1 oz</td>
<td>69.95</td>
<td></td>
<td>52.46</td>
<td></td>
</tr>
<tr>
<td>80105</td>
<td>COSMESIS ANTI-REDNESS &amp; BLEMISH LOTION - 2-1 oz bottles</td>
<td>123.12</td>
<td></td>
<td>92.34</td>
<td></td>
</tr>
<tr>
<td>80120</td>
<td>COSMESIS CORRECTIVE CLEARING MASK - 2 oz jar</td>
<td>59.95</td>
<td></td>
<td>44.96</td>
<td></td>
</tr>
<tr>
<td>80120</td>
<td>COSMESIS CORRECTIVE CLEARING MASK - 2-2 oz jars</td>
<td>105.52</td>
<td></td>
<td>79.14</td>
<td></td>
</tr>
<tr>
<td>80108</td>
<td>COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz</td>
<td>71.60</td>
<td></td>
<td>53.70</td>
<td></td>
</tr>
<tr>
<td>80108</td>
<td>COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 2-1 oz bottles</td>
<td>126.00</td>
<td></td>
<td>94.50</td>
<td></td>
</tr>
<tr>
<td>80123</td>
<td>COSMESIS FACE REJUVENATING ANTIoxidANT CREAM - 2 oz jar</td>
<td>65.00</td>
<td></td>
<td>48.75</td>
<td></td>
</tr>
<tr>
<td>80123</td>
<td>COSMESIS FACE REJUVENATING ANTIoxidANT CREAM - 2-2 oz jars</td>
<td>114.40</td>
<td></td>
<td>85.80</td>
<td></td>
</tr>
<tr>
<td>80107</td>
<td>COSMESIS FINE LINE-LESS - 1 oz</td>
<td>69.95</td>
<td></td>
<td>52.46</td>
<td></td>
</tr>
<tr>
<td>80107</td>
<td>COSMESIS FINE LINE-LESS - 2-1 oz bottles</td>
<td>123.12</td>
<td></td>
<td>92.34</td>
<td></td>
</tr>
<tr>
<td>80131</td>
<td>COSMESIS HAIR SUPPRESS FORMULA - 4 oz bottle</td>
<td>53.75</td>
<td></td>
<td>40.31</td>
<td></td>
</tr>
<tr>
<td>80131</td>
<td>COSMESIS HAIR SUPPRESS FORMULA - 2-4 oz bottles</td>
<td>94.60</td>
<td></td>
<td>70.95</td>
<td></td>
</tr>
<tr>
<td>80115</td>
<td>COSMESIS HEALING MASK - 2 oz bottle</td>
<td>59.95</td>
<td></td>
<td>44.96</td>
<td></td>
</tr>
<tr>
<td>80115</td>
<td>COSMESIS HEALING MASK - 2-2 oz bottles</td>
<td>105.52</td>
<td></td>
<td>79.14</td>
<td></td>
</tr>
<tr>
<td>80109</td>
<td>COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz</td>
<td>52.95</td>
<td></td>
<td>39.71</td>
<td></td>
</tr>
<tr>
<td>80109</td>
<td>COSMESIS HYALURONIC FACIAL MOISTURIZER - 2 bottles of 1 oz</td>
<td>93.20</td>
<td></td>
<td>69.90</td>
<td></td>
</tr>
<tr>
<td>80110</td>
<td>COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz</td>
<td>52.95</td>
<td></td>
<td>39.71</td>
<td></td>
</tr>
<tr>
<td>80110</td>
<td>COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 2 bits of 1 oz</td>
<td>93.20</td>
<td></td>
<td>69.90</td>
<td></td>
</tr>
<tr>
<td>80103</td>
<td>COSMESIS LIFTING &amp; TIGHTENING COMPLEX - 1 oz jar</td>
<td>69.95</td>
<td></td>
<td>52.46</td>
<td></td>
</tr>
<tr>
<td>80103</td>
<td>COSMESIS LIFTING &amp; TIGHTENING COMPLEX - 2 bottles of 1 oz</td>
<td>123.12</td>
<td></td>
<td>92.34</td>
<td></td>
</tr>
<tr>
<td>80155</td>
<td>COSMESIS MELATONIN CREAM - 1 oz jar</td>
<td>28.00</td>
<td></td>
<td>21.00</td>
<td></td>
</tr>
<tr>
<td>80155</td>
<td>COSMESIS MELATONIN CREAM - 2-1 oz jars</td>
<td>46.00</td>
<td></td>
<td>34.50</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Retail</td>
<td>Member Price</td>
<td>Qty</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------</td>
<td>--------------</td>
<td>-----</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>00907</td>
<td>DHEA - 25 mg, 100 caps</td>
<td>$14.00</td>
<td>$10.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01250</td>
<td>DHEA COMPLETE - 60 veg. caps</td>
<td>$48.00</td>
<td>$36.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00355</td>
<td>DHEA COMPLETE - 4 bottles of 60 veg. caps</td>
<td>$172.80</td>
<td>$129.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00454</td>
<td>DHEA - 15 mg, 100 caps</td>
<td>$12.00</td>
<td>$9.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00882</td>
<td>DHEA - 50 mg, 60 caps</td>
<td>$16.00</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00883</td>
<td>DHEA - 100 mg, 60 caps</td>
<td>$22.50</td>
<td>$16.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01058</td>
<td>DHEA SKIN CREAM - 1.7 oz pump</td>
<td>$29.99</td>
<td>$22.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01358</td>
<td>DIGEST RC - 30 tablets</td>
<td>$19.95</td>
<td>$14.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DIGEST RC - 4 boxes of 30 tablets</td>
<td>$68.00</td>
<td>$51.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01272</td>
<td>D,L-PHENYLALANINE CAPSULES - 500 mg, 100 caps</td>
<td>$18.75</td>
<td>$14.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00034</td>
<td>D,L-PHENYLALANINE CAPSULES - 4 bottles of 100 caps</td>
<td>$64.00</td>
<td>$48.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00303</td>
<td>D,L-PHENYLALANINE PLUS POWDER - 100 grams of powder</td>
<td>$26.00</td>
<td>$19.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00257</td>
<td>DMAE BITARTRATE - 150 mg, 200 caps</td>
<td>$14.00</td>
<td>$10.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00222</td>
<td>DMAE POWDER (37% DMAE) - 100 grams of powder</td>
<td>$24.00</td>
<td>$18.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00197</td>
<td>DMAE-GINKGO CAPSULES - 100 caps</td>
<td>$36.00</td>
<td>$27.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00059</td>
<td>DMG - 125 mg dimethylglycine, 60 tablets</td>
<td>$18.50</td>
<td>$13.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01052</td>
<td>DNA PROTECTION FORMULA - 60 veg. caps</td>
<td>$28.00</td>
<td>$21.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00321</td>
<td>DR. PROCTOR'S ADVANCED HAIR FORMULA - 2 oz</td>
<td>$39.95</td>
<td>$29.26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00320</td>
<td>DR. PROCTOR'S ADVANCED HAIR FORMULA SHAMPOO - 8 oz bottle</td>
<td>$24.95</td>
<td>$18.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00376</td>
<td>DR. TUNG'S TONGUE CLEANER</td>
<td>$8.45</td>
<td>$6.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00899</td>
<td>DUAL-ACTION MICRODERMARABRASION ADV. EXFOLIATE - 2.4 net oz jar</td>
<td>$39.95</td>
<td>$29.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00240</td>
<td>DUAL-C - 90 caps</td>
<td>$12.00</td>
<td>$9.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DUAL-C - 4 bottles of 90 caps</td>
<td>$42.00</td>
<td>$31.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00388</td>
<td>ECHINACEA - 250 mg, 60 caps</td>
<td>$14.35</td>
<td>$10.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00104</td>
<td>ECHINACEA - 4 bottles of 60 caps</td>
<td>$50.00</td>
<td>$37.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0124</td>
<td>EDA - 500 mg, 100 caps</td>
<td>$17.50</td>
<td>$13.13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Can only be sold in the United States and cannot be sold into the health food retail store channel.
† Member pricing not valid on this item.

* Due to license restrictions, this product is not for sale to wholesalers outside of the United States of America and Canada.

