

# LifeExtension<sup>®</sup>

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June 2010

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

*Unprecedented Breakthrough!*

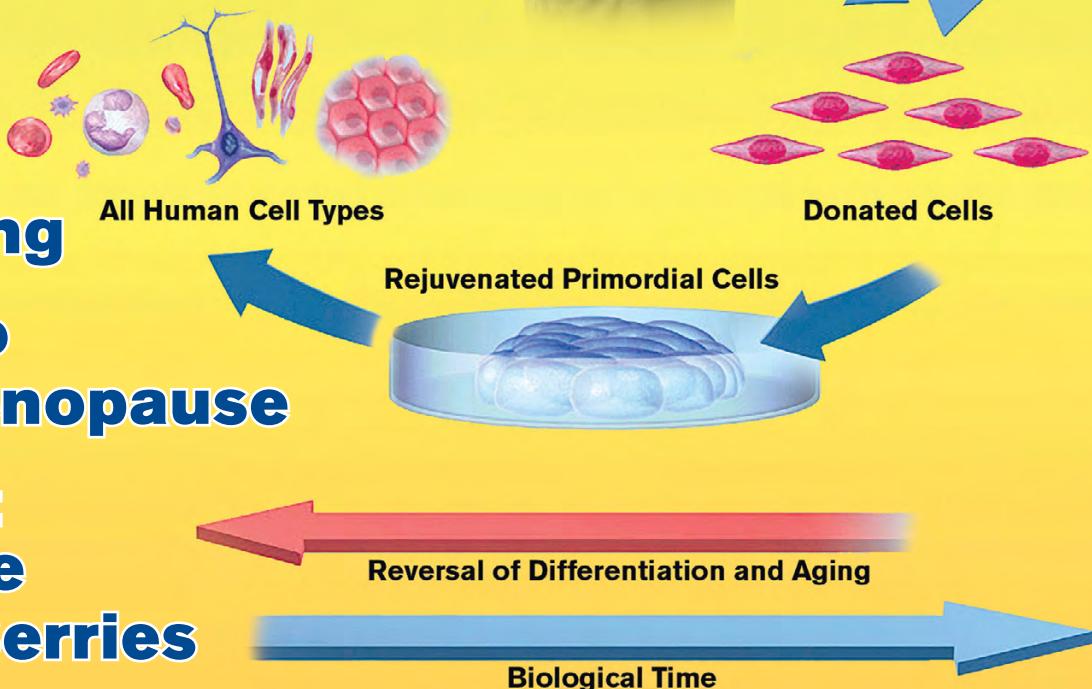
## Scientists Reverse Aging of Human Cells

Genetic Engineering  
Transports Cells Back  
to Beginning of Life

## Critical Importance of Annual Blood Testing

## New Way to Manage Menopause

## Antioxidant Powerhouse Effects of Berries



## REWINDING THE “CLOCK” OF CELLULAR AGING

# The Ultimate Two-Per-Day Tablet

The most comprehensive nutrient formula in the world is **Life Extension Mix**. Some Foundation members, however, prefer to take their nutrients separately and need only a basic multi-nutrient supplement to fill the missing gaps. For many years, these members had to rely on commercial "one-a-day" supplements that provide very low potencies.

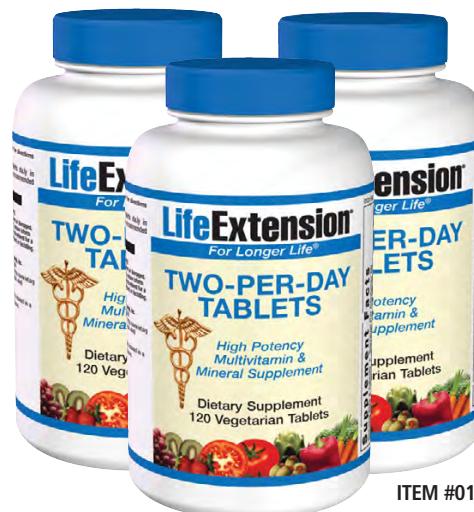
In response to requests for a **science-based** multi-nutrient, a special formula was compounded to provide the **greatest potencies** that can fit into two tablets. When compared to

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

Sample Ingredient Comparison	LIFE EXTENSION TWO-PER-DAY	Centrum®
Vitamin C	500 mg	60 mg
Vitamin E	200 IU (natural)	30 IU (synthetic)
Folic acid	800 mcg	400 mcg
Vitamin B12	300 mcg	6 mcg
Vitamin B6	75 mg	2 mg
Zinc	30 mg	11 mg
Selenium	200 mcg	55 mcg
Lutein	5 mg	(none)*
Lycopene	2 mg	(none)*
Vitamin B1	75 mg	1.5 mg
Vitamin B2	50 mg	1.7 mg
Niacin (as niacinamide)	50 mg	20 mg
Pantothenic acid	100 mg	10 mg
Biotin	300 mcg	30 mcg
Boron	300 mcg	75 mcg
Chromium	200 mcg	35 mcg
Molybdenum	100 mcg	45 mcg
Magnesium	100 mg	50 mg
Manganese	2 mg	2.3 mg
Iodine	150 mcg	150 mcg
Potassium	25 mg	80 mg
Vitamin A (preformed)	500 IU	1,015 IU
Vitamin A (as beta-carotene)	4,500 IU	2,485 IU
Vitamin D	2,000 IU	400 IU
Choline Bitartrate	20 mg	(none)
Inositol	50 mg	(none)
PABA	30 mg	(none)
Calcium	12 mg	200 mg

conventional "one-a-day" products, **Life Extension Two-Per-Day** contains up to **50 times more potency**!

The box on this page reveals how much more potent the **Two-Per-Day formula** is compared to the leading commercial multi-vitamin. Few consumers realize that commercial supplements often contain the cheapest form of nutrients that don't provide optimal benefits. For example, the **30 IU** of synthetic vitamin E contained in Centrum® may provide relatively little vitamin E to the bloodstream. Studies show that synthetic vitamin E is distributed throughout the body only about half as much as natural vitamin E.<sup>1-5</sup> The **200 IU** of natural vitamin E contained in **Two-Per-Day** thus provides about **13 times** more vitamin E activity than does Centrum®.



ITEM #01415

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

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

### References

1. Am J Clin Nutr. 1997 Mar;65(3):785-9.
2. Am J Clin Nutr. 1998 Apr;67(4):669-84.
3. Biofactors. 1999;10(2-3):115-20.
4. Mol Aspects Med. 2007 Oct;28(5-6):423-36.
5. J Nutr Biochem. 2004 Jul;15(7):380-95.

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

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

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

**To order Life Extension Two-Per-Day Tablets,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

Contains soybeans, rice, and 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.



## REPORTS

**36 THE SECRET BEHIND AÇAÍ'S ANTIOXIDANT POWER**

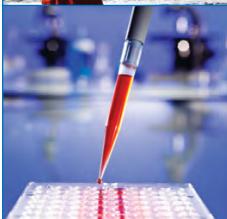
Touted commercially as an antioxidant powerhouse, only recently has açaí gained compelling scientific validation. Compounds isolated in freeze-dried açaí extract have been shown to enter human cells and neutralize free radicals at very low doses. Find out how these and other findings confirm berry polyphenols' unrivaled capacity to blunt free radical damage and thwart degenerative disease.

**26 A REVOLUTION IN NATURAL MENOPAUSE RELIEF**

Conventional medicine has failed women facing menopause. Synthetic hormone replacement therapy's deadly risks—including breast cancer, heart attack, and stroke—leave them with few safe options. Researchers have discovered a unique adaptogen that can relieve most menopausal symptoms by operating at the *neurological* level.

**72 TOPICAL VITAMIN D PROTECTS AGING SKIN**

While most people are aware of vitamin D's importance to overall health, few know of its essential role in skin health. As you age your skin loses 75% of its ability to make vitamin D. The many ways vitamin D protects your skin are explained, along with the promise of topical application to help preserve its youthful appearance.

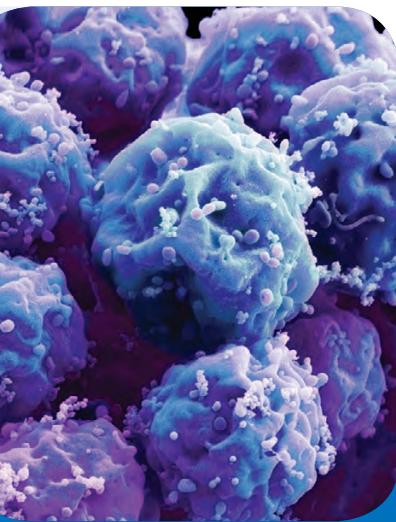
**50 WHY FDA-APPROVED DRUGS FAIL TO PREVENT HEART ATTACK**

Recent headlines about a cholesterol-lowering drug demonstrate how medical apathy generates enormous confusion over which drugs actually work. Outdated guidelines for measuring risk factors in the blood are a big part of the problem. Fortunately, **Life Extension®** members find out what optimal levels of cardiac risk markers are before they suffer a heart attack.

## DEPARTMENTS

**7 AS WE SEE IT—****Epidemic Testosterone Deficiency**

An analysis of blood tests of male Life Extension members reveals *alarming* rates of testosterone deficiency. Aside from waning sexual performance, depression, and diminished strength, low testosterone has been definitively linked to men's risk of death from all causes. Fortunately, men don't have to guess their testosterone status. Comprehensive blood testing reveals the level of *free testosterone* so that aging men can restore it to youthful ranges.

**26 ON THE COVER****SCIENTISTS REVERSE AGING OF HUMAN CELLS**

A scientific study partially funded by the **Life Extension Foundation** has demonstrated that the aging of human cells can be reversed. Published in the journal *Regenerative Medicine*, researchers succeeded for the first time in turning back the clock of aging in adult human cells. In an exclusive interview, Dr. Michael West explains the results of this unprecedented breakthrough.

**IN THE NEWS 17**

Green tea may combat eye disease; chocolate reduces heart disease risk; DHA destroys neuroblastoma cells; soy protective against lung cancer; and more.

**PROFILE 87**

Is testosterone therapy right for you? Is it dangerous? Does it *really* work? Armed with years of experience, Dr. Abraham Morgentaler of Harvard Medical School clears the air, detailing testosterone's profoundly positive impact on men's health and quality of life.





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## CONTRIBUTORS

Dayna Dye • Marc Ellman, MD • Roni Enten, MSC, CNS

Gregory M. Fahy, PhD • William Faloon • Jon Finkel • Julius Goepp, MD

Gary Goldfaden, MD • Robert Goldfaden • Saul Kent • Elizabeth Wagner, ND

## ADVERTISING

**Marketing Director** • Rey Searles • [rsearles@lifeextension.com](mailto:rsearles@lifeextension.com)

**National Advertising Manager** • Tim Lord • 404-347-8672

## DIRECTOR OF BUSINESS DEVELOPMENT

Ron Antriasian • [rantriasian@lifeextension.com](mailto:rantriasian@lifeextension.com) • 781-271-0089

## CIRCULATION & DISTRIBUTION

Life Extension • 1100 West Commercial Blvd., Ft. Lauderdale, FL 33309

Editorial offices: 954-766-8433 • fax: 954-491-5306

**Customer Service: 800-678-8989 • email: [customerservice@lef.org](mailto:customerservice@lef.org)**

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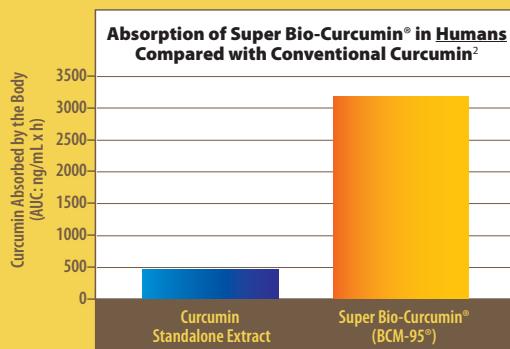
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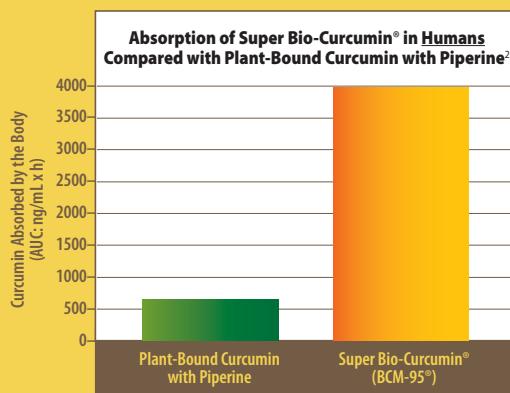
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# Achieve Multiple Health Benefits From Highly Absorbable Curcumin

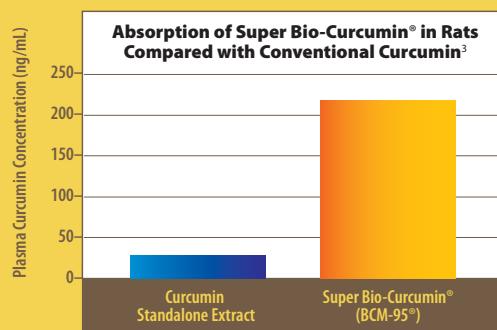
## How Much Curcumin Are You Absorbing?



**Chart 1.** Super Bio-Curcumin® (BCM-95®) showed 6.9 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with conventional curcumin (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).



**Chart 2.** Super Bio-Curcumin® (BCM-95®) showed 6.3 times greater bioavailability (absorption and sustainability over 8 hours) in humans compared with plant-bound curcumin with piperine (as measured by the area under the curve [AUC] in a plot of blood levels against time, that is, the total amount of curcumin absorbed by the body over 8 hours).



**Chart 3.** Bioavailability in rats fed with BCM-95® is 7.8 times higher than conventional 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.<sup>1,2</sup>

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*.

## SUPER BIO-CURCUMIN® WITH BCM-95®



ITEM #00407

Life Extension®'s **Super Bio-Curcumin**® contains the patent-pending BCM-95® turmeric compound. A bottle containing 60 **Super Bio-Curcumin® with BCM-95®** capsules retails for \$30. If a member buys four bottles, the price is reduced to just **\$19.88** per bottle. Each bottle will last most members two months.

### References:

1. Spice India. 2006 Sept;19(9):11-5.
2. A novel bioenhanced preparation of curcuminoids. Study submitted for publication, 2007.
3. Bioavailability study of BCM-95® in rats. Orcas International Inc. 2006.

To order Super Bio-Curcumin® with BCM-95®, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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Contains rice.

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

**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.

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

**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. Ghen, DO, PhD**, holds a doctorate in holistic health and anti-aging, and serves on the faculty of Medicine at the Benemerita Universidad Autonoma De Puebla, Mexico, as a Professor of Cellular Hemopoietic Studies. He is the author of *The Ghen 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.

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

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

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

**Roberto Marasi, MD**, is a psychiatrist in Brescia and in Piacenza, Italy. He is involved in anti-aging strategies and weight management. 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 diplomate of the American Board on Anti-Aging Medicine.

**Michele G. Morrow, DO, FAAFP**, is a board-certified family physician who merges mainstream and alternative medicine using functional medicine concepts, nutrition, and natural approaches. 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** graduated the University of Iowa Medical School and did his internship, residency and fellowship in 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**, a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staffs of the University of Southern California and UCLA.

**Ron Rothenberg, MD**, is a full clinical professor at the University of California San Diego School of Medicine, and founder of California HealthSpan Institute in San Diego, CA. Dr. Rothenberg is an internationally recognized clinician, researcher, lecturer, and educator in preventive and anti-aging medicine.

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

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

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

**Ronald L. Shuler, BS, DDS, CCN, LN**, is involved in immunoncology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis.

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

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

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

**Stephen Strum, MD**, is a medical oncologist 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 practice for prostate cancer patients in Ashland, OR.

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

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

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

**Jonathan V. Wright, MD**, is medical director of the Tahoma Clinic in Renton, WA, and a board member of the Vitamin C Foundation and the American Preventive Medical Association, among many other groups.

## SCIENTIFIC ADVISORY BOARD



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



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



**John Boik, PhD**, is the author of two books on cancer therapy, *Cancer and Natural Medicine* (1996) and *Natural Compounds in Cancer Therapy* (2001). He obtained his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new 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 Castrinarius, 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 hypothermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.



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



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



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



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



**Michael D. Ozner, MD, FACC, FAHA** is a board-certified cardiologist who specializes in cardiovascular disease prevention. He serves as medical director for the Cardiovascular Prevention Institute of South Florida, and is a noted national speaker on heart disease prevention. Dr. Ozner is also author of *The Great American Heart Hoax and The Miami Mediterranean Diet* (2008, Benbella Books). For more information visit [www.drozner.com](http://www.drozner.com).



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



**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.

**L**ow levels of testosterone have been implicated in a host of life-threatening health problems. Maintaining normal testosterone levels is one of the most important steps you can take to regain your health and improve your performance.

If you're over 40, odds are you're already starting to feel the debilitating effects of low testosterone. Research shows that by the time they are 60 years old, men typically produce **60% less** testosterone than they did at age 20.<sup>1</sup> With this drastic reduction comes several well-documented problems—from the blues and cognitive impairment to reduced sex drive and abdominal weight gain. Normal testosterone has been associated with maintaining a healthy cardiovascular system.<sup>2</sup>

#### RESTORING HEALTH AND SEXUAL VIGOR

Life Extension®'s **Super MiraForte** contains high potencies of **chrysin** and **nettle root**—plant extracts that naturally reduce the aromatization (conversion) of testosterone to estrogen to enhance free testosterone levels.<sup>3</sup> **Bioperine®** is included to facilitate the absorption of **chrysin** (a natural flavonoid) into the bloodstream.

**Muira puama** is a rainforest herb classified in the Brazilian Pharmacopeia as an aphrodisiac. In a trial of men with decreased libido and other sexual issues, **62%** of those taking **muira puama** reported positive results in regard to libido, while **51%** of those with a common sexual problem felt that the herb was helpful.<sup>4</sup> A second trial examined men with decreased libido and found that **85%** of the test subjects taking **muira puama** enjoyed an enhanced libido, **90%** had improved sexual function, and **100%** of test subjects experienced an increase in intercourse frequency.<sup>5</sup>

To augment these protective effects, a standardized **lignan extract** from Norwegian spruce is included in Super MiraForte. These lignans convert to enterolactone in the intestine that is then rapidly absorbed into the bloodstream where it provides significant biological effects.<sup>6</sup> Enterolactone has demonstrated **anti-estrogen** and **anti-DHT** effects that are of particular importance for the aging prostate gland.<sup>7-9</sup>

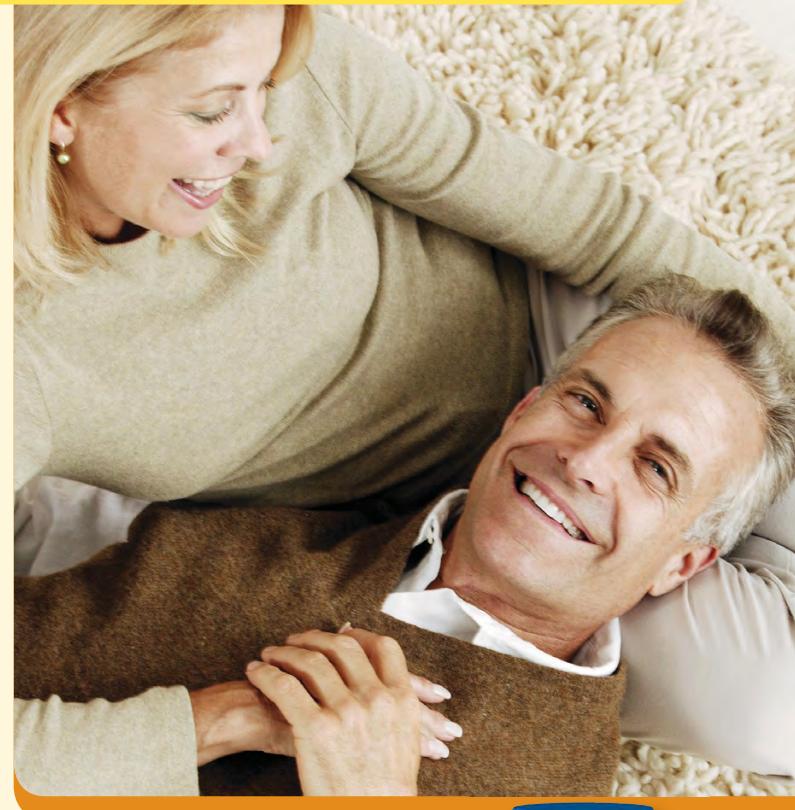
The suggested daily dose of four capsules of Super MiraForte contains potencies of the following nutrients:

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

# SUPER MIRAFORTE

**SUPPORTS HEALTHY TESTOSTERONE LEVELS—NATURALLY**

**with Standardized Lignans**



The retail price for a bottle of 120 capsules of **Super MiraForte with Standardized Lignans** is \$62. If a member buys four bottles, the price is reduced to just **\$42** a bottle.

**Caution:** If you are taking any medication, use only under physician supervision. Men with existing prostate cancer may not be able to use this product. Elevations in free testosterone can unmask an occult (hidden) prostate cancer. Anyone with this concern should have a baseline PSA prior to using this product and a follow-up PSA test 60 days later. If a significant elevation of PSA is found, discontinue this product and advise physician. Do not take more than 15 mg per day of Bioperine®.

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Item #01315

**To order Super MiraForte with Standardized Lignans,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

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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.

## Startling Low Testosterone Blood Levels in Male Life Extension Members



BY WILLIAM FALOON



**Aging** is accompanied by reduced levels of **hormones** required to sustain life.

As **testosterone** levels **decline** in **men**, their risk of dying markedly **increases**.<sup>1-3</sup>

**Heart disease**,<sup>4-8</sup> **osteoporosis**,<sup>9-11</sup> and **muscle wasting**<sup>12-14</sup> are strongly linked to **testosterone deficiency**, as are **chronic inflammatory**<sup>15,16</sup> and **neurodegenerative** disorders.<sup>17,18</sup> Most doctors are surprised to learn that men with low testosterone show an increased incidence of **prostate cancer**.<sup>19-25</sup>

Long before life prematurely ends, **testosterone deficit** can manifest in the form of psychological disturbances such as **depression**,<sup>26-29</sup> reduced **sexual** desire,<sup>30-33</sup> and a loss of **sense of well being**.<sup>29,34</sup>

We at **Life Extension**<sup>®</sup> have long urged male members to have their testosterone blood levels **tested**. A pooled analysis of 7,619 **free testosterone** blood tests has uncovered an *epidemic* of **testosterone deficits** in male **Life Extension** members.

The encouraging news is that *restoring* testosterone to youthful ranges can easily be accomplished at minimal cost.

# AS WE SEE IT

## What are Optimal Free Testosterone Levels?

The number of men who suffer testosterone *deficiency* is so high that laboratory **reference ranges** accept ridiculously low levels as "normal."

We at **Life Extension** suggest that men maintain their **free testosterone** in the range of **20** to **25** pg/mL of blood.<sup>35</sup> Others with expertise in this area believe free testosterone as low as **15** pg/mL is adequate.<sup>36</sup>

Conventional blood labs, on the other hand, say aging men are alright with as little as **6.6** pg/mL of free testosterone in their blood—an absurdly low level!

Mainstream medicine's ignorance regarding the need to maintain **free testosterone** in the higher ranges is a significant cause of premature disability and death in aging men.

(Note: **Free testosterone** is the biologically active form of this hormone measured in the blood. **Total testosterone** blood levels are not as reliable an indicator of an aging man's testosterone status as **free testosterone**.)

## Life Extension Members Not Immune From Testosterone Deficit

Most people are in a state of denial as to how long *nature* intends us to live. A 30 to 40 year old man is often shocked when his blood test results uncover strikingly low **free testosterone** levels.

In our analysis of male members aged **40-49** years, the mean free testosterone blood level was only **12.4 pg/mL**. Those aged **30-39** years did not fare that much better, with mean free testosterone levels of only **12.8 pg/mL**.

Table 1 on this page shows how much **free testosterone** levels *decrease* with age. Men aged **70** and higher have free testosterone blood levels of only **8.9 pg/mL** (Table 1).

TABLE 1. Free Testosterone (pg/mL)

Age Groups	Mean	Median
30 to 39	12.84	11.80
40 to 49	12.42	11.10
50 to 59	11.38	10.50
60 to 69	10.71	9.40
70 Plus	8.89	7.90
All Groups	<b>10.66</b>	<b>9.50</b>

As I will explain next, even these disappointingly low numbers are still better than the average population. That's because many **Life Extension** members take steps to maintain *higher* free testosterone levels.

## Shocking Percentages of Testosterone Deficiency

I have reviewed hundreds of testosterone blood tests and consistently observed less than optimal levels. When I saw the mean findings from *free testosterone* blood tests of **Life Extension** members, I was not totally surprised.

As Table 2 on this page reveals, only **4.2%** of men had high opti-

mal **free testosterone** blood levels. Another **9.6%** of the men were in the mid-range of **15 to 22 pg/mL**.

A startling **86%** of the men had less than 15 pg/mL of free testosterone, placing them at high risk for virtually *every* age-related disease.

These findings, obtained from pooled blood test results of 7,619 men, provide an intriguing opportunity to rescue the collapsing health system this country faces. If men start paying as much attention to their testosterone blood levels as they do **cholesterol**, the incidence of degenerative disease will plummet!

## How Testosterone Protects Against Heart Attacks

Most people know that higher blood levels of **HDL** protect against atherosclerosis and subsequent heart attack. What few understand is the critical role that **testosterone** plays in *enabling* HDL to *remove* built-up cholesterol away from the arterial wall.

**HDL** removes cholesterol from the arterial wall and returns it to the liver for safe disposal via a process known as **reverse cholesterol transport**. Testosterone enhances HDL-induced reverse cholesterol transport from the arterial wall.<sup>37</sup> That is one of testosterone's unique and life saving anti-atherosclerotic effects.

TABLE 2. Free Testosterone

Age Groups	<15 pg/mL	15-22 pg/mL	>22 pg/mL	All
30 to 39	2.3%	0.6%	0.2%	<b>3.1%</b>
40 to 49	8.9%	1.8%	0.6%	<b>11.3%</b>
50 to 59	22.0%	3.2%	1.1%	<b>26.3%</b>
60 to 69	28.5%	2.9%	1.5%	<b>32.9%</b>
70 Plus	24.5%	1.1%	0.8%	<b>26.4%</b>
All Groups	<b>86.3%</b>	<b>9.6%</b>	<b>4.2%</b>	<b>100.0%</b>

Under optimal circumstances, HDL efficiently *removes* cholesterol from arterial walls and then transports it (via reverse cholesterol transport) to the liver for elimination (mostly through the bile duct into the intestines). When there is a *deficiency* of **testosterone**, HDL is less efficient in removing debris from the arterial wall and the liver is less efficient in breaking down cholesterol-laden HDL from the bloodstream.

Armed with this knowledge, you can now see past the charade perpetrated by the medical establishment that still questions the value of **testosterone supplementation**.

Numerous well-controlled human studies show that higher testosterone levels play a critical role in maintaining healthy blood flow throughout the body by accelerating **reverse cholesterol transport**—thereby helping to prevent atherosclerosis.<sup>44,45</sup>

### Low Testosterone Sharply Increases Coronary Artery Disease Risk

The relationship between **low testosterone** and **increased** coronary artery disease incidence has been the featured topic of several covers of ***Life Extension Magazine***® over the past two decades.

One study evaluated men under age 45 who presented with coronary artery disease compared with an age-matched control group. The findings revealed that even moderately reduced free testosterone blood levels (below 17.3 pg/mL of blood) in these younger men resulted in a **3.3-fold greater** risk of developing premature coronary artery disease compared with men who had values above 17.3 pg/mL.<sup>46</sup>

### How Testosterone Affects HDL

- Testosterone elevates the hepatic lipase enzyme that the liver needs to safely clear the body of excess cholesterol.
- The liver contains a receptor called scavenger receptor B1 that acts to stimulate cholesterol uptake for processing and disposal. Testosterone beneficially increases scavenger receptor B1.<sup>37</sup>
- Furthermore, a liver enzyme called *hepatic lipase* functions to remove phospholipids from the surface of HDL and helps enhance the uptake of these HDL-derived lipids by scavenger receptor B1.<sup>47,48</sup> Testosterone increases the activity of hepatic lipase.<sup>48</sup>
- By increasing both *scavenger receptor B1* and *hepatic lipase* activities, testosterone facilitates an increase in reverse cholesterol transport, a process that removes excess cholesterol from the tissues and carries it to the liver for processing and disposal.<sup>39</sup>
- The important take home point is the critical role of **reverse cholesterol transport** in enabling HDL to protect against atherosclerosis.

While a person can reduce their arterial wall exposure to cholesterol through healthier diets and by taking certain drugs, the average person still synthesizes about 650 mg every day of cholesterol in their *peripheral* tissues (outside of the liver). If there is any distortion in the HDL-mediated removal of cholesterol (i.e. **reverse cholesterol transport**) from the arterial wall, the consequence is **atherosclerosis**.<sup>38</sup>

Said differently, **testosterone** is *required* for optimal transport of excess cholesterol from our

tissues and blood vessels to our liver for processing and disposal. In the **testosterone-deficient** state, **reverse cholesterol transport** is compromised, and excess cholesterol cannot be removed from the arterial wall.<sup>39-41</sup>

**HDL and free testosterone** levels often plummet in aging humans.<sup>42,43</sup> The combination of **low HDL** and **low** testosterone virtually guarantees an explosion in demand for vascular stents and drugs that earn tens of billions of dollars in profits each year for pharmaceutical behemoths.

## NATURAL HORMONES SLASH HEART DISEASE MORTALITY!

### Hormone Status

### Three-Year Survival Rate

High levels of DHEA, testosterone, and IGF-1

83%

Deficiency in one hormone (DHEA, testosterone, or IGF-1)

74%

Deficiency in two hormones (DHEA, testosterone, or IGF-1)

55%

Deficiency in all three hormones (DHEA, testosterone, and IGF-1)

27%



A landmark study analyzed the relationship of natural hormones (free testosterone, DHEA, and insulin-like growth factor-1 [IGF-1]) to death rates in men suffering from chronic heart failure.<sup>4</sup> The findings from this study are tabulated on the chart in this box. As one can see, more men die when any of these hormones are deficient. This same chart shows catastrophic mortality when two or more of these hormones are deficient.<sup>4</sup>

A large number of studies reveal that higher testosterone or dehydroepiandrosterone (DHEA) levels are associated with reduced heart disease risk.<sup>49-54</sup> DHEA is a low-cost dietary supplement, while IGF-boosting nutrients and natural

testosterone cream are available to Americans at affordable prices.

Cardiac drugs generate outrageous profits for pharmaceutical interests. Pharmaceutical companies thus face huge economic losses if too many Americans use natural hormones to reduce their reliance on expensive prescription drugs.

To put this testosterone blood reading in perspective, aging men who don't use testosterone-boosting nutrients or drugs often have very **low** free testosterone blood levels (less than 10 pg/mL of blood). These same men often have

low HDL blood test readings in the danger zone (less than 40-50 mg/dL). Is it any wonder that despite aggressive use of statin drugs and other advances in cardiac medicine, heart attack and stroke are still today's leading killers?

## Low Testosterone Increases Prostate Cancer Risk

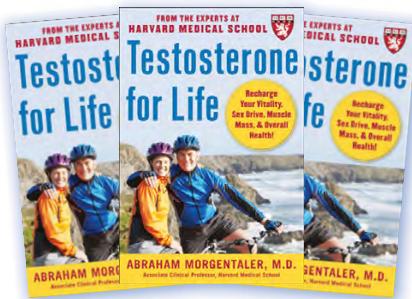
Fear of prostate cancer is the leading reason why aging men have shied away from restoring their free testosterone to youthful ranges. To dispel this concern, *Life Extension* long ago analyzed every published study and found there is no basis for asserting that testosterone causes prostate cancer.<sup>55-60</sup>

Our observations from the thousands of blood tests we perform each year for members confirm this. What we found is that men with low testosterone appear to be more likely to contract prostate cancer.

In the landmark book, *Testosterone for Life* (McGraw-Hill, 2008), Harvard professor Abraham Morgentaler thoroughly discredited the notion that testosterone causes prostate cancer.<sup>61</sup>

What came as a bombshell to the medical establishment was the compilation by Dr. Morgentaler of scientific facts showing that men with low testosterone levels have an increased percentage of prostate cancer-positive biopsies.<sup>62,63</sup>

To further help dispel the myth that higher testosterone levels increase PSA levels (and presumably prostate cancer risk), the two charts on the next page compiled from our blood test analysis clearly show that as free testosterone levels decline in aging men, their PSA levels sharply increase.



### What Are Your Free Testosterone Levels?

While our data analysis of 7,619 blood tests of male **Life Extension** members showed less-than-optimal free testosterone levels, there was a considerable amount of individual variability.