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00504</td>
<td>$29.00</td>
<td>$21.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01302</td>
<td>$18.50</td>
<td>$25.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00756</td>
<td>$2.95</td>
<td>$3.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00345</td>
<td>$32.00</td>
<td>$39.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00141</td>
<td>$3.00</td>
<td>$3.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00522</td>
<td>$12.00</td>
<td>$14.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00512</td>
<td>$4.95</td>
<td>$5.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00113</td>
<td>$9.00</td>
<td>$10.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00314</td>
<td>$10.00</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00795</td>
<td>$12.00</td>
<td>$14.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00128</td>
<td>$14.00</td>
<td>$16.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01091</td>
<td>$12.00</td>
<td>$14.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01411</td>
<td>$12.00</td>
<td>$14.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00203</td>
<td>$2.25</td>
<td>$2.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00953</td>
<td>$4.00</td>
<td>$4.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00954</td>
<td>$1.50</td>
<td>$1.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00230</td>
<td>$18.00</td>
<td>$21.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01405</td>
<td>$26.00</td>
<td>$31.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00656</td>
<td>$4.00</td>
<td>$4.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00138</td>
<td>$4.50</td>
<td>$5.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00873</td>
<td>$2.50</td>
<td>$3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00800</td>
<td>$22.00</td>
<td>$26.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00867</td>
<td>$12.00</td>
<td>$14.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00627</td>
<td>$3.00</td>
<td>$3.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00661</td>
<td>$2.00</td>
<td>$2.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01060</td>
<td>$49.99</td>
<td>$59.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00955</td>
<td>$22.50</td>
<td>$27.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01049</td>
<td>$40.00</td>
<td>$48.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00155</td>
<td>$8.00</td>
<td>$9.60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 9**

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00140</td>
<td>$52.00</td>
<td>$65.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00109</td>
<td>$18.00</td>
<td>$22.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00410</td>
<td>$8.00</td>
<td>$10.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00108</td>
<td>$18.00</td>
<td>$22.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01021</td>
<td>$9.00</td>
<td>$11.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01292</td>
<td>$56.00</td>
<td>$69.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01902</td>
<td>$50.00</td>
<td>$60.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00563</td>
<td>$24.00</td>
<td>$29.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01492</td>
<td>$78.00</td>
<td>$93.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00506</td>
<td>$19.95</td>
<td>$24.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01224</td>
<td>$26.00</td>
<td>$31.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01050</td>
<td>$33.95</td>
<td>$40.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00316</td>
<td>$23.95</td>
<td>$28.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00214</td>
<td>$22.95</td>
<td>$27.54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00789</td>
<td>$24.75</td>
<td>$29.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00513</td>
<td>$40.00</td>
<td>$48.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00017</td>
<td>$15.00</td>
<td>$18.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01003</td>
<td>$15.00</td>
<td>$18.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00544</td>
<td>$19.50</td>
<td>$23.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00101</td>
<td>$6.00</td>
<td>$7.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00200</td>
<td>$15.00</td>
<td>$18.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00102</td>
<td>$3.50</td>
<td>$4.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01455</td>
<td>$127.00</td>
<td>$152.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00654</td>
<td>$127.00</td>
<td>$152.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00102</td>
<td>$3.00</td>
<td>$3.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01454</td>
<td>$127.00</td>
<td>$152.40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 10**

**LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**
<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01465</td>
<td>LIFE EXTENSION MIX™ - 315 tablets without copper</td>
<td>$98.00</td>
<td>$73.50</td>
<td></td>
</tr>
<tr>
<td>01465</td>
<td>LIFE EXTENSION MIX™ - 4 bottles of 315 tablets without copper</td>
<td>$344.00</td>
<td>$258.00</td>
<td></td>
</tr>
<tr>
<td>01465</td>
<td>LIFE EXTENSION MIX™ - 10 bottles of 315 tablets without copper</td>
<td>$695.00</td>
<td>$521.25</td>
<td></td>
</tr>
<tr>
<td>01467</td>
<td>LIFE EXTENSION MIX™ w/EXTRA NIACIN 315 tablets w/o copper</td>
<td>$98.00</td>
<td>$73.50</td>
<td></td>
</tr>
<tr>
<td>01467</td>
<td>LIFE EXTENSION MIX™ w/EXTRA NIACIN 4 bottles of 315 tablets w/o copper</td>
<td>$344.00</td>
<td>$258.00</td>
<td></td>
</tr>
<tr>
<td>01467</td>
<td>LIFE EXTENSION MIX™ w/EXTRA NIACIN 10 bottles of 315 tablets w/o copper</td>
<td>$695.00</td>
<td>$521.25</td>
<td></td>
</tr>
<tr>
<td>01464</td>
<td>LIFE EXTENSION MIX™ - 490 caps without copper</td>
<td>$110.00</td>
<td>$82.50</td>
<td></td>
</tr>
<tr>
<td>01464</td>
<td>LIFE EXTENSION MIX™ - 4 bottles of 490 caps without copper</td>
<td>$392.00</td>
<td>$294.00</td>
<td></td>
</tr>
<tr>
<td>01464</td>
<td>LIFE EXTENSION MIX™ - 10 bottles of 490 caps without copper</td>
<td>$850.00</td>
<td>$637.50</td>
<td></td>
</tr>
<tr>
<td>01466</td>
<td>LIFE EXTENSION MIX™ POWDER - 14.81 oz of powder without copper</td>
<td>$98.00</td>
<td>$73.50</td>
<td></td>
</tr>
<tr>
<td>01466</td>
<td>LIFE EXTENSION MIX™ POWDER - 4 bottles of powder without copper</td>
<td>$344.00</td>
<td>$258.00</td>
<td></td>
</tr>
<tr>
<td>01466</td>
<td>LIFE EXTENSION MIX™ POWDER - 10 bottles of powder without copper</td>
<td>$720.00</td>
<td>$540.00</td>
<td></td>
</tr>
<tr>
<td>01279</td>
<td>LIFE EXTENSION MOUTHWASH w/POMEGRANATE - 16 oz bottle</td>
<td>$18.50</td>
<td>$13.88</td>
<td></td>
</tr>
<tr>
<td>01279</td>
<td>LIFE EXTENSION MOUTHWASH w/POMEGRANATE - 4 - 16 oz bottle</td>
<td>$68.00</td>
<td>$51.00</td>
<td></td>
</tr>
<tr>
<td>01401</td>
<td>LIFE EXTENSION ONE-PER-DAY - 60 veg. tablets</td>
<td>$19.95</td>
<td>$14.96</td>
<td></td>
</tr>
<tr>
<td>01401</td>
<td>LIFE EXTENSION ONE-PER-DAY - 4 bottles of 60 veg. tablets</td>
<td>$72.00</td>
<td>$54.00</td>
<td></td>
</tr>
<tr>
<td>00011</td>
<td>LIFE EXTENSION SHAMPOO - 16 oz bottle</td>
<td>$6.00</td>
<td>$4.50</td>
<td></td>
</tr>
<tr>
<td>00011</td>
<td>LIFE EXTENSION SHAMPOO - 4 bottles of 12 oz bottles</td>
<td>$19.00</td>
<td>$14.25</td>
<td></td>
</tr>
<tr>
<td>01278</td>
<td>LIFE EXTENSION TOOTHPASTE MINT FLAVOR - 4 oz</td>
<td>$9.50</td>
<td>$7.13</td>
<td></td>
</tr>
<tr>
<td>01278</td>
<td>LIFE EXTENSION TOOTHPASTE MINT FLAVOR - 4 - 4 oz tubes</td>
<td>$34.60</td>
<td>$26.00</td>
<td></td>
</tr>
<tr>
<td>01416</td>
<td>LIFE EXTENSION TWO-PER-DAY - 60 caps</td>
<td>$9.95</td>
<td>$7.46</td>
<td></td>
</tr>
<tr>
<td>01416</td>
<td>LIFE EXTENSION TWO-PER-DAY - 4 bottles of 60 caps</td>
<td>$36.00</td>
<td>$27.00</td>
<td></td>
</tr>
<tr>
<td>01415</td>
<td>LIFE EXTENSION TWO-PER-DAY - 120 veg. tablets</td>
<td>$18.95</td>
<td>$14.21</td>
<td></td>
</tr>
<tr>
<td>01415</td>
<td>LIFE EXTENSION TWO-PER-DAY - 4 bottles of 120 veg. tablets</td>
<td>$68.00</td>
<td>$51.00</td>
<td></td>
</tr>
<tr>
<td>00263</td>
<td>LIFE FLORA™ - 300 mg, 120 caps</td>
<td>$20.50</td>
<td>$15.38</td>
<td></td>
</tr>
<tr>
<td>00263</td>
<td>LIFE FLORA™ - 4 bottles of 120 caps</td>
<td>$75.00</td>
<td>$56.25</td>
<td></td>
</tr>
<tr>
<td>00032</td>
<td>LIFEMIX - 1 lb can of powder</td>
<td>$25.00</td>
<td>$18.75</td>
<td></td>
</tr>
<tr>
<td>00032</td>
<td>LIFEMIX - 4 cans of powder</td>
<td>$90.00</td>
<td>$67.50</td>
<td></td>
</tr>
<tr>
<td>00294</td>
<td>LIQUID EMULSIFIED VITAMIN A DROPS - 20,000 IU per drop</td>
<td>$27.00</td>
<td>$20.25</td>
<td></td>
</tr>
<tr>
<td>00331</td>
<td>5-LOXIN™ - 75 mg, 100 veg. caps</td>
<td>$15.90</td>
<td>$11.93</td>
<td></td>
</tr>
<tr>
<td>00331</td>
<td>5-LOXIN™ - 4 bottles of 100 veg. caps</td>
<td>$69.00</td>
<td>$51.75</td>
<td></td>
</tr>
<tr>
<td>01013</td>
<td>L-lysine capsules - 620 mg, 100 caps</td>
<td>$9.00</td>
<td>$6.75</td>
<td></td>
</tr>
<tr>
<td>01013</td>
<td>L-lysine capsules - 4 bottles of 100 caps</td>
<td>$32.00</td>
<td>$24.00</td>
<td></td>
</tr>
<tr>
<td>00129</td>
<td>L-lysine powder - 300 grams of powder</td>
<td>$16.00</td>
<td>$12.00</td>
<td></td>
</tr>
<tr>
<td>00129</td>
<td>L-lysine powder - 4 bottles of powder</td>
<td>$55.00</td>
<td>$41.25</td>
<td></td>
</tr>
<tr>
<td>01017</td>
<td>LUSTRE™ - 90 tablets</td>
<td>$17.50</td>
<td>$13.13</td>
<td></td>
</tr>
<tr>
<td>01017</td>
<td>LUSTRE™ - 4 bottles of 90 tablets</td>
<td>$62.00</td>
<td>$46.50</td>
<td></td>
</tr>
<tr>
<td>01014</td>
<td>LUTEIN PLUS - 150 grams of powder</td>
<td>$25.00</td>
<td>$18.75</td>
<td></td>
</tr>
<tr>
<td>01014</td>
<td>LUTEIN PLUS - 4 bottles of powder</td>
<td>$88.00</td>
<td>$66.00</td>
<td></td>
</tr>
<tr>
<td>00128</td>
<td>LYCOPENE - 10 mg, 60 softgels</td>
<td>$24.98</td>
<td>$18.74</td>
<td></td>
</tr>
<tr>
<td>00455</td>
<td>LYCOPENE EXTRACT - 15 mg, 90 softgels</td>
<td>$35.00</td>
<td>$26.25</td>
<td></td>
</tr>
<tr>
<td>00515</td>
<td>LYCOPENE EXTRACT - 4 bottles of 90 softgels</td>
<td>$120.00</td>
<td>$90.00</td>
<td></td>
</tr>
</tbody>
</table>

**M**

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01044</td>
<td>MAGNESIUM CAPS - 500 mg, 100 caps</td>
<td>$9.50</td>
<td>$7.13</td>
<td></td>
</tr>
<tr>
<td>01044</td>
<td>MAGNESIUM CAPS - 4 bottles of 100 caps</td>
<td>$32.00</td>
<td>$24.00</td>
<td></td>
</tr>
<tr>
<td>00502</td>
<td>MAGNESIUM CITRATE CAPS - 160 mg, 100 caps</td>
<td>$9.00</td>
<td>$6.75</td>
<td></td>
</tr>
<tr>
<td>00502</td>
<td>MAGNESIUM CITRATE CAPS - 4 bottles of 100 caps</td>
<td>$30.00</td>
<td>$22.50</td>
<td></td>
</tr>
<tr>
<td>00057</td>
<td>MAGNESIUM OXIDE POWDER - 1 kilogram of powder</td>
<td>$14.00</td>
<td>$10.50</td>
<td></td>
</tr>
<tr>
<td>00057</td>
<td>MAGNESIUM OXIDE POWDER - 4 bottles of powder</td>
<td>$52.52</td>
<td>$39.39</td>
<td></td>
</tr>
<tr>
<td>00704</td>
<td>MAITAKE® SX-FRACTION - 90 veg. tablets</td>
<td>$49.95</td>
<td>$37.46</td>
<td></td>
</tr>
<tr>
<td>00547</td>
<td>MELATONIN - 300 mcg, 100 caps</td>
<td>$5.75</td>
<td>$4.31</td>
<td></td>
</tr>
<tr>
<td>00547</td>
<td>MELATONIN - 4 bottles of 100 caps</td>
<td>$20.00</td>
<td>$15.00</td>
<td></td>
</tr>
</tbody>
</table>

**N**

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00215</td>
<td>N-ACETYL CYSTEINE CAPSULES - 600 mg, 60 caps</td>
<td>$14.00</td>
<td>$10.50</td>
<td></td>
</tr>
<tr>
<td>00215</td>
<td>N-ACETYL CYSTEINE CAPSULES - 4 bottles of 60 caps</td>
<td>$54.00</td>
<td>$40.50</td>
<td></td>
</tr>
<tr>
<td>00168</td>
<td>NAPCA W/ALOE VERA - 8 fl oz bottle</td>
<td>$10.00</td>
<td>$7.50</td>
<td></td>
</tr>
<tr>
<td>00168</td>
<td>NAPCA W/ALOE VERA - 4 bottles</td>
<td>$36.00</td>
<td>$27.45</td>
<td></td>
</tr>
<tr>
<td>00066</td>
<td>NATTOKINASE - 60 softgels</td>
<td>$24.98</td>
<td>$18.74</td>
<td></td>
</tr>
<tr>
<td>00718</td>
<td>NATTOKINASE (FIBRINOGEN RESIST FORMULA) - 30 caps</td>
<td>$49.00</td>
<td>$36.75</td>
<td></td>
</tr>
<tr>
<td>00981</td>
<td>NATURAL APPETITE CONTROL - 90 softgels</td>
<td>$28.00</td>
<td>$21.00</td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 11**