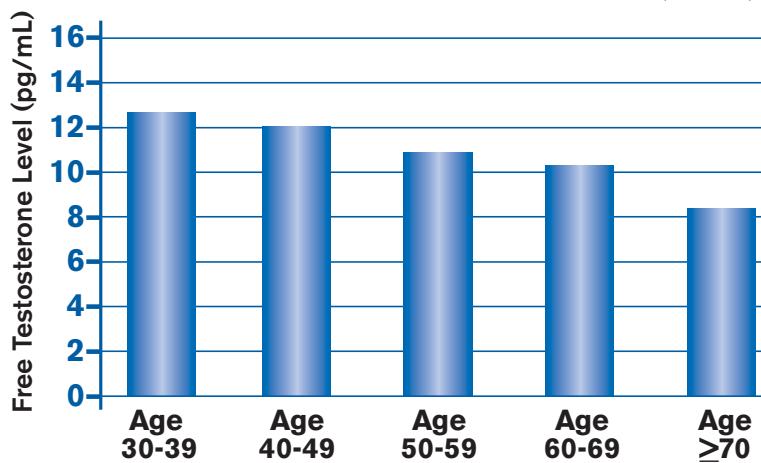
Some 60-year old men, for example, had relatively youthful (high) free testosterone levels, while others were dangerously low.

An aging male does not have

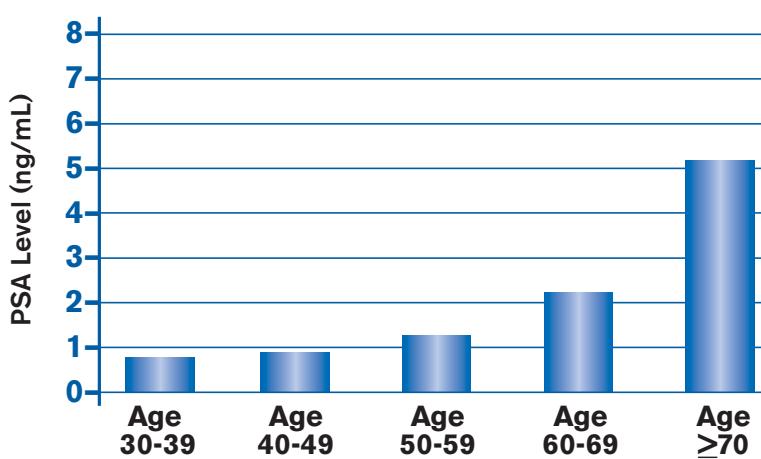
to guess what his **free testosterone** level is. Blood tests provide an accurate measurement to ascertain if testosterone supplementation is warranted and what dose should be initially used.

Blood tests also measure **PSA** (prostate-specific antigen) to help rule out prostate cancer. While testosterone does not cause prostate cancer, men with pre-existing prostate malignancy are usually advised to avoid supplemental testosterone until the disease is cured.

### Mean Free Testosterone by Age Quintile in 7,619 Life Extension Member Tests (Male)



### Mean PSA by Age Quintile in 7,619 Life Extension Member Tests (Male)



### Low-cost and Convenient Blood Testing

The high prices that commercial labs charge for comprehensive blood testing precludes most people from having them done.

**Life Extension** breaks down these price barriers by offering complete **Male** or **Female Blood Test Panels** at the lowest prices anywhere. Once a year, we discount the popular Male and Female Blood Test Panels down to only **\$199**—about **80%** less than what commercial labs charge. The next page describes the many tests included in these Male and Female Panels.

Instead of having to make a doctor's appointment, we send you a requisition form and list of drawing stations in your area where you can go at your convenience.

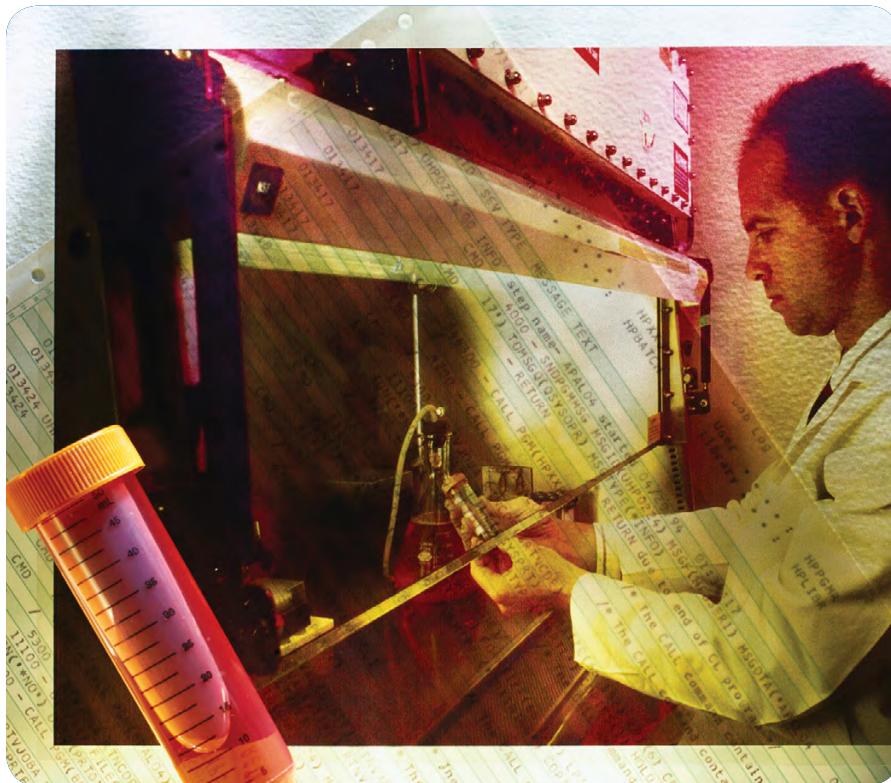
The **Blood Test Super Sale** ends June 7, 2010, so please order your requisition kit soon to take advantage of these extra discounted prices. You can have your blood drawn anytime after receiving your requisition kit.

The results of your blood tests are mailed directly to you. If you have any questions, you are welcome to call our health advisor helpline.

Annual blood testing is the single most effective method of detecting abnormalities that can be corrected *before* they lead to serious illness or death. A call to **1-800-208-3444** is all you have to do to order these comprehensive tests at extra discounted prices.

For longer life,

William Faloon



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## 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)

**NEW & IMPROVED**  
.....  
**NOW INCLUDES TSH!**

#### 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)

**NEW & IMPROVED**  
.....  
**NOW INCLUDES TSH!**

#### METABOLIC PROFILE

**Glucose**

**Kidney function tests:** creatinine, BUN, uric acid, BUN/creatinine ratio

**Liver function tests:** AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase

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**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

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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.

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# 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.

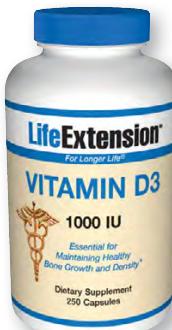
You can choose the right dose of **vitamin D3** for you from the large selection of vitamin D3 supplements below. Remember to factor in that you may be getting **1,000-3,000 IU** of vitamin D in multi-nutrient formulas you already take.

## ■ Vitamin D3 1,000 IU • 250 capsules

Retail: **\$12.50**

Four bottle Member Price: **\$8.44**

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.



## ■ Vitamin D3 1,000 IU with Sea-Iodine\*

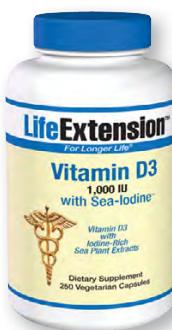
**250 vegetarian capsules**

Retail: **\$22**

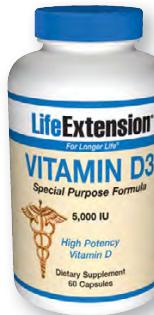
Four bottle Member Price: **\$15**

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.



To order any of these **high-potency** vitamin D3 supplements, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)



## ■ Vitamin D3 5,000 IU • 60 capsules

Retail: **\$11**

Four bottle Member Price: **\$7.43**

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.



## ■ Vitamin D3 5,000 IU with Sea-Iodine\*

**60 vegetarian capsules**

Retail: **\$14**

Four bottle Member Price: **\$9.38**

Most people do not ingest enough vitamin D and iodine, especially those seeking to reduce their salt intake. Combining **5,000 IU** of **vitamin D3** and **1,000 mcg** of **iodine** into one capsule makes taking these two nutrients economical and convenient. **Item# 01372**

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



## ■ Vitamin D3 7,000 IU • 60 capsules

Retail: **\$14**

Four bottle Member Price: **\$9.45**

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.



## ■ Vitamin D3 Liquid Emulsion 2,000 IU • 1 ounce

Retail: **\$28**

Four bottle Member Price: **\$18.75**

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 hyperparathyroidism (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.



# Complete Skin Protection

## From Inside Out

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

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

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

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

**Enhanced FernBlock® with Sendara™** is complemented with a powerful antioxidant called **Phyllanthus emblica**. This natural extract blocks a chemical reaction that generates several types of skin-damaging free radicals, thus shielding the skin against the destruction of collagen and other dermal matrix proteins. An *in vitro* study<sup>2</sup> using a patented extract of both **ashwagandha** and **Phyllanthus emblica** demonstrated an impressive **54%** inhibition of collagen-degrading enzymes and an **86%** inhibition of those that break down hyaluronic acid—the skin's natural moisturizer.

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

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

Contains corn and rice.

#### References

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



Item #01311

TO ORDER  
**Enhanced FernBlock®  
with Sendara™**,  
call 1-800-544-4440 or  
visit [www.LifeExtension.com](http://www.LifeExtension.com)



# TRIPLE ACTION CRUCIFEROUS Vegetable Extract with Apigenin

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).<sup>1-4</sup>

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.<sup>5-8</sup> **Apigenin**, a powerful plant flavonoid found in plants such as **parsley** and **celery**, is also added to the formula to boost cell protection,<sup>9</sup> while 25 mg of a natural source of benzyl isothiocyanate (BITC), are included to maintain cell health.<sup>10</sup>

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**.

**To order Triple Action Cruciferous Vegetable Extract,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)**

Contains yeast and corn.



ITEM #01468



ITEM #01469

**Triple Action Cruciferous Vegetable Extract provides the following concentrates in just one capsule:**

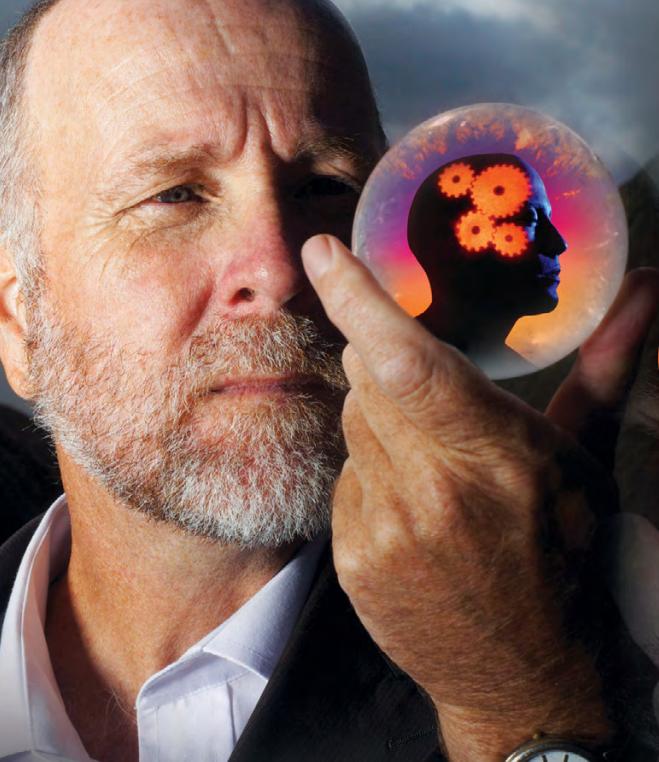
<b>Broccoli Super Concentrate</b>	.....	400 mg
	[standardized to 4% glucosinolates (16 mg)]	
<b>Watercress 4:1 extract</b>	.....	50 mg
<b>Indole-3-Carbinol (I3C)</b>	.....	80 mg
<b>Rosemary Extract</b>	.....	50 mg
<b>Cat's Claw Extract</b>	.....	50 mg
<b>Cabbage Extract</b>	.....	25 mg
<b>DIM (di-indolyl-methane)</b>	.....	14 mg
<b>Apigenin</b>	.....	25 mg

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**.

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10. *Food Chem Toxicol.* 2008 Jul;46(7):2358-64.

# FIGHT BACK AGAINST BRAIN AGING WITH COGNITEX



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

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



Item #00921



Item #00922

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.

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

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

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



## IN THE NEWS

### Green Tea Could Help Combat Diseases of the Eye

Green tea catechins are able to penetrate eye tissue, which may help protect against glaucoma and other eye diseases, according to Hong Kong researchers.

Chi Pui Pang of the Chinese University of Hong Kong and colleagues orally administered a green tea extract to rats and measured catechin and 8-epi-isoprostanate (a marker of oxidative stress) levels in the animals' eye tissues at varying time points up to 20 hours later. The team found varying distribution of catechins throughout the animals' cornea, lens, retina, choroid-sclera, vitreous humor, and aqueous humor. A significant reduction in 8-epi-isoprostanate rapidly followed green tea administration and was well maintained in all tissue and fluid examined with the exception of the choroid-sclera, demonstrating the antioxidant activity of catechins absorbed by these areas.\*

"Our results indicate that green tea consumption could benefit the eye against oxidative stress," the authors conclude.

—Dayna Dye

\* *J Agric Food Chem.* 2010 Feb 10;58(3):1523-34.

**Editor's note:** Delivery of orally consumed nutrients to the eye can be less than optimal. This study reassures those who consume green tea and green tea supplements that tea catechins do penetrate eye tissue to exert their antioxidant benefits.

### Eating More Chocolate Associated with Fewer Cardiovascular Events

An article published in the *European Heart Journal* reveals more good news for chocolate lovers: consuming as little as a square of chocolate per day could help reduce the risk of hypertension and heart disease.\*

Dr. Brian Buijsee of the German Institute of Human Nutrition and his colleagues analyzed data from 19,357 participants in the Potsdam arm of the European Prospective Investigation into Cancer, which enrolled 27,548 middle aged men and women between 1994 and 1998. Subjects were followed for an average of 8 years.

Participants whose chocolate intake was among the highest 25% at an average of 7.5 grams per day had lower blood pressure and a 39% lower risk of experiencing heart attack or stroke compared to subjects whose intake was lowest at 1.7 grams per day.

The researchers attribute the benefits observed in this study to chocolate's flavanol content.

—Dayna Dye

\* *Eur Heart J.* 2010 Mar 31.

**Editor's note:** Life Extension members obtain concentrated cocoa polyphenols (from dark chocolate) in many of the supplements they take.



# IN THE NEWS

## Multinutrient Supplementation Reduces Body Fat and Lipids in Obese Women

An article published in the *International Journal of Obesity* reports a positive effect on fat loss and lipid lowering in obese women who consumed a daily multinutrient supplement.\*

C. H. Sun and associates at Harbin Medical University randomized 96 women to receive a daily placebo, a calcium tablet, or a multivitamin and mineral supplement. After 26 weeks, women who received the multinutrient supplement had significantly lower body weight, body mass index, fat mass, respiratory quotient, and total and LDL cholesterol; and higher resting energy expenditure and HDL levels compared with placebo and baseline levels. Participants who received calcium alone had lower LDL and higher HDL levels than the placebo group at the trial's conclusion.

"The findings of this study support the notion that besides calcium, obese individuals need other vitamins and minerals for balancing energy metabolism, controlling body weight and for improving lipid profiles," the authors note.

—Dayna Dye

\* *Int J Obes.* 2010 Feb 9.

**Editor's note:** A multinutrient supplement not only ensures adequate vitamin and mineral intake while dieting, but, according to this study, may assist in weight loss.

## DHA Destroys Neuroblastoma Cells

A recent issue of the *FASEB Journal* reports the discovery of scientists at the Karolinska Institute of the ability of docosahexaenoic acid, or DHA, to kill neuroblastoma cells in vitro.\*

Helena Gleissman, PhD and her colleagues tested the effect of DHA on cultured neuroblastoma cells and analyzed them for DHA's metabolic byproducts. They found that while DHA itself destroyed the cancer cells, the fatty acid's derivatives were even more effective at killing these cells.

The current study and previous research show that while DHA has been demonstrated to help protect neural cells from stress-induced apoptosis (programmed cell death), it also induces apoptosis in neuroblastoma cells. "We hope that this study can provide a deeper understanding of the actions of omega-3 fatty acids and their products in cancer cells, and why they can be of such high importance in treatment of the disease," Dr. Gleissman commented.

—Dayna Dye

\* *FASEB J.* 2010 Mar;24(3):906-15.

**Editor's note:** The authors note that the finding may have implications for other cancers as well.



## Soluble Fiber Improves Immune Function

An article in *Brain, Behavior, and Immunity* reports the finding of researchers at the University of Illinois that soluble fiber reduces inflammation and strengthens immune function.\*

Gregory Freund and colleagues gave mice low fat diets containing insoluble fiber or soluble fiber from citrus pectin for 6 weeks, after which the animals received an injection of lipopolysaccharide, which elicits the effects of bacterial infection. "Two hours after lipopolysaccharide injection, the mice fed soluble fiber were only half as sick as the other group, and they recovered 50% sooner," coauthor Christina Sherry reported. "And the differences between the groups continued to be pronounced all the way out to 24 hours. In only six weeks, these animals had profound, positive changes in their immune systems."



"Soluble fiber changes the personality of immune cells—they go from being pro-inflammatory, angry cells to anti-inflammatory, healing cells that help us recover faster from infection," Dr. Freund stated.

—Dayna Dye

\* *Brain, Behav, Immun.* 2010 May.

**Editor's Note:** Soluble fiber can be obtained by consuming oats, apples, barley, nuts, seeds, citrus fruits, strawberries, lentils, and carrots, or by using powdered supplements.

## Diets High in Fat Increase Risk of Macular Degeneration

Decreased consumption of fat in one's diet may help protect against the development of age-related macular degeneration (AMD), according to results of the Carotenoids in Age-Related Eye Disease Study.

For their research, the investigators followed nearly 2,000 women aged 50 to 79 as part of the larger Women's Health Initiative Observational Study. Via the use of questionnaires and retinal photography, they concluded that women who consumed the highest levels of dietary polyunsaturated fats were approximately twice as likely to have AMD when compared to those women who consumed the least. However, monounsaturated fatty acids were associated with a lower risk of AMD.\*

"This research adds to the large body of evidence from other studies to suggest that high fat intake is associated with having AMD, but extends the evidence to include earlier stages of AMD," researcher Niyati Parekh, PhD of New York University, told *Life Extension*.

Dr. Parekh further explained that despite their findings, they do not suggest distinguishing between different types of fat, as other factors may be involved. "The total level of fat intake was associated with higher odds for AMD, without distinction about 'type' of fat," said Dr. Parekh. "In this sample, monounsaturated fats came largely from meat and milk rather than added fat. Therefore, we speculate that vitamins and minerals which accompanied these fats in food may explain lower risk for AMD in some women."

—Marc Ellman, MD

\* *Arch Ophthalmol.* 2009 Nov;127(11):1483-93.

## Soy Protective Against Lung Cancer

Soy consumption may help prevent lung cancer, based on findings of a large prospective study performed in Japan. For their study, researchers followed more than 75,000 men and women over an average of 11 years and found that those who consumed the highest quantities of isoflavones, which are obtained primarily from soy products, had the lowest chance of developing lung cancer during the study period.\*



Interestingly, the researchers found that the association between increased soy and decreased lung cancer held true only for men who never smoked, but not in current or previous smokers. The findings were similar in women, although less significant. They measured soy consumption via a questionnaire inquiring about soy-rich products including miso soup, soymilk, fermented soybeans, and various forms of tofu. They admit that not specifically inquiring about isoflavone supplement use was a limitation of their study.

—Marc Ellman, MD

\* *Am J Clin Nutr.* 2010 Mar;91(3):722-8.

## Vitamin C May Protect Against Glaucoma

Vitamin C may be protective against normal-tension glaucoma, according to a Japanese study. Normal-tension glaucoma is a form of glaucoma where optic nerve damage continues despite relatively low intraocular pressures (as opposed to traditional glaucoma where the intraocular pressure is elevated). The researchers hypothesized that vitamin C may play a role in glaucoma due to its antioxidant properties and the fact that its concentration is 15 times higher in the aqueous fluid of the eye than it is in the blood.

For their study, the researchers at the glaucoma subspecialty clinic of Keio University Hospital measured blood levels of vitamins A, folic acid, C, E, and uric acid in 47 patients with newly-diagnosed normal-tension glaucoma. They found that vitamin C levels were significantly lower in normal-tension glaucoma patients than in healthy controls without glaucoma (4.6 µg/mL vs. 6.3 µg/mL). They also found that uric acid levels were higher in the glaucoma patients. The researchers did not find a statistical difference in levels of vitamins A, folic acid, or E.\*

Based on their findings, the researchers suggest further study in alternative treatments for glaucoma. "Vitamin C supplementation may be an alternative therapy for normal-tension glaucoma," lead researcher Kenya Yuki, MD, told *Life Extension*.

—Marc Ellman, MD

\* *Graefes Arch Clin Exp Ophthalmol.* 2010 Feb;248(2):243-8.



# IN THE NEWS



## High Omega-3 Levels May Decrease Disease Risk

Very high intake of the omega-3 fatty acids EPA and DHA may decrease the risk of numerous chronic diseases, according to a study published in the *American Journal of Clinical Nutrition*.\*

Scientists examined red blood cell (RBC) levels of EPA and DHA as a percentage of total fatty acids in relation to chronic disease risk markers in 357 Yup'ik Eskimos. EPA and DHA comprised an average of 2.8% and 6.8%, respectively, of total fatty acid content of RBCs in this group.

High RBC levels of EPA and DHA were associated with lower levels of triglycerides and C-reactive protein (CRP) and higher levels of high-density lipoprotein (HDL), signaling reduced risk of inflammation, heart disease, and type 2 diabetes.

The authors concluded that increasing omega-3 intake to levels much higher than those consumed by the general public may have profoundly beneficial effects on chronic disease risk.

—Elizabeth Wagner, ND

\* *Am J Clin Nutr.* 2010 Mar;91(3):777-85.

**Editor's Note:** The Omega Score™ test available through Life Extension can help individuals monitor and maintain optimal blood levels of omega-3 fatty acids.

## Vitamin C Inhibits New Blood Vessel Growth to Tumors

High levels of vitamin C in the blood may help fight cancer by preventing angiogenesis, the growth of new blood vessels necessary to feed growing tumors, according to a recent report.<sup>1</sup>

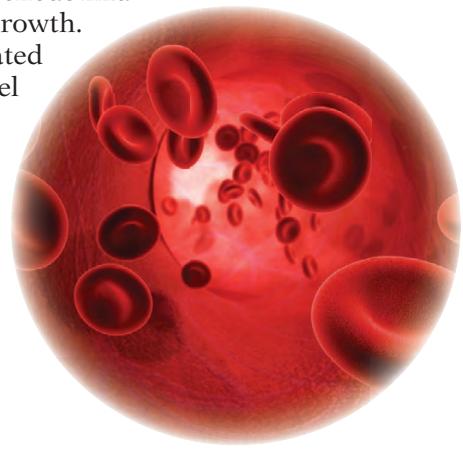
Fighting angiogenesis is a target of cancer therapy. Unfortunately, many existing angiogenesis inhibitors have toxic side effects, prompting scientists to seek safer, natural alternatives.

Scientists analyzed the effects of high levels of vitamin C on angiogenesis in two assays: an ex vivo study using rat tissues and an in vivo study in mice. Both studies showed that high levels of vitamin C, obtainable through intravenous infusion, inhibited new blood vessel growth. In the in vivo assay, vitamin C-treated tissue showed 30% less blood vessel growth than untreated tissue.<sup>1</sup>

These findings complement previous research showing that high levels of vitamin C are selectively toxic to tumors in living animals.<sup>2</sup>

—Elizabeth Wagner, ND

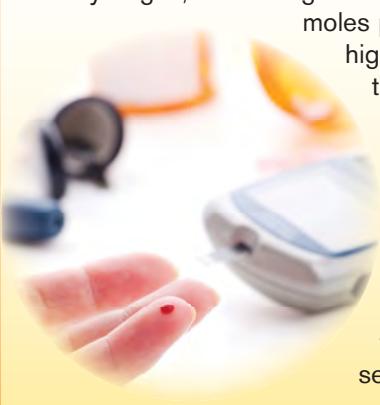
1. *J Angiogenes Res.* 2010 Jan 18;2:2.
2. *P R Health Sci J.* 2005 Jun;24(2):145-50.



## Selenium May Decrease Diabetes Risk

Researchers at the University of Montpellier I recently conducted a study to determine whether increased blood levels of selenium may decrease a man's risk of abnormal blood sugar metabolism, and possibly protect against diabetes.\*

The study, led by Tasnime Akbaraly, followed 1,162 healthy French men and women for nine years. Over that time, they documented 70 new cases of dysglycemia in men and 57 cases in women. When the study began, the average selenium blood level for men was 1.08 micromoles per liter and 1.1 for women. Men with the highest selenium levels were 50% less likely to develop dysglycemia than men with the lowest average levels.

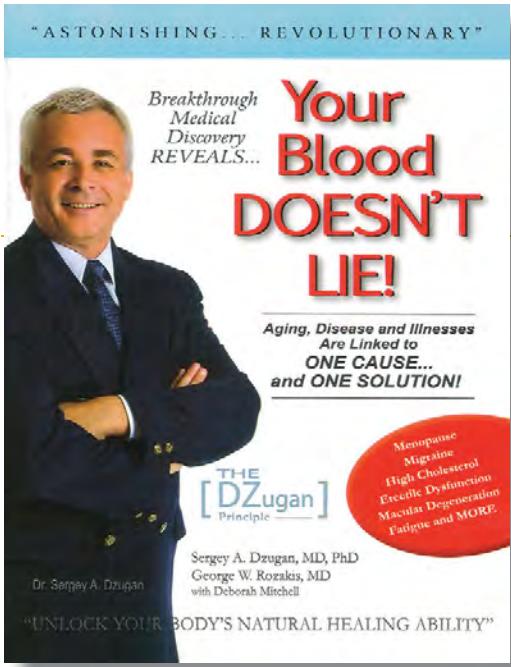


"The reason we observed a protective effect of selenium in men but not in women is not completely clear, but might be attributed to women being healthier at baseline, having better antioxidant status in general and possible differences in how men and women process selenium," Akbaraly said.

—Jon Finkel

\* *Nutr Metab (Lond).* 2010 Mar 18;7(1):21.

### BOOK REVIEWS



In his latest book, Sergey Dzugan, MD, PhD uncovers the failure of mainstream doctors to properly test and evaluate their patient's blood—and the horrendous consequence of needless diseases the aging population suffers as a result.

Dr. Dzugan was recently awarded the honorary title of Academician for Outstanding Achievement in Science by the International Academy of Creative Endeavors. Academician is the highest ranking a doctor can achieve in many countries.

*Your Blood Doesn't Lie!* is a tour de force of exciting scientific principles designed to "unlock your body's natural healing ability." In the words of Dr. George Rozakis, "this book is the first of its kind because it unifies the philosophy of what is loosely called antiaging medicine, alternative medicine, holistic medicine, and bioidentical hormone medicine. It unifies these fields under one principle, which we call the **Dzugan Principle**."

### YOUR BLOOD DOESN'T LIE!

By Dr. Sergey A. Dzugan

The Dzugan principle is present throughout every chapter in the book. Its essence is that many of the health issues people face spring from errors of hormones and body chemistry. By reversing these errors through altering body chemistry, changing diet habits, ingesting the proper supplements, and many other strategies, physical optimization can be achieved.

The book is divided into two parts. Part one is titled "*A Revolutionary Approach to Medicine and Healing*." This first half of the book is dedicated to explaining restorative medicine and why the current medical model for treating patients is inadequate. In addition, part one goes over the important weapons in the fight to maintain optimal health, including extraordinarily valuable information on bioidentical hormones and nutrients.

Part two focuses the Dzugan Principle on specific diseases and medical conditions. With stunning clarity, Dzugan writes about his strategy to combat cardiovascular disease, cholesterol, menopause, infertility, erectile dysfunction, migraines, arthritis, fibromyalgia, lupus, macular degeneration, psychological disorders, and even alcoholism, insomnia, and chronic stomach problems.

Between the covers of this book, you not only learn why the public is ill-advised about certain diseases, but why mainstream medicine continues to "put out health fires" rather than prevent them in the first place. *Your Blood Doesn't Lie!* provides valuable information on preventing some of the major health scourges of modern society.

The cover price of *Your Blood Doesn't Lie!* is **\$24.95**. Member price is **\$17.47**.

**SUPERCHARGED ASCORBIC ACID!**

# Vitamin C Tabs *with Dihydroquercetin*

Since it was first isolated nearly 80 years ago, **vitamin C** has been deemed essential for life and for maintaining optimal health and well-being. Its potent antioxidant properties and critical role in facilitating essential biochemical reactions throughout the body have made **vitamin C** the world's most widely consumed nutritional supplement.

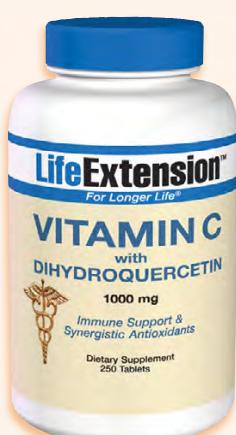
Because humans do not manufacture **vitamin C** internally, it must be obtained through dietary sources or supplements. Few people realize, however, that **vitamin C** is a *water-soluble* nutrient that is quickly oxidized and excreted by the body,<sup>1</sup> which limits its efficacy. Until now, those seeking to capture **vitamin C**'s optimal health benefits have had no choice but to consume it several times throughout the day.

Fortunately, a *flavonoid* antioxidant known as **dihydroquercetin** functions as a **vitamin C** "supercharger." Studies demonstrate that *dihydroquercetin* acts to inhibit the oxidation of **vitamin C**, thereby helping to maintain its concentration and to recycle **vitamin C** throughout the body.<sup>2,3</sup> This synergistic relationship between *dihydroquercetin* and **vitamin C** greatly enhances the efficacy of both molecules in the body's organs and tissues.

**Vitamin C with Dihydroquercetin** was formulated for those seeking to obtain optimal efficacy and antioxidant protection from their vitamin C supplement. The suggested daily dose of one tablet of this formula supplies **1,000 mg of vitamin C** (as ascorbic acid), along with **10 mg of**

**Dihydroquercetin-3-rhamnoside**, a highly bioavailable form of dihydroquercetin derived from grape leaf extract.

A bottle containing 250 tablets of **Vitamin C with Dihydroquercetin** retails for \$25.50. If a member buys four bottles, the price is reduced to just **\$17.44 per bottle**. Contains corn.



ITEM #00927

**To order VITAMIN C with Dihydroquercetin,  
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# The Latest Advance in COQ10 Technology

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**Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™** contains an organic compound called **PrimaVie® shilajit** that research shows **doubles** levels of CoQ10 in the **mitochondria**.<sup>1</sup>

**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.<sup>2</sup>

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.<sup>3,4</sup>
2. Facilitating more efficient *delivery* of CoQ10 into the **mitochondria**, resulting in greater cellular energy output.<sup>5-9</sup>

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.<sup>5-9</sup>

PrimaVie® is a registered trademark of Natreon, Inc.  
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## Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™

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

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

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To order **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™**  
call **1-800-544-4440** or visit  
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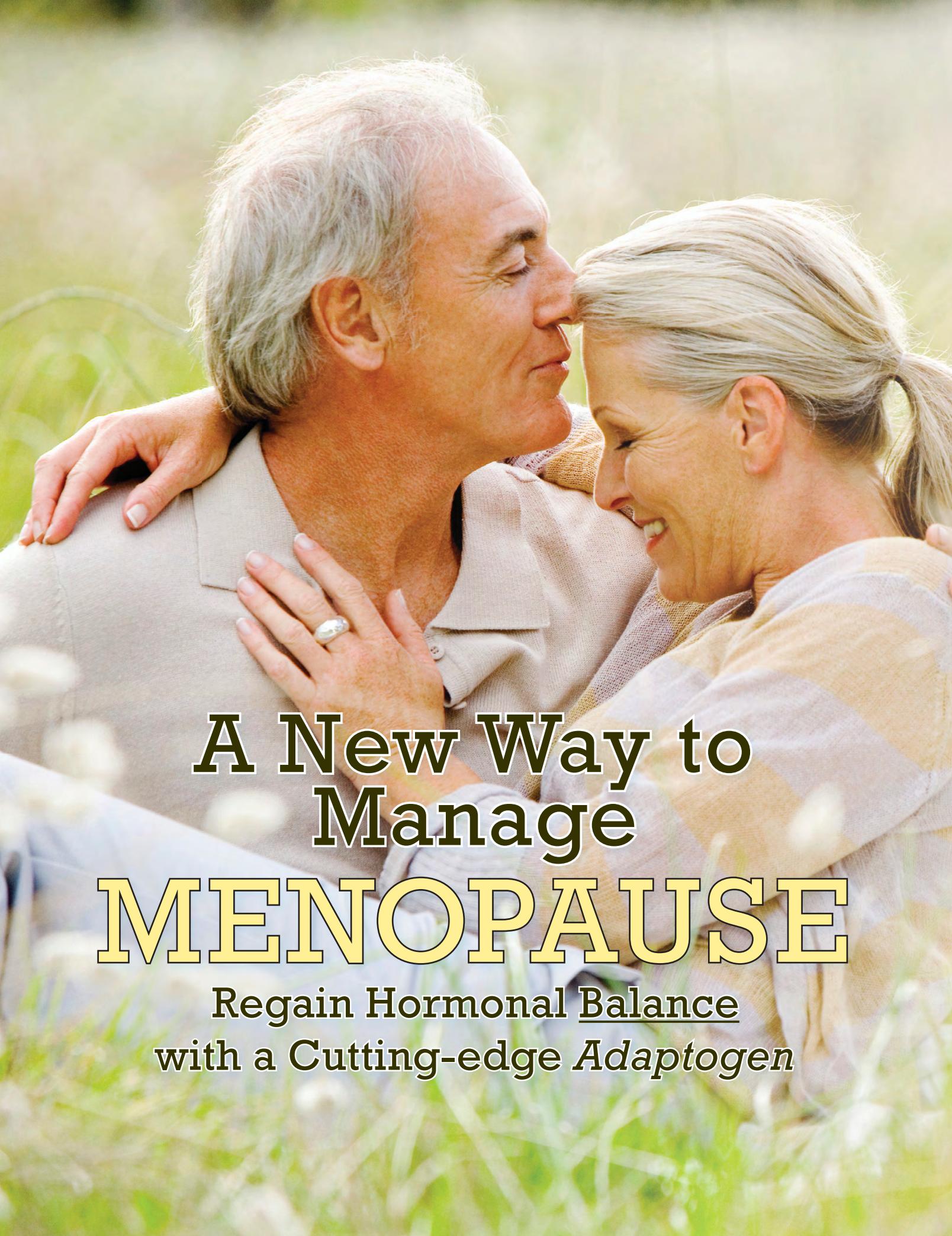


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# A New Way to Manage **MENOPAUSE**

Regain Hormonal Balance  
with a Cutting-edge Adaptogen



BY JULIUS GOEPP, MD

According to recent research, conventional medicine largely *fails* the estimated 60% of American women aged 40-65 who seek relief from menopausal symptoms each year.<sup>1</sup>

The problem lies in an unconscionable lack of safe, effective options.

Many women will no longer submit to standard hormone replacement therapy and risk the dangers of synthetic and *horse-derived* hormone drugs like **Premarin®** and **Prempro®**. Doctors persist in prescribing these drugs even after the Women's Health Initiative exposed their deadly side effects in 2002 and 2004.<sup>2-4</sup>

Many aging women are challenged with the safer option of *bioidentical* hormone therapy thanks to FDA-induced inflated prices, medical bias, and obstructionist government practices.

Fortunately, there remains a small but significant community of scientists committed to finding natural methods for optimal menopause management.

In a little-known advance, researchers recently uncovered a novel method to *control* the rapid hormonal fluctuations at the heart of menopausal suffering. They have documented potent anti-menopausal effects in a novel extract of **maca** root (*Lepidium meyenii*, also known as *Lepidium peruvianum*), a clinically proven **adaptogen** native to South America.<sup>5</sup>

In this article, the results of their findings are detailed. Using a highly refined, standardized form of maca, up to **87% of women reported positive improvements in relief of menopausal symptoms**, including hot flashes, fatigue, night sweats, and mood swings.<sup>5</sup>

Additional research has documented maca's ability to improve sexual desire and fertility and reduce menopause-induced stress and weight gain, along with beneficial effects on lipid levels and bone density.<sup>6-11</sup>

Here you will discover how maca operates differently than other therapeutic regimens, in part by promoting optimal function of the *hypothalamic-pituitary-adrenal (HPA) axis*.<sup>12,13</sup> This complex set of structures originating within the brain *governs* the endocrine (hormone) system, exerting favorable effects not only on aging ovaries, but on the thyroid and adrenal glands as well, to support improved hormonal balance, greater energy, and vitality in women going through menopause. The result is a cutting-edge, multimodal approach that may revolutionize menopause management in the future. > >

## A Scientifically Validated, Natural Alternative

Cultivated exclusively above 12,000 feet in the remote central highlands of the Andes, maca (*Lepidium meyenii*, also known as *L. peruvianum*) is a cruciferous plant whose fleshy bulb has been used since the pre-Columbian era as a fertility enhancer and aphrodisiac for both sexes.<sup>14-16</sup> It is prized in traditional Peruvian medicine as an adaptogen with particular utility in easing the physical and emotional stresses of menopause.<sup>14,17</sup> Modern-day scientific methods, as applied first in high-tech laboratories in Peru and now around the world, have revealed compelling biochemical features of the maca bulb that bear out its traditional therapeutic applications.



Containing over 53 distinct components, maca extracts have been found to have a multiplicity of biological activities in non-animal lab tests, including antimicrobial and pesticidal effects.<sup>18</sup> Maca extracts also have mild antioxidant capabilities, and offer some protection against chemically induced liver cell damage.<sup>19,20</sup>

However, the most exciting discovery surrounding maca extracts arises from extensive literature documenting its favorable effects on sexual function and response—and the growing body of scientific evidence on its effects during menopause.

In animal studies, maca is capable of reducing and in some cases entirely neutralizing variations in body chemistry induced by stress. In animal models, it eradicates stress-induced ulcers while preventing the adrenal gland enlargement that results from chronic stress.<sup>14</sup> Acting across multiple biochemical pathways, maca also eliminates stress-induced decreases in free fatty acids in the blood and mitigates visible stress responses in animal studies.<sup>14</sup>

In a remarkable study of healthy adult mice and rats, maca extract administered for 22 days led to a remarkable fourfold-plus increase in the number of episodes of successful sexual intercourse compared to controls.<sup>10</sup> The number of females testing positive for the presence of sperm following intercourse also more than doubled. In male animals with erectile dysfunction, maca extract dramatically reduced the amount of time it took for them to achieve an erection after stimulation. The authors of the study concluded that maca had successfully enhanced sexual function and confirmed its aphrodisiac properties.<sup>10</sup>

Maca also enhances *fertility* of female animals during their reproductive periods, as indicated by an increase in litter size in supplemented animals.<sup>15</sup> Maca also induces *estrogenic* effects in animals whose ovaries have been removed to simulate menopause, including an increase in the weight and size of the uterus.<sup>15</sup>

Many of maca's dramatic effects on sexual function and sex hormones are augmented by impressive balancing and stabilizing effects on steroid hormones associated with stress, including the stress hormone cortisol and its endocrinological trigger, adrenocorticotropic hormone (ACTH), secreted by the *adrenal* gland.

A prolific team of Australian and Polish researchers have made great strides in mapping out maca's complicated interactions with the ovarian, adrenal, and hypothalamic feedback response systems that regulate sexual function—and whose activities are adversely affected by menopause. In animal studies, this group has shown that maca in very high quantities is completely safe, while in more moderate doses it exerts profound adaptogenic effects by decreasing cortisol and ACTH levels significantly.<sup>12,13</sup> In an animal model of menopause using a novel and proprietary maca extract, the team also found that maca possesses distinct antidepressant *and* sedative effects—without inducing any changes in cognitive function.<sup>13</sup>

Other researchers have replicated these compelling findings in animal models of menopause, demonstrating maca exhibits antidepressant activity, while specific forms of the plant have beneficial effects on learning as well.<sup>16</sup> In a particularly impressive study, Peruvian scientists revealed that maca significantly ameliorated chemically-induced memory impairment in large part by blocking the enzyme *acetylcholinesterase* (AChE)—the same mechanism of action mobilized by prescription drugs for Alzheimer's disease.<sup>21,22</sup> In a related study, the same researchers demonstrated that maca significantly improved memory function in mice whose ovaries had been removed to mimic the hormonal effects of menopause, which often include memory impairment.<sup>23</sup>

Maca's powerfully beneficial effect on menopausal changes may extend to other tissues as well. Most notably, in a pre-clinical model, maca mitigated weight gain and increased estrogen levels following onset of menopause, while preventing detrimental increases in blood lipid abnormalities.<sup>24</sup> Blood markers of bone loss were also restored to levels found in pre-menopausal animals, suggesting that maca may also be effective in preventing post-menopausal osteoporosis. These results received further validation in a study indicating a favorable effect on bone mineral density and composition in a rat model of postmenopausal osteoporosis.<sup>17</sup> Evidence is also emerging that compounds contained in maca prevent ultraviolet light-induced skin damage in rat studies—a key finding since post-menopausal women experience skin changes (including elevated cancer risk) resulting from ultraviolet exposure.<sup>25</sup>



## Maca: A New Way to Manage Menopause

- An estimated 60% of American women aged 40-65 seek relief from menopausal symptoms each year—many of whom are largely failed by mainstream medicine.
- Standard hormone replacement therapy, still touted as effective by many physicians, increases the risk of cardiovascular disease and breast cancer. Bioidentical hormone therapy remains largely unavailable and unaffordable to most women.
- Scientists seeking safe, natural alternatives to existing therapies have focused on **adaptogens**, plant-derived compounds that safely induce favorable alterations in energy, neutralize stress, and promote optimal health by increasing metabolism, stamina, sex drive, and healing ability—with few side effects.
- An adaptogen known as **maca** has been shown to provide multimodal relief from menopausal symptoms, including hot flashes, fatigue, night sweats, and mood swings.
- Maca operates differently than other natural interventions for menopause, promoting optimal function of the *hypothalamic-pituitary-adrenal (HPA)* axis that governs hormone levels in the body.
- Compelling data from animal and human studies demonstrate maca's unique, multitargeted ability to balance shifting hormone levels during menopause.
- Maca induces favorable effects on blood lipid profiles and bone density markers, two parameters that decline drastically during menopause.
- Maca also helps to reduce the depression and anxiety that accompany menopause, and exerts beneficial effects on sexual desire and function.

## Clinical Studies Confirm Benefits for Women

An international team based at Charles Sturt University in Australia has added substantially to these findings through extensive research in humans using an organic, standardized maca extract. Their first study, a pilot, placebo-controlled test among early postmenopausal women, showed encouraging results: there were significant changes in the “background” hormones that influence sex hormone secretion, resulting in increased estrogen and progesterone levels after 8 months of supplementation.<sup>26</sup> These hormonal shifts were accompanied by substantially reduced feelings of discomfort associated with menopause.



These findings led to a randomized, placebo-controlled, multicenter trial completed by 124 early postmenopausal women aged 49 and up.<sup>11</sup> In this study, women had to meet not only symptomatic but also *biochemical* criteria for enrollment: they had to exhibit low estrogen levels in addition to elevated levels of follicle-stimulating hormone (FSH). The rationale behind these criteria is simple: low estrogen and elevated FSH levels establish that ovarian function has indeed fallen below levels typical of the reproductive years, and defines the early postmenopausal period. Women ingested a total of **2,000 mg** of maca daily or a placebo, for up to 4 months, and biochemical profiles as well as a standardized index of menopausal symptoms were followed.

The results were extraordinary. The maca extract stimulated production of estradiol while simultaneously suppressing FSH levels—a nearly unprecedented induction of hormonal balance.<sup>11</sup> There was also a significant increase in beneficial high-density lipoprotein (HDL) in supplemented women—but not in controls. Most importantly from the women’s own experiences, maca significantly reduced both the frequency and severity of individual menopausal symptoms, particularly hot flashes and night sweats.

These findings contributed to a significant decrease in the overall Kupperman Index, a standardized measure of menopausal symptom severity. The authors of the study found in maca “*an attractive non-hormonal addition to the choices available to early-postmenopausal women in the form of a natural plant alternative to Hormone Replacement Therapy (HRT)—hence, reducing dependence on hormone therapy programs.*”<sup>11</sup>

The same team added to this body of evidence through a separate, randomized controlled trial, this time studying two symptom scales for increased resolution and examining a much larger array of biochemical parameters that typically deteriorate in the post-menopausal period.<sup>27</sup> Once again, they recorded a dramatic decrease in standardized symptom scores over the course of the study, with similarly impressive, favorable alterations in FSH and estradiol levels.

In addition, they documented a remarkable suppression of cortisol and ACTH, the hormones associated with stress, and an increase in serum iron concentrations. Bone density markers were also noticeably increased.<sup>27</sup>

Other researchers have replicated and extended these findings. There’s now solid evidence for maca’s benefits on psychological symptoms and measures of sexual dysfunction in postmenopausal women.<sup>28</sup> Interestingly, the team conducting this study also observed reductions in anxiety and depression, along with improved sexual function *unrelated* to changes in



sex hormone levels, indicating a broader spectrum of multimodal benefit. Researchers at the Massachusetts General Hospital further revealed that maca extracts can alleviate sexual dysfunction in women taking selective serotonin reuptake inhibitor (SSRI) antidepressant medications, while increasing libido.<sup>29</sup>

## Summary

An estimated 60% of American women aged 40-65 seek relief from menopausal symptoms each year, and many of them fail to achieve adequate relief from the offerings of mainstream medicine. Standard hormone replacement therapy, still touted as effective by many physicians, increases the risk of cardiovascular disease and breast cancer. Bioidentical hormone therapy is not readily available and affordable for many women. Scientists seeking safe, natural alternatives to existing therapies have focused on **adaptogens**, plant-derived compounds that safely induce favorable alterations in energy, neutralize stress, and promote optimal health by increasing metabolism, stamina, sex drive,

and healing ability with few side effects. An adaptogen known as **maca** has been shown to provide multimodal relief from menopausal symptoms, including hot flashes, fatigue, night sweats, and mood swings. Maca operates differently than other natural interventions for menopause, promoting optimal function of the hypothalamic-pituitary-adrenal axis that governs hormone levels in the body. Compelling data from animal and human studies demonstrate maca's unique, multitargeted effects at balancing shifting hormone levels during menopause. Maca induces favorable effects on blood lipid profiles and bone density markers, two parameters that decline drastically during menopause. Maca also helps to reduce the depression and anxiety that accompany menopause, and has beneficial effects on sexual desire and function. •

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

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# Attack Subcutaneous BELLY FLAB with new Topical Solution

Normal aging results in surplus **abdominal fat** accumulation in most men and women. The **visceral fat** that grows around internal belly organs is the most dangerous from a vascular and inflammatory disease standpoint. While visceral fat is relatively responsive to moderate exercise, scientists have discovered that even the most disciplined individual may struggle with a different type of fat. Easily recognizable as belly flab or a persistent belly pouch, this **subcutaneous** belly fat sits directly under abdominal skin and lingers long after other excess pounds have been exercised away.

Trimming and toning belly fat becomes more difficult with age and yo-yo dieting, as this can stretch skin beyond its limits and lead to sagging belly skin.

A comprehensive program to reduce **visceral fat** was unveiled in **Life Extension**.\* A novel **topical** preparation has also been developed to help reduce the appearance of **subcutaneous** fat while firming loose abdominal skin.

**Belly Slim & Tone** is a unique blend of five active ingredients that *slim* to help create a well-defined silhouette and *tone* by helping skin become firmer and more elastic.

## TOPICAL SLIMMING INGREDIENTS

**Belly Slim & Tone** contains two lipotropic extracts. The first is a marine extract called **Sphacelaria scoparia**, which is derived from a special alga called sea broom that has been studied for its



\* Jun 2009;15(6):26-35

To order **BELLY SLIM & TONE**,  
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ability to inhibit the growth of fat cells. The second extract is called **Xantalgosil C®** that contains a synergistic combination of organic silicon and a xanthic base (similar to the caffeine and theophylline found in green tea). Both of these extracts work in tandem to help address the unsightly appearance of belly fat endured by many people, **producing results comparable to the effects of vigorous exercise**. These novel ingredients are complemented with caffeine, which works locally to help reshape a more refined belly contour.

## TONING COMPONENTS

**Belly Slim & Tone** also contains an extract derived from the green alga **Chlorella vulgaris**, which is rich in amino acids and proteins, and **Regu®-Stretch**, an active complex that helps the appearance of skin that has been stretched beyond its limits. Both of these specialized ingredients help skin look firmer and more toned. Increased skin firmness and elasticity is especially beneficial for improving the visual texture of loose skin.

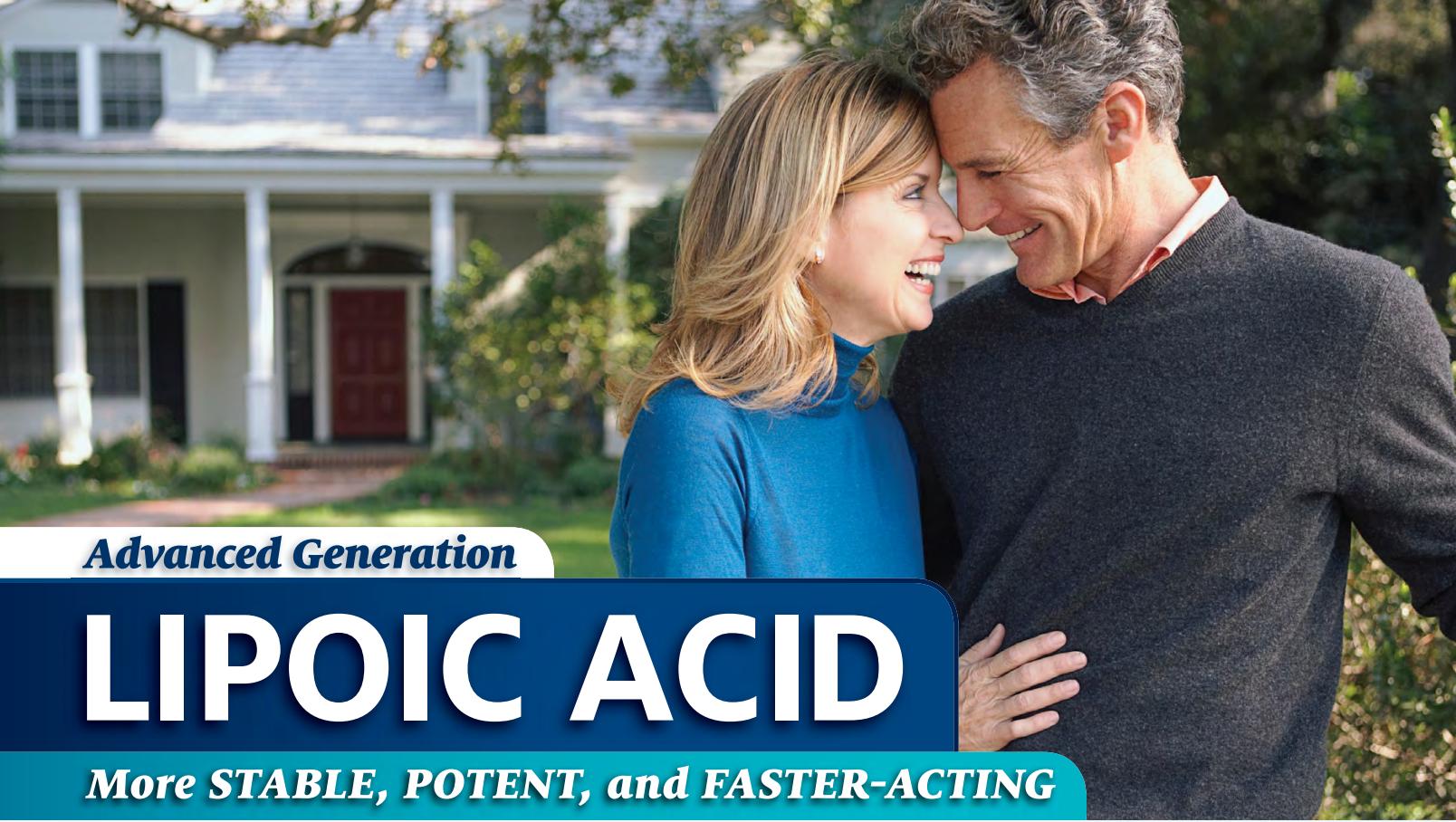
All of the active ingredients in **Belly Slim & Tone** are encased within **QuSome®** liposomes, an advanced delivery technology that ensures optimal distribution of ingredients.

## RE-SCULPTING A NEW YOU

Now you can get that trimmed and toned look with new **Belly Slim & Tone**. A 6-fl oz bottle of **Belly Slim & Tone** retails for \$42. If a member buys four bottles, the cost is only **\$28.50 per bottle**.

Item #01040

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**Advanced Generation**

# LIPOIC ACID

**More STABLE, POTENT, and FASTER-ACTING**



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.<sup>1</sup>

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

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.<sup>2</sup>



## POWERFUL ANTIOXIDANT PROTECTION

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.



Item #01208

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**Super R-Lipoic Acid**,  
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Contains soybeans and rice.

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.

# Femmenessence MacaPause®

## A New Frontier in Natural Menopause Support

For years, aging women have faced an urgent need for more options in the management of menopausal symptoms. Those who advocated safer approaches were vindicated when clinical studies confirmed that synthetic estrogen-progestin drugs increase risk of breast cancer, stroke, and other diseases.<sup>1-3</sup>

In a major scientific advance, a 100% natural form of support is now available that helps menopausal women in an entirely new way.

**Femmenessence MacaPause®** contains a proprietary compound of **maca** root (*Lepidium peruvianum Chacon*) that has been shown to provide significant support to women undergoing menopause.<sup>4-6</sup> Up to **87%** reported improvement of menopausal discomforts in clinical trials, including:

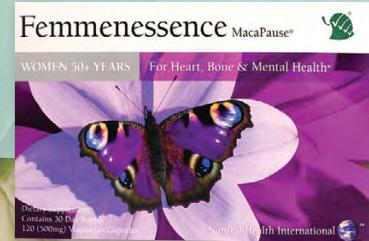
- **Better mood**
- **More energy**
- **Healthy body weight**
- **Fewer hot flashes**
- **Fewer night sweats**
- **Enhanced sexual experience**
- **Healthy hormone metabolism**
- **Support for bone health**

What makes **Femmenessence MacaPause®** unique is **Maca-GO™**, a proprietary concentration of 4 distinct phenotypes of all-natural, **organically certified** maca. Unlike many other nutrients for menopause support, maca is an *adaptogen*.<sup>7</sup> Scientists believe these plant-based energizers increase the activity of molecular “chaperones,” modulating response to stressors that affect cellular function and longevity.<sup>8</sup> Randomized clinical trials show that these herbal extracts support energy, brain health, sexual experience, and reduce stress.<sup>9</sup>

The result is a cutting-edge approach that gives menopausal women a new, natural alternative. The suggested daily serving of **2,000 mg** may help to decrease common complaints associated with menopause, either alone or in conjunction with other forms of natural female support.



A box containing 120 (500 mg) vegetarian capsules (30-day supply) of **Femmenessence MacaPause®** retails for \$34.99. **Life Extension®** members pay just **\$26.24**.

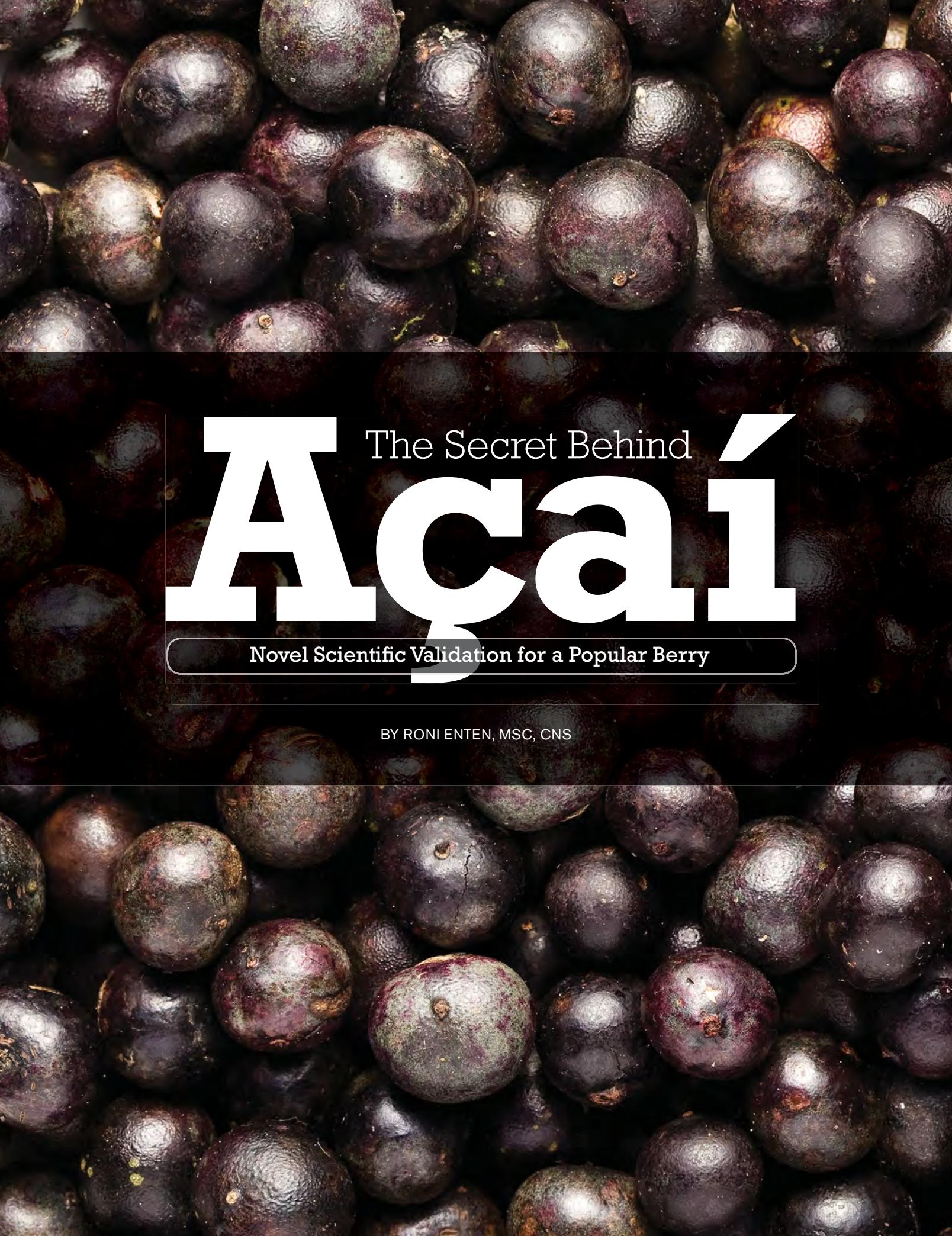


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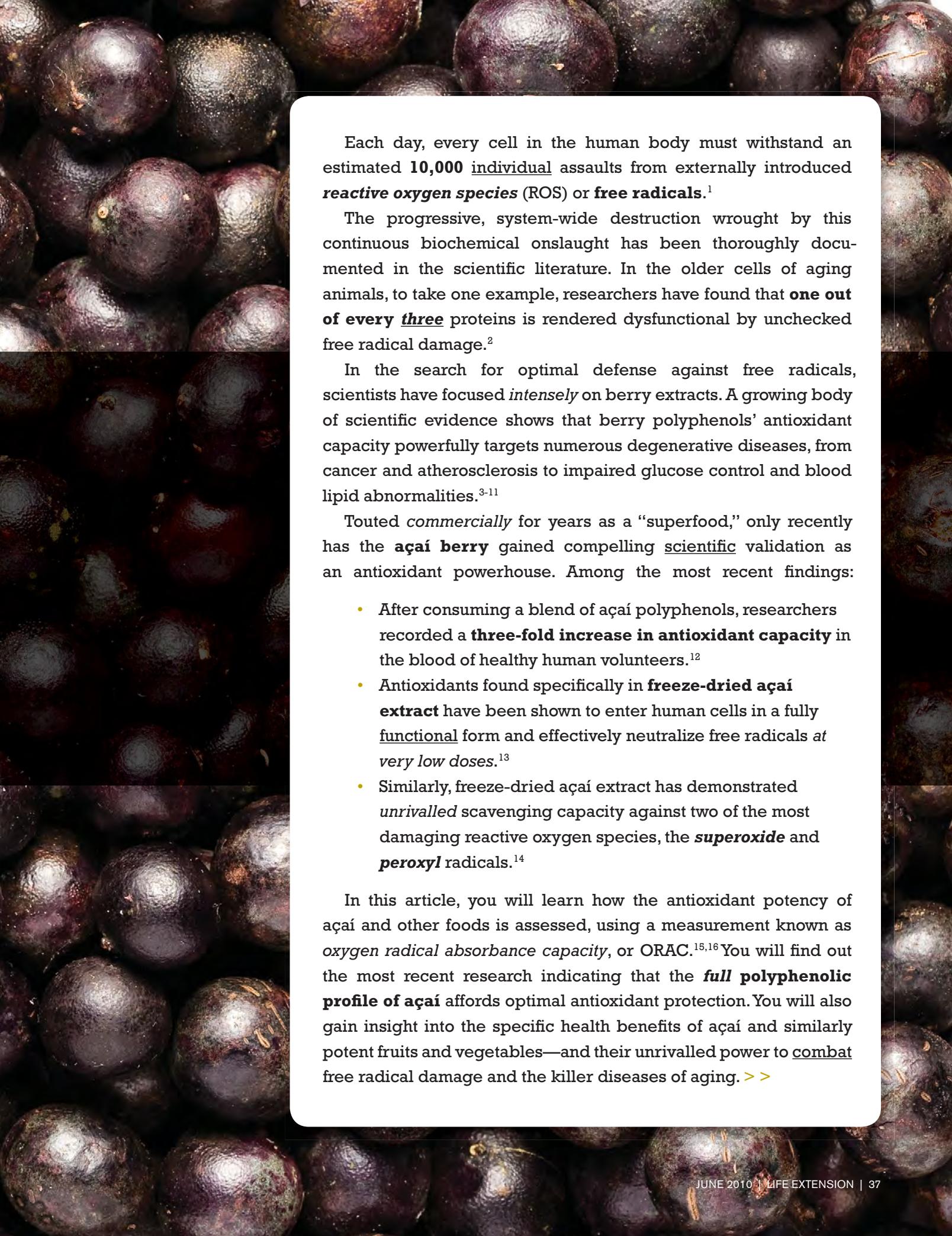
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# The Secret Behind Açaí

Novel Scientific Validation for a Popular Berry

BY RONI ENTEN, MSC, CNS



Each day, every cell in the human body must withstand an estimated **10,000 individual** assaults from externally introduced **reactive oxygen species (ROS)** or **free radicals**.<sup>1</sup>

The progressive, system-wide destruction wrought by this continuous biochemical onslaught has been thoroughly documented in the scientific literature. In the older cells of aging animals, to take one example, researchers have found that **one out of every three** proteins is rendered dysfunctional by unchecked free radical damage.<sup>2</sup>

In the search for optimal defense against free radicals, scientists have focused *intensely* on berry extracts. A growing body of scientific evidence shows that berry polyphenols' antioxidant capacity powerfully targets numerous degenerative diseases, from cancer and atherosclerosis to impaired glucose control and blood lipid abnormalities.<sup>3-11</sup>

Touted *commercially* for years as a “superfood,” only recently has the **açaí berry** gained compelling scientific validation as an antioxidant powerhouse. Among the most recent findings:

- After consuming a blend of açaí polyphenols, researchers recorded a **three-fold increase in antioxidant capacity** in the blood of healthy human volunteers.<sup>12</sup>
- Antioxidants found specifically in **freeze-dried açaí extract** have been shown to enter human cells in a fully functional form and effectively neutralize free radicals *at very low doses*.<sup>13</sup>
- Similarly, freeze-dried açaí extract has demonstrated *unrivalled* scavenging capacity against two of the most damaging reactive oxygen species, the **superoxide** and **peroxyl** radicals.<sup>14</sup>

In this article, you will learn how the antioxidant potency of açaí and other foods is assessed, using a measurement known as *oxygen radical absorbance capacity*, or ORAC.<sup>15,16</sup> You will find out the most recent research indicating that the **full polyphenolic profile of açaí** affords optimal antioxidant protection. You will also gain insight into the specific health benefits of açaí and similarly potent fruits and vegetables—and their unrivaled power to combat free radical damage and the killer diseases of aging. >>



## Assessing Antioxidant Potency

The standard index for determining the antioxidant value of various organic compounds is known as **oxygen radical absorbance capacity**, or ORAC.<sup>17-19</sup> Developed by scientists at the USDA Human Nutrition Research Center on Aging at Tufts, the ORAC test is considered one of the most sensitive and reliable methods for measuring the ability of antioxidants to absorb free radicals. While other analytic methodologies may be used, ORAC is often considered preferable because of its biological relevance to antioxidant action *in vivo* (in living organisms).<sup>20</sup> It measures both the degree and speed with which a certain food inhibits the action of an oxidizing agent, then integrates these two measurements into a single value, producing an accurate assessment of different types of antioxidants of different strengths.<sup>21,22</sup>

The ORAC value of a given food is proportional to its polyphenol content. Fruits and vegetables with a higher ORAC value—or richer color—have been shown to *suppress* free radicals more effectively than lightly pigmented foods.<sup>23</sup> Scientists at the US Department of Agriculture advise that we ingest foods equivalent to 3,000-5,000 ORAC units per day in order to maintain optimal antioxidant protection in bodily tissues and plasma<sup>24,25</sup>—a number that may be too low.