**SUB-TOTAL OF COLUMN 12**

**MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS**

To order online visit: www.lifeextension.com
<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00984</td>
<td>NATURAL BP MANAGEMENT - 60 tablets</td>
<td>$42.00</td>
<td>$31.50</td>
<td></td>
</tr>
<tr>
<td>00913</td>
<td>NATURAL ESOPHAGIARD - 10 softgels</td>
<td>19.95</td>
<td>14.96</td>
<td></td>
</tr>
<tr>
<td>00712</td>
<td>NATURAL ESTWEG N/POMEGRANATE EXTRACT - 60 caplets</td>
<td>38.00</td>
<td>28.50</td>
<td></td>
</tr>
<tr>
<td>01221</td>
<td>NATURAL FEMALE SUPPORT - 30 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td></td>
</tr>
<tr>
<td>00990</td>
<td>NATURAL SLEEP - 3 mg, 60 caps</td>
<td>12.99</td>
<td>9.74</td>
<td></td>
</tr>
<tr>
<td>00277</td>
<td>NATURAL SLEEP MEATONIN - 5 mg, 60 caps</td>
<td>18.00</td>
<td>13.50</td>
<td></td>
</tr>
<tr>
<td>00987</td>
<td>NATURAL STRESS RELIEF - 30 veg. caps</td>
<td>28.00</td>
<td>21.00</td>
<td></td>
</tr>
<tr>
<td>01000</td>
<td>NEW FACE SOLUTION - 1.7 oz bottle</td>
<td>54.00</td>
<td>40.50</td>
<td></td>
</tr>
<tr>
<td>00096</td>
<td>NIAVIN (B-3) CAPSULES - 1000 mg, 100 caps</td>
<td>12.75</td>
<td>9.56</td>
<td></td>
</tr>
<tr>
<td>00372</td>
<td>NIAVIN (B-3) CAPSULES - 500 mg, 100 caps</td>
<td>7.65</td>
<td>5.74</td>
<td></td>
</tr>
<tr>
<td>00373</td>
<td>NO-FLUSH NIAVIN - 800 mg, 100 caps</td>
<td>19.00</td>
<td>14.25</td>
<td></td>
</tr>
<tr>
<td>00262</td>
<td>NUTRAFLORA - 500 grams of powder</td>
<td>46.00</td>
<td>34.50</td>
<td></td>
</tr>
<tr>
<td>01035</td>
<td>NUTRIM POWDER - 170 grams powder</td>
<td>25.95</td>
<td>19.46</td>
<td></td>
</tr>
<tr>
<td>00523</td>
<td>N-ZIMES® - 270 caps</td>
<td>23.90</td>
<td>17.93</td>
<td></td>
</tr>
<tr>
<td>01014</td>
<td>OCTACOSANOL - 8000 mcg, 60 caps</td>
<td>$17.99</td>
<td>$13.49</td>
<td></td>
</tr>
<tr>
<td>01483</td>
<td>(SUPER) OMEGA 3 EPA/DHA w/SEASME LIGNANS &amp; OLIVE FRUIT EXTRACT - 60 softgels</td>
<td>18.00</td>
<td>13.50</td>
<td></td>
</tr>
<tr>
<td>01482</td>
<td>(SUPER) OMEGA 3 EPA/DHA w/SEASME LIGNANS &amp; OLIVE FRUIT EXTRACT - 120 softgels</td>
<td>32.00</td>
<td>24.00</td>
<td></td>
</tr>
<tr>
<td>01484</td>
<td>(SUPER) OMEGA 3 EPA/DHA w/SEASME LIGNANS &amp; OLIVE FRUIT EXTRACT (ENTERIC COATED) - 120 softgels</td>
<td>249.00</td>
<td>186.75</td>
<td></td>
</tr>
<tr>
<td>00717</td>
<td>ONLY TRAY MINERALS - 90 caps</td>
<td>15.00</td>
<td>11.25</td>
<td></td>
</tr>
<tr>
<td>00915</td>
<td>OPTIZINC® - 30 mg, 90 veg. caps</td>
<td>5.95</td>
<td>4.46</td>
<td></td>
</tr>
<tr>
<td>00043</td>
<td>L-ORNITHINE CAPSULES - 500 mg, 100 caps</td>
<td>24.95</td>
<td>18.71</td>
<td></td>
</tr>
<tr>
<td>00107</td>
<td>PABA CAPS - 500 mg, 100 caps</td>
<td>$13.99</td>
<td>$10.49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PABA CAPS - 4 bottles of 100 caps</td>
<td>49.32</td>
<td>36.99</td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 13**
<table>
<thead>
<tr>
<th>No.</th>
<th>Life Extension Members Receive 25% Off the Retail Price of All Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>01092</td>
<td>(ENHANCED LIFE EXTENSION) PROTEIN (VANILLA) - 1 kg. of powder</td>
</tr>
<tr>
<td></td>
<td>$38.00</td>
</tr>
<tr>
<td>01093</td>
<td>(ENHANCED LIFE EXTENSION) PROTEIN (CHOCOLATE) - 1 kg. of powder</td>
</tr>
<tr>
<td></td>
<td>$38.00</td>
</tr>
<tr>
<td>01094</td>
<td>(ENHANCED LIFE EXTENSION) PROTEIN (NATURAL) - 1 kg. of powder</td>
</tr>
<tr>
<td></td>
<td>$38.00</td>
</tr>
<tr>
<td>01095</td>
<td>(ENHANCED LIFE EXTENSION) PROTEIN (BERRY) - 1 kg. of powder</td>
</tr>
<tr>
<td></td>
<td>$38.00</td>
</tr>
<tr>
<td>00290</td>
<td>(DESIGNER WHEY) PROTEIN - Vanilla 2 lbs of powder</td>
</tr>
<tr>
<td></td>
<td>$41.95</td>
</tr>
<tr>
<td>00282</td>
<td>(DESIGNER WHEY) PROTEIN - Chocolate 2 lbs of powder</td>
</tr>
<tr>
<td></td>
<td>$41.95</td>
</tr>
<tr>
<td>00283</td>
<td>(DESIGNER WHEY) PROTEIN - Natural 2 lbs of powder</td>
</tr>
<tr>
<td></td>
<td>$41.95</td>
</tr>
<tr>
<td>01056</td>
<td>PURE-GARP - 200 caps</td>
</tr>
<tr>
<td></td>
<td>$24.95</td>
</tr>
<tr>
<td>01209</td>
<td>(WATER-SOLUBLE) PUMPKIN SEED EXTRACT - 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$20.00</td>
</tr>
<tr>
<td>01210</td>
<td>(WATER-SOLUBLE) PUMPKIN SEED EXTRACT - 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$22.00</td>
</tr>
<tr>
<td>01027</td>
<td>PYRIDOXAMINE CAPS - 50 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$22.00</td>
</tr>
<tr>
<td>01031</td>
<td>PYCNOGENOL® - 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$86.95</td>
</tr>
<tr>
<td>01207</td>
<td>PYRIDOXAMINE CAPS - 4 bottles of 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$79.20</td>
</tr>
<tr>
<td>01309</td>
<td>(OPTIMIZED) QUERCETIN - 250 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$18.00</td>
</tr>
<tr>
<td>01030</td>
<td>RED YEAST RICE (Bluebonnet)- 600 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$16.95</td>
</tr>
<tr>
<td>00979</td>
<td>RED YEAST RICE (Nature’s Plus)- 600 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$23.20</td>
</tr>
<tr>
<td>00660</td>
<td>RED RICE EXTENDED RELEASE (Nature’s Plus)- 30 veg. tablets</td>
</tr>
<tr>
<td></td>
<td>$20.55</td>
</tr>
<tr>
<td>00605</td>
<td>REGIMINT® - 60 enteric-coated caps</td>
</tr>
<tr>
<td></td>
<td>$19.95</td>
</tr>
<tr>
<td>00448</td>
<td>REJUVENEX® BODY LOTION - 6 oz tube</td>
</tr>
<tr>
<td></td>
<td>$24.00</td>
</tr>
<tr>
<td>00918</td>
<td>REJUVENEX® FACTOR - 1.7 oz Airless pump bottle</td>
</tr>
<tr>
<td></td>
<td>$65.00</td>
</tr>
<tr>
<td>01220</td>
<td>(ULTRA) REJUVENIGHT (DREAM CREAM) - 2 oz jar</td>
</tr>
<tr>
<td></td>
<td>$52.00</td>
</tr>
<tr>
<td>00706</td>
<td>(ULTRA) REJUVENIGHT w/PROGESTERONE - 2 oz jar</td>
</tr>
<tr>
<td></td>
<td>$42.00</td>
</tr>
<tr>
<td>01413</td>
<td>RESVERATROL w/PTEROSTILBENE - 20 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$24.00</td>
</tr>
<tr>
<td>01410</td>
<td>RESVERATROL w/PTEROSTILBENE - 100 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$36.00</td>
</tr>
<tr>
<td>01409</td>
<td>(OPTIMIZED) RESVERATROL w/PTEROSTILBENE - 250 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$46.00</td>
</tr>
<tr>
<td>00889</td>
<td>RHODIOLIA EXTRACT - 250 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$11.75</td>
</tr>
<tr>
<td></td>
<td>RHODIOLIA EXTRACT - 4 bottles of 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$42.32</td>
</tr>
</tbody>
</table>

**QUOTAS**

<table>
<thead>
<tr>
<th>No.</th>
<th>Life Extension Members Receive 25% Off the Retail Price of All Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>01309</td>
<td>(OPTIMIZED) QUERCETIN - 250 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$18.00</td>
</tr>
<tr>
<td>00979</td>
<td>RED YEAST RICE (Nature’s Plus)- 600 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$23.20</td>
</tr>
<tr>
<td>00660</td>
<td>RED RICE EXTENDED RELEASE (Nature’s Plus)- 30 veg. tablets</td>
</tr>
<tr>
<td></td>
<td>$20.55</td>
</tr>
<tr>
<td>00605</td>
<td>REGIMINT® - 60 enteric-coated caps</td>
</tr>
<tr>
<td></td>
<td>$19.95</td>
</tr>
<tr>
<td>00448</td>
<td>REJUVENEX® BODY LOTION - 6 oz tube</td>
</tr>
<tr>
<td></td>
<td>$24.00</td>
</tr>
<tr>
<td>00918</td>
<td>REJUVENEX® FACTOR - 1.7 oz Airless pump bottle</td>
</tr>
<tr>
<td></td>
<td>$65.00</td>
</tr>
<tr>
<td>01220</td>
<td>(ULTRA) REJUVENIGHT (DREAM CREAM) - 2 oz jar</td>
</tr>
<tr>
<td></td>
<td>$52.00</td>
</tr>
<tr>
<td>00706</td>
<td>(ULTRA) REJUVENIGHT w/PROGESTERONE - 2 oz jar</td>
</tr>
<tr>
<td></td>
<td>$42.00</td>
</tr>
<tr>
<td>01413</td>
<td>RESVERATROL w/PTEROSTILBENE - 20 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$24.00</td>
</tr>
<tr>
<td>01410</td>
<td>RESVERATROL w/PTEROSTILBENE - 100 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$36.00</td>
</tr>
<tr>
<td>01409</td>
<td>(OPTIMIZED) RESVERATROL w/PTEROSTILBENE - 250 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$46.00</td>
</tr>
<tr>
<td>00889</td>
<td>RHODIOLIA EXTRACT - 250 mg, 60 veg. caps</td>
</tr>
<tr>
<td></td>
<td>$11.75</td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 15**

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

**SUB-TOTAL OF COLUMN 16**

*These products are not 25% off retail price.