## Unrivalled Free Radical Defense

The açaí (*Euterpe oleracea* Mart.) is a species of palm tree indigenous to the area surrounding the Amazon in South America. Its berries resemble grapes

### ORAC: Top-Ranked Antioxidant Foods

Açaí berries	18,400
Pomegranates	10,500
Blackberries	5,100
Bilberry	4,200
Blueberries	3,200
Plums	2,800
Raspberries	2,700
Strawberries	2,600
Oranges	2,400
Elderberry	2,200
Cherries	2,100
Black Currant	1,160
Red grapes	1,100
Broccoli flowers	900
Kiwi fruit	900
Beets	840
Red bell pepper	710
Grapefruit, pink	483
Onion	450
Corn	400
Eggplant	390

The numerical values above indicate ORAC units per 100 grams (about 3.5 ounces).<sup>26-29</sup>

and ripen seasonally in similar fashion, progressing from green to a deep purple color.<sup>30</sup> They have long served as a critical nutritional source for the native peoples of Central and South America. Modern scientific analysis revealed that the açaí berry's complete polyphenolic profile boasts a *formidable* array of beneficial compounds, including polyunsaturated and monounsaturated fatty acids (**11.1%** and **60.2%**, respectively), along with **19** health-promoting amino acids.<sup>31</sup>

Celebrated in traditional cultures for its life-sustaining power, the *magnitude* of açaí's antioxidant capability only recently emerged in scientific studies.<sup>32</sup> Açaí powerfully counteracts several of the most destructive **reactive oxygen species** (ROS), or free radicals. In freeze-dried form, it has been shown to effectively *inhibit* the ROS **superoxide** in assays, and excels against the **peroxyl** radical in particular, with the *highest reported total ORAC score of any fruit or vegetable*.<sup>33</sup> Açaí was also found to be active against the **peroxynitrite** and **hydroxyl** radicals in ORAC assays.<sup>34,35</sup> It has also been identified recently as a potent **COX-1** and **COX-2** inhibitor, which may give it the ability to provide relief from pain and inflammation.<sup>36</sup>

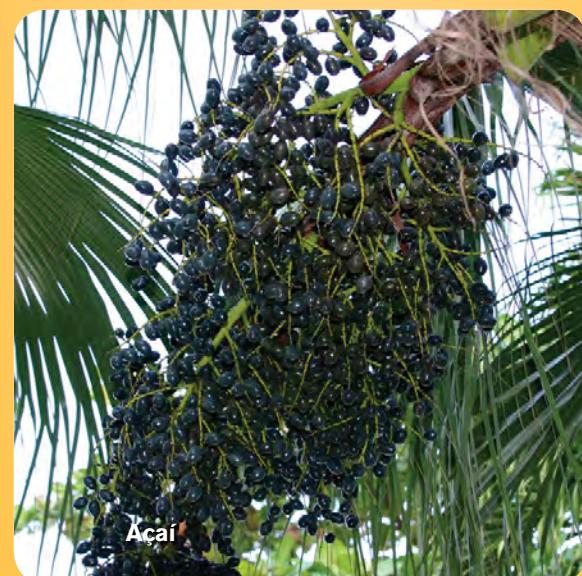
A study designed to evaluate total free radical scavenging capacity among various antioxidant foods revealed that when compared to common European fruit and vegetable juices, all the açaí samples studied *ranked in the top class of peroxyl radical scavengers*.<sup>37</sup> The authors found the samples to be so high in antioxidant capacity that the numbers could only be estimated. Another study found that human plasma antioxidant activity is significantly increased after the consumption of açaí pulp and juice, observing individual increases in plasma antioxidant activity of up to **2.3-3-fold**, respectively.<sup>38</sup>

Its potent antioxidant properties and highly beneficial polyphenolic profile endow açaí with a singular ability to *combat* cellular aging and oxidative damage. The latest research reveals the potential for significant beneficial effects on longevity and incidence of chronic disease. A study on the life span and survival of *Drosophila melanogaster* flies found that dietary supplementation of **2%** açaí increased the life span of females fed a high-fat diet by approximately **20%**, compared to controls fed a high-fat diet without açaí.<sup>39</sup> Açaí was noted to promote the activation of important stress-response pathways, alleviate the oxidative stress of aging, and protect against the negative effects of dietary fats.<sup>40,41</sup>

Evidence is also building for açaí as a major cancer fighter. Polyphenolic mixtures of açaí pulp and oil extracts inhibited the proliferation of human colon cancer cells in the lab **by up to 90.7%**<sup>42</sup> and a study

## Scientific Validation for Açaí

- Every cell in the human body withstands an estimated 10,000 individual strikes by free radicals each day, a leading factor in aging and degenerative disease onset.
- Although promoted *commercially* for years as a nutritionally dense food, the deep purple **açaí berry** has only recently gained compelling scientific validation.
- In a recent clinical study, a blend of complete açaí polyphenols increased antioxidant capacity **three-fold** in the blood of healthy human volunteers.
- Antioxidants found specifically in **freeze-dried açaí extract** have been shown to enter human cells in a fully functional form and effectively neutralize free radicals at very low doses.
- Freeze-dried açaí extract is also extraordinarily effective against the most damaging reactive oxygen species, the **superoxide** and **peroxyl** radicals.
- Scientific research suggests that together with similarly pigmented foods rich in *anthocyanins* (blueberries, black currant, and raspberries), açaí may serve as a frontline defense against multiple diseases of aging.



on human leukemia cells found açai polyphenols **reduced cell proliferation from 56-86%.**<sup>43</sup> Açai pulp was also found to be protective when administered to mice prior to the chemotherapeutic drug **doxorubicin.**<sup>44</sup>

Açaí is also emerging as a major cardiovascular protector.<sup>45</sup> In one study, açai extract induced long-lasting *endothelium-dependent vasodilation* (relaxing of the arterial wall) in the abdominal vascular tissue of rats.<sup>46</sup> Supplementation with açai berries has also been shown to reduce total and non-HDL cholesterol in animals with experimentally induced high cholesterol.<sup>47</sup>

Açaí's high antioxidant capacity also benefits brain function, with potential implications for the treatment of neurological disorders, including Alzheimer's disease and Parkinson's disease. Research has shown that pre-treatment of brain tissue from the cerebral cortex, cerebellum, and hippocampus with açai decreased ROS-induced damage of lipids and proteins *in all brain tissues tested.*<sup>48</sup>

### Anthocyanins: Broad-Spectrum Disease Protection

The most powerful antioxidant berries to emerge in recent studies contain a class of polyphenols (plant-based compounds) known as **anthocyanins**. These nutrients produce the deep red, blue, and purple pigments found throughout the plant kingdom.

Fruits and vegetables bearing these colors—**blueberries, cranberries, pomegranates, black currants, beets, and açai**—are especially rich in anthocyanins. Although present only in minute quantities, they are readily absorbed into the blood upon ingestion, where they initiate a physiological response in the body that quells free radical activity.

The most up-to-date research indicates that anthocyanins confer a broad array of health benefits, including:

- inhibiting cancer cell growth and inducing apoptosis (programmed cell death) in several cancer cell lines<sup>49-52</sup>
- reducing the risk of cardiovascular disease<sup>53-55</sup>
- enhancing glucose tolerance and lipid profiles<sup>56,57</sup>
- improving eye function<sup>58,59</sup>
- limiting cellular oxidative DNA damage.<sup>60,61</sup>

An 8-week, randomized, placebo-controlled study published this year confirmed not only that they are highly bioavailable—*they can also significantly increase levels of other beneficial polyphenols in the blood.*<sup>62</sup>



In addition to açai, anthocyanins are distributed widely among nature's most brightly colored fruits and vegetables.

#### Blueberry

Blueberries have been shown to enhance cognitive performance, and are abundant in polyphenols that can cross the blood-brain barrier and localize in regions critical to learning and memory.<sup>63</sup> Blueberries protect the myocardium from ischemic damage and prevent post-myocardial infarction heart failure.<sup>64</sup> They have also been found to improve insulin resistance and thus glucose control in pre-clinical models.<sup>65</sup> Taken together with probiotics, they may help counteract colitis (inflammation of the large intestine).<sup>66</sup>

#### Bilberry

This relative of the blueberry may provide a frontline defense against cardiovascular disease. Researchers have found that bilberry significantly inhibits **angiotensin-converting enzyme**, or ACE, which contributes to hypertension by promoting dangerous narrowing of the arteries (vasoconstriction).<sup>67</sup> Bilberries enhance short-term memory in animal models, suggesting they may have potential to help ward off Alzheimer's disease.<sup>68</sup> Like many anthocyanin-rich foods, bilberries also inhibit proliferation of breast cancer cells and induce apoptosis in animal models.<sup>69</sup> They improve insulin sensitivity, helping to prevent diabetes.<sup>70</sup> Bilberry extract helps to upregulate enzymes that defend against ocular oxidative stress as well, suggesting it may be beneficial for protecting the eyes against age-related disorders, like macular degeneration.<sup>71</sup>

### Black Currant

Black currant boasts potent anti-viral activity<sup>72</sup> and has been shown to relax the aorta by enhancing the synthesis of nitric oxide.<sup>73</sup> Black currant also reduced the oxidative stress induced by exercise and may enhance immune responsiveness to pathogens.<sup>74</sup> One study found that black currant extract improved volunteers' ability to adapt to the symptoms of tired eyes.<sup>75</sup> Black currant has also been shown to stop the growth of certain harmful bacteria.<sup>76</sup>

### Cranberry

Cranberries are probably best known for the support they provide the urinary tract, by inhibiting the adherence of *E. coli* to the urethra and bladder.<sup>77</sup> They're also proven fighters of oxidative stress. An 8-week, double-blind, placebo-controlled trial involving 65 healthy women found that **1,200 mg** of cranberry extract per day prompted a *significant decrease in serum levels of advanced oxidation protein products*—a key measure of oxidative stress.<sup>78</sup> Cranberries also display anti-proliferative activity against several types of cancer *in vitro* and *in vivo*, including gastric cancer<sup>79</sup> and esophageal adenocarcinoma.<sup>80</sup> They may also help to fend off ulcers by preventing *Helicobacter pylori*, the bacterium which causes peptic ulcers, from adhering to the stomach lining.<sup>81,82</sup>

Blueberries have been shown to enhance cognitive performance and are abundant in polyphenols... critical to learning and memory.

### Elderberry

Like black currant, elderberry is a natural anti-viral that shows promise in protecting against both seasonal and H1N1 swine influenza. Elderberry anthocyanins have been found to bind to H1N1 and block the ability of the virus to infect host cells. Researchers have favorably compared its activity to that of *oseltamivir* (Tamiflu®).<sup>83</sup> A randomized, double-blind, placebo-controlled study on a standardized elderberry product found that it reduced the duration of the flu symptoms to just **3-4 days**.<sup>84</sup> The study also showed it to be *effective against 10 different strains of influenza*. Elderberry also reduces lipid peroxides, neutralizes lipid peroxyl radicals, inhibits LDL oxidation,<sup>85</sup> and offers significant protection to endothelial cells against oxidative stress.<sup>86</sup>

### Pomegranate

Pomegranate provides broad-spectrum benefits across many physiological systems. Extracts of pomegranate have shown promise in *reducing* the potential for metastasis in breast cancer.<sup>87</sup> They initiate programmed cell death and inhibit the proliferation of



prostate, lung, colon, and other cancers.<sup>88-91</sup> The fruit has also been shown to reduce inflammation in colitis<sup>92</sup> and suppress inflammation and joint damage in rheumatoid arthritis,<sup>93</sup> not to mention its status as a known cardiovascular tonic.<sup>94</sup>

## Other Beneficial Pigmented Plants

A rich variety of additional brightly pigmented foods afford similar health benefits.

**Raspberries** protect against DNA damage<sup>95</sup> in HT-29 colon cancer cells, and inhibit HT-115 colon cancer invasion, *in vitro*.<sup>96</sup> In combination with other berry extracts, raspberry extracts have shown efficacy against oral, breast, and prostate cancers in the lab.<sup>97</sup> The antioxidant capacity of **aronia** or chokeberries have yielded some of the highest ORAC values recorded;<sup>98</sup> drinking the juice of these berries reduces exercise-induced oxidative damage to red blood cells<sup>99</sup> and in one study, a cholesterol-lowering effect was observed in animals with experimentally induced high cholesterol.<sup>100</sup> Aronia has also been found to decrease lipid peroxidation and oxidative stress.<sup>101</sup>

**Grapes and grape seeds** have been shown to inhibit colon cancer cell invasion<sup>102</sup> and decrease LDL oxidation and platelet aggregation, among other cardioprotective activities.<sup>103</sup> Grapes have also been found to extend the life span of fruit flies, and may help combat Parkinson's and other neurodegenerative diseases.<sup>104</sup>

**Strawberry** extracts have been shown to *inhibit* the growth of oral, colon, and prostate cancer cells,<sup>105</sup> improve lipid profiles and peroxidation<sup>106</sup> and lower the risk of coronary artery disease.<sup>107</sup>

**Blackberries** have shown themselves to be extremely beneficial in the management of inflammation, suppressing pro-inflammatory cytokines in animal models. Blackberry extracts also show potential in inhibiting the growth of human colon cancer cells in the laboratory, suggesting a potential role in cancer prevention.<sup>108</sup>

**Cherries** have been found to reduce blood lipid abnormalities<sup>109</sup> and glucose intolerance and abdominal obesity in mice.<sup>110,111</sup> **Tart cherries** have been found effective in suppressing inflammation-induced pain.<sup>112</sup>

The benefits of anthocyanins are not limited to fruits: studies have shown that the black soybean shows promise in fighting colon cancer<sup>113</sup> and insulin resistance,<sup>114</sup> and promotes wound healing in skin cells and reduces inflammation in endothelial cells.<sup>115</sup>

**Purple corn** possesses anti-mutagenic effects, reducing expression of genes involved in proliferation of tumor cells.<sup>116,117</sup>

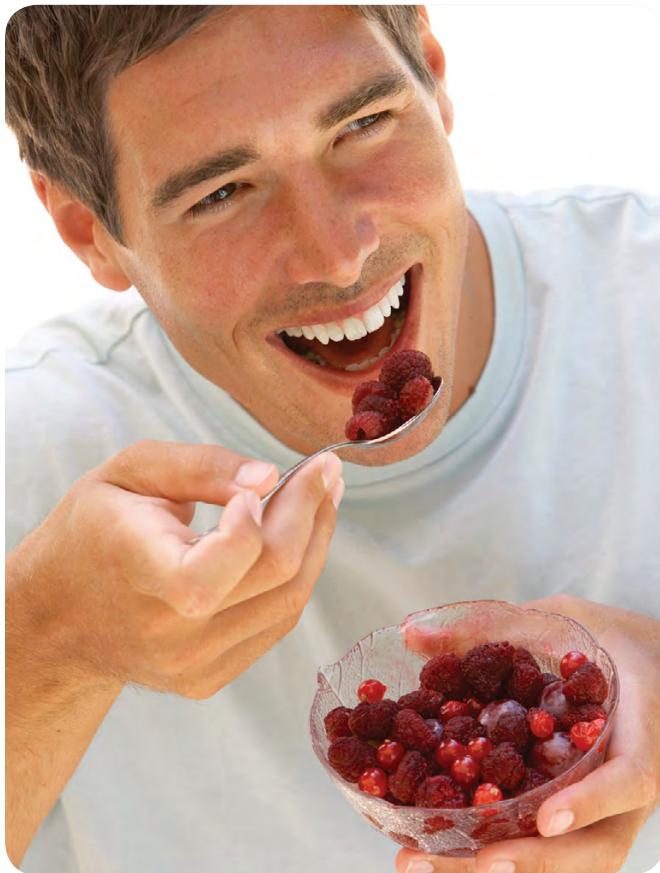
## Summary

Each day, every cell in the human body withstands 10,000 individual strikes by free radicals, a leading factor in aging and degenerative disease onset. In the search for optimal defense against free radicals, scientists have focused *intensely* on berry extracts for their potent antioxidant capacity. Although promoted *commercially* for years as a nutritionally dense food, the deep purple **açaí berry** has only recently gained compelling scientific validation. In a recent clinical study, a blend of complete açai polyphenols increased antioxidant capacity **three-fold** in the blood of healthy human volunteers. Antioxidants found specifically in **freeze-dried açai extract** have been shown to enter human cells in a fully functional form and effectively neutralize free radicals at very low doses. Freeze-dried açai extract is also extraordinarily effective against the most damaging reactive oxygen species, the **superoxide** and **peroxyl** radicals. Scientific research suggests that together with similarly pigmented foods rich in anthocyanins (blueberries, black currant, and raspberries), açai may serve as a frontline defense against multiple diseases of aging. ●

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

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- **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.<sup>8-10</sup>

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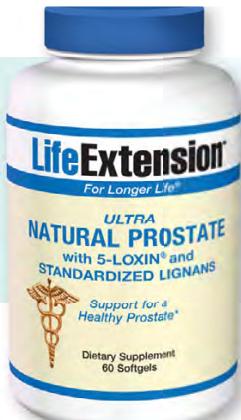
- **Nettle root extract** (*Urtica dioica*). Testosterone converts to estrogen at higher rates as men age. Prostate cells are sensitive to estrogen's growth stimulatory effects. Nettle root helps support prostate cells against excess estrogen levels.<sup>11</sup>
- **Pygeum.** Normal aging results in 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.<sup>12</sup>
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- **Cernitin®.** This European pollen extract has been shown to relax smooth muscle tone of the urethra, counteract DHT, and help regulate inflammatory reactions.<sup>14-17</sup>
- **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.<sup>18,19</sup>
- **Lycopene.** This carotenoid, associated with the tomato's red color, helps maintain healthy DNA gene function in prostate cells.<sup>20-24</sup>

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<b>USPlus® Saw Palmetto</b> (C <sub>2</sub> DeepExtract™)	<b>320 mg</b>
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<b>5-LOXIN®</b>	<b>70 mg</b>
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<b>Stinging nettle root extract</b> ( <i>Urtica dioica</i> )	<b>240 mg</b>
<b>Pygeum extract</b>	<b>100 mg</b>
<b>Lycopene</b>	<b>10 mg</b>
<b>Phytosterol complex</b> (standardized to 26.6% beta-sitosterol)	<b>678 mg</b>
<b>HMRlignan™</b> Proprietary blend of Norway Spruce and ActiFlax™ Flax Lignan extracts	<b>20.15 mg</b>
<b>Boron</b>	<b>3 mg</b>

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



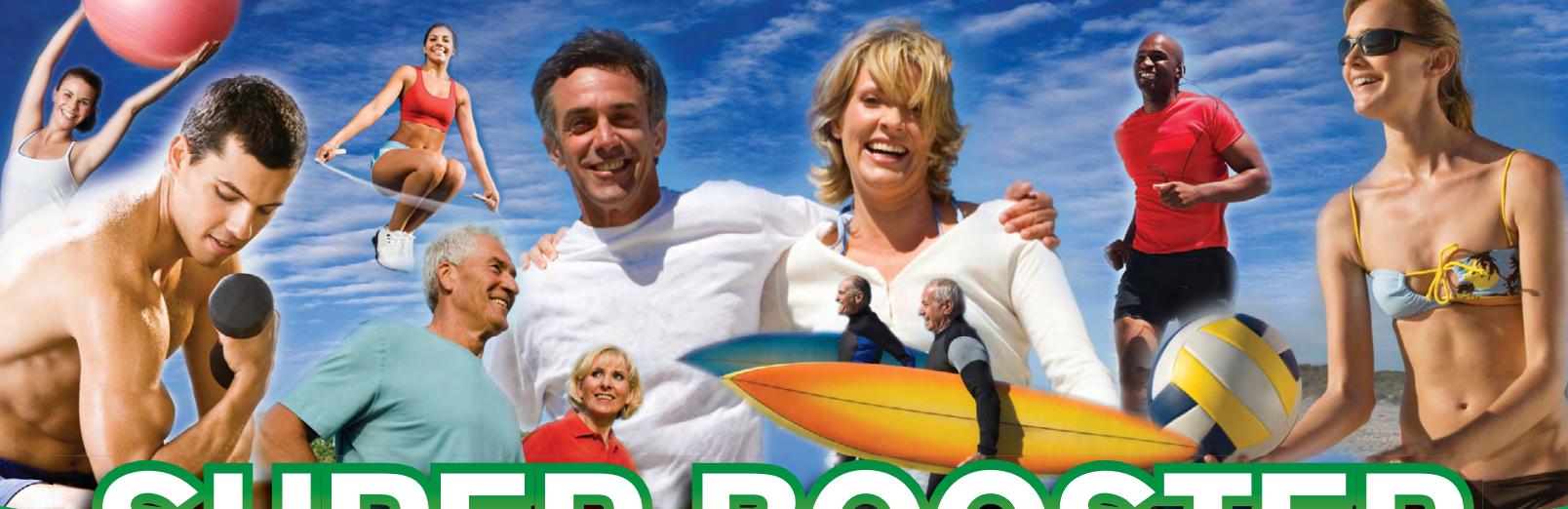
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To order  
**Ultra Natural Prostate Formula**,  
call **1-800-544-4440** or  
visit **www.LifeExtension.com**



# SUPER BOOSTER

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

**D**espite 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,

## 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 .....	1000 mcg
Sesame lignans .....	20 mg
Lycopene .....	10 mg
Lutein .....	2 mg
Se-methylselenocysteine .....	67 mcg
L-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

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.

Contains soybeans, peanuts, and sesame.

• **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.



Item #01380

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

Caution: If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your healthcare provider before taking this product. Individuals with in-born errors of copper metabolism (e.g. Wilson's disease) should avoid daily, chronic use of this product. Lyc-O-Mato® is a registered trademark of LycORed Natural Products Limited.

## Next-Generation Formula

# Enhanced Berry Complete with RZD™ Açaí



### **Another Breakthrough in Antioxidant Defense!**

In 2008, Life Extension® introduced **Berry Complete**, a unique, high-potency blend of extracts from Nature's most powerful free radical fighters.<sup>1-5</sup> The antioxidant strength of just one capsule equaled **more than 50%** of the recommended five daily servings of fruits and vegetables.

Today, we introduce an *even more* powerful antioxidant formula. A single capsule of the new **Enhanced Berry Complete with RZD™ Açaí** delivers an antioxidant value equivalent to **more than 100%** of the recommended daily fruit and vegetable intake.

It is also the first antioxidant formula to use a cutting-edge extraction technology called **Radiant Zone Drying™**. This patented process delivers the most *complete* nutritional profile of the **açaí berry**—for a breakthrough in antioxidant defense.

#### **ORAC:** **A Measure of Antioxidant Power**

To measure the antioxidant strength of various foods, scientists use what is known as the ORAC index. While berries score higher than most fruits and vegetables, **açaí** boasts one of the *highest* ORAC values known to modern science.

Unfortunately, most commercial products containing **açaí** do not reflect the full nutritional content of the fruit. Only a *fraction* of its phenolic content survives industrial processing, handling, and storage.

RZD™ extraction technology allows for optimal delivery of **açaí** polyphenols, including highly beneficial **anthocyanins**, **proanthocyanidins**, and **flavonoids**, along with **essential fatty acids** and other vital compounds.

Each vegetarian capsule of **Enhanced Berry Complete with RZD™ Açaí** also contains standardized extracts of high-ORAC value foods including:

Blackcurrant	Grape
Blackberry	Cranberry
Elderberry	Prune
Wild blueberry	Strawberry
Wild bilberry	Pomegranate
Sweet cherry	Black soybean hull
Tart cherry	Blue corn
Raspberry	

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**Enhanced Berry Complete with RZD™ Açaí** gives you a convenient way to obtain a broad spectrum of seasonal, hard-to-find, highly perishable foods, for optimal antioxidant value.

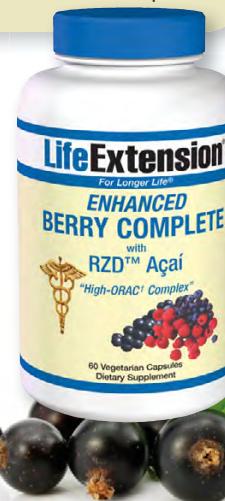
A bottle containing 60 vegetarian capsules of **Enhanced Berry Complete with RZD™ Açaí** retails for \$29. If a member buys four bottles, the cost is just **\$19.50** per bottle.

#### **References**

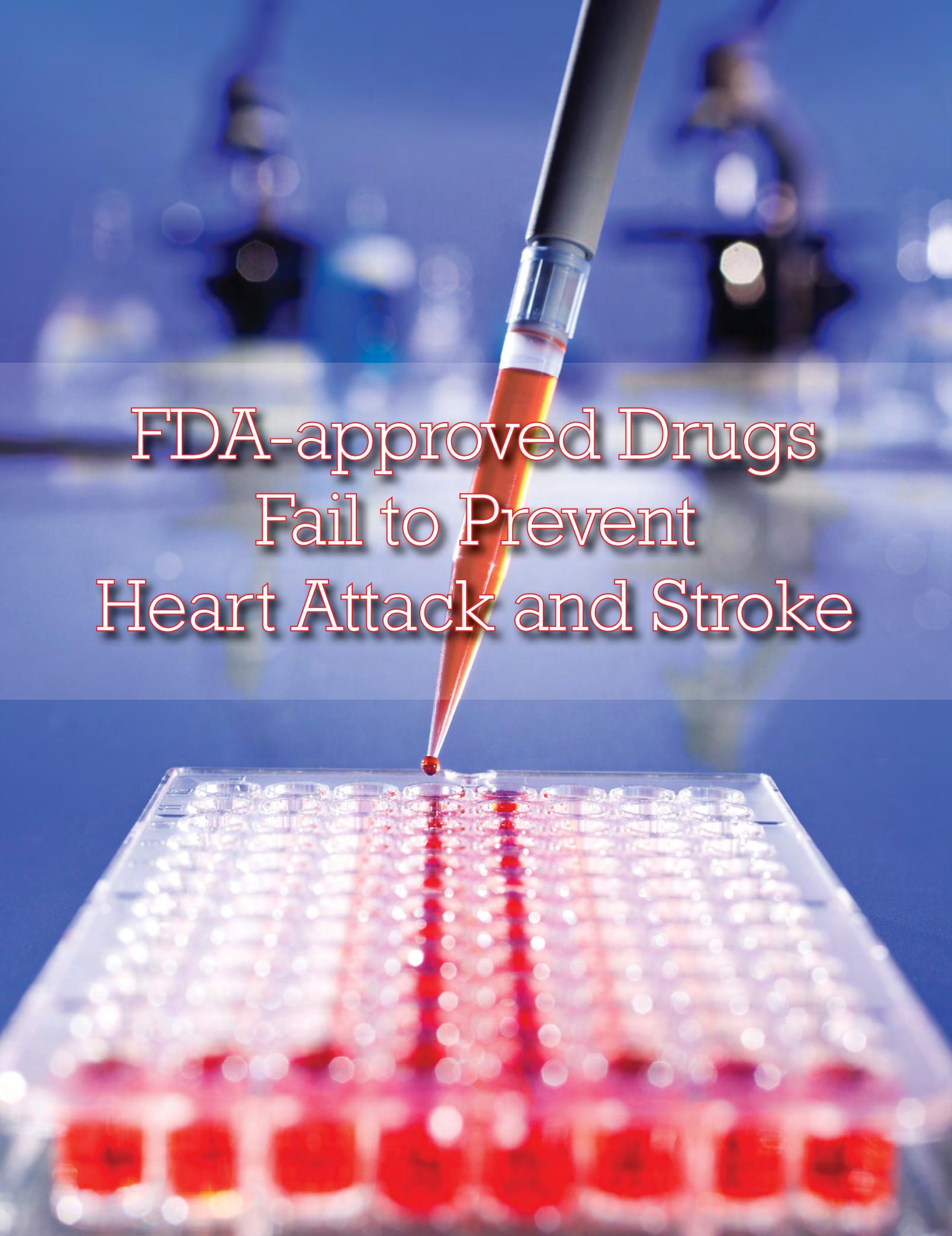
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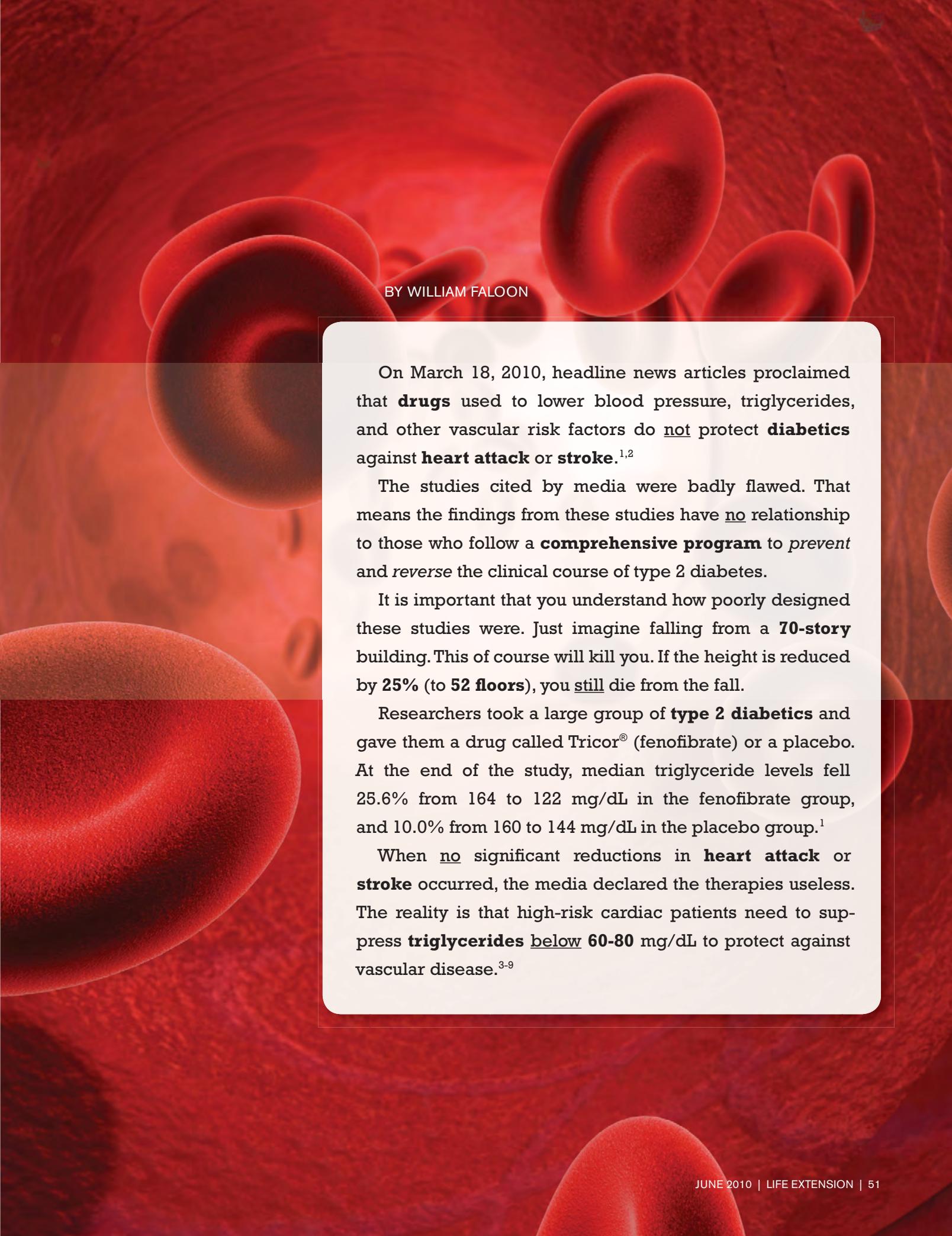
Contains soybeans. Contains corn.



To order **Enhanced Berry Complete with RZD™ Açaí**,  
call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)



# FDA-approved Drugs Fail to Prevent Heart Attack and Stroke



BY WILLIAM FALOON

On March 18, 2010, headline news articles proclaimed that **drugs** used to lower blood pressure, triglycerides, and other vascular risk factors do not protect **diabetics** against **heart attack or stroke**.<sup>1,2</sup>

The studies cited by media were badly flawed. That means the findings from these studies have no relationship to those who follow a **comprehensive program** to prevent and reverse the clinical course of type 2 diabetes.

It is important that you understand how poorly designed these studies were. Just imagine falling from a **70-story** building. This of course will kill you. If the height is reduced by **25%** (to **52 floors**), you still die from the fall.

Researchers took a large group of **type 2 diabetics** and gave them a drug called Tricor® (fenofibrate) or a placebo. At the end of the study, median triglyceride levels fell 25.6% from 164 to 122 mg/dL in the fenofibrate group, and 10.0% from 160 to 144 mg/dL in the placebo group.<sup>1</sup>

When no significant reductions in **heart attack** or **stroke** occurred, the media declared the therapies useless. The reality is that high-risk cardiac patients need to suppress **triglycerides** below 60-80 mg/dL to protect against vascular disease.<sup>3-9</sup>



## Why Drugs Don't Prevent Heart Attacks in Diabetics

As **Life Extension**<sup>®</sup> long ago stated, triglyceride blood levels above 100 mg/dL in healthy people are **dangerous**. Those with other cardiovascular risk factors (like diabetes) need to keep triglycerides below 60-80. Conventional doctors still believe antiquated reference ranges that claim triglyceride levels up to **149** are safe.

There are **17 independent risk factors** that cause heart attack and stroke. In the flawed clinical trials on type 2 diabetics, researchers *partially* corrected only **5** (or fewer) of these **17** risk factors. Is it any wonder why conventional cardiology fails so many aging individuals?

The medical establishment refuses to utilize findings from the published scientific literature to protect their patients. That's why it is so important that **Life Extension** members have a comprehensive **Male** or **Female Blood Test Panel** every year.

These blood tests not only detect a wide range of cardiac risk factors, but they also can identify those in a **pre-diabetic** state.