MAY 2010
## Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00327</td>
<td>ST. JOHN’S W’RT EXTRACT (PLANETARY) - 600 mg, 60 tablets</td>
<td>$16.75</td>
<td>$12.56</td>
<td></td>
</tr>
<tr>
<td>00971</td>
<td>SUN PROTECTION SPRAY W/BETA GLUCAN - SPF30 - 6 oz bottle</td>
<td>$14.95</td>
<td>$11.11</td>
<td></td>
</tr>
<tr>
<td>00747</td>
<td>(OVERCAST POLARIZED) SUNGLASSES - gray color, large</td>
<td>$27.00</td>
<td>$20.25</td>
<td></td>
</tr>
<tr>
<td>00748</td>
<td>(OVERCAST POLARIZED) SUNGLASSES - 2 pairs, gray color</td>
<td>$42.00</td>
<td>$31.50</td>
<td></td>
</tr>
<tr>
<td>00758</td>
<td>SUPER ABSORBABLE SOY ISOFAVONES - 60 caps</td>
<td>$28.00</td>
<td>$21.00</td>
<td></td>
</tr>
<tr>
<td>01408</td>
<td>SUPER SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL 60 softgels</td>
<td>$28.00</td>
<td>$21.00</td>
<td></td>
</tr>
<tr>
<td>01407</td>
<td>SUPER SAW PALMETTO W/BETA-SITOSTEROL - 30 softgels</td>
<td>$15.00</td>
<td>$11.25</td>
<td></td>
</tr>
<tr>
<td>00578</td>
<td>SUPER SULFUR COMPLEX - 200 mcg, 100 caps</td>
<td>$12.00</td>
<td>$9.00</td>
<td></td>
</tr>
<tr>
<td>00674</td>
<td>SYTRINOL™ - 60 softgels</td>
<td>$32.00</td>
<td>$24.00</td>
<td></td>
</tr>
<tr>
<td>01008</td>
<td>TAL•SHF® COSMETICS • For information please call 1-800-544-4440 or visit <a href="http://www.lifeextension.com">www.lifeextension.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>00199</td>
<td>TAURINE CAPSULES - 1000 mg, 50 caps</td>
<td>$38.95</td>
<td>$6.71</td>
<td></td>
</tr>
<tr>
<td>00153</td>
<td>TAURINE POWDER - 300 grams, powder</td>
<td>$20.00</td>
<td>$15.00</td>
<td></td>
</tr>
<tr>
<td>01304</td>
<td>THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps</td>
<td>$18.00</td>
<td>$13.50</td>
<td></td>
</tr>
<tr>
<td>00555</td>
<td>(L) THEANINE - 100 mg, 60 caps</td>
<td>$24.00</td>
<td>$18.00</td>
<td></td>
</tr>
<tr>
<td>01308</td>
<td>THERALAC - 30 caps</td>
<td>$44.95</td>
<td>$33.71</td>
<td></td>
</tr>
<tr>
<td>00224</td>
<td>THYMIC IMMUNE FACTORS - 100 caps</td>
<td>$18.00</td>
<td>$13.50</td>
<td></td>
</tr>
<tr>
<td>00668</td>
<td>(METABOLIC ADVANTAGE) THYROID FORMULA - 100 caps</td>
<td>$17.95</td>
<td>$13.46</td>
<td></td>
</tr>
<tr>
<td>00349</td>
<td>TGIN - 50 grams of powder</td>
<td>$14.00</td>
<td>$10.50</td>
<td></td>
</tr>
<tr>
<td>00359</td>
<td>TGIN TABLETS - 500 mg, 180 tablets</td>
<td>$18.00</td>
<td>$13.50</td>
<td></td>
</tr>
<tr>
<td>00366</td>
<td>TOCOTRIENOLS - 50 mg, 60 softgel caps</td>
<td>$39.95</td>
<td>$29.96</td>
<td></td>
</tr>
<tr>
<td>00781</td>
<td>TOCOTRIENOLS WITH SESAME LIGNANS - 60 softgels</td>
<td>$38.00</td>
<td>$28.50</td>
<td></td>
</tr>
<tr>
<td>01400</td>
<td>(SUPER-ABSORBABLE) TOCOTRIENOLS - 60 softgels</td>
<td>$30.00</td>
<td>$22.50</td>
<td></td>
</tr>
<tr>
<td>01274</td>
<td>TOTAL SUN PROTECTION CREAM W/BETAGLUCANS - SPF30, 4 oz Tube &amp; PHOTO-AGING RECOVERY COMPLEX</td>
<td>$28.00</td>
<td>$20.00</td>
<td></td>
</tr>
<tr>
<td>01468</td>
<td>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps</td>
<td>$24.00</td>
<td>$18.00</td>
<td></td>
</tr>
<tr>
<td>01469</td>
<td>TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL - 4 bottles</td>
<td>$32.00</td>
<td>$24.00</td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 17**

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>01046</td>
<td>TRIPLE ACTION UNDER EYE REJUVENATOR - 0.5 oz pump</td>
<td>$24.00</td>
<td>$18.00</td>
<td></td>
</tr>
<tr>
<td>00866</td>
<td>TRYPOTRENATE® L-TRYPTOPHAN - 500 mg, 90 veg. caps</td>
<td>$38.00</td>
<td>$28.50</td>
<td></td>
</tr>
<tr>
<td>01202</td>
<td>(OPTIMIZED) TRYPOTRENATE® PLUS - 50 veg. caps</td>
<td>$40.00</td>
<td>$30.00</td>
<td></td>
</tr>
<tr>
<td>00036</td>
<td>L-TYROSINE POWDER - 100 grams of powder</td>
<td>$22.50</td>
<td>$16.88</td>
<td></td>
</tr>
<tr>
<td>00326</td>
<td>L-TYROSINE TABLETS - 500 mg, 100 tablets</td>
<td>$12.50</td>
<td>$9.38</td>
<td></td>
</tr>
<tr>
<td>00035</td>
<td>L-TYROSINE PLUS POWDER - 100 grams of powder</td>
<td>$29.00</td>
<td>$21.00</td>
<td></td>
</tr>
<tr>
<td>00310</td>
<td>UDO’S CHOICE® - 17 oz liquid (omega fatty acids)</td>
<td>$27.49</td>
<td>$21.99</td>
<td></td>
</tr>
<tr>
<td>00311</td>
<td>UDO’S CHOICE® - 1000 mg, 180 caps</td>
<td>$33.79</td>
<td>$27.03</td>
<td></td>
</tr>
<tr>
<td>00322</td>
<td>UDO’S CHOICE® WHOLESAKE FOOD - 1 lb bottle</td>
<td>$27.49</td>
<td>$21.99</td>
<td></td>
</tr>
<tr>
<td>01061</td>
<td>ULTIMATE FLORA ADVANCED IMMUNITY - 30 caps</td>
<td>$29.99</td>
<td>$22.49</td>
<td></td>
</tr>
<tr>
<td>00213</td>
<td>VANADYL SULFATE - 7.5 mg, 100 tablets</td>
<td>$15.00</td>
<td>$11.25</td>
<td></td>
</tr>
<tr>
<td>01018</td>
<td>VASCULAR PROTECT - 120 vegetarian caps</td>
<td>$48.00</td>
<td>$36.00</td>
<td></td>
</tr>
<tr>
<td>00252</td>
<td>VELVET DEER ANTLER - 250 mg, 30 caps</td>
<td>$36.00</td>
<td>$27.00</td>
<td></td>
</tr>
<tr>
<td>00408</td>
<td>VENOTONE - 60 caps</td>
<td>$18.95</td>
<td>$14.21</td>
<td></td>
</tr>
<tr>
<td>00427</td>
<td>VINPOCETINE - 5 mg, 100 tablets</td>
<td>$18.00</td>
<td>$13.50</td>
<td></td>
</tr>
<tr>
<td>01033</td>
<td>VISION OPTIMIZER - 90 caps</td>
<td>$29.95</td>
<td>$22.46</td>
<td></td>
</tr>
<tr>
<td>01098</td>
<td>VITAL GRENDS MIX - 319.5 grams of powder</td>
<td>$48.00</td>
<td>$36.00</td>
<td></td>
</tr>
<tr>
<td>00991</td>
<td>VITAMIN B1 CAPS - 500 mg, 100 caps</td>
<td>$16.99</td>
<td>$12.74</td>
<td></td>
</tr>
<tr>
<td>00909</td>
<td>VITAMIN B1 POWDER - 100 grams of powder (Thiamin)</td>
<td>$18.00</td>
<td>$13.50</td>
<td></td>
</tr>
<tr>
<td>00993</td>
<td>VITAMIN B2 CAPS - 100 mg, 100 caps</td>
<td>$12.99</td>
<td>$9.74</td>
<td></td>
</tr>
<tr>
<td>00992</td>
<td>VITAMIN B2 POWDER - 30 grams of powder</td>
<td>$10.50</td>
<td>$7.88</td>
<td></td>
</tr>
<tr>
<td>00996</td>
<td>VITAMIN B3 (NIACIN) - 1000 mg, 100 caps</td>
<td>$12.75</td>
<td>$9.56</td>
<td></td>
</tr>
<tr>
<td>00372</td>
<td>VITAMIN B3 (NIACIN) - 500 mg, 100 caps</td>
<td>$7.65</td>
<td>$5.74</td>
<td></td>
</tr>
<tr>
<td>00374</td>
<td>VITAMIN B3 (NIACIN) - 4 bottles of 100 caps</td>
<td>$60.68</td>
<td>$45.51</td>
<td></td>
</tr>
<tr>
<td>00990</td>
<td>VITAMIN B5 POWDER - 500 mg, 100 caps</td>
<td>$67.52</td>
<td>$50.64</td>
<td></td>
</tr>
<tr>
<td>00999</td>
<td>VITAMIN B6 POWDER - 300 grams of powder (Pantothenic Acid)</td>
<td>$10.50</td>
<td>$7.88</td>
<td></td>
</tr>
<tr>
<td>00997</td>
<td>VITAMIN B6 POWDER - 100 grams of powder</td>
<td>$37.52</td>
<td>$28.14</td>
<td></td>
</tr>
<tr>
<td>00956</td>
<td>VITAMIN B6 CAPS - 250 mg, 100 caps</td>
<td>$12.50</td>
<td>$9.38</td>
<td></td>
</tr>
<tr>
<td>00999</td>
<td>VITAMIN B6 POWDER - 4 bottles of 100 caps</td>
<td>$44.00</td>
<td>$33.00</td>
<td></td>
</tr>
<tr>
<td>00361</td>
<td>VITAMIN B12 TABLETS - 500 mcg, 100 dissolve-in-mouth tablets</td>
<td>$8.75</td>
<td>$6.56</td>
<td></td>
</tr>
<tr>
<td>01061</td>
<td>VITAMIN B12 TABLETS - 4 bottles of 100 dissolve-in-mouth tablets</td>
<td>$29.00</td>
<td>$21.75</td>
<td></td>
</tr>
</tbody>
</table>