More than **23 million** Americans have type 2 diabetes today. The frightening projection from the **National Institutes of Health** is that at least **57 million** Americans are in a "pre-diabetic" state, indicating they are at significant future risk of suffering deadly diabetic complications like kidney failure, blindness, peripheral nerve damage, heart disease, and stroke.<sup>10</sup>

If detected early, those with elevated blood sugar levels (but not overt diabetes) can reduce type 2 diabetes risk by **58%** with lifestyle interventions.<sup>11</sup> The drug **metformin** alone reduces diabetes risk by **31%.**<sup>11</sup> **Life Extension** members have access to a much wider range of natural approaches to further protect against type 2 diabetes.

Doctors have finally come to the realization of the critical need to prevent "pre-diabetes" from mushrooming into full-blown **type 2 diabetes**. Prevention begins with the **comprehensive blood testing** offered to **Life Extension** members at a fraction of the cost of commercial labs.

## Blood Test Super Sale... Lowest Prices of the Year!

Once a year, Life Extension® discounts its already low blood test prices. Until June 7, 2010, members can order the Male or Female Blood Test Panel for only **\$199**.

According to the February 11, 2010 *New England Journal of Medicine*:

**"The lifetime risk of type 2 diabetes is now more than one in three in the general population."**<sup>12</sup>

**Comprehensive blood testing** not only reveals if you are **pre-diabetic** (or diabetic), but the test results also identify certain risk factors that if corrected can prevent type 2 diabetes from developing.

Type 2 diabetes is not an *acute* illness. For many people, the disease festers in the body for seven to ten years *before* actual diagnosis. Studies have shown that type 2 diabetes can be prevented in at-risk people,<sup>10, 13-16</sup> which is the reason why early detection is so important before deadly complications like coronary artery disease result.

The regular member discounted price for the blood tests included in the **Male or Female Panels** is \$269. If you order by June 7, 2010, the price is slashed to **\$199**.

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 these blood tests by phone or if you have any questions, call **1-800-208-3444** (24 hours a day).

You can also order online by visiting [www.lef.org/Blood](http://www.lef.org/Blood).

## Nutrients in Lieu of Drugs

The FDA-approved drug Tricor® is associated with a wide range of side effects, whereas fish oil provides multiple vascular benefits.<sup>17-21</sup> Fish oil and other nutrients dramatically slash stubbornly high triglyceride levels.<sup>22-29</sup> Comprehensive blood testing reveals whether the nutrients, hormones, and drugs you take are reducing vascular risk factors to optimal safe ranges. •

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

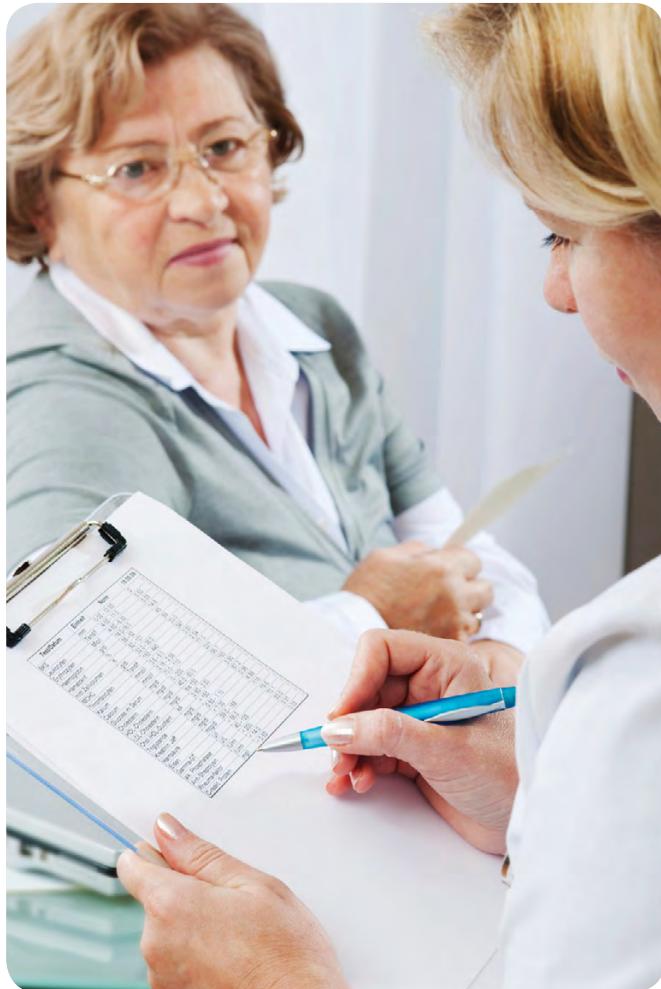
## FDA-approved Drugs Fail to Prevent Cardiovascular Events in Diabetics

- Recently published research indicates that drugs used to lower blood pressure, triglycerides, and other vascular risk factors do not protect diabetic individuals from heart attack or stroke. These results are misleading, since the studies were significantly flawed.
- For example, individuals with diabetes received a drug called Tricor®, which lowered their median triglyceride level by 25.6% (from 164 to 122 mg/dL). Life Extension has long advocated that those with high cardiovascular risk lower their triglycerides to 60-80 mg/dL.
- Another reason the studies failed is that there are 17 risk factors for cardiovascular disease. These flawed clinical trials only attempted to correct 5 or fewer of these risk factors.
- The most important step you can take to protect your current and future health is to undergo annual comprehensive blood testing to evaluate your risk of developing cardiovascular disease and type 2 diabetes. If testing reveals risk factors outside of healthy parameters, you can take early action to prevent these deadly diseases of aging.



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# Fight Back Against Aging!

## 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.<sup>1-5</sup>

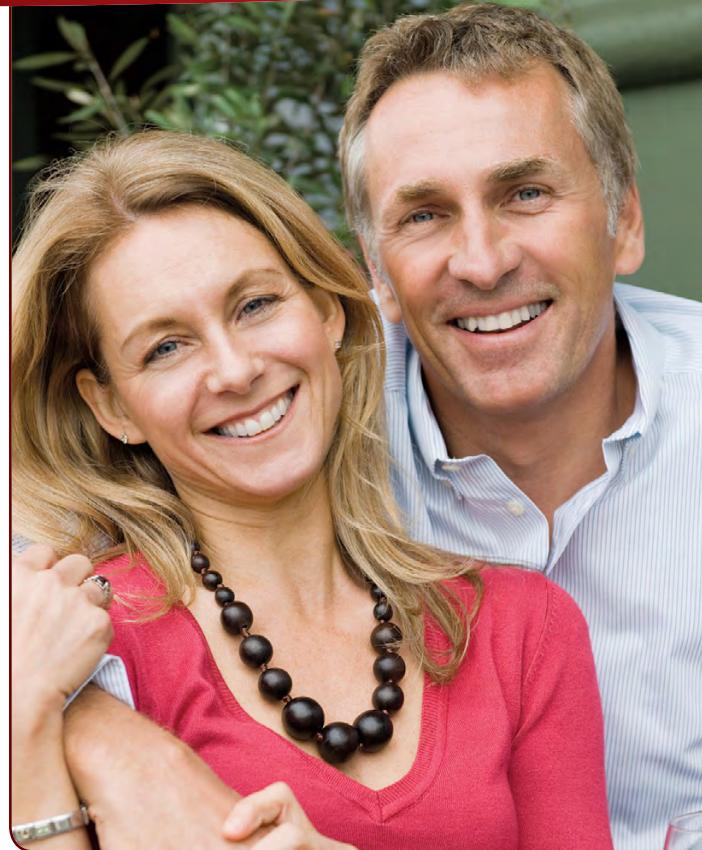
■ **LUTEOLIN** Systemic inflammation is involved in most undesirable consequences of aging. Culprits behind **chronic inflammatory** reactions are pro-inflammatory **cytokines**, such as **interleukin-1** and **tumor necrosis factor alpha**. *Luteolin* is a super-potent plant extract that has been shown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

■ **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.<sup>12-14</sup> 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.<sup>15</sup>

■ **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.<sup>16-19</sup>

■ **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.<sup>20-23</sup>

■ **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.<sup>24</sup>



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 .....	150 mg (microencapsulated)
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](http://www.LifeExtension.com)

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Contains soybeans.

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

# Petition for Redress of Grievances

to

US Attorney General Eric Holder



FDA Food Czar Michael R. Taylor



The World Health Organization (WHO) has just recommended that drinking water contain 25-50 mg of magnesium per liter to prevent deaths from heart attack and stroke. ([www.MgWater.com/download](http://www.MgWater.com/download)) American bottled water averages <5 mg of magnesium (Mg) per liter, while bottled water in the rest of the world averages about 20 mg of magnesium per liter.

The FDA and DOJ caused the Mg-deficient-water problem by destroying the American mineral water industry in the 1930's, in the mistaken belief that "pure" water was good, and that mineral water was just impure water. **Now, it is up to the FDA and DOJ to correct their blunder, requiring the Mg content of bottled or canned beverages to be put in labels' nutrition panels, and requiring that all bottled or canned beverages contain at least 25 mg of Mg per liter.**

Epidemiological studies indicate that millions of Americans may have died due to the FDA's and DOJ's destruction of the American mineral water industry. See:

<http://www.mgwater.com/anderson.shtml>      <http://www.mgwater.com/lancet.shtml>

<http://www.mgwater.com/finland.shtml>      <http://www.mgwater.com/singh.shtml>

Foods no longer contain as much magnesium as they did a century ago, due to increased food processing and possible soil depletion. Consumers have generally rejected magnesium-rich whole grain foods like brown rice and brown bread, in favor of magnesium-stripped white rice and white bread. Bottled beverages are the most practical way of delivering magnesium to consumers. Recent studies clearly confirm that water-borne Mg is far, far better in preventing cardiovascular pathologies than food-borne Mg.

## Please Act NOW!

Health freedom advocate Paul Mason has paid to run this ad in *Reason*, *New Republic*, *National Review*, *Beverage Industry*, and *Beverage Spectrum* magazines.

This ad space is being donated to Paul Mason by the Life Extension Foundation®.

The organizations supporting this ad are the Magnesium Online Library ([www.MgWater.com](http://www.MgWater.com)) and Adobe Springs Water Co., LLC (408-897-3023).





# Ease Joint Discomfort With Arthro-Immune Joint Support

*Effectively  
Combat Inflammation*



One capsule provides:

BCM-95® Bio-Curcumin® Extract ..... 250 mg  
PARACTIN® Andrographis Extract ..... 150 mg

Item #01404

Inflammatory conditions debilitate millions of adults, resulting in *restricted mobility* and *reduced strength*. **Inflamed joints** can lead to extensive damage to surrounding connective tissues, which causes the hands, feet, and arms to become painful, swollen and stiff.

While conventional methods can produce side effects, **Arthro-Immune Joint Support** from **Life Extension**® combines two clinically proven plant extracts into one powerful formula to help those suffering from inflammation.

**Andrographis paniculata** has received acclaim for its beneficial effect on inflammation.<sup>1</sup> A Chilean study involved 60 adults who took either 150 mg **andrographis extract** a day or a placebo. Those taking the extract showed *dramatic improvement* of several outcomes, **including fewer numbers of tender and/or swollen joints**. For joints that remained tender and/or swollen, the intensity was lessened.<sup>2</sup>

**Curcumin** is a compound that is universally recognized for its impressive *antioxidant* and *fluid-regulating* properties. In an as-yet-unpublished double-blind clinical trial, an enhanced absorbing curcumin was shown to have a beneficial effect on inflammation.<sup>3</sup>

**Life Extension's Arthro-Immune Joint Support** contains **PARACTIN® Andrographis extract**, which has been used in clinical, animal and *in vitro* studies that have demonstrated

its efficacy in *combating* inflammation. It also contains **BCM-95® Bio-Curcumin®**, which is considered the *gold standard* curcumin, with bioavailability *far superior* to that of most curcumin extracts.

**Life Extension's Arthro-Immune Joint Support** provides scientifically validated plant extracts that have been shown to have significant salutary effects on tender or swollen joints. **Just one** capsule a day provides a potent serving of **PARACTIN®** and **BCM-95® Bio-Curcumin®**. A bottle of 60 capsules retails for \$30. When a member buys four bottles, the price is reduced to only **\$20.25 per bottle**.

**CAUTION:** Do not take if you have gallbladder problems or gallstones. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult your health care provider before taking this product.

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1. *Int Immunopharmacol.* 2009 Mar;9(3):313-8.
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3. Chandran B, Chakrith VK, Thomas SPO. A multicentre, randomized, controlled human clinical study to assess the efficacy and safety of Biocurcumax (BCM-95) compared to diclofenac sodium. Submitted for publication. 2009.

To order **Arthro-Immune Joint Support**,  
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**Embryonic stem cells (ESCs),**  
colored scanning electron micrograph.

**ESCs are pluripotent, that is they are  
able to differentiate into any cell type.**

**The type of cell they mature into  
depends upon the biochemical signals  
received by the immature cells.**

**This ability makes ESCs a potential  
source of cells to repair damaged tissue  
in diseases such as Parkinson's  
and insulin-dependent diabetes.**

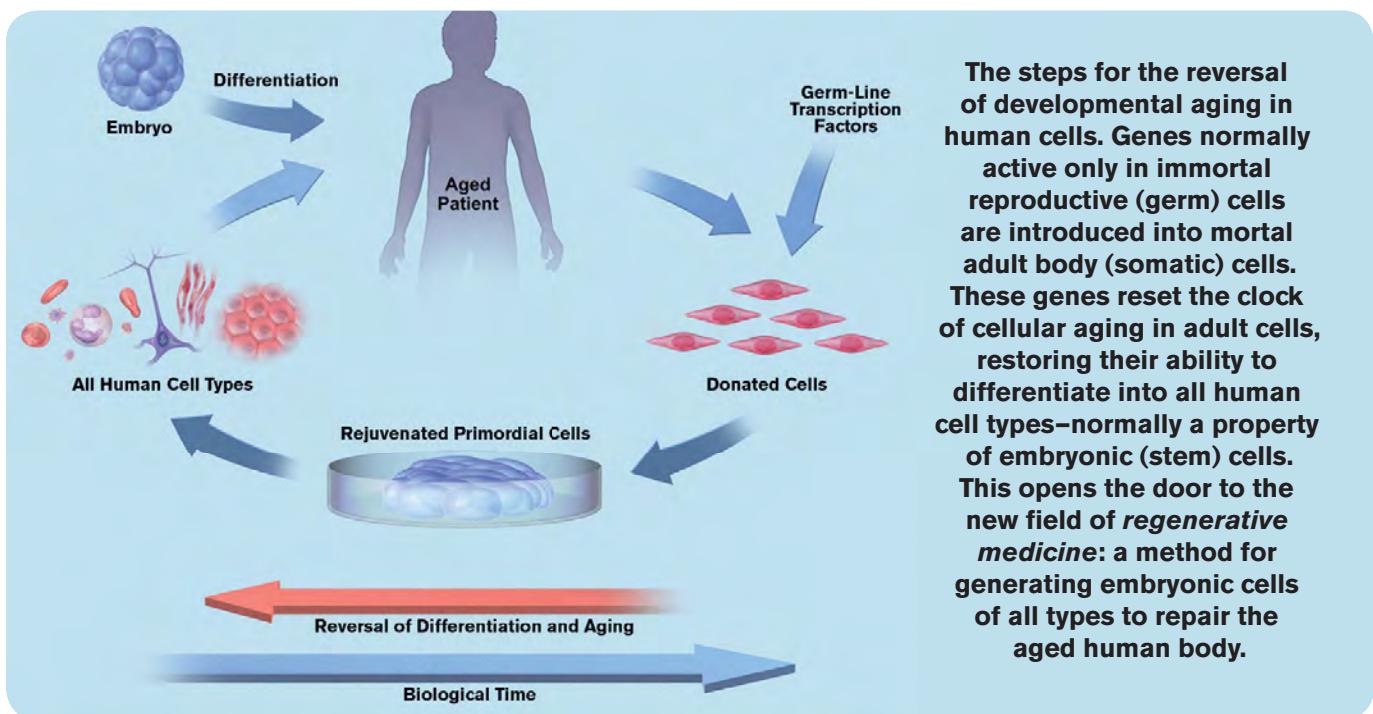
**Magnification: x3000.**

# Immortal Stem Cells for Anti-Aging Therapies

An Interview with **Michael D. West, PhD**

BY GREGORY M. FAHY, PhD AND SAUL KENT

On Feb. 20, 2010, Gregory M. Fahy, PhD and Saul Kent interviewed Michael West, PhD, CEO of BioTime, Inc., about a new breakthrough published in the journal *Regenerative Medicine*. The paper reported the reversal of what Dr. West has called the “developmental aging” of adult human cells in the laboratory dish. Utilizing genes that grant our reproductive cells the potential for immortal growth, the researchers showed that it was possible to turn back the clock in human body cells, enabling the potential for young patient-specific cells of any kind for use in regenerative medicine. This research was funded in part by the **Life Extension Foundation®**. We asked Dr. West to elaborate on the details of his groundbreaking research, and to expound on the implications for the future of rejuvenative medicine. > >



**The steps for the reversal of developmental aging in human cells. Genes normally active only in immortal reproductive (germ) cells are introduced into mortal adult body (somatic) cells. These genes reset the clock of cellular aging in adult cells, restoring their ability to differentiate into all human cell types—normally a property of embryonic (stem) cells. This opens the door to the new field of *regenerative medicine*: a method for generating embryonic cells of all types to repair the aged human body.**

**Fahy:** Before we get to the details of your paper on the reversal of developmental aging, let's set the stage. Your discovery relates to the field of regenerative medicine. What do you mean by regenerative medicine and how does it differ from medicine as it exists today?

**West:** Well, the name "regenerative medicine" came from Bill Haseltine, then of Human Genome Sciences, one of the early leaders in genomics and DNA technology. Back in the 1990s, Bill learned that researchers in aging were making important progress on turning back the clock of aging in human cells through cloning, and then creating young cells that could potentially regenerate or repair all the tissues of the aged human body. And so, upon hearing of that realistic prospect, he christened the field "regenerative medicine" in the belief that it would one day become a major part of medical practice. So, based on its origins, I would define regenerative medicine as that collection of technologies that utilizes embryonic pluripotent stem cells and their derivatives to regenerate tissues in the body ravaged from disease, primarily degenerative disorders associated with aging.

**Fahy:** The implication of the term is that we're actually going to be able to regenerate or re-grow parts of the aging body because of this ability to turn back the clock of cellular aging.

**West:** Yes. First, let's talk about cellular aging. The problem with human biology is that the immortal reproductive cells that built you and me develop into differentiated cells within our bodies and as a result,

lose the capacity to proliferate (divide) forever. So, the cells of the body are mortal, meaning they have a finite life span, and as our tissues age, or deteriorate from disease, our body has a finite capacity to regenerate and repair those tissues. As a result, we suffer progressive declines in function that lead to our death.

**Fahy:** So, are you saying that an inadequate ability to generate new cells in the aging body is linked to the body's inability to repair itself as we grow older?

**West:** Every tissue is different, but that's basically what I am saying. The goal of gerontology for many years has been to find the reason that our reproductive lineage continues to make babies generation after generation while the other cells in our body, called somatic cells, have a finite life span and are mortal, or, in other words, to discover the reason babies are born young. The answer is that we come from a lineage of cells that have been proliferating since the dawn of life on earth. The cells that made us have no dead ancestors. That recognition is causing a major shift in our thinking about aging, towards recognizing that aging may be more simple than we once thought. Although complex in the way it's played out in thousands of genes and proteins, in reality, it may be that only a small number of central mechanisms cause the somatic cells in our body to age. So, the goal has been to discover a way of transferring the immortality of reproductive cells into the body in order to increase the potential life span of individual human beings.

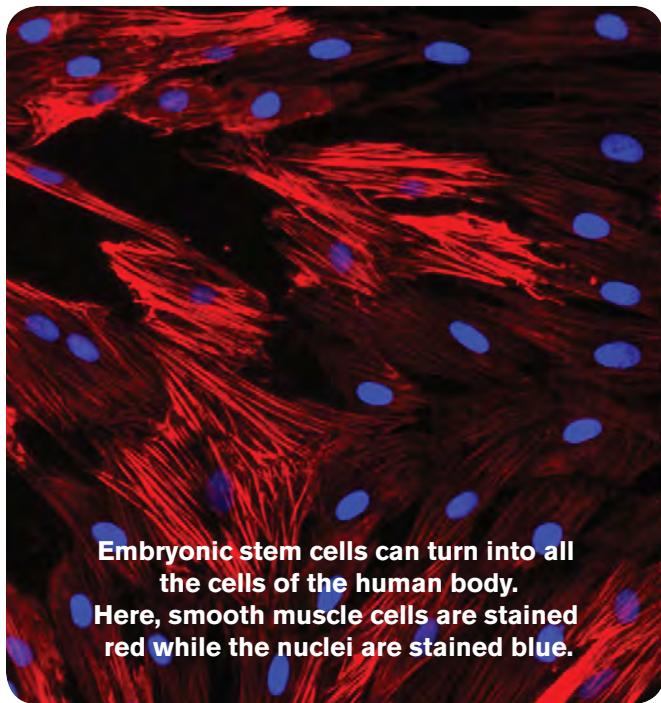
**Fahy:** What gives the germ line immortality, or as you put it, why are babies born young?

**West:** Well, the first clue was published in 1986.<sup>1</sup> Howard Cooke reported that specific regions of DNA at the ends of our chromosomes called *telomeres* are long and constant in length in our reproductive cells (sperm in particular in this case) with age, but shorten progressively in body cell types as we age.

That publication led me to realize that an old theory of aging by Alexey Olovnikov from Russia now had scientific support. Olovnikov's theory was that the difference between our reproductive cells and our body cells is that the ends of the DNA strands shorten over time in somatic or body cells, but are maintained at a long length in reproductive cells.<sup>2</sup>

That shortening was considered by Olovnikov to be a clock of cellular aging, similar to the way the length of a fuse leading to a bomb can be a kind of clock—the longer it's set, the longer it will burn before the bomb goes off. And, of course, the bomb going off here is the aging of somatic cells. Olovnikov proposed that there is an immortalizing enzyme that is shut off in body cell types, causing them to have a finite life span.

Back around 1990, I became convinced the telomere hypothesis was correct, and founded Geron, where we isolated and purified this immortalizing enzyme, which we called telomerase. In 1998 we demonstrated that the addition of telomerase to body cell types such as skin cells or cells from the retina involved in macular degeneration stopped these cells from aging.<sup>3</sup>



## Immortal Cells

Early in the history of evolution, life existed as single cells, not unlike the protozoa swimming around in pond water today. These animals replicated by simply splitting into two new cells. They didn't have to die and are therefore called "immortal."

In the following millennia, these immortal cells spun off specialized helper cells to help them compete in feeding and reproduction. These helper cells selflessly served the needs of the immortal cells and became what we call the "body" while the immortal cells became what we call the "germ line." Since the immortal cells carried genetic information, they selected for the body to die after it served its purpose.

Where are these immortal cells in you and me? In the adult human, they are the egg cells in a woman's ovary, and the sperm-forming cells in the testicles of a man. When a sperm and egg unite, the resulting cells continue the germ line by forming a small cluster of immortal cells that go on to make new body and new immortal reproductive cells of a new human being, a cycle that continues forever.

For the first time in the history of life on earth, the body cells have evolved a brain that is capable of understanding evolution and capable of deciphering the molecular mechanisms of cellular mortality and immortality. This conscious body is now plotting to take on the legacy of immortality for itself.

**Fahy:** What are adult stem cells?

**West:** There are tissues in the human body that have evolved a source of regenerative cells—or adult stem cells—to repair the tissues when they are damaged. For example, when a cave bear attacked an ancient Neanderthal and scratched the surface of his skin, there had to be stem cells there that could within a few days repair that damage. Similarly, our livers can regenerate extensively when damaged by toxins, accidents, or diseases. And when you have a strained muscle, muscle can regenerate too.

But unfortunately, not all cells and tissues of the human body have extensive regenerative capacity, and indeed, in the case of humans, adult stem cells all appear to be mortal. They can regenerate tissue function, but only for a finite period of time. We can observe the aging of adult stem cells through telomere shortening.

If we can learn the lessons of how our reproductive lineage has been creating babies for millions of years to continue the human species, we should be able to design medical therapies to allow the human body to regenerate itself and escape the genetic boundaries of human life.

**Fahy:** You have suggested in the past that this might be accomplished using stem cells derived from embryos, and, in particular, embryos created by somatic cell nuclear transfer (cloning).

**West:** Once we knew it was telomerase that was maintaining the germ line, it occurred to me that we might be able to isolate germ line cells from human embryos and just propagate them in a laboratory dish. These cells should be immortal in the laboratory just like they are in nature. Think of it this way: they would be in a sense the immortal stem cell of human life itself, regenerating human beings generation after generation, forever. If we could tap into that amazing lineage of cells, it could allow us to manufacture all cell types in the human body. And theoretically we could make an unlimited assembly line, making new young tooth-forming cells, new young cells for the retina, for the cornea, for the heart, for the kidneys, and so on. And so that was the genesis of the project to isolate human embryonic stem cells, a project that began in the mid-1990s and culminated with the publication of human embryonic stem and embryonic germ cells in 1998.<sup>4,5</sup>

The isolation of these cells was controversial because of the need to derive the cells from human embryos. Certainly elevating their notoriety was President George W. Bush's first national address on August 9, 2001, when he discussed the ethics of the cells and policy on federal funding of the research.

These cells nevertheless caused a great deal of enthusiasm. I think people were initially assuming that existing embryonic stem cell lines would be used for the manufacture of all future products. But in my mind, those lines couldn't ultimately work for many uses because of transplant rejection. Many of the cell types in the human body are rejected after being transplanted from one person to another. The immune system recognizes them as foreign cells and attacks and kills them. So we initially sought to solve the problem of transplant rejection by making these all-powerful embryonic stem cells genetically identical to the patient in need of the therapy through cloning.

In 2001, we published the first account of cloned human embryos in an attempt to make patient-specific stem cells.<sup>6</sup> We said at the time that our goal was not the cloning of human beings, but was only to clone patient-specific embryonic stem cells that would not be rejected. We anticipated that the use of cloning

would not only take a skin cell back to an embryonic state, but that it would also make an old cell young again by rebuilding the telomere back to an embryonic state. So our goal was to be able to produce young cells of any type identical to the patient's own cells, and we called the process for doing this therapeutic cloning.<sup>7</sup>

**Fahy:** Why was therapeutic cloning insufficient?

**West:** Of course, it was very controversial because of the need to clone human embryos. In addition, the difficulties of getting a sufficient number of human egg cells and the technical challenge of implementing cloning made advances in that field slow and difficult. What we desperately needed was to find a means to make all these therapies we'd been talking about possible on a scalable and affordable platform that would allow them to be implemented commercially for millions of patients.

**Fahy:** Which brings us to induced pluripotent stem cells (or iPS cells). What are these cells and how are they generated?

**West:** iPS cell technology is a way of using just a handful of genes to coax a cell back in time without using egg cells or cloning. And this is the exciting part: the technology works. It is one of the most active areas in medical research today.

Let me tell you a fun story. Shortly after we cloned human embryos in 2001, I was at a birthday party for Jack Szostak in Boston. Jack, along with Liz Blackburn and Carol Greider, won the Nobel Prize in 2009 for their early research in telomere biology. Mark Ptashne was at Jack's house too, and after a few glasses of wine I asked him, "Mark, after hearing about cloning, how many genes do you think are in the egg cell that are responsible for taking the cell back in time?" After a couple more sips of wine, Mark, who is an expert in transcription factors, the master regulators of all the genes in somatic cells, said quite definitely, though I think tongue-in-cheek, "four." I responded "you're wrong" with an exclamation point, because I believed there were published data suggesting that what is in the egg cell that is required to turn back the clock in cells is enormously complex.

However, a couple years later we were using microarray DNA sequences on a chip to look at the thousands of genes in embryonic stem cells and in hundreds of cell types we had purified using a technology we call ACTCellerate. And using computer programs to search for the genes that were different in these cells, we found, at the top of the list, almost as if highlighted in glowing bold letters, four transcription factors that are active in embryonic stem cells and

inactive in virtually all body cell types—*Oct4*, *Sox2*, *Lin28*, and *Nanog*. I looked at these genes and, remembering my conversation with Mark, had to ask myself, “Could it really be that simple? Could I be looking at the master regulators of the immortal renewal of human life?”

As I thought about this carefully, I came to believe that the earlier data that cloning was complex was not that solid, and so we filed patent applications on the use of these and other related germ line-specific genes as master regulators that, if expressed in a human body cell, would be fully capable of transporting an old skin cell (and many other adult body cells) back to an embryonic state, rewinding the “clock” of development whereby embryonic cells normally differentiate into the specialized cells of the body, as well as the telomere “clock” of cellular aging. Since this is resetting both, we call it the *reversal of developmental aging*.

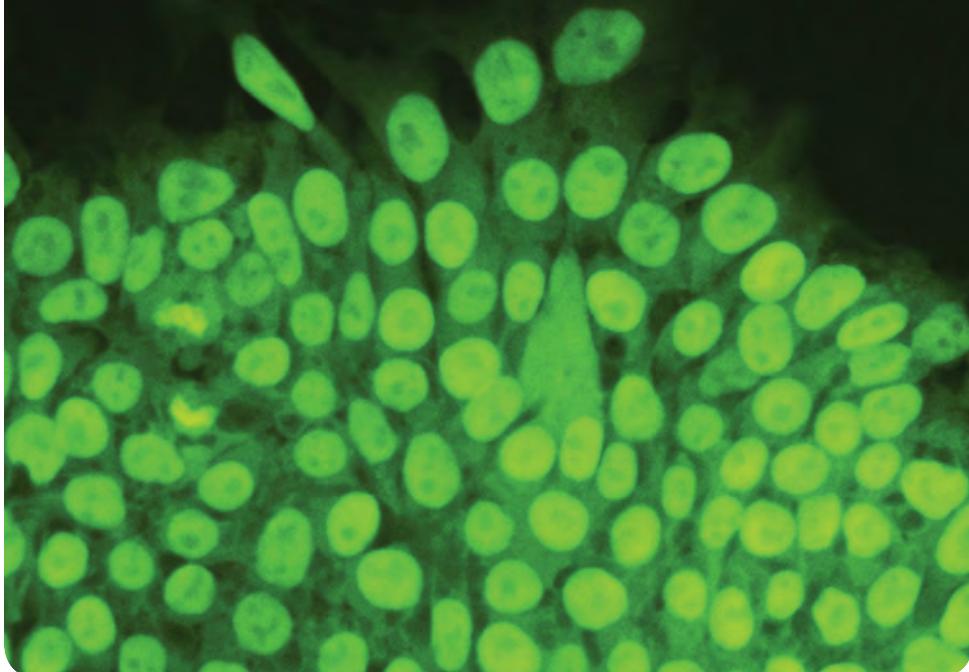
**Kent:** You’re leaving out the fact that scientists did, in fact, find that these four transcription factors do indeed work.

**West:** Right. In 2007, Yamanaka of Japan and James Thomson in Wisconsin, published the first papers showing that this family of transcription factors was indeed successful at turning back the developmental clock of aging.<sup>8,9</sup> Taking a skin cell, for instance, back to an embryonic state. Since no embryos are used in their derivation, they are called “induced pluripotent stem (iPS) cells” instead of embryonic stem (ES) cells.

**Fahy:** iPS cell technology has been on the cutting edge of regenerative medicine ever since. But you found a problem. What is it?

**West:** Recognizing the problems of implementing cloning, we began working in this field in the 1999–2005 time frame with a strong interest in what happens to the clock of cellular aging. Thomson and Yamanaka had not carefully looked at whether the clock of cellular aging was reversed in their iPS cell lines, so after these lines and others were widely distributed in the scientific community, we surveyed their

**The age-reversed cells in the study are shown here stained for a marker called “Oct4”, a protein normally only expressed in the immortal reproductive lineage.**



telomere lengths and saw that they were not at the length expected for the beginning of life.

In cloning, when you take a cell from an old animal and transplant that cell or its nucleus into an egg cell, the clock of aging gets rewound. So even though you take a cell from a very old animal, the young cloned animal is born young. Cloning takes a body cell and transforms it back into an immortal germ line cell and creates a baby just as if it had been sperm and egg that created it. The rumors that cloned animals are generally born old are myths.<sup>10</sup> That’s been firmly shown not to be the case.<sup>11</sup> So the egg cell can function as a cellular time machine, reversing developmental aging,<sup>12</sup> so an animal cloned from an old animal is born young.<sup>13</sup>

Now, with iPS technology, which is a way of performing the equivalent of cloning without using an egg cell or making an embryo, everyone believed from the start that it would also transport the cell back to immortality, since that is what happens in cloning. But when we looked at telomeres in several widely used iPS cell lines we saw they were all short. In the paper we just published,<sup>14</sup> our survey showed that, although all iPS cell lines out there do reactivate telomerase and otherwise look like embryonic stem cells, they do not properly reset the clock of aging because their telomeres remain shorter than they should be.

The good news is that we found a way to identify iPS cells that *have* reset the clock of aging. And so while iPS cell technology is not as efficient as cloning in rapidly and reliably reversing the clock of aging, we've shown in this paper that it can be made to work quite simply. So the ability to reverse the aging of human cells both from the standpoint of embryological development and in terms of the clock of aging and in an ethically non-problematic manner, and to do it on a commercial and affordable scale, makes regenerative medicine an attractive pathway to profoundly intervene in human aging.