* These products are not 25% off retail price.

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
# Buyers Club Order Form

## Life Extension Members Receive 25% Off the Retail Price of All Products

To order online visit: www.lifeextension.com

<table>
<thead>
<tr>
<th>No.</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00144</td>
<td>VITAMIN B12 POWDER - 100 grams of powder</td>
<td>$12.00</td>
<td>$9.00</td>
<td></td>
</tr>
<tr>
<td>00297</td>
<td>VITAMIN B12 POWDER - 4 bottles of powder</td>
<td>42.52</td>
<td>31.89</td>
<td></td>
</tr>
<tr>
<td>00927</td>
<td>VITAMIN C WITH DIHYDROQUERCETIN - 1000 mg, 250 tablets</td>
<td>25.50</td>
<td>19.13</td>
<td></td>
</tr>
<tr>
<td>00928</td>
<td>VITAMIN C WITH DIHYDROQUERCETIN - 4 bottles of 250 tablets</td>
<td>93.00</td>
<td>69.75</td>
<td></td>
</tr>
<tr>
<td>00084</td>
<td>(BUFFERED) VITAMIN C POWDER - 454.6 grams of powder</td>
<td>23.95</td>
<td>17.96</td>
<td></td>
</tr>
<tr>
<td>00085</td>
<td>(BUFFERED) VITAMIN C POWDER - 4 bottles of powder</td>
<td>88.00</td>
<td>66.00</td>
<td></td>
</tr>
<tr>
<td>00864</td>
<td>VITAMIN D - 2000 IU, 1 fl oz</td>
<td>28.00</td>
<td>21.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN D - 4 bottles of 1 fl oz</td>
<td>100.00</td>
<td>75.00</td>
<td></td>
</tr>
<tr>
<td>00251</td>
<td>VITAMIN D3 CAPS - 1000 IU, 250 caps</td>
<td>12.50</td>
<td>9.38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN D3 CAPS - 4 bottles of 250 caps</td>
<td>45.00</td>
<td>33.75</td>
<td></td>
</tr>
<tr>
<td>00713</td>
<td>VITAMIN D3 CAPS - 5000 IU, 60 caps</td>
<td>11.00</td>
<td>8.25</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN D3 CAPS - 4 bottles of 60 caps</td>
<td>39.60</td>
<td>29.70</td>
<td></td>
</tr>
<tr>
<td>01418</td>
<td>VITAMIN D3 CAPS - 7000 IU, 60 caps</td>
<td>14.00</td>
<td>10.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN D3 CAPS - 4 bottles of 60 caps</td>
<td>50.40</td>
<td>37.80</td>
<td></td>
</tr>
<tr>
<td>01371</td>
<td>VITAMIN D3 w/SEA-IODINE - 1000 IU, 250 veg. caps</td>
<td>22.00</td>
<td>16.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN D3 w/SEA-IODINE - 4 bottles of 250 veg. caps</td>
<td>80.00</td>
<td>60.00</td>
<td></td>
</tr>
<tr>
<td>01372</td>
<td>VITAMIN D3 w/SEA-IODINE - 5000 IU, 60 veg. caps</td>
<td>14.00</td>
<td>10.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN D3 w/SEA-IODINE - 4 bottles of 60 veg. caps</td>
<td>50.00</td>
<td>37.50</td>
<td></td>
</tr>
<tr>
<td>00063</td>
<td>VITAMIN E CAPS (NATURAL) - 400 IU, 100 caps</td>
<td>18.75</td>
<td>14.06</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN E CAPS (NATURAL) - 4 bottles of 100 caps</td>
<td>69.00</td>
<td>51.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN E CAPS (NATURAL) - 10 bottles of 100 caps</td>
<td>150.00</td>
<td>112.50</td>
<td></td>
</tr>
<tr>
<td>00082</td>
<td>VITAMIN E POWDER (SYNTHETIC) - 300 grams of powder</td>
<td>28.95</td>
<td>21.71</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VITAMIN E POWDER (SYNTHETIC) - 4 bottles of powder</td>
<td>100.00</td>
<td>75.00</td>
<td></td>
</tr>
<tr>
<td>01225</td>
<td>(LOW-DOSE) VITAMIN K2 (MK-7) - 45 mcg, 90 softgels</td>
<td>18.00</td>
<td>13.50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(LOW-DOSE) VITAMIN K2 (MK-7) - 4 bottles of 90 softgels</td>
<td>64.00</td>
<td>48.00</td>
<td></td>
</tr>
</tbody>
</table>

### Z

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Retail</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>00986</td>
<td>(SUPER) ZEAXANTHIN W/LUTEIN &amp; MESO-ZEAXANTHIN - 60 softgels</td>
<td>$22.00</td>
<td>$16.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01286</td>
<td>(SUPER) ZEAXANTHIN W/LUTEIN &amp; MESO-ZEAXANTHIN - 60 softgels PLUS ASTAXANTHIN</td>
<td>42.00</td>
<td>31.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(SUPER) ZEAXANTHIN W/LUTEIN &amp; MESO-ZEAXANTHIN - 4 bottles of 60 softgels</td>
<td>79.20</td>
<td>59.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00152</td>
<td>ZINC GLUCONATE POWDER - 100 grams of powder</td>
<td>8.00</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ZINC GLUCONATE POWDER - 4 bottles of powder</td>
<td>27.50</td>
<td>20.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00061</td>
<td>ZINC LOZENGES WITH VITAMIN C - 75 lozenges</td>
<td>9.50</td>
<td>7.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ZINC LOZENGES WITH VITAMIN C - 4 bottles of 75 lozenges</td>
<td>27.00</td>
<td>20.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01051</td>
<td>ZYFLAMEND - 120 softgels</td>
<td>60.95</td>
<td>45.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>01029</td>
<td>ZYFLAMEND EASYCAPS - 180 caps</td>
<td>31.95</td>
<td>23.96</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SUB-TOTAL OF COLUMN 19**

## 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.

---

LIFE EXTENSION MEMBERS RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS
### Buyers Club Order Form

**ORDER SUBTOTALS**

<table>
<thead>
<tr>
<th>Sub-Total Column 1</th>
<th>Sub-Total Column 2</th>
<th>Sub-Total Column 3</th>
<th>Sub-Total Column 4</th>
<th>Sub-Total Column 5</th>
<th>Sub-Total Column 6</th>
<th>Sub-Total Column 7</th>
<th>Sub-Total Column 8</th>
<th>Sub-Total Column 9</th>
<th>Sub-Total Column 10</th>
<th>Sub-Total Column 11</th>
<th>Sub-Total Column 12</th>
<th>Sub-Total Column 13</th>
<th>Sub-Total Column 14</th>
<th>Sub-Total Column 15</th>
<th>Sub-Total Column 16</th>
<th>Sub-Total Column 17</th>
<th>Sub-Total Column 18</th>
<th>Sub-Total Column 19</th>
</tr>
</thead>
</table>

### ORDER TOTALS

- Sub-Total A (Sub-total of Columns 1 through 19) **$5.50**
- Postage And Handling (Any size order, continental U.S.) **$5.50**
- C.O.D.s (Add $7 for C.O.D. orders)
- Shipping

**GRAND TOTAL** (Must be in U.S. dollars)

---

### LIFE EXTENSION FOUNDATION® MEMBERS ONLY

**MEMBER NO.**

PRINT MEMBERSHIP NO. FOR MEMBER DISCOUNT

---

**NOT A MEMBER? JOIN TODAY!**

- I want to join the Life Extension Foundation®.
  - Enclosed is $75 for annual membership. (Canadians add $7.00, all others outside the U.S. add $35.00). Send me: Disease Prevention & Treatment Protocol Book

- **CHECK HERE FOR C.O.D. ORDERS**
- **CHECK HERE FOR UPS BLUE LABEL (2ND DAY)**
- **CHECK HERE FOR UPS RED LABEL (OVERNIGHT)**

---

### BILL TO ADDRESS

<table>
<thead>
<tr>
<th>NAME</th>
<th>E-MAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS</td>
<td></td>
</tr>
<tr>
<td>CITY/STATE/ZIP-POSTAL CODE</td>
<td>COUNTRY</td>
</tr>
<tr>
<td>PHONE</td>
<td>FAX</td>
</tr>
<tr>
<td>VISA/MASTERCARD/AMEX/DISCOVER #</td>
<td></td>
</tr>
<tr>
<td>EXP. DATE</td>
<td></td>
</tr>
</tbody>
</table>

---

### SHIP TO ADDRESS

<table>
<thead>
<tr>
<th>NAME</th>
<th>E-MAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADDRESS</td>
<td></td>
</tr>
<tr>
<td>CITY/STATE/ZIP-POSTAL CODE</td>
<td>COUNTRY</td>
</tr>
<tr>
<td>PHONE</td>
<td>FAX</td>
</tr>
<tr>
<td>SIGNATURE</td>
<td></td>
</tr>
</tbody>
</table>

---

**PRICES SUBJECT TO CHANGE WITHOUT NOTICE. PLEASE NOTIFY THE LIFE EXTENSION FOUNDATION® OF ANY ADDRESS CHANGE**
<table>
<thead>
<tr>
<th>LIFE EXTENSION MEDIA</th>
<th>Retail Price</th>
<th>Member Price</th>
<th>Qty</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>*33816 FDA: FAILURE, DECEPTION, ABUSE</td>
<td>$20.00</td>
<td>$19.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*33818 STAY YOUNG &amp; SEXY WITH BIO-IDENTICAL HORMONE REPLACEMENT</td>
<td>$19.95</td>
<td>$18.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*33815 KNOCKOUT</td>
<td>$25.99</td>
<td>$24.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*33814 CHEATING DEATH</td>
<td>$24.99</td>
<td>$23.99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33813 TIMESHIP</td>
<td>$45.00</td>
<td>$33.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*33812 LIFE OVER CANCER</td>
<td>$25.00</td>
<td>$17.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33594 TEXTBOOK OF BIO-IDENTICAL HORMONES</td>
<td>$49.95</td>
<td>$37.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>*33811 THE GREAT AMERICAN HEART HOAX</td>
<td>$24.95</td>
<td>$17.47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33810 THE ULTRAMIND SOLUTION</td>
<td>$27.50</td>
<td>$19.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33809 TESTOSTERONE FOR LIFE</td>
<td>$16.95</td>
<td>$11.87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33808 BREAKTHROUGH: EIGHT STEPS TO WELLNESS</td>
<td>$25.95</td>
<td>$18.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33599 YOUNGER YOU</td>
<td>$24.95</td>
<td>$15.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33598 AGELESS</td>
<td>$25.00</td>
<td>$17.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33666 ULTIMATEMETABOLISM: THE SIMPLE PLAN FOR AUTOMATIC WEIGHT LOSS</td>
<td>$25.00</td>
<td>$15.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33422 BRAIN LONGEVITY</td>
<td>$14.95</td>
<td>$11.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33017 CANCER THERAPY</td>
<td>$19.95</td>
<td>$15.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33677 DANGEROUS DOSES</td>
<td>$25.00</td>
<td>$16.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33600 DISEASE PREVENTION AND TREATMENT, EXPANDED FOURTH EDITION</td>
<td>$49.95</td>
<td>$37.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price per book when 4 books purchased</td>
<td>$44.00</td>
<td>$33.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33994 THE EDGE EFFECT</td>
<td>$12.95</td>
<td>$9.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33700 ENDING AGING</td>
<td>$28.94</td>
<td>$17.75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33488 FEMALE AND FORGETFUL</td>
<td>$18.99</td>
<td>$14.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33388 THE FIRST IMMORTAL</td>
<td>$6.99</td>
<td>$6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33557 FOREVER AGELESS</td>
<td>$24.95</td>
<td>$18.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33966 LIFE EXTENSION REVOLUTION</td>
<td>$16.00</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33887 MAXIMIZE YOUR VITALITY &amp; POTENCY</td>
<td>$14.95</td>
<td>$11.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33010 MELATONIN</td>
<td>$22.95</td>
<td>$15.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33180 THE MELATONIN AND AGING SOURCEBOOK</td>
<td>$79.95</td>
<td>$59.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33011 THE MELATONIN MIRACLE</td>
<td>$6.80</td>
<td>$5.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33837 THE METABOLIC PLAN</td>
<td>$14.95</td>
<td>$11.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33805 MIAMI MEDITERRANEAN DIET WITH 300 RECIPES</td>
<td>$24.95</td>
<td>$16.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33906 THE MIGRAINE CURE</td>
<td>$24.00</td>
<td>$15.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33026 MIND FOOD &amp; SMART PILLS</td>
<td>$13.95</td>
<td>$11.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35699 OVERDOSE</td>
<td>$24.95</td>
<td>$16.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33880 PRESCRIPTION FOR DISASTER DVD</td>
<td>$18.00</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33670 A PRIMER ON PROSTATE CANCER</td>
<td>$28.95</td>
<td>$21.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33582 SAVE YOUR SIGHT</td>
<td>$13.99</td>
<td>$8.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33004 STAYING YOUNG. THE OWNER’S MANUAL FOR EXTENDING YOUR WARRANTY</td>
<td>$35.00</td>
<td>$21.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33805 THE CR WAY</td>
<td>$15.95</td>
<td>$11.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33955 THE SEXY YEARS</td>
<td>$25.00</td>
<td>$17.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33676 THE SIDE EFFECTS BIBLE</td>
<td>$16.95</td>
<td>$11.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33399 VOCAL EXCERPTS FROM SCIENTIFIC STUDIES</td>
<td>$6.00</td>
<td>$3.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33695 WE BECOME SILENT</td>
<td>$24.98</td>
<td>$18.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33803 WHAT YOUR DOCTOR MAY NOT TELL YOU ABOUT DIABETES</td>
<td>$14.99</td>
<td>$10.49</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33703 JOHN ABOO’S NO EXCUSES WORKOUT DVD</td>
<td>$13.30</td>
<td>$9.98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sub-Total (U.S. Dollars): $75.50

Shipping only $5.50 U.S. • $1750 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 $75.50

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

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 $700, all others outside the U.S. add $35.00.) Send me: Disease Prevention & Treatment Protocol Book

* Until April 14, 2010, the price is 50% of the cover price of $20.
Stimulate Your Natural Immune Defenses
Advanced Dual-Protection Probiotic Improves Respiratory and Gut Immunity

Ultimate Flora Advanced Immunity

- 30-count
- Retail price $29.99
- Member price $22.49
- Item #01061

Growing research into the benefits of probiotics—the good bacteria in the human digestive tract, where more than 70 percent of the body’s natural immune defenses can be found—has prompted leading health experts to recommend daily supplementation with a high-potency probiotic to naturally stimulate the immune system and enhance resistance during peak times throughout the year.