**Kent:** But as you said, the majority of iPS cells don't maintain the length of their telomeres. What percentage of the cells that are produced in this manner are, in fact, turned back in time based on their telomere lengths and telomerase activity?

**West:** These are still the early days of our investigation of iPS technology, but of the six lines we generated, one successfully reset the clock of aging. And so our current success rate is one out of six. But of course those numbers will likely change with larger studies.

**Kent:** Do you know any reason that might explain why one in six are different from the others?

**West:** We've taken the successful cell line whose telomeres got reset all the way back to embryonic telomere lengths again, and looked at it carefully using DNA chips that measure gene expression in all human genes, and we were able to identify some genes related to the telomere that, at minimum, are a marker of the cells whose clocks have been turned back successfully.

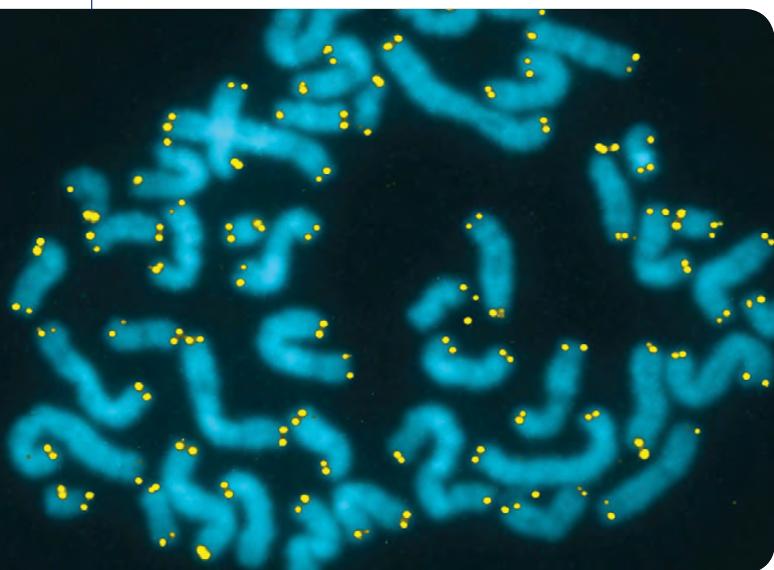
Why the egg cell is so much more efficient than these genes remains unknown, but the important thing is that it really is a matter of efficiency here. Even if the efficiency is never improved beyond one out of six, we still have a commercially feasible technology.

**Fahy:** However, you referred in your paper to the possibility of developments such as the use of germ cell extracts and the like that might be able to improve the efficiency of making fully successful iPS cells. Do you have plans to actually pursue that, and is it a practical approach?

**West:** Yes. We are now developing a technology we call ReCyte™. ReCyte™ uses testicular cells called EC cells that we genetically engineer to express large quantities of these master regulators such as *Oct4*, *Sox2*, and *Lin28* to be little time machines to transport a patient's cells back in time. ReCyte™ is a technology designed specifically to increase the efficiency of reprogramming, and to do so on a robotic, commercial scale. Based on our understanding of how all this technology works, we believe this will allow us to manufacture a product for resetting the clock of aging in cells inexpensively and efficiently and improve the quality of reprogramming, making the safest and most efficacious cells available for patients that can be produced as of today.

**Kent:** You may be right about that, but right now the best you can do is one out of six. And as I understand it, the way this technology will be most effectively used is to take somatic cells from individuals and turn them back into embryonic-like cells. What is the chance that you'll be unable to do so effectively in a particular individual?

**The clock of cellular aging resides at the very ends of the chromosomes, regions called "telomeres." Shown here in a blue color are stained human chromosomes, and the telomeric DNA is stained bright yellow.**



**West:** In our paper we manually created these lines, so we only made six cell lines, one of which properly rewound the clock. With the newer robotic platform we are developing, we could increase that number of lines markedly. So, even with no improvements in efficiency, we could increase the number of lines to make a successful outcome for a particular patient highly probable.

**Fahy:** Is the ReCyte™ process patented by BioTime?

**West:** Yes. ReCyte™ is a proprietary technology of BioTime and is based on several issued and pending patents.

**Fahy:** Do you also have exclusive ownership over the process of choosing cells that spontaneously maintain their telomeres and excluding those that don't?

**West:** We've filed for patent protection on the selection process to identify these cell types based on the data in our paper.

**Fahy:** Are there alternative ways of achieving the same effect you've been able to obtain? For example, it has been possible to artificially restore telomerase to cells since 1998,<sup>3</sup> as you referred to earlier in the interview. Is there any reason iPS cells could not simply be telomerized to correct their defect in telomere maintenance?

**West:** Well, we looked at a telomerized line in our publication, an iPS cell line from Harvard Medical School. That line had, in addition to these germ line genes that make this time machine work embryologically, some added telomerase, in the belief that there may be a problem with the telomere. But those cells still have inappropriately short telomeres. And so what we've learned is that telomerase is indeed very important, but merely adding telomerase to the iPS techniques as currently used in most laboratories is not sufficient.

**Fahy:** In the paper, you speculate that maybe the reason the iPS cells are not maintaining their telomeres is that they're not maintaining their undifferentiated embryonic state over time. Is there any evidence that they might be losing their undifferentiated state?

**West:** All I can say is that what's so striking about iPS cells is how similar they are to human embryonic stem cells in every respect. If one scans through 30,000 plus genes and looks at the expression of all those genes in human embryonic stem cells and iPS cells they are essentially indistinguishable. It's very difficult, in fact, to find any differences, and it was hard for us to find what differences might be causing this inefficient resetting of the clock of aging. So the striking thing is

their similarity, not that there are problems with the technology. However, we mention in the paper that our survey of widely-studied iPS cell lines may have been influenced by the poor culture of the cells in some laboratories.

There have been reports that iPS cells are less likely to make various cell types, like neurons, compared to embryonic stem cells. But it's important to remember that most of the world is working with iPS cells that are geriatric in terms of aging, and so all of those studies need to be repeated with these new cell lines that have their clock of aging reset properly before any conclusions can be drawn about the normality or abnormality of iPS cells.

**Fahy:** What about the possibility that the cells that are naturally able to restore and maintain their telomeres are those that have DNA damage?

**West:** We looked carefully throughout the genome of these cells using what is called SNP analysis and couldn't find any evidence of DNA damage such as rearrangements, so for this and other reasons, we don't have any reason to think the iPS cells that maintain their telomeres do so because of DNA damage the way cancer cells do.

A long-standing theory of aging is that our body accumulates cells that have broken chromosomes, serious DNA damage, and damage unrelated to telomere shortening *per se*. And that almost certainly happens. Nevertheless, we also know that the human body has many *trillions* of cells that are completely intact, and with modern sequencing technologies it's now possible for just a few thousand dollars to completely sequence a cell line's genome. And so I believe it will be commercially feasible to perform a previously unthinkable amount of quality control to be sure that the young cell types that we make by new technologies like ReCyte™ are pristine, young cells as good as the cells we were born from, and not carrying a significant load of genetic damage.

**Kent:** Robert Bradbury and others have talked about plucking pristine stem cells out of a pool of adult stem cells and having the best possible adult stem cells rather than some of them being contaminated or damaged.

**West:** There are many cells in the aged human, even in a person of a hundred years of age, that are entirely normal and have essentially not aged to a significant degree. The problem in aging is that an increasing percentage of cells in the human body have very serious DNA damage, and it only takes a few of those cells to stimulate what we call bystander effects; they can cause damage to a wide range of cells around that

cell, resulting in the manifestations of human aging. But yes, there remain cells, including stem cells, that have pristine DNA, and the selection of those cells to create whole populations of cells is one approach to developing new stem cell therapies.

But I believe the most powerful approach is to use those pristine cells as a source of DNA when taken back in this time machine of reprogramming to make all the cell types of the human body pristine, and thereby give the physician the ability to regenerate the inner ear for hearing loss in aging, the retina for macular degeneration, part of the midbrain in Parkinson's disease, the heart muscle to deal with the number one killer, heart disease, and cartilage, which has no regenerative capacity whatsoever and whose loss is the number one complaint of the elderly, and so on.

By taking the cells back in time, both from an aging standpoint and also by taking them back in time in development to make embryonic cells, we hope to unlock early pathways of embryological development that are utilized in primitive vertebrates that allow them to profoundly regenerate tissues, such as re-growing amputated limbs and so on.

**Fahy:** Is there any independent confirmation of your discovery that there is a telomere problem with most iPS cells? Have others found at least any indirect signs that are in agreement with your observations?

**West:** Back in 1999, my old company, Geron, in collaboration with the Roslyn Institute, announced that cloned animals were born old. The thought then was that it would be unthinkable that cloning would be so miraculous that it would reverse both development and aging as well. But in 2000 we published evidence<sup>11</sup> that cloning actually does reverse both development and aging, and since that time it's become established that cloning really does both. So much so that, when iPS researchers saw that telomerase is reactivated in iPS cells, they assumed that this was sufficient for telomeres to be restored, without looking at the telomeres themselves.

We were a bit concerned that we were the only ones who had identified that most iPS cells do not rewind the clock of aging, but just recently a group at Advanced Cell Technology published a paper show-



**Illustration of a telomere:** Telomeres consist of a DNA sequence (TTAGGG) that is repeated over and over again, forming the tips or "caps" of our chromosomes. Breakage or erosion of telomeres as a result of age can trigger cascades of events that lead to tissue degeneration. The telomere is shown being unwound from a chromosome (top left).

ing that all iPS cell lines they looked at showed accelerated aging when turned into blood-forming cells,<sup>16</sup> even though they did not look at telomeres specifically. And in our new paper,<sup>14</sup> we cite similar additional indirect evidence from other labs in support of our findings.

More recently, a group at Harvard showed an increase in telomere length after reprogramming by iPS technology in cells affected by a premature aging disease caused by a mutation involving one of the telomerase components.<sup>15</sup> And so the scientific community is presently somewhat confused over this issue, but we believe that the answer is that iPS technology is indeed capable of reversing the aging of human cells, it's just that it's not 100% of the time, and so it's necessary to identify the cells that have had their clock of aging rewound.

**Fahy:** How serious of a problem would it be if you used iPS cells that had not had their telomeres restored?

**West:** It all depends on the application. In the case of the heart muscle, if you're in heart failure and you need new heart muscle regenerated identical to your own so it will be not rejected, I think you could get away with cells that were not embryonic in regard to cellular aging. But for many of the cells of the human body there really is, I believe, a great advantage to giving us back the cells we were born with many decades earlier.

An example is blood-forming cells. In aging we can watch telomere length shorten in the blood cells every decade, and the tie-in between that shortening of telomeres and the onset of chronic infectious disease and other immune disorders, like anemias, is pretty well documented. To give us back the blood-forming cells that we were born with, so our immune system would have a robust reservoir of cells capable of fighting infections, would be highly desirable.

**Fahy:** There has been some talk recently about the possibility of *transdifferentiation* as an alternative to iPS cell technology, in which instead of going back to an embryonic state, you simply convert cell A into target cell B without having to go back in time and then redifferentiate the cell back to target cell B. You just go straight to your target. Do you see that as a significant competitor to iPS cell technology, and do you think that the same issues that you've identified for iPS cells will pertain to transdifferentiated cells?

**West:** I believe these master regulatory genes we call transcription factors are able to take cells back to the germ line, but will also be able to take a cell, like a skin cell, directly to a neuron. The advantage of taking cells back to the germ line is that we reset the clock of aging in cells, as well as make all these primitive embryonic lineages that we anticipate will be more effective in regenerating tissue function compared to adult cells.

**Kent:** How do you see regenerative medicine dealing with non-dividing cells such as neurons and muscle cells, which are critically important?

**West:** Non-proliferating cells can become injured or lost as a result of aging, so to extend human longevity, medicine needs to have a way to replace those cells and tissues as well. For example, in Parkinson's disease, cells are lost in the mid-brain, resulting in the progressive symptoms of the disease, which we can only partially treat today, and the loss of heart muscle cells can progress to heart failure, now a leading cause of death in the United States. The hope of regenerative medicine would be for the first time to add to the doctor's toolbox products that could allow the regeneration of these cells and tissues to replace those worn out

with age and thereby essentially cure these important diseases for the first time.

**Kent:** You just referred to the loss of non-dividing cells as a result of aging, yet you tend to equate aging with telomere shortening, which should not happen in non-dividing cells. Can you clarify what you mean by aging in non-dividing cells?

**West:** I am glad you brought that up, Saul, because there is this debate in the aging research community about the mechanisms of aging, and the critics of the telomere hypothesis use this as one of their arguments. I would point out two things. First, most tissues with non-dividing cells, like the brain and heart, are also full of cells that do divide over time. In the case of the brain, the dividing cells are called astrocytes, and in the heart they are stromal fibroblasts. And so, in my mind it is specious to point to these tissues as evidence against the role of cellular aging in the aging brain and heart since the dividing cells could be important pacemakers. Second, the lack of telomerase activity in non-dividing cells could also impart an inability to repair telomeres broken as a result of normal wear-and-tear. So, we might have degenerative changes occurring in non-dividing cells as a result of the lack of telomerase but not from replicative senescence.

**Fahy:** There are natural precedents for replacement of non-dividing cells in the brain. The brain makes new cells all the time in a process called neurogenesis. This is particularly active in the hippocampus, which is where memories are distributed, so replacing non-dividing cells even in the brain seems to be feasible.

**Kent:** While it's true that new neurons can be developed in the hippocampus from neural stem cells, which aid in learning and memory, this natural process doesn't work nearly well enough to prevent the loss of memory and other cognitive functions with aging, or to prevent the development of age-related diseases such as Parkinson's disease and Alzheimer's disease. Perhaps the introduction of additional neural stem cells will be able to solve these problems, but isn't there a risk that if you replace neurons in the brain that contain memories and information regarding the individual's personality with young, healthy neurons, that these neurons won't have that information and the identity of the person could be partially or entirely lost?

**West:** Absolutely. The goal of regenerative medicine is, obviously, to both repair the human body and to maintain the identity of the individual in the process, so ultimately we will need to look carefully at this unique problem you're mentioning regarding specific sites in the brain.

**Kent:** Perhaps rather than replacing dysfunctional neurons outright, we'll be able to repair them by replacing component parts of these neurons, which might not affect memory encoded in these neurons.

**West:** I think there's a lot of potential for exactly what you're suggesting.

One of the hallmarks of our time is shifting paradigms in the way we think about aging. Not that many years ago, neurobiologists were set in stone in the belief that the neurons in the human brain do not proliferate, and now we have a complete revolution in thought with scientific evidence that these cells can turn over. This is consistent with what we're talking about today, regenerative medicine, which could enable doctors to regenerate new, young cells of any kind to replace those worn out with aging.

**Kent:** What evidence do you have to support the idea that once you introduce these young cells into a person's body, they will rejuvenate the area in which you have injected them or the system which you have tried to rejuvenate?

**West:** In the history of embryology research, there have been scientists who have been transplanting embryonic cells and tissues, oftentimes between different bird species like chick and quail. And what we see there is that these primitive embryonic cells are unusually plastic, by which I mean that they can be scooped up with a syringe or a scalpel and transplanted into corresponding tissue and recognize where they are, and promote scarless regeneration. While the aging human body is progressively dysfunctional and increasingly ravaged with disease processes, the cells that we envision putting into the body are cells with an amazing amount of plasticity that can recognize where they are and what they need to do.

A simple way of seeing this is that early in evolution, before telomerase was repressed and a lot of these changes occurred to cause aging, primitive vertebrates maintained their embryonic plasticity, and we can still see this in some animals today. As I alluded to earlier, there are species of salamanders in which you can cut off a leg, you can remove a large chunk of their heart or even of their brain, and the tissues will regenerate. An arm will grow back right where it was cut off, and you'll have a new functioning limb with blood vessels and nerves and muscles and bones and cartilage, all in their proper places. That is the type of plasticity and regenerative capacity that these embryonic cells have, and it is the reason Bill Haseltine christened this field regenerative medicine.

**Kent:** Another possibility is that there could be a risk of getting cancer as a result of using immortal iPS cells.

**West:** That's possible. Some scientists hypothesize that in order to live as long as humans live without dying of cancer, evolution selected to turn off the immortalizing gene telomerase in virtually all cells of the human body. The result is that it gave us a genetic limit to our life span, but it also limited our exposure to cancer. Once we've reproduced and raised our babies, we've helped to continue the species, and it is okay from an evolutionary standpoint to die from old age.

But it's important to remember that the iPS cells only are immortal in the germ line state. Once we turn them into the early cell lineages of the human body, telomerase is shut off.

**Kent:** Severe calorie restriction extends maximum life span, which indicates that aging has been slowed, but postpones the incidence of cancer as well. So both problems *can* be addressed simultaneously.

**West:** I share your optimism. I believe that through new technologies aimed at targeting and destroying tumors combined with a more complete understanding of the connections between telomere shortening and cancer, we can find ways to walk that tightrope. If we eliminate the major causes of aging and dramatically improve the quality of human aging or even human life span, it's almost a certainty that we will increasingly then have to face the problems of cancer. That's just the reality of human biology.

**Kent:** If we had a chance of slowing or reversing aging and increasing our maximum healthy life span in exchange for an added risk of cancer, I think many people would likely take that risk because cancer in many cases is both preventable and curable, but so far aging is not.

**Fahy:** Since all of the adult-onset forms of cancer are probably caused by telomere shortening rather than from having telomeres that are too long,<sup>17</sup> it seems that nature's use of telomere shortening as an anti-cancer device may have been overdone! Also, immortal stem cells already exist in some places in the body, and yet most people don't die of cancer.

**Kent:** When do you anticipate that the initial therapies based on iPS cell technology will be available to humans?

**West:** In the United States, with its stringent regulatory burden of approval, it could take many years. In other countries, such as China and India, you have very sophisticated and large medical establishments and even larger aging populations than the US. In the case of China, the post-Mao baby-boom generation is significantly larger than the post World War II baby-boom generation in the US. I believe that these

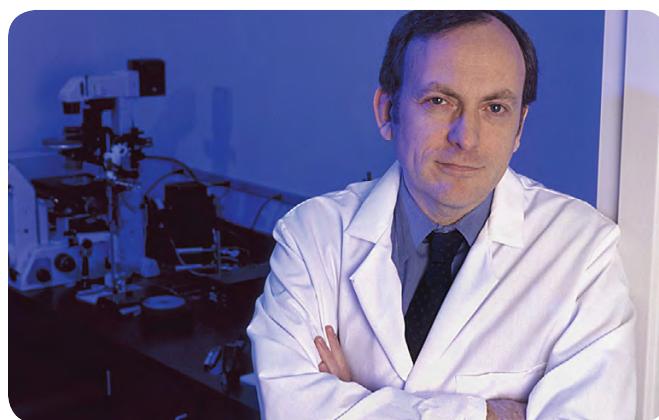
technologies will be implemented in a fraction of the time there than in the United States. But it's important, again, to emphasize that nowhere in the world are these technologies available today. I would urge people not to rush off and seek therapies that have not been proven safe and effective.

A tsunami of aging is coming our way, which is going to be disastrous in its consequences, both to the individuals in need of healthcare and to the economies of countries that will be faced with escalating healthcare costs. In my opinion, we now have the science and technologies to prepare for this tsunami by developing new medical therapies within the next 10 years to reverse age-related degenerative diseases and profoundly influence the course of aging itself.

In the face of this impending healthcare and economic crisis, many gerontologists are reaching out for capital to fund their research. To advance these novel therapies through regulatory approval will require significant capital expenditure. The day that these technologies can be used to treat human beings is entirely dependent on the number of scientists that can be employed to move development forward.

I want to take this opportunity to thank the Life Extension Foundation for their financial help in the early stages of this project. Now it's time for Congress to fund basic research in aging. The looming baby-boom population threatens to break the bank. Our future is in the balance.

**Fahy:** Thank you, Dr. West, for this extremely important and strategic look into the future of therapies to combat aging. ●



Michael West, PhD-CEO, BioTime, Inc.

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Gregory M. Fahy, PhD  
Chief Scientific Officer  
and Vice President,  
21st Century Medicine



Saul Kent  
Co-Founder,  
Life Extension  
Foundation

# 3 WAYS TO BENEFIT FROM CALORIE RESTRICTION

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.<sup>1</sup> Studies on humans show that a calorie reduction of only **20%** dramatically improves biomarkers associated with longevity.<sup>2-4</sup>

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.



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**



**Item #00229**



**Item #00228**



**Item #01285**

### To order **CALORIE RESTRICTION MIMETIC FORMULA**

or any of the other supplements that help protect against chronically bloated bloodstreams, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

## 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.<sup>6</sup>

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),<sup>7-8</sup> **InSea™** (targets amylase and glucosidase activity),<sup>9</sup> **Irvingia** (targets amylase activity)<sup>10-11</sup> and **L-arabinose** (targets sucrase activity)<sup>12</sup> 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 \$64. If a member buys four bottles, the price is reduced to

**\$45 per bottle.** Contains soybeans, tree nuts, yeast, and corn. **Item # 01492**



**Item #01492**

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

## 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.<sup>13-20</sup> In particular, they help "mimic" caloric restriction's favorable impact on **genes** that influence the aging process.<sup>13-20</sup>

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.<sup>21</sup> Compounds that mimic caloric restriction bring about favorable changes in *gene expression* and improve the primary *biomarkers* of aging.<sup>22</sup>

Those taking high-dose vitamin D, along with coenzyme Q10 and fish oil are already favorably altering many of their gene expression patterns. **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 **Calorie Restriction Mimetic Formula** provides:



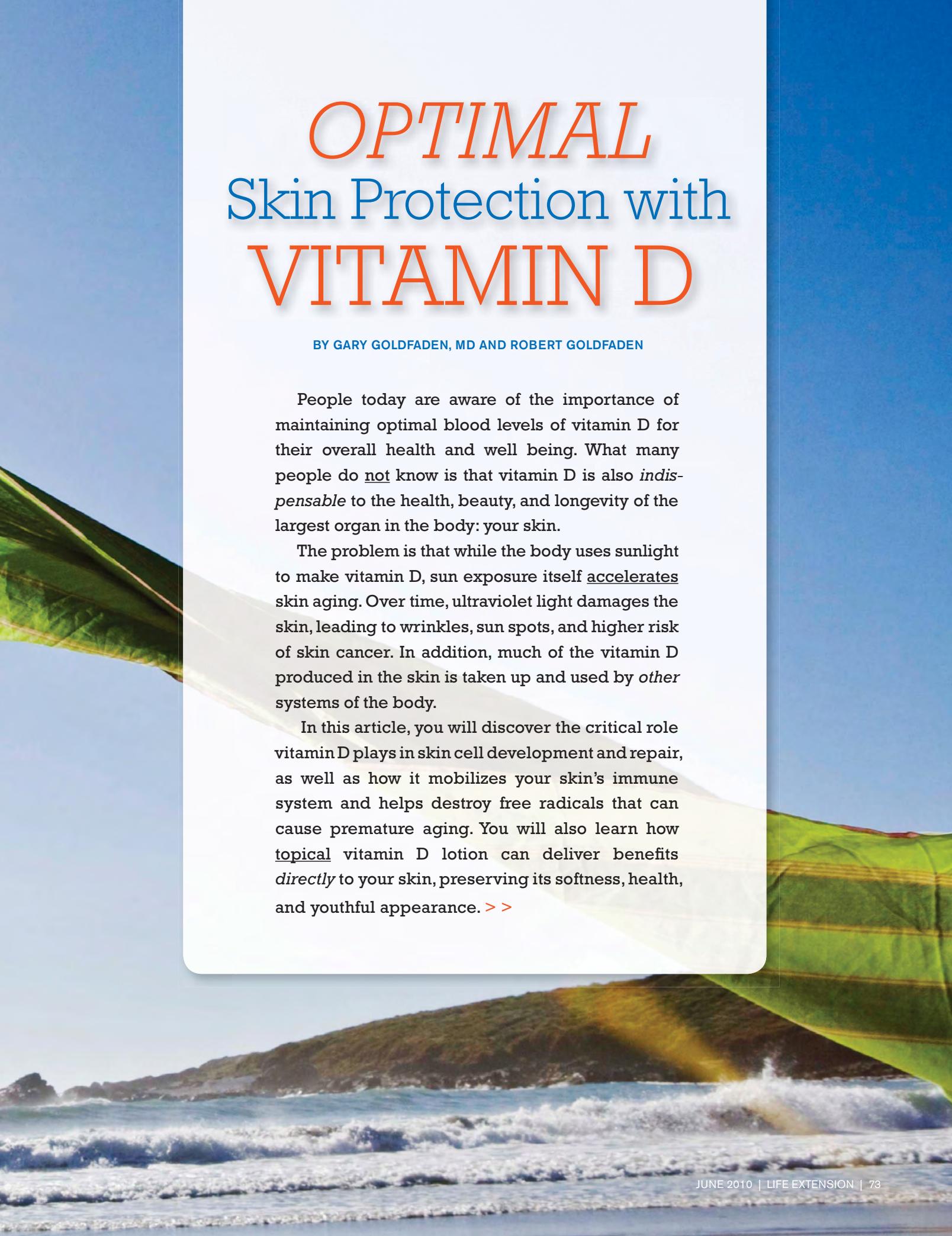
**Item #01419**

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

A bottle containing 60 vegetarian capsules of **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 **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.





# OPTIMAL Skin Protection with VITAMIN D

BY GARY GOLDFADEN, MD AND ROBERT GOLDFADEN

People today are aware of the importance of maintaining optimal blood levels of vitamin D for their overall health and well being. What many people do not know is that vitamin D is also *indispensable* to the health, beauty, and longevity of the largest organ in the body: your skin.

The problem is that while the body uses sunlight to make vitamin D, sun exposure itself accelerates skin aging. Over time, ultraviolet light damages the skin, leading to wrinkles, sun spots, and higher risk of skin cancer. In addition, much of the vitamin D produced in the skin is taken up and used by *other* systems of the body.

In this article, you will discover the critical role vitamin D plays in skin cell development and repair, as well as how it mobilizes your skin's immune system and helps destroy free radicals that can cause premature aging. You will also learn how topical vitamin D lotion can deliver benefits *directly* to your skin, preserving its softness, health, and youthful appearance. > >



## Shedding Light on Vitamin D's True Identity

Technically, vitamin D doesn't fit the classic definition of a vitamin at all. A vitamin is a substance that is crucial to normal everyday life function, but can't be synthesized in sufficient quantities by an organism, and thus must be obtained from the diet.<sup>1</sup> Your skin has the ability to manufacture as much as **10,000 IU of vitamin D** after 20–30 minutes of summer sun exposure.<sup>2</sup> But there are many limiting factors to internal vitamin D synthesis that include age, skin color, geographic latitude, seasonal variation in sunlight availability, and the widespread (but necessary) use of sunscreen, which all make it *difficult* for your body to produce the vitamin D it needs for optimal health through sun exposure alone.

Too much sun damages the skin, creating wrinkles and fine lines, while increasing skin cancer risk. Still, your skin's ability to synthesize a portion of its daily requirement directly from sunlight<sup>3</sup> makes vitamin D unique among all other nutrients.

Functionally speaking, vitamin D more closely resembles a *hormone* than a vitamin.<sup>4,5</sup> Hormones are chemical messengers produced by certain glands and cells in your body that bind to specific receptors in order to produce a targeted biological response. The active form of vitamin D, ***calcitriol***, is one of the most powerful hormones in the human body, endowed with

the ability to activate **over 2,000 genes** (roughly 10% of the human genome).<sup>2</sup> In order to become calcitriol, however, vitamin D must first undergo a complex series of biochemical reactions that begin in your *epidermis*, the outermost layer of your skin and the key to its youthful appearance. (See sidebar on page 76.)

## The Key Nutrient for Skin Cell Growth and Replacement

Being fat-soluble, vitamin D as calcitriol easily crosses the phospholipid membranes of your cells and migrates to the nucleus. Here it binds with **vitamin D receptors**,<sup>6</sup> a special group of proteins that sense the presence of steroid hormones. This linking regulates the **expression of genes** that turn different cell functions on or off.<sup>7,8</sup> Vitamin D receptors are directly involved in **cell proliferation** and **differentiation**, as well as optimal **immune function**. These issues are vitally important to your skin, which not only serves as your first line of defense against pathological invaders, but must also replace approximately **30-40,000 lost cells a minute**.<sup>9</sup>

This constant loss of cells on your skin's surface must be offset naturally by an ongoing vitamin D-dependent renewal process that takes place in specialized cells called **keratinocytes**. Keratinocytes account for **about 95%** of all cells in your epidermis.<sup>10</sup> They possess two properties which make them

extremely valuable—the ability to actively divide, and the ability to differentiate. They are continuously providing new cells for replenishment of your skin's surface.

Cell activity in this layer is responsible for the creation of an underlying structural framework for your skin to reinforce the delicate matrix of skin tissue. This helps your epidermis form a watertight barrier that **locks in moisture** and keeps your skin soft and supple.

This is where vitamin D comes in: *rates of cell division and differentiation are triggered by growth factors and other molecules that are controlled by the presence of vitamin D.*<sup>11-13</sup> If adequate amounts of vitamin D are not available, your epidermal cells won't differentiate optimally. As a result, the outer layer of your skin may become **thinner** and **more fragile**. It begins to sag from lack of adequate support. Dryness and wrinkles set in as moisture is gradually lost to the outside.<sup>14</sup> This is one of the main reasons why vitamin D is absolutely **essential** to the maintenance of healthy-looking skin.

### Skin Repair and Protection

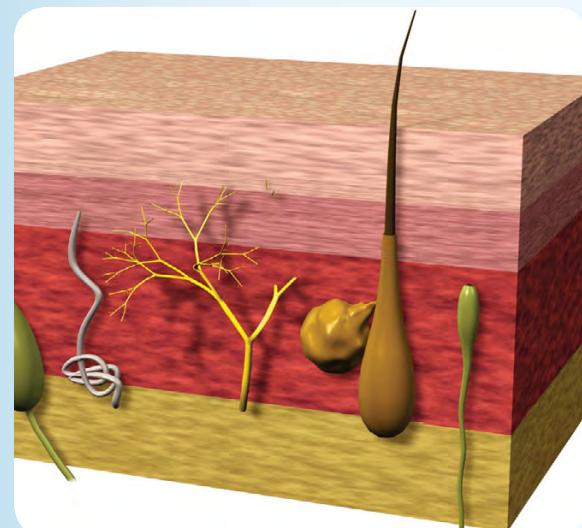
What most people know as “the immune system” is actually one of two components of your body’s total immune capacity. Known to scientists as the **adaptive** immune system, its ability to mount a strong defense against invading microorganisms and then retain protective antibodies for the future is vital to our survival.

Individuals also possess *another* immune system that serves as the body’s first line of defense against bacteria, viruses, and other pathogens. Located partially in your skin, it is called the **innate** immune system. Its purpose is to recognize and repel all foreign invaders in a non-specific fashion, regardless of whether the particular pathogen has been encountered before or not. Innate immunity is so important that nature saw fit to preserve it through almost 60 million years of evolution. It is essential that we have an innate response not only to provide an immediate defense against pathogens, but also to reduce the painful inflammation caused by an overreaction of the body’s immune system.

The skin is a crucial component of the body’s innate immune system. The skin’s **keratinocytes** can metabolize vitamin D to its active metabolites, while the enzymatic machinery of skin cells can help produce vitamin D receptors. Within the skin, vitamin D and its receptors help form an impermeable barrier and promote an innate immune response against foreign microbes.<sup>12</sup>

## Skin Protection and Vitamin D

- In addition to overall health, vitamin D plays an integral role in skin protection and rejuvenation.
- In its active form as **calcitriol**, vitamin D contributes to skin cell growth, repair, and metabolism. It optimizes the skin’s immune system and helps destroy free radicals that can cause premature aging.
- While the body can produce vitamin D on its own through sun exposure, too much sun accelerates skin aging. Over time, it can damage the skin, leading to wrinkles, sun spots—and increased risk of skin cancer.
- Age, skin color, geographic latitude, seasonal variations in sunlight availability, and sunscreen use make it *difficult* for your body to produce all the vitamin D it needs.
- Much of the vitamin D produced in the skin is also taken up and used by other systems of the body.
- Between the ages of 20 and 70, *your skin loses about 75% of its ability to produce vitamin D3*—the metabolic precursor to calcitriol.
- Along with optimal vitamin D intake, topical vitamin D application can exert a protective and rejuvenating effect on aging skin.



## Sunlight, Heat, and Skin: The Intricate Process of Vitamin D Production

There are five distinct layers that make up your epidermis. These are (from outer to inner): the *stratum corneum*, *stratum lucidum*, *stratum granulosum*, *stratum spinosum*, and *stratum basale*. Where vitamin D is concerned, however, it's the *stratum basale* and *stratum spinosum* that are the most important. These two layers contain the highest concentration of a substance called **7-dehydrocholesterol** (about 25-50 micrograms for every square centimeter of skin).<sup>29</sup> 7-dehydrocholesterol absorbs UVB light wavelengths that are present in sunlight.