Ultimate Flora Advanced Immunity™ from ReNew Life is a specially formulated probiotic that provides a unique two-part approach to enhancing immunity.* Three clinically proven natural ingredients—EpiCor® immunogen, S. boulardii beneficial probiotic yeast and ResistAid™ LAG—work synergistically to promote a balanced immune system and enhance the body’s natural defenses during peak seasons.*

EpiCor® Immunogen
A natural derivative of S. cerevisiae (brewer’s yeast), EpiCor is comprised of beta-glucan, mannan oligosaccharide (MOS) and additional beneficial metabolites with immune-supporting vitamins, minerals, amino acids and potent antioxidants.*

EpiCor has been shown to activate key immune cells in the body, specifically targeting the lungs and respiratory system to promote optimal immune function during peak seasons such as spring and winter.*

Saccharomyces boulardii Probiotic Yeast
The 10 billion cultures of Saccharomyces boulardii in Ultimate Flora Advanced Immunity™ stimulate optimal immune function by strengthening the protective intestinal barrier and promoting the growth of beneficial microflora in the gut.*

One of the most promising natural immune-enhancing components, S. boulardii is a non-pathogenic yeast that has been utilized worldwide as a probiotic to support immune defenses as well as to relieve occasional diarrhea and digestive upset.* Unlike the thousands of species of microorganisms that inhabit the human digestive tract normally, S. boulardii is a transient yeast and must be obtained through supplementation. Upon ingestion, S. boulardii passes through the intestines and exerts its beneficial effects throughout the entire gastrointestinal tract.*

ResistAid™ LAG
ResistAid is a uniquely effective natural antioxidant that contains Arabinogalactan, the key component of the immune-enhancing herb Echinacea.* Found in a more bioactive form in ResistAid, arabinogalactan exhibits a stimulatory effect on the human immune system by helping to increase beneficial immune cell populations.*

Research has shown that supplementation with LAG can increase the number of immune-defending white blood cells and in turn enable the immune system to more effectively cope with seasonal and everyday stress.* The potent antioxidant capacity of ResistAid is attributed to its high levels of beneficial plant compounds known as polyphenols.*

Now you can obtain the natural benefits of each of these uniquely powerful ingredients in a single daily supplement. It’s the most advanced probiotic available for optimal immune system and respiratory function.*

To order Ultimate Flora Advanced Immunity, call 1-800-544-4440 or visit www.lef.org

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.
Thank you, Life Extension Members for telling your family and friends about Theralac. We are pleased Theralac has helped so many of you!

For those who have tried Theralac you know this probiotic restores peace within your intestinal tract FAST. Making comfort down deep requires the action of a powerful probiotic that rapidly restores a healthy microbial balance.

When probiotics are in control, a state of eubiosis exists and life is good: effective digestion, absorption, and regularity prevail. When probiotics are lacking, a state of dysbiosis, often results: an unhealthy condition characterized by indigestion, cramping, bloating and discomfort.

Theralac’s Rescue Plan: Just take one or two Theralac capsules daily and you will feel it working in less than a week, guaranteed. When you get back to feeling comfortable inside, back off to a maintenance dose of 2 capsules/week and save money! Theralac’s patented formulation makes this value added benefit possible.

Theralac works better than other probiotics because it delivers FIVE clinically proven strains at a therapeutic dose of 30 billion CFU* alive and deep into the intestinal tract. Studies show that Theralac’s probiotic strains adhere to and colonize mucosal surfaces where they competitively exclude undesirable microorganisms (see theralac.com for references).

Leading doctors now recommend Theralac in their publications: Dr. Russell Blaylock in The Blaylock Wellness Report and Gary Huffnagle, PhD, in The Probiotics Revolution.

Call Life Extension now to order Theralac and feel the benefits for yourself. Theralac is guaranteed through expiration and protected by 2 US patents.

Theralac, 30 capsules Item# 01038 Retail price: $44.95 Call for LEF Member Pricing

Life Extension® Call 800-544-4440 theralac.com

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.
Partner with an anti-aging physician and take charge of your health destiny today.
Find one near you via the Physician Directory at www.worldhealth.net

Pamper yourself while surrounded by natural beauty
The Royal Haciendas in the Riviera Maya

SPECIAL RATE FOR LifeExtension® MEMBERS

$139.00 Per night in a Luxury Suite
CALL NOW 1-800-791-4403
Daily from 8 a.m. to 8 p.m. CST
mexico@levacations.com

Valid travel dates: April 20 – June 18, 2010. Prices may change at any moment. Subject to availability.
Does Your Pharmacy Care if You Live or Die?

Today's chain pharmacies have become drug-dispensing assembly lines. They fill whatever your doctor prescribes or insurance covers, regardless of what is best for your individual needs.

At Life Extension Pharmacy™ we do things differently. We take advantage of our partnership with the Life Extension Foundation® for intimate knowledge of the peer-reviewed scientific literature about the prescription drugs you take … including drug interactions, side effects, lower-cost alternatives, and, in some cases, safer and more effective ways to use your medications. It's our mission to preserve your health and save you money.

Our Independent Thinking

As well as offering advice on the safety and effectiveness of your prescriptions, our team of pharmacists also explains how they can work synergistically with nutrient and hormone supplements to keep you healthy.

Consider the anti-coagulant drug Coumadin® (warfarin) as an example. While most doctors advise patients who are taking Coumadin® to avoid vitamin K supplements and vitamin K-containing foods, recent research demonstrates that Coumadin® plus low-dose vitamin K supplements (around 45 mcg a day) can achieve more stable measurement of blood clotting time (the INR test). Even more important is that Coumadin®’s horrendous side effects (accelerated atherosclerosis and bone loss) may be preventable in the presence of stable vitamin K levels in the body.

Another problem occurs with drugs prescribed to treat prostate cancer (such as Lupron®) that deplete the body of testosterone. Through our collaboration with the Life Extension Foundation, we can advise patients on the specific steps they should take to protect against the lethal "Androgen Deprivation Syndrome."

Another example is the statin drug Crestor®. This high-priced medication is flying out of pharmacies across the country. But should it be? Recent studies reveal that it's not right for everyone who is taking it. Visit www.LifeExtensionRx.com/crestor for our in-depth analysis on the latest Crestor® study.

Tailored Services

So keep this in mind... the Life Extension Pharmacy™ puts your welfare first. If a lower-cost drug may work better for you than an expensive brand name, we’re going to recommend it. Combining the Life Extension Foundation’s nutraceutical expertise with our pharmacists’ in-depth knowledge of pharmaceuticals and customized prescription compounding, Life Extension Pharmacy™ is committed to helping you get the very best results from your therapy.

<table>
<thead>
<tr>
<th>Simvastatin 40-mg (90 Tablets)</th>
<th>CVS Price</th>
<th>Life Extension Rx Price</th>
<th>% Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVS Price</td>
<td>$154.99</td>
<td>Life Extension Rx Price</td>
<td>$21.23*</td>
</tr>
<tr>
<td>% Saved</td>
<td></td>
<td></td>
<td>86%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glyburide 5-mg (90 Tablets)</th>
<th>CVS Price</th>
<th>Life Extension Rx Price</th>
<th>% Saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVS Price</td>
<td>$33.59</td>
<td>Life Extension Rx Price</td>
<td>$13.06*</td>
</tr>
<tr>
<td>% Saved</td>
<td></td>
<td></td>
<td>61%</td>
</tr>
</tbody>
</table>

* Prices as of March 15, 2010. Prices subject to change.

Saving Your Money & Your Health

Life Extension Pharmacy™ offers a range of ways to save you money including low-cost compounded drugs, life-saving prescription drugs at greatly discounted prices, and practical suggestions on how to conserve your health care dollars. To see how much we can save you, look at our prices for the statin simvastatin and the antidiabetic drug glyburide compared with CVS in the table above!

To find out how you may benefit by transferring your prescriptions, call 1-877-877-9700.

Life Extension Pharmacy, Inc. is a licensed pharmacy based in Fort Lauderdale, FL. A portion of prescription proceeds goes to the Life Extension Foundation, a nonprofit organization.
WHY ESTROGEN BALANCE IS CRITICAL FOR AGING MEN

A study in the *Journal of the American Medical Association* confirms that too much (or too little) estrogen increases a man’s risk of death. Most male *Life Extension* members test their blood estrogen level regularly and take the necessary steps to achieve optimal balance.

POMEGRANATE IS MORE THAN JUST A FRUIT

The benefits of pomegranate fruit are well known, but scientists have recently uncovered unique properties in the pomegranate flower and seed that are of particular interest to those suffering chronic inflammatory conditions as well as excess glucose and lipid blood levels.

NEW BLOOD TEST REVEALS RISK OF CARDIAC DEATH

A new at-home blood test called the Omega Score™ enables you to evaluate your omega-3 status. The results reveal a measure of your risk of cardiac arrest. Find out how easy it is to assess your personal Omega Score™.

HIDDEN EPIDEMIC OF CHRONIC KIDNEY DISEASE

Researchers have uncovered the epidemic of chronic kidney disease striking aging Americans. The encouraging news is that there are proven methods to diagnose kidney disease early and protect against this widespread killer.

PLUS

LOU FERRIGNO’S SECRET TO MAINTAINING STRENGTH
LOW COQ10 LINKED TO CHRONIC FATIGUE
GREEN TEA SUPPRESSES FIBROID TUMORS
SUPPLEMENTS HELP AGING HUMANS REMAIN ACTIVE

Visit us at www.LifeExtension.com