Ultraviolet-B (UVB) light breaks the B ring of 7-dehydrocholesterol's chemical structure to form what is called **pre-D3**. Pre-D3, a thermodynamically unstable molecule, then undergoes a heat-induced rearrangement to form the prohormone vitamin D3 or **cholecalciferol**.<sup>30</sup>

From here, vitamin D3 is transported to your liver, where it is combined with the 25-hydroxylase enzyme to form **calcidiol** (25-hydroxycholecalciferol or 25-hydroxyvitamin D). Once produced, calcidiol is stored in your liver until it is needed. Later calcidiol is released into the blood where it's transported to the proximal tubules of your **kidneys**. Here it is hydroxylated by another enzyme, 1-alpha-hydroxylase, to create the biologically active form of vitamin D, **1,25-dihydroxycholecalciferol** or **calcitriol**. Following this conversion, calcitriol is released back into the bloodstream and carried to the various target organs of your body by binding primarily to **vitamin D binding proteins** (85-88%) and albumin (12-15%).<sup>31</sup>



An intriguing study demonstrated one mechanism by which vitamin D may participate in innate immunity.<sup>15</sup> After a skin *wound* occurred, keratinocytes surrounding the wound increased the expression of genes coding for antimicrobial receptors and the antimicrobial peptide, *cathelicidin*. The active form of vitamin D helped induce these gene expression changes, assisting the eradication of infectious invaders at the site of the skin wound. Vitamin D thus helps keratino-

cytes recognize and respond to microbes and protect wounds against infection.

Topical application of a vitamin D analog has been found to increase expression of the LL-37 antimicrobial peptide in human skin. LL-37 is a prevalent antimicrobial peptide expressed by keratinocytes that plays numerous roles in skin health, including: controlling microbial flora in intact and damaged skin, attracting immune cells, promoting epithelial repair, and supporting angiogenesis needed for skin healing. Decreased expression of numerous antimicrobial peptides has been reported in certain skin conditions such as atopic dermatitis and chronic leg ulcers.<sup>16</sup>

Together, these findings highlight vitamin D's crucial role in helping skin cells recognize and respond to invading microorganisms, protecting healing wounds against infection, and promoting skin healing.

## Fighting Age-Accelerating Free Radicals in Your Skin

Although your body metabolizes oxygen very efficiently, your cells still get damaged by **reactive oxygen species** (ROS)—reactive molecules that contain oxygen.<sup>17</sup> This happens when an oxygen molecule sacrifices one of its electrons during chemical reactions inside your body. The oxygen molecule is then left with

an unpaired electron in its outer orbit, making it highly unstable.<sup>18</sup> This **oxygen free radical** has to reestablish its balance and form an octet (an atom with eight valence electrons), so it steals a neighboring electron from other natural proteins in your skin to regain stability. This sets off chain reactions that result in an aftermath of misshapen and broken molecules. In the end, the structure of your skin is damaged and its cellular structure is weakened.<sup>19,20</sup> Free radicals initiate the deterioration of your skin's structural support and decrease its elasticity, resilience, and suppleness.

The most common oxygen free radicals are the **singlet oxygen**, the **hydroxyl radical**, and the **superoxide anion**, all of which are normally found in your skin because of its high rate of metabolic oxidation and the availability of fatty acids.<sup>21-23</sup> However, other factors such as **air pollution**, **alcohol consumption**, **cigarette smoke**, and **stress** can increase free radical production as well.<sup>24</sup>

Stress not only generates potent, destructive free radicals—it also produces **adrenaline-related products** that restrict blood flow to your skin. Your skin is able to protect itself from this destructive oxidative



While most people now understand the importance of maintaining optimal vitamin D blood levels for its numerous health benefits, few know of its role in skin protection and rejuvenation.

## Summary

While most people now understand the importance of maintaining optimal vitamin D blood levels for its numerous health benefits, few know of its role in skin protection and rejuvenation. More a hormone than a vitamin, it is integral to the beauty, suppleness, and youthful appearance of skin. The complex process of vitamin D synthesis and utilization yields the active form, **calcitriol**, a hormone-like compound intrinsic to cellular proliferation and differentiation. Vitamin D thus contributes to skin cell growth, repair and metabolism. It mobilizes the skin's immune system and helps destroy free radicals that can cause premature aging. Between the ages of 20 and 70, **your skin loses about 75% of its ability to produce vitamin D3**—the necessary precursor to **calcitriol**. In conjunction with optimal intake of vitamin D3, topical vitamin D application may enhance its protective and rejuvenating effect on aging skin. •

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

stress through the use of low molecular weight antioxidants that combat free radicals. **Among the most important of these is vitamin D.** In fact, *vitamin D has been found to be more effective in reducing lipid peroxidation and increasing enzymes that protect against oxidation than vitamin E.*<sup>25,26</sup>

Unfortunately, between the ages of 20 and 70, **your skin loses about 75% of its ability to produce vitamin D3**—the metabolic precursor of calcitriol, the biologically active form of vitamin D.<sup>27</sup> In addition, your skin is the last organ of your body that receives antioxidants from the food and supplements you eat.<sup>28</sup> Much of the active vitamin D that your body produces is used to help build and maintain strong bones. However, if antioxidants are applied *topically*, protection for your skin can be enhanced.

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# BONE RESTORE

## for Lifelong Bone Health

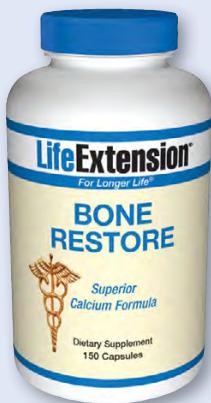
Maintaining strong, healthy bones is a cornerstone to successful aging. Unfortunately, even supplement users often fail to consume enough **calcium**, **vitamin D**, and other nutrients shown to help maintain healthy bones.

New research on **vitamin D** has led an increasing number of experts to advise men and women to consume **1,000 IU** (and higher) of vitamin D each day to help maintain bone density.

The daily dose of **Bone Restore** provides **1,200 elemental milligrams** of highly absorbable calcium, plus **1,000 IU** of **vitamin D3**.

**Bone Restore** also contains ample **magnesium**, along with nutrients that enable calcium and magnesium to be incorporated in the bone matrix.

In addition, **Bone Restore** delivers a patented form of **boron** that is identical to natural plant forms found in food. Considered more bioavailable than other forms of boron, **FruiteX B® OsteoBoron®** supports healthy joints and bone.



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

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



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

<b>Highly-Absorbable Calcium</b>	<b>1,200 mg</b>
(from dicalcium malate, bis-glycinate, and fructoborate)	
<b>Vitamin D3</b>	<b>1,000 IU</b>
<b>Magnesium</b>	<b>340 mg</b>
<b>Boron</b>	<b>3 mg</b>
(calcium fructoborate as patented FruiteX B® OsteoBoron®)	
<b>Zinc</b>	<b>2 mg</b>
<b>Manganese</b>	<b>1 mg</b>
<b>Silicon</b>	<b>5 mg</b>

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

# Lubricating Aging EYES

Maintaining eye health is a major concern as we age.

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**.



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To order **Brite Eyes III** today, call **1-800-544-4440**  
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Advanced Whole-Body Formula!

# VITAMIN D LOTION

## for Everyday Radiance

Aging may be measured in years, but when it comes to your skin, every second counts. Over the course of a normal day, the *epidermis*, the outermost layer of your skin, naturally loses 30-40,000 cells *per minute*.<sup>1</sup>

As you get older, your skin replaces these dead cells more slowly and produces less natural oil, as wrinkles, lines, and areas of dry rough-looking skin begin to appear. Sun exposure, pollution, and stress also take a daily toll by heightening the activity of damaging free *radicals*.<sup>2</sup>

Now you can replenish these areas and preserve your skin's youthful radiance with new **Vitamin D Lotion** from Cosmesis®. Created by renowned dermatologist Gary Goldfaden, MD, this cutting-edge formula supplies rejuvenating factors directly to aging skin to maintain its healthy-looking, natural glow.

### The Key Nutrient for Dry, Aging Skin

**Vitamin D Lotion** contains a highly absorbable form of vitamin D3 called *cholecalciferol*.<sup>3</sup> It readily penetrates the outer layer of your skin, nourishing dry areas by helping to lock in moisture before it's lost. This helps to offset the visible impact of your skin's gradually declining ability to renew itself.

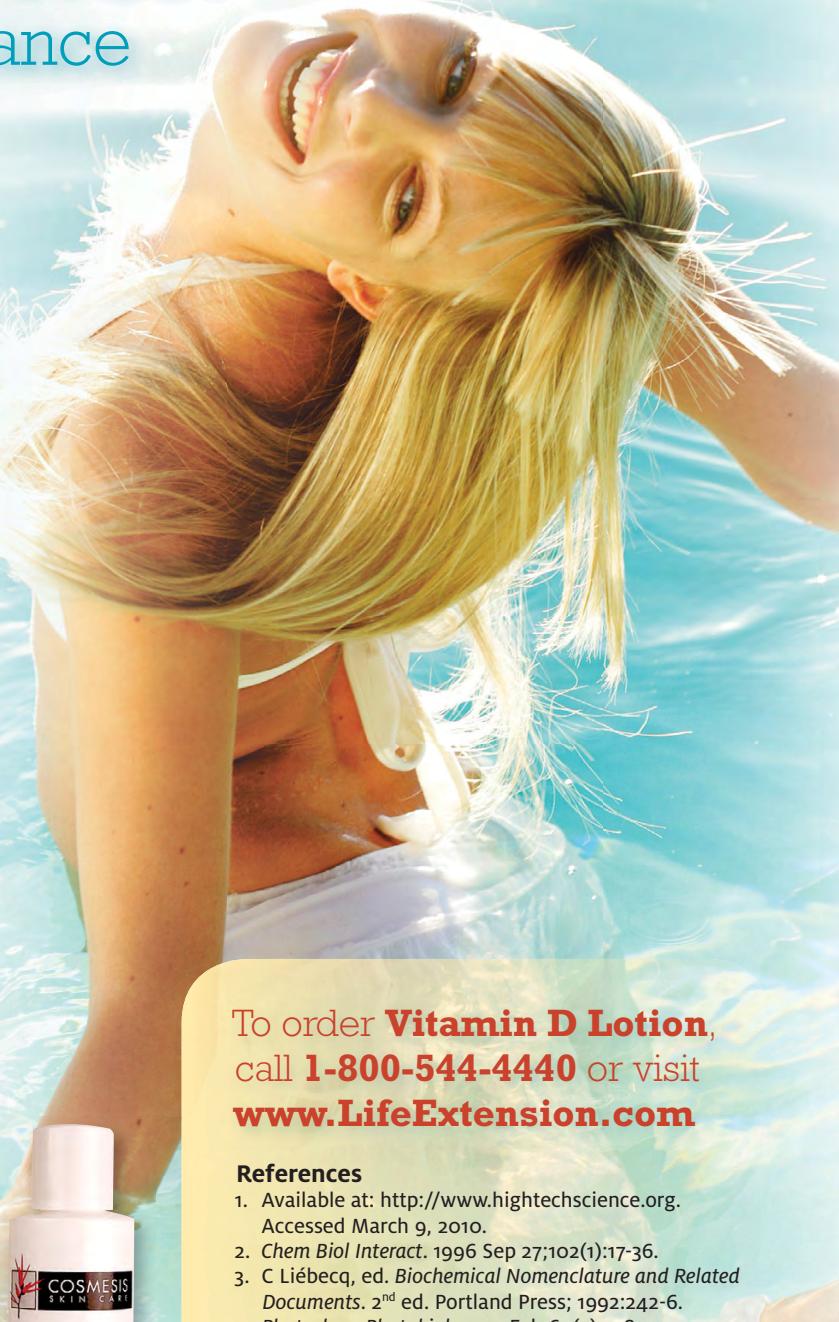
Because of its quenching action, this active nutrient also helps with rough patches, dry spots, and areas of tough-looking skin that result from dehydration, cold weather, irritating fabric, or repeated friction and pressure.

Upper arms, elbows, knees, hands, and extremities are especially susceptible. Applying **Vitamin D Lotion** helps to restore their natural appearance.

A proprietary blend of highly refined tea extracts (green, black, red, white) has been added to *augment* vitamin D's moisturizing and rejuvenating effect with polyphenols and antioxidants.<sup>4-6</sup>

Use **Vitamin D Lotion** wherever it's needed, for a radiant complexion and soft, supple skin.

The retail price for a 4 oz bottle of **Vitamin D Lotion** is \$29.95. If a member buys two bottles, the cost is only **\$21** each.



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To order **Vitamin D Lotion**,  
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# NATURAL STRESS RELIEF WITH LEMON BALM AND L-THEANINE

It's hard to find a natural antidote to today's overstressed world. The encouraging news is that **lemon balm** (*Melissa officinalis*), a plant native to the Mediterranean region, has been **clinically proven** to help with **anxiety** and **sleeplessness**. What's more, lemon balm produces these calming effects while also enhancing memory and attention!<sup>1</sup>

Cyracos® lemon balm extract is prepared from special lemon balm chosen for its high concentrations of *hydroxycinnamic* and *rosmarinic acids*. These active lemon balm constituents appear to enhance mood by modulating specific nicotinic and muscarinic receptors in the cerebral cortex of the brain.

Aside from relieving everyday stress and sleep problems, the anxiety-relieving properties of this plant extract may also offer smokers relief from the mental stress of quitting, aid in leveling mood swings, and help reduce the emotional hunger associated with dieting (or calorie restriction).

## RELAXATION PROMOTING EFFECTS OF L-THEANINE

The Japanese have long known that *L-theanine*, an amino acid derived from green tea, is a natural relaxant that diminishes stress<sup>2</sup>—without drowsiness, impaired thought, or other side effects.

*L-theanine* produces calming effects in the brain in ways that have been compared to meditation, massage, and aromatherapy. *L-theanine* induces relaxation without causing drowsiness. In fact, studies show that **L-theanine enhances the brain's ability to concentrate, learn, and remember**. Unlike caffeine, *L-theanine* increases GABA (gamma-aminobutyric acid), an inhibitory neurotransmitter that not only induces relaxation but also produces a sense of well-being. *L-theanine* may normalize levels of dopamine, a critical brain hormone that is depleted by various stress factors.

## A HOST OF HEALTH-ENHANCING BENEFITS

Research shows that *L-theanine* has numerous health-enhancing effects, including protecting cognitive function.\* In studies of neurons in cell culture, *L-theanine* significantly reversed glutamate-induced toxicity, a major cause of normal brain aging.<sup>3</sup>

To order Natural Stress Relief  
with Lemon Balm and L-Theanine,  
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ITEM #00987



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LEMON BALM

+

L-THEANINE

=

NATURAL STRESS RELIEF

Based on an enormous amount of published data showing the multiple beneficial effects of lemon balm extract and *L-theanine*, Life Extension® has combined these potent, but safe nutrients into a proprietary formula called **Natural Stress Relief**. Each capsule of **Natural Stress Relief** provides:

---

300 mg of **Cyracos® lemon balm extract**  
200 mg of **Suntheanine® L-Theanine**

---

Note that the amount of *L-theanine* in this product is **double** that of most *L-theanine* stand-alone supplements. The reason for this potency increase is reports of greater benefit when at least **200 mg of L-theanine** are taken.

The retail price of a 30 count bottle of **Natural Stress Relief** is \$28. If a member buys four bottles, the price of this potent stress-relieving formula is reduced to just **\$18** per bottle.

**BEWARE OF IMITATIONS** The *L-theanine* used in the new **Natural Stress Relief** is Suntheanine®, the only pure form of *L-theanine* available worldwide and the only form protected by 40 internationally recognized patents and scientifically proven in clinical studies to be safe and efficacious. Independent laboratory analysis has verified that certain other products on the market claiming to contain "L-theanine" are only half *L-theanine*, the other half being a different form of theanine known as "D-theanine" which has not been scientifically evaluated in published studies. Suntheanine® is a registered trademark of Taiyo International, Inc. Use of Suntheanine® is protected by US Trademark Registration No. 2,548,957. Cyracos® is a registered trademark of Naturex, Inc.



## WELLNESS PROFILE

BY JULIUS GOEPP, MD

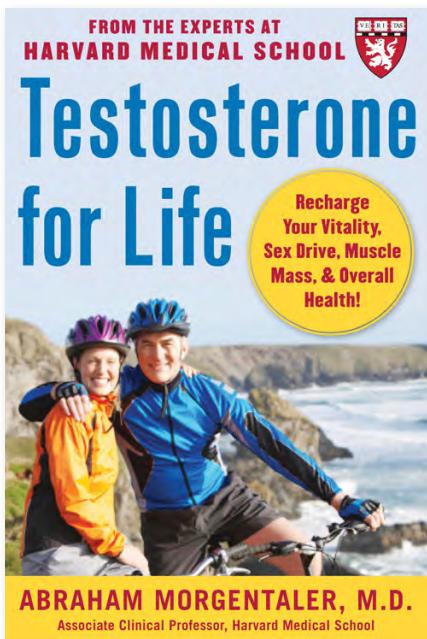


Abraham Morgentaler, MD, FACS

### Testosterone Therapy for Life

Millions of men needlessly suffer from low sex drive, loss of energy, and diminished enthusiasm for life—because of low levels of the male hormone testosterone. Normal levels can be readily restored using simple testosterone replacement therapy (TRT)—but in many audiences, those very words evoke the responses we commonly attribute to the hormone itself: rage, aggression, impulsiveness, and territoriality! Most physicians and many lay people continue to labor under a host of misconceptions, both about testosterone's effects on human biology and behavior, and about the role of testosterone therapy in older adults.

The truth is finally emerging, however, thanks largely to the efforts of Dr. Abraham Morgentaler of the Harvard Medical School, and a small number of equally dedicated clinician-scientists who have devoted their careers to understanding testosterone's myriad effects on humans throughout the life span, and on building a fact-based, myth-busting approach to TRT, thus revealing its benefits and its risks.



We recently had the opportunity to interview Dr. Morgentaler at length about his latest book, *Testosterone for Life* (McGraw-Hill, 2008),<sup>1</sup> and about the exciting breakthroughs in men's health and medicine for older adults in which he has participated. Morgentaler is no newcomer to this field—he's a practicing urologist, an Associate Clinical Professor of Urology at the Harvard Medical School and the founder of Men's Health Boston (a center focusing on sexual and reproductive health for men). The author of a number of books including *The Male Body* (Fireside, 1993) and *The Viagra Myth* (Jossey-Bass, 2003), Morgentaler has been working in men's health, and particularly on the impact of testosterone, since he was an undergraduate student 30 years ago.

It's unusual for undergraduates to publish as a first author, especially in the field that turns out to be their life's work—so we asked Dr. Morgentaler to take us back to 1978 and his original study in the journal *Hormones and Behavior*.<sup>2</sup> Morgentaler laughed—"We were

actually studying lizards, which have very elaborate and ritualized mating behaviors," he recalled. "We were just beginning to learn about the powerful effects of testosterone on specific regions of the brain, and how it influences behavior." To that end, Morgentaler and his mentor, Dr. David Crews, were working with lizards that had been castrated to remove any source of native testosterone. "Castration completely eliminated the mating displays in male lizards," Morgentaler noted. "They were simply oblivious to females in their presence."

But when Crews and Morgentaler implanted testosterone in a very primitive brain center called the *pre-optic area*, the mating ritual was restored completely!<sup>2</sup> "What was particularly remarkable about this," Morgentaler continued, "was that these effects were purely local—we didn't see any increase in blood testosterone levels. This showed us that testosterone has very precise, very specific effects on highly complex behaviors that originate deep in the brain." The pre-optic area is responsible for many aspects of reproductive behavior in humans as well,<sup>3</sup> and in fact the interaction of testosterone with the brain is a fundamental fact throughout the animal kingdom. Intrigued by all this, Dr. Morgentaler set out on a lifetime of discovery. Let's be "armchair travelers" on the high points of his journey.

## Testosterone and Aging: Why Should We Care?

"The first question to be asked in thinking about testosterone in humans is 'Why should we care?'" Morgentaler began. "Among men more than 45-50 years old, the prevalence of low testosterone

is at least 20-30%," he continued (that's an estimated 2 to 4 million men in the US alone!).<sup>4</sup> "Many people (highly-respected physicians among them) have long believed that levels decline as a natural consequence of advancing age,<sup>5,6</sup> and that therefore there is nothing we can or should do about it," he went on. "That's like telling a middle-aged person that since vision typically deteriorates with age, there's no point in prescribing glasses—or that we shouldn't treat atherosclerosis to prevent heart attacks, because it too is an age-related phenomenon. It just doesn't make sense!"

How can a man know if he has low testosterone levels (or as Dr. Morgentaler calls it, "Low T")? "Not every man with low T will have symptoms," Morgentaler responded, "though many people with symptoms aren't aware that they have low T. Because of their lack of understanding of the problem, compounded by some genuinely erroneous data that have been misquoted or overstated for decades, most doctors don't regularly check testosterone levels—so many men go on suffering, undiagnosed."

"In my practice, of course I see men whose complaints are primarily sexual: diminished drive and interest in sex, but also poor performance and absent or unsatisfying orgasms." But low T also affects mood and behavior outside the bedroom. "I also find a very large number of men whose complaints are non-sexual in nature: they have chronic fatigue, they feel tired, lack energy and focus; they seem to have lost much of the drive that made them the men they thought they were (and liked to be)." As one of Dr. Morgentaler's patients put it eloquently, "it feels like I have 'brain fog' all the time."

Millions of men needlessly suffer from low sex drive, loss of energy, and diminished enthusiasm for life—because of low levels of the male hormone testosterone.

Physical performance can suffer as well. Many patients complain that it takes much longer to “recharge” after exertion. “They tell me they just feel *dead* after what was once a normal workout,” Morgentaler reports, “or they say that they just can’t seem to improve with progressive training. That makes a lot of sense since we know that reduced testosterone levels contribute to loss of muscle bulk and strength, as well as to increased fat stores.”<sup>5,7</sup>

It isn’t just the men themselves who perceive these gradual changes—in fact, frequently their wives and partners see the problems most clearly, especially when it comes to mood and behavior. “I sometimes ask a man if he feels crankier or more short-tempered than he used to,” Morgentaler relates. “Often the guy will say ‘No, not really,’ but his wife will exclaim ‘Oh my gosh yes, that’s exactly what’s going on! I thought it was just me!’”

That seemed paradoxical—doesn’t testosterone *cause* men to have a short fuse, to be ready for a fight, and to be reactive? “That’s just one of the many misconceptions about testosterone,” said Morgentaler. “It probably comes from widespread public knowledge about athletes who take a variety of steroid hormones at unnaturally high levels.<sup>8</sup> In fact we find that men who’ve become nastier as their T levels dropped actually stabilize their moods with replacement therapy.” Researchers at Germany’s Institute



of Reproductive Medicine recently provided some independent support for this observation, noting that “testosterone substitution can increase positive mood and decrease negative mood.”<sup>9</sup>

But there are less obvious reasons to be concerned about declining testosterone levels—reasons that relate to total body health, not just behavior and performance, sexual or otherwise. According to Canadian expert Dr. Jerald Bain, “Testosterone is more than a ‘male sex hormone.’ It is an important contributor to the robust metabolic functioning of multiple bodily systems.”<sup>8</sup> Dr. Morgentaler concurs, vehemently. “Testosterone stimulates and maintains muscle and bone growth, for example—many men don’t realize that low T puts them at increased risk for osteoporosis with advancing age. It also

stimulates red blood cell production, helping to prevent anemia.” Testosterone levels are reduced in type 2 diabetes and the metabolic syndrome, and although cause and effect remain unclear, therapy with testosterone in these conditions can reduce LDL cholesterol, blood sugar, glycated hemoglobin, and insulin resistance.<sup>8,10,11</sup> Finally, Morgentaler notes, “Men with low T die earlier than those with normal T.”<sup>7,12</sup> That alone is ample reason to take notice.

Summarizing the “Why should we care” question, Dr. Morgentaler said, “If I told you of a known medication that can improve mood and performance, while reducing the risks for a host of chronic, apparently age-related conditions, and has the real potential for increasing longevity, you would jump at it. Well, there’s solid evidence for all

of that with responsible TRT. Men who feel old, have decreased 'get up and go,' and diminished sex drive may not simply be 'getting old;' they may be suffering from a *treatable hormone deficiency*." The good news is that Morgentaler believes there's a growing awareness of this issue, both among lay people and physicians: "I predict that within 5-10 years primary care physicians will be checking T levels routinely, and that men will know their T levels just like they know their cholesterol and PSA levels today."

## Obstacles to Acceptance of T Replacement Therapy

Why will it take even that long for such a successful approach to become mainstream? "There are three fundamental obstacles to widespread acceptance of TRT," Morgentaler observed. "The first

is that the benefits, though clear, have not been as well-documented in the literature as they should be, and therefore physicians simply don't get a chance to learn as much as they could. Paradoxically, testosterone was 'grandfathered' into approval by the FDA years ago, so its benefits weren't as rigorously demonstrated as would be required today. That means that, until recently, physicians didn't have a large body of evidence to turn to. Fortunately, that's changing with an increased number of studies on the subject." In fact, by 2004 Dr. Morgentaler and a colleague found sufficient data to write a review article for the *New England Journal of Medicine* in which they provided the kind of summary that modern physicians need in order to best understand both the benefits and the possible risks of TRT.<sup>4</sup>

"Another obstacle to acceptance is that the diagnosis of testosterone insufficiency has been and is confusing to people both within and outside of medicine," Morgentaler continued. "One of the main benefits I hope that my book will provide is to help individuals and their physicians to decide if low T is actually present or not. Some of this confusion has had to do with lack of awareness, some with lack of understanding of the various ways of measuring testosterone, and some with variations in the standards that laboratories use in reporting it."

"The last, and possibly greatest, hurdle to overcome is the persistent idea that TRT causes prostate cancer," Dr. Morgentaler went on. "As I point out in my book, this concept turns out to be based on a very few, very sketchy, and very old reports, most of which have also been very inaccurately cited—but cited so frequently that they've

taken on the aura of truth. In fact, while prostate cancers do usually need testosterone to grow, there's interesting laboratory evidence that prostate cancer cells behave less aggressively in the presence of testosterone than they do without it, suggesting that normal levels of testosterone may even turn out to be beneficial for men with prostate cancer.<sup>13</sup>

"Fortunately," Dr. Morgentaler concluded, "all of these barriers are now relaxing, as it becomes clear how many body systems rely on healthy, normal T levels, and how normal T levels contribute to prevention of cardiovascular disease, diabetes, and the metabolic syndrome."<sup>10,14</sup>

## Making the Diagnosis

With the growing number of scholarly articles on T replacement therapy helping physicians and lay people alike overcome the knowledge barrier, the next step is clarifying the diagnosis. The most important clues come from the patient's own history. "When I hear a man say 'The sofa speaks to me,' I am concerned," Dr. Morgentaler said. "So often I hear variations on that theme—men just find that their new 'normal' level of activity is much lower than it used to be. They have trouble focusing, staying on top of their game. I see men from all walks of life, often those whose careers have been built on being sharp, on asking incisive questions, on making snap decisions—and they're finding they just have trouble doing those things." As we've seen, mood can also be affected—it's well known that men with low T are more prone to depression.<sup>15</sup> "Beyond depression, my patients also frequently complain of dramatic mood swings," Morgentaler noted.



### Testosterone Therapy

- Men with diminished sex drive, energy, and enthusiasm for life may be suffering from low testosterone levels ("Low T").
- Testosterone levels drop with advancing age—but that doesn't mean the consequences are an inevitable part of aging.
- Harvard urologist Dr. Abraham Morgentaler has led the scientific effort to better understand how low T impacts a man's overall function, performance, and even longevity.
- Most doctors still subscribe to the myth that T replacement increases the risk of prostate cancer, so they may resist treating their patients appropriately.
- Testosterone for Life*, the new book by Harvard expert Dr. Abraham Morgentaler, documents the life-changing effects of safe, responsible testosterone replacement therapy (TRT).
- Morgentaler busts the T replacement-prostate cancer myth—and even provides evidence that it is safe in men at high risk for cancer.
- Men with low T (and their families) can enjoy enhanced quality of life with simple, effective, and easy to use T replacement therapy.

Blood levels are an important part of the diagnostic process too—but it isn't entirely black and white. "While we currently don't recommend that every man undergo regular testosterone checks as a screening test," Morgentaler noted, "We do need to get primary care doctors thinking about the diagnosis in an increasingly broad

way. Men who complain of fatigue, poor focus, and low energy levels, in addition to those with purely sexual complaints, should have their T levels checked. Not all will have low T, of course, but we know that we're missing a very large number of people at present."

As with any other blood test, it's important to know what the "normal" levels are, and how they apply to an individual. "According to the FDA, 'a 'normal' total T level is 300 ng/dL," says Morgentaler. "Strictly interpreted that would mean that a man with a level of 299 is low, while a man with a level of 301 is normal. That's simply not a sensible approach. The Endocrine Society, a very august group, has produced guidelines that mirror the FDA, though they do point out that no single number should be used and that symptoms should guide the diagnosis.<sup>16</sup> The International Society for the Study of the Aging Male<sup>17</sup> uses a higher number, 348. The point is that *we need to interpret these numbers in the context of a man's signs and symptoms.*" In other words, if a man's symptoms are consistent with low T and his level is anywhere near the low end of these scales, he and his physician should consider a trial of T replacement therapy.

According to Dr. Morgentaler, "Which tests are done, where they are done, and how they are reported also matter. Most primary care physicians use local laboratories, which can be inaccurate and arbitrary in their 'normal' reporting range. We pulled 25 hospital laboratories' reference ranges at random, and found 17 different low and high 'normal' values." Worse, none of these values were based on symptoms—they were based simply on standard deviation from average levels in the population. "In a population with 10% of

men with truly low T levels, this approach means you'd miss three-quarters of them with standard testing," Morgentaler points out. This can have significant impact when a primary care physician, appropriately concerned about the possibility of low T, gets back a "normal" result and falsely concludes that the problem lies elsewhere.

"A more rational approach, and one we've taken with other blood tests such as cholesterol, glucose, and PSA, is to establish healthy *target* levels based on the literature," continued Morgentaler. "That way we have an objective measure that actually says something about a person's risk for a particular outcome."

Physicians may also need some reminding about which test to order for testosterone. Like other sex hormones, testosterone is found in the blood largely bound to a protein called *sex hormone-binding globulin*, or SHBG.<sup>10</sup> But it's the "free" testosterone that actually affects risk and performance, and standard testing measures only *total* T (free plus bound). "Physicians need to order *both* total and free T levels when they do their testing," says Morgentaler. "If *either one* is low or in the 'low normal' range in a man with symptoms consistent with low T, then treatment should be considered." Do doctors need to send this test out to specialized labs? "Not at all," responded Dr. Morgentaler. "Most labs can do both tests—physicians just have to know to order them."

### So You Have Low T—What Can Be Done About It?

Fortunately, once the diagnosis has been made on the basis of concerning symptoms and low or low-normal T levels, treatment is

fairly straightforward. "We have many options for treatment of men with low T," Dr. Morgentaler observed. "There's no recommended pill available in the US—there are some old ones still around that are not very effective and they are associated with significant liver toxicity, so no one should be using them for TRT." But just about every other route has been explored.

"I usually start a man on a fairly short-acting form of T replacement," Morgentaler continued, "so that we can gauge the effects together and make adjustments as needed. The market leader in this area is the testosterone gel, which is easy to use and has minimal skin reactivity. A man just showers, dries, and then applies the gel to the upper arms or shoulders. It's absorbed very rapidly, so there's no need to cover the area with a dressing of any kind. Men like the gel because it's convenient, and we like it because it delivers reliable blood levels of testosterone quickly."

The gel will probably replace the still-available transdermal patch, still in use especially by the Veterans Administration. "The patch is easy to use, but it causes a significant amount of skin irritation," says Dr. Morgentaler, "and it doesn't produce great blood testosterone levels." There's also the injection route—an intramuscular shot given every 2 weeks. "The advantage," Morgentaler notes, "is that we always get adequate levels this way—but of course it requires biweekly shots which most people don't like."

In a revival of an old technique (remember the lizard experiments), time-release implants are now available as well. "These are inserted just under the skin in the buttocks—we use 8-10 rice grain-sized pellets that slowly release T into the circulation. They produce

great levels, there's no ongoing maintenance required, and they are fully-absorbed, so never need to be removed," says Morgentaler.

Finally, in terms of readily-available options, there are oral *pastiches*—tiny tablets that are placed between the cheek and gum. "They're not visible to others," Dr. Morgentaler points out, "and you just switch them every 12 hours." These may be a good option for men who are uncomfortable with gels, injections, or implants.

What's on the horizon? "A long-lasting injectable form of testosterone, called testosterone undecanoate, may soon be available—if approved by the FDA it will be called Avede™ (it is known as Nebido® outside the US), and it is good for 2.5 months. This product is ideal for men who've had a favorable response to treatment, and just want to continue with good T levels without having to fuss with other dosing forms," Dr. Morgentaler remarked.

What about side effects? "Testosterone therapy is safe," Dr. Morgentaler stressed, "because unlike most pharmaceuticals, testosterone is a naturally occurring product of a man's body. The replacement hormone is identical to endogenous testosterone. We see fairly minimal side effects of appropriate treatment: some minor swelling and tenderness of the breasts, and occasionally some acne breakouts occur. T therapy may also cause elevation of red blood cell counts, but there have been no reports of stroke or other related adverse effects.<sup>4</sup> An important consideration, though, is that production of sperm will decrease during treatment, and testicular size may also decrease. All reported side effects go away as soon as treatment is stopped, which is also reassuring." And unlike the

effects seen in body builders who use high-dose androgen injections that include non-testosterone hormones, "T therapy doesn't cause kidney, liver, or cardiovascular disease. We monitor our patients by checking their T and PSA levels, examining their skin and breasts periodically, and checking blood counts once or twice yearly," says Morgentaler.

## T Therapy and Prostate Cancer

With diagnosis simplified and so many safe treatment options available, why are only about 5% of men with low T getting appropriate care?<sup>4</sup> There's a persistent fear of prostate cancer, and the belief that T therapy causes the disease continues to influence physicians and patients alike. "Most of my research and scientific writing has been on the purported relationship between T therapy and prostate cancer," Dr. Morgentaler said. "The concerns have a historical basis—it's long been known that *reducing* testosterone or its effects in men with metastatic prostate cancer makes the cancers smaller and slows their growth. That, perhaps naturally, led to the assumption that *increasing* testosterone would make the cancers larger and speed their growth."

But in the past ten years, Morgentaler and other scientists have been aggressively challenging that assumption. "Long-term studies looking for increased incidence of prostate cancer in men with naturally high T levels have consistently failed to show any relationship at all," notes Morgentaler. "Other studies showed that PSA was unchanged in men who received treatment that increased their T levels to more than twice the 'normal' range." In fact, Dr.

Morgentaler has published data showing that men with significant reductions in testosterone levels actually have an *increased risk* for prostate cancer.<sup>18</sup>

Other world-class researchers have become interested. A “pooled data” study by dozens of scientists in the Endogenous Hormones, Prostate Cancer Collaborative Group and published in the *Journal of the National Cancer Institute* reviewed 18 prospective studies that included 3,886 men with prostate cancer and 6,438 control subjects.<sup>19</sup> The studies had all evaluated the risk of prostate cancer and levels of total and free testosterone as well as other sex hormones. The conclusion? “In this collaborative analysis of the worldwide data on endogenous hormones and prostate cancer risk, serum concentrations of sex hormones *were not associated with the risk of prostate cancer.*”

“More and more placebo-controlled studies are showing no increase in prostate cancer in men actually receiving T therapy,” Dr. Morgentaler noted. “So far these are only short-term studies because we just haven’t been doing it long enough,” he continued, “but the longitudinal studies are so strong that I believe the question has been answered firmly.” Does T therapy cause increases in PSA (the marker for early prostate cancer)? “There’s no difference between PSA ‘trigger events’ (PSA over the threshold of 4 ng/dL) in men receiving T replacement and those who aren’t,” Morgentaler said, citing data both from his own work<sup>20</sup> and another pooled meta-analysis study.<sup>21</sup>

Based on the overwhelming wealth of data, Dr. Morgentaler is now beginning to provide T replacement therapy to men who’ve had prostate cancer—something that would have been anathema just a

few years ago.<sup>22</sup> Other experts are beginning to follow suit.<sup>23,24</sup> Even more impressively, Morgentaler and his colleague Emani Rhoden at Harvard have also begun T therapy in men at high risk for prostate cancer—men who have biopsy-proven *prostatic intraepithelial neoplasia (PIN)*, which is considered to be a precancerous condition.<sup>25</sup> This is more than just good science—Morgentaler’s work is providing improved quality of life for men who thought they’d seen the last of their male vigor. “I saw an 84-year-old man with prostate cancer,” recalls Morgentaler. “He wasn’t interested in treating the cancer at his age, and he wanted T therapy because he was interested in the benefits. Two years later he’s actually seen a decrease in his PSA levels, and more importantly, *he feels great!*”

**Cautionary note:** *Although quite a number of urologists and oncologists will now offer TRT to men with a history of prostate cancer, primarily after successful treatment of the cancer, many others are still concerned that treatment may increase the risk of cancer recurrence. And language mandated by the FDA for all commercial testosterone products advises against using TRT in men with any history of prostate cancer. The field still awaits large studies to determine the degree of safety of TRT in men with prostate cancer.*

### Summary

Dr. Morgentaler closed our discussion with this summary of where we are with T replacement therapy: “Low T is common—much more so than most people realize. It has effects far beyond the very important impact on sexual function; in fact low T is associated with everything from



# WELLNESS PROFILE

atherosclerosis to the metabolic syndrome to male osteoporosis. And men with low T simply don't feel good, and they don't know why. Low T is vastly under-treated, yet T replacement therapy is safe and rapidly effective—we typically see results within weeks of starting treatment. I believe that any man over the age of 50 who feels rundown, off his game, or has any of the other symptoms of low T owes it to himself and his family to have his T levels checked, and if they are low, to be treated." The final words in Morgentaler's book say it eloquently: "We always have choices when it comes to our health. For many men with low T, learning about the condition and finding help to treat it is a good choice—a choice for life."<sup>1</sup> ●

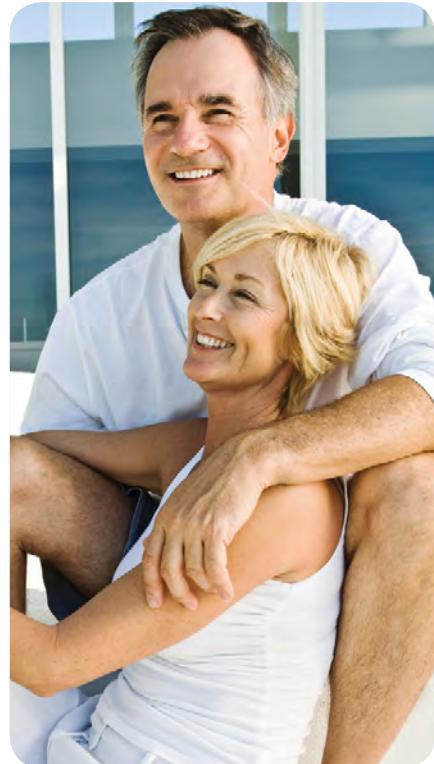
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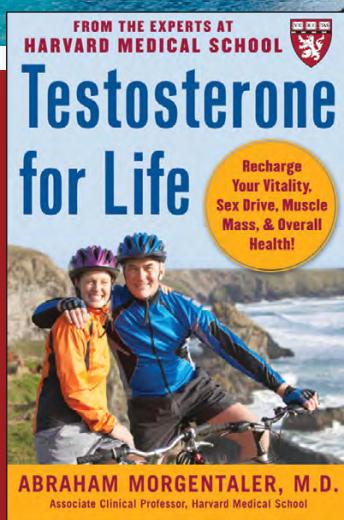


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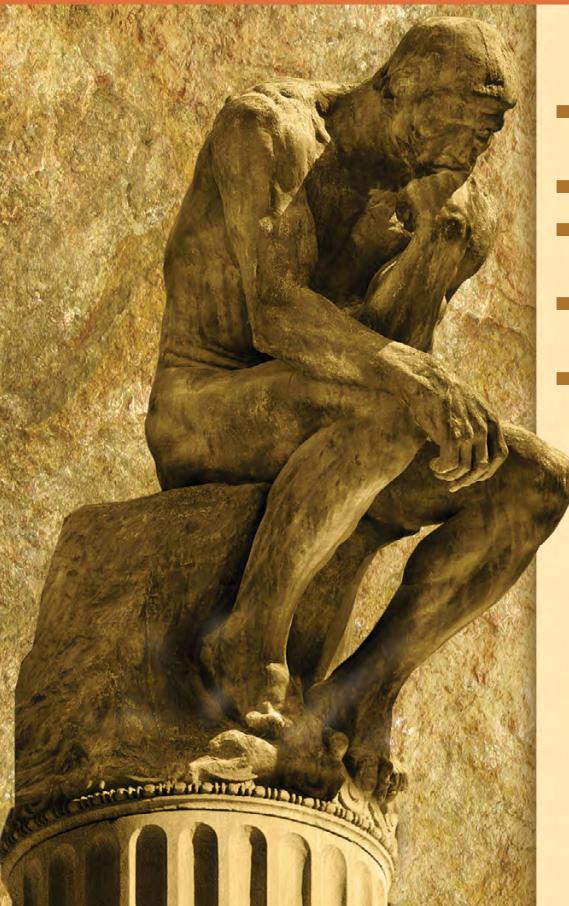
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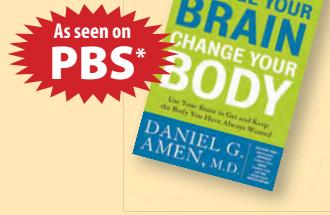
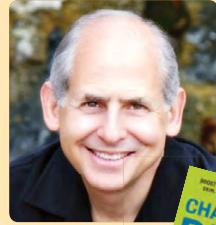
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For those residing in the Ft. Lauderdale, Florida area, blood draws are also performed at the Life Extension Nutrition Center from 9:00 am to 2:00 pm Monday through Saturday. Simply purchase the blood test and have it drawn with no wait! Our address 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.

ANNUAL

# Blood Test

April 1-June 7, 2010 SUPER SALE



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

##### MEN'S ANNUAL BLOOD TESTING

<input type="radio"/> <b>MALE LIFE EXTENSION PANEL (LC322582)</b>	\$199
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	
<b>NEW &amp; IMPROVED</b> <b>NOW INCLUDES TSH!</b>	
<input type="radio"/> <b>MALE HORMONE ADD-ON PANEL<sup>†</sup> (LCADDM)</b>	\$115
Pregnenolone and Dihydrotestosterone (DHT) To provide an even more in-depth analysis of a man's hormone status, Life Extension has created this panel as an addition to the Male Life Extension Panel. This panel provides information about a testosterone metabolite that can affect the prostate; and the hormone pregnenolone that acts as a precursor to all other hormones.	
<input type="radio"/> <b>THYROID ADD-ON PANEL (LCTHYROID)</b>	\$36
Free T3 & Free T4. LE strongly recommends adding these important thyroid tests to the Male or Female Life Extension Panels, especially for those interested in weight loss.	
<input type="radio"/> <b>VITAMIN D (25-OH) (LC081950)</b>	\$35.25
This test is used to assess vitamin D status in your body.	
<input type="radio"/> <b>OMEGA SCORE<sup>™***</sup> (LCOMEGA)</b>	<b>NEW</b> \$98
Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score <sup>™</sup> also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.	

##### WOMEN'S ANNUAL BLOOD TESTING

<input type="radio"/> <b>FEMALE LIFE EXTENSION PANEL (LC322535)</b>	\$199
CBC/Chemistry Profile (description on next page) DHEA-S Estradiol Homocysteine C-Reactive Protein (high-sensitivity) Progesterone Free Testosterone Total Testosterone TSH for thyroid function	
<b>NEW &amp; IMPROVED</b> <b>NOW INCLUDES TSH!</b>	
<input type="radio"/> <b>FEMALE HORMONE ADD-ON PANEL<sup>†</sup> (LCADDF)</b>	\$92.50
Pregnenolone and Total Estrogen To provide an even more in-depth analysis of a woman's hormone status, Life Extension has created this panel as an addition to the Female Life Extension Panel. This panel provides information about total estrogen status; and the hormone pregnenolone that acts as a precursor to all other hormones.	
<input type="radio"/> <b>THYROID ADD-ON PANEL (LCTHYROID)</b>	\$36
Free T3 & Free T4. LE strongly recommends adding these important thyroid tests to the Male or Female Life Extension Panels, especially for those interested in weight loss.	
<input type="radio"/> <b>VITAMIN D (25-OH) (LC081950)</b>	\$35.25
This test is used to assess vitamin D status in your body.	
<input type="radio"/> <b>OMEGA SCORE<sup>™***</sup> (LCOMEGA)</b>	<b>NEW</b> \$98
Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Score <sup>™</sup> also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.	

##### BLOOD TEST SUPER SALE SPECIAL: Add a **VITAMIN D** test for only \$25 when purchasing any of the following panels:

- Male Life Extension Panel (**LC322582COMBO**)
- Female Life Extension Panel (**LC322535COMBO**)
- Male Hormone Retest Profile (**LCRTMCOMBO**)
- Female Hormone Retest Profile (**LCRTFCOMBO**)

##### SUGGESTED ADDITIONS TO ANNUAL BLOOD TESTING

<input type="radio"/> <b>FIBRINOGEN<sup>†</sup> (LC001610)</b>	\$23.25
High levels of this blood-clotting factor increase the risk of heart attack and stroke.	
<input type="radio"/> <b>COENZYME Q10<sup>†</sup> (LC120251)</b>	\$108.75
Research is revealing that maintaining higher blood levels of CoQ10 may offer greater health benefits. This test measures blood levels of CoQ10.	
<input type="radio"/> <b>CORTISOL (LC004051)</b>	\$29.25
This test is used to help assess adrenal function.	
<input type="radio"/> <b>LP-PLA2 (PLAC TEST) (LC123240)</b>	\$93.75
This test is used to aid in predicting risk for coronary heart disease, and ischemic stroke associated with atherosclerosis. Lp-PLA2 is a cardiovascular risk factor that provides unique information about the stability of the plaque inside your arteries.	
<input type="radio"/> <b>VAP<sup>™</sup> TEST (LC804500) (UPDATED)</b>	<b>NEW LOW PRICE</b> \$67.50
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.	
<input type="radio"/> <b>CELIAC DISEASE ANTIBODY SCREEN (LC334971)</b>	\$74.25
This test measures deamidated gliadin IgA; tissue transglutaminase IgA; serum IgA quantitation.	
<input type="radio"/> <b>FOOD SAFE ALLERGY TEST<sup>**</sup> (LCM73001)</b>	\$130.50
This test measures delayed (IgG) food allergies for 45 common foods.	
<input type="radio"/> <b>FERRITIN (LC004598)</b>	\$21
Used to evaluate iron stores in the body and to determine iron deficiency anemia.	
<input type="radio"/> <b>HEMOGLOBIN A1C (LC001453)</b>	\$23.25
Used to assess long-term glucose control.	
<input type="radio"/> <b>VITAMIN B12/FOLATE (LC000810)</b>	\$24.75
This test measures the amount of vitamin B12 and folic acid in the blood.	
<input type="radio"/> <b>INSULIN (FASTING) (LC004333)</b>	\$31.50
Can predict those at risk of diabetes, obesity, and heart and other diseases.	

\*For non-member pricing call **1-800-208-3444**.

\*\* This test is packaged as a kit, requiring a finger stick performed at home.

\*Certain tests need to be shipped to the lab on dry ice for customers using a blood draw kit, and incur an additional \$35 charge. If you are going to LabCorp, this charge **does not apply**.



## POPULAR PANELS

**CBC/CHEMISTRY PROFILE (LC381822)**

**Note:** This CBC/Chemistry profile is included in the Male and Female Life Extension panels.

**CARDIOVASCULAR RISK PROFILE**

Total Cholesterol	Cholesterol/HDL Ratio
HDL Cholesterol	Estimated CHD Risk
LDL Cholesterol	Glucose

**LIVER FUNCTION PANEL**

AST (SGOT)	Total Bilirubin
ALT (SGPT)	Alkaline phosphatase
LDH	

**KIDNEY FUNCTION PANEL**

BUN	BUN/Creatinine Ratio
Creatinine	Uric Acid

**BLOOD PROTEIN LEVELS**

Total Protein	Globulin
Albumin	Albumin/Globulin Ratio

**BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE**

Red Blood Cell Count	Monocytes
White Blood Cell Count	Lymphocytes
Eosinophils	Platelet Count
Basophils	Hemoglobin
Polys (Absolute)	Hematocrit
Lymphs (Absolute)	MCV
Monocytes (Absolute)	MCH
Eos (Absolute)	MCHC
Baso (Absolute)	Polynucleated Cells
RDW	

**BLOOD MINERAL PANEL**

Calcium	Sodium
Potassium	Chloride
Phosphorus	Iron

**LIFE EXTENSION THYROID PANEL (LC304131)**

TSH, T4, Free T3, Free T4

**FEMALE HORMONE RE-TEST PROFILE<sup>†</sup> (LCRTF)**

CBC/Chemistry Profile, DHEA-S, Total Estrogen, Pregnenolone, Total and Free Testosterone, Progesterone, and TSH. Continual monitoring of hormone levels is necessary for women seeking to maintain optimal blood level values.

**MALE HORMONE RE-TEST PROFILE<sup>†</sup> (LCRTM)**

CBC/Chemistry Profile, DHEA-S, DHT, Estradiol, PSA, Pregnenolone, Total and Free Testosterone, and TSH. Continual monitoring of hormone levels is necessary for men seeking to maintain optimal blood level values.

**DR. LICHTEN COMPREHENSIVE THYROID PANEL (LICHEN02)**

TSH, T4, Free T3, Reverse T3, Thyroid antibodies, Thyroid peroxidase antibodies, Red cell magnesium, vitamin D(25-OH).

**DR. LICHTEN CARDIAC RISK FACTORS<sup>†</sup> (LICHEN05)**

Homocysteine, C-Reactive Protein, Ferritin, Fibrinogen, ABO, and Rh blood typing.

**DR. LICHTEN COMPREHENSIVE MALE PANEL (LICHEN01M)**

Male Life Extension Panel PLUS: IGF-1, FSH, LH, TSH, Free T4, Cortisol, Fasting Insulin, Sex Hormone Binding Globulin, and Hemoglobin A1C.

**DR. LICHTEN COMPREHENSIVE FEMALE PANEL (LICHEN01F)**

Female Life Extension Panel PLUS: IGF-1, FSH, LH, TSH, Free T4, Cortisol, Fasting Insulin, Sex Hormone Binding Globulin, and Hemoglobin A1C.

\$26

## POPULAR SINGLE TESTS

**OSTEOCALCIN<sup>†</sup> (LC010249)**

A valuable aid in identifying risk of developing osteoporosis.

\$68.25

**DPD CROSS LINK TEST (LC511105)**

A urine test used as a tool to assess the true rate of bone turnover.

\$59.25

**IGF-1 (LC010363)**

Indicates growth hormone secretion levels. Low levels have been associated with atherosclerosis as well as all-cause mortality.

\$56.25

**INSULIN-LIKE GROWTH FACTOR**

**BINDING PROTEIN 3 (IGFBP3) (LC140152)**

Elevated levels in hypertensive individuals have been associated with nine-fold increase of carotid arteriosclerosis.

\$35.25

**DHEA-SULFATE (LC004697)**

This test shows if you are taking the proper amount of DHEA.

\$45.75

**DIHYDROTESTOSTERONE (DHT)<sup>†</sup> (LC500142)**

Measures serum concentrations of DHT.

\$74.25

**ESTRADIOL (LC004515)**

For men and women. Determines the proper amount in the body.

\$24.75

**FREE-PSA (INCLUDES TOTAL PSA)<sup>†</sup> (LC480780)**

Recommended to determine if an elevated PSA is indicative of prostate cancer.

\$45.75

**FREE AND TOTAL TESTOSTERONE (LC140103)**

Determines whether testosterone replacement should be considered as a therapy for depression, abdominal obesity, low energy, poor mental performance, or loss of libido.

\$74.25

**PROGESTERONE (LC004317)**

Primarily for women. Determines the proper amount in the body.

\$41.25

**PREGNENOLONE<sup>†</sup> (LC140707)**

Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing's syndrome.

\$87

**SEX HORMONE BINDING GLOBULIN (SHBG) (LC082016)**

This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.

\$24.75

**URINARY 2/16 ESTROGEN METABOLITE RATIO (LCU73000)**

The ratio is relevant as a risk factor for estrogen-sensitive diseases including breast and cervical cancers and osteoporosis.

\$128

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

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

**ORDER 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

### MEMBER NO.

Male  Female

Name

Date of Birth (required) / /

Address

City

State Zip

Phone

Credit Card No.

Expiration Date /

Mail your order form to:

**Life Extension**  
NATIONAL DIAGNOSTICS, INC.

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

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

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

# Products

## AMINO ACIDS

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
Branched Chain Amino Acids  
D, L-Phenylalanine Capsules  
GABA Powder  
Glycine Capsules  
Glycine Powder  
Arginine Capsules  
L-Arginine Free Base Powder  
Arginine/L-Ornithine Capsules  
L-Carnitine Capsules  
L-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

## BONE & JOINT HEALTH

ArthroMax™ with Theaflavins  
Bone-Up™  
Bone Restore™  
Bone Strength Formula w/KoAct™  
Chondroitin Sulfate  
Chondrox  
Fast Acting Joint Formula  
Glucosamine Chondroitin Capsules

## BRAIN HEALTH

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
CDP Choline Capsules  
Cognitex with NeuroProtection Complex  
Cognitex with Pregnenolone & NeuroProtection Complex  
DMAE  
DMAE-Ginkgo  
DMAE Powder (37% DMAE)  
Ginkgo Biloba Certified Extract™  
Huperzine A  
Lecithin with B5 and BHA  
Lecithin Granules  
Methylcobalamin Lozenges  
Optimized Ashwagandha Extract  
Phosphatidylserine Capsules  
Rhodiola Extract  
Super Ginkgo Extract  
Vinpocetine

## DIGESTIVE

Agave Digestive-Immune Support  
Bromelain Powder  
Carnosothe w/PicroProtect  
Digest RC™  
Enhanced Super Digestive Enzymes  
(also available with Probiotics)  
Florastor  
Intact Digest  
Life Flora™  
Natural Esophaguard  
NutraFlora (FOS) Powder  
N-Zimes™  
Pancreatin  
Papain Powder  
Primal Defense  
Regimint™

## DURK AND SANDY PRODUCTS

Blast™  
Dual-C  
Inner Power™  
Memory Upgrade

## EYE CARE

Bilberry Extract  
Blackcurrant Freeze Dried Extract  
Brite Eyes 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®  
SlimStyles® 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  
Cho-Less  
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 Lignans & Olive Fruit Extract  
Super Ubiquinol CoQ10  
Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support  
Strynol™  
Theaflavin Standardized Extract  
TMG Powder  
TMG Tablets  
Vascular Protect

## HERBAL/PHYTO PRODUCTS

Artichoke Leaf Extract  
Astaxanthin  
Berry Complete  
Blackcurrant Juice Concentrate  
Blueberry Extract  
Blueberry Extract w/Pomegranate and CocoaGold™  
Butterbur Extract w/Standardized Rosmarinic Acid  
Calcium D-Glucarate  
Chloroplex  
Cilantro Herbal Extract  
Citrus Bioflavonoid  
CocoaGold™  
Enhanced Berry Complete with RZD™ Acai  
Grapeseed Extract with Resveratrol & Pterostilbene  
Green Tea Leaves  
Hesperidin Complex Powder  
Huperzine A with Natural Vitamin E  
Kyolic® Garlic Formula 105  
Kyolic® Reserve  
Lycopene  
Mega Green Tea Extract  
Mega Green Tea Extract (Decaffeinated)  
Mega Lycopene  
Mega Silymarin with Isosilybin B  
Nutrim  
Optimized Ashwagandha Extract

## Phyto-Food

Pomegranate Extract  
Pomegranate Extract with CocoaGold™ (Full-Spectrum) Pomegranate™  
Pomegranate Juice Concentrate  
ProGreens®  
Pure-Gar™  
Pycnogenol  
Optimized Quercetin  
Resveratrol with Pterostilbene  
Rhodiola Extract  
Rosmarinic Acid Extract  
Rutin Powder  
Silymarin  
SODzyme™ 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  
i26 Hyperimmune Egg  
Immune Protect with PARACTIN®  
Lactoferrin  
Maitake SX-Fraction  
Norwegian Shark Liver Oil  
Primal Defense™  
ProBoost™ Thymic Protein A  
Pure Gar™  
Sambu® Guard  
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  
Boswella  
Boswella™ 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  
PhosphOmega™ Krill Oil  
Perilla Oil  
Serraflazyme  
Shark Cartilage  
SODzyme™ with Glisodin® and Wolfberry  
Super Omega-3 EPA/DHA with Sesame Lignans & Olive Fruit Extract  
Tart Cherry  
Udo's Choice Oil  
Zyflamend Easy

# Products

## LIVER HEALTH

Branch Chain Amino Acids  
HepatoPro  
Mega Silymarin with Isosilybin B  
N-Acetyl Cysteine  
SAMe  
Silymarin

## MINERALS

Biosil  
Bone Restore  
Bone Strength Formula w/KoAct™  
Bone-Up™  
Boron Capsules  
Calcium Citrate with D3  
Chromium Ultra  
Copper  
Iodoral  
Iron Protein Plus  
Magnesium  
Magnesium Citrate  
Mineral Formula for Men  
Mineral Formula for Women  
Only Trace Minerals  
OptiZinc  
Sea-Iodine™  
Selenium  
Se-Methylselenocysteine  
Vanadyl Sulfate  
Zinc/Vitamin C Lozenges

## MISCELLANEOUS

Blood Pressure Monitor Arm Cuff Medium  
Cell Sensor Gauss Meter™  
Empty Gelatin Capsules  
The Capsule Filler Machine  
The Pill Cutter and Grinder

## MITOCHONDRIAL SUPPORT

Acetyl-L-Carnitine  
Acetyl-L-Carnitine-Arginate  
Mitochondrial Energy Optimizer  
Optimized Carnitine with GlycoCarn®  
Super Absorbable CoQ10™ with d-Limonene  
Super Alpha Lipoic Acid with Biotin  
Super R-Lipoic Acid  
Super Ubiquinol CoQ10 with Enhanced Mitochondrial™ Support

## MOOD RELIEF

L-Theanine  
Natural Stress Relief  
Optimized TryptoPure™ Plus  
SAMe  
St. John's Wort Extract  
Tryptopure™ L-Tryptophan

## MOUTH CARE

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

## MULTIVITAMIN

Children's Formula Life Extension Mix  
Comprehensive Nutrient Pack  
Life Extension Booster  
Life Extension Mix™ Capsules  
Life Extension Mix™ Powder  
Life Extension Mix™ Tablets  
Life Extension Mix™ w/o Copper Capsules  
Life Extension Mix™ w/o Copper Powder  
Life Extension Mix™ w/o Copper Tablets  
Life Extension Mix™ w/Extra Niacin  
Life Extension Mix™ w/Extra Niacin w/o Copper  
Life Extension Mix™ w/Stevia Powder  
Life Extension Mix™ w/Stevia w/o Copper Powder  
Life Extension One-Per-Day  
Life Extension Two-Per-Day  
Super Booster Softgels w/Advanced K2 Complex  
Vital Greens Mix

## PET CARE

Life Extension Cat Mix  
Life Extension Dog Mix

## PROSTATE & URINARY HEALTH

BetterWOMAN®  
Optimized Cran-Max® with UTIRose™  
5-LOXIN®  
(Water-Soluble) Pumpkin Seed Extract  
Super Saw Palmetto with Beta-Sitosterol  
Super Saw Palmetto/Nettle Root Formula  
w/Beta-Sitosterol  
Ultra Natural Prostate Formula

## SKIN CARE

Anti-Aging Mask  
Anti-Glycation Serum  
Antioxidant Facial Mist  
Antioxidant Rejuvenating Foot Cream  
Antioxidant Rejuvenating Foot Scrub  
Antioxidant Rejuvenating Hand Cream  
Antioxidant Rejuvenating Hand Scrub  
Anti-Redness & Blemish Lotion  
Cellulite Suppress™ Formula  
Corrective Clearing Mask  
Derma Whey  
Dual-Action MicroDerm Abrasion  
Essential Plant Lipids Reparative Serum  
Face Master® Platinum  
Face Rejuvenating Antioxidant Cream  
Enhanced FernBlock® with Sendara™  
Fine Line-Less  
Hair Suppress Formula  
Healing Mask  
Hyaluronic Facial Moisturizer  
Hydroderm®  
Lavilin Underarm Deodorant  
Life Extension Sun Protection Spray  
Lifting & Tightening Complex  
Melatonin Cream  
Mild Facial Cleanser  
NaPCA w/Aloe Vera  
Neck Rejuvenating Antioxidant Cream  
New Face Solution  
Peel Off Cleansing Mask  
Pigment Correcting Cream  
(Ultra) Rejuvenex®  
Rejuvenex® Body Lotion  
Rejuvenex® Factor  
Rejuvenating Serum  
Skin Lightening Serum  
Skin Stem Cell Serum  
Total Sun Protection Cream  
Triple Action Under Eye Rejuvenator  
Ultra Rejuvenex®  
Ultra RejuveNight® w/ Progesterone  
Ultra RejuveNight® w/o Progesterone  
Ultra Lip Plumper  
Ultra Wrinkle Relaxer  
Under Eye Refining Serum  
Under Eye Rescue Cream  
Vitamin C Serum  
Vitamin D Lotion  
Vitamin K Healing Cream

## SOY

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

## SPECIAL PURPOSE FORMULA

Anti-Alcohol Antioxidants w/HepatoProtection Complex  
Benfotiamine w/Thiamine  
Breast Health Formula  
Butterbur Extract w/Standardized Rosmarinic Acid  
Chlorella  
Chlorophyllin w/Zinc  
CocoaGold w/Beta Glucan  
Coriolus Versicolor Super Strength  
Derma-Vits™  
Enhanced Cinsulin® w/Glucose Management Proprietary Blend  
EDTA  
(European Leg Solution) Diosmin95  
Fem Dophilus  
Femmenessence MacaPause®  
GlucoFit™  
Ideal Bowel Support 299V  
Lustre™

## Maitake SX-Fraction™

Menopause Solutions  
Migra-eeze™  
Natural Female Support  
Pecta-Sol®  
Potassium Iodide  
Prelox® Natural Sex for Men®  
Pyridoxamine  
Rosmarinic Acid Extract

## SPORTS PERFORMANCE

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

## VITAMINS

Ascorbic Acid Powder  
Ascorbyl Palmitate Capsules  
Ascorbyl Palmitate Powder  
B1  
B2  
B12  
Beta-Carotene  
Biotin Capsules  
Biotin Powder  
Buffered Vitamin C Powder  
Complete B Complex  
Eligen® B12  
Folic Acid + B12  
Folic Acid powder  
Gamma E Tocopherol w/Sesame Lignans  
Gamma E Tocopherol/Tocotrienols  
Inositol Capsules  
Inositol Powder  
Liquid Emulsified Vitamin A  
Mega Lycopene Extract  
Methylcobalamin  
MK-7  
No-Flush Niacin  
Optimized Folate  
PABA Capsules  
PABA Powder  
Super Ascorbate C Capsules  
Super Ascorbate C Powder  
Super K w/Advanced K2 Complex  
Tocotrienols w/Sesame Lignans  
Vitamin B1 Powder  
Vitamin B2 Powder  
Vitamin B3 (Niacin) Capsules  
Vitamin B5 Powder  
Vitamin B6  
Vitamin B12 Powder  
Vitamin C  
Vitamin D  
Vitamin D3  
Vitamin D3 w/Sea-Iodine™  
Vitamin E Succinate  
Vitamin K1

## WEIGHT MANAGEMENT

Alli® Refill Pack  
Belly Slim & Tone  
Chitosan  
CitriChrome  
7-Keto DHEA  
DHEA Complete  
Enhanced Fiber Food  
Fucoxanthin Slim™  
HCA  
Integra-Lean® Irvingia  
Optimized Irvingia w/Phase 3™ Calorie Control Complex  
Life Mix  
Natural Appetite Control  
SlimStyles® PGX Natural Weight Loss  
Stevia Liquid Extract  
Super CLA Blend w/Guarana and Sesame Lignans  
Super CLA Blend w/Sesame Lignans  
Udo's Choice Wholesome Fast Food Blend  
WellBetX PGX® Soluble Fiber Blend

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail	Member Price	Qty	Total
<b>A</b>					
00449	ACETYL-L-CARNITINE - 500 mg, 100 caps	\$56.00	\$42.00		
	ACETYL-L-CARNITINE - 4 bottles of 100 caps	186.64	139.98		
00788	ACETYL-L-CARNITINE ARGINATE - 100 caps	59.00	44.25		
	ACETYL-L-CARNITINE ARGINATE - 4 bottles of 100 caps	203.96	152.97		
01308	ADVANCED LIPID CONTROL - 60 veg. caps	30.00	22.50		
	ADVANCED LIPID CONTROL - 4 bottles of 60 veg. caps	108.00	81.00		
01300	ADVANCED ORAL HYGIENE - 60 veg. mint lozenges	20.00	15.00		
	ADVANCED ORAL HYGIENE - 4 bottles of 60 veg. mint lozenges	72.00	54.00		
01417	AGAVE DIGESTIVE-IMMUNE SUPPORT - 360 grams of powder	30.00	22.50		
	AGAVE DIGESTIVE-IMMUNE SUPPORT - 4 bottles of powder	108.00	81.00		
00681	AHCC - 500 mg, 30 caps	48.98	36.74		
	AHCC - 4 bottles of 30 caps	174.20	130.65		
46925	ALLI® REFILL PACK - 60 mg, 120 caps	69.95	58.00		
00261	ALL-IN-ONE WEIGHT LOSS FORMULA - 300 caps	59.95	44.96		
	ALL-IN-ONE WEIGHT LOSS FORMULA - 2 bottles of 300 caps	110.00	82.50		
	ALL-IN-ONE WEIGHT LOSS FORMULA - 4 bottles of 300 caps	174.00	130.50		
00457	(SUPER) ALPHA-LIPOOIC ACID w/BIOTIN - 250 mg, 60 caps	37.00	27.75		
	(SUPER) ALPHA-LIPOOIC ACID w/BIOTIN - 4 bottles of 60 caps	128.00	96.00		
01420	ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO - 100 caps	18.00	13.50		
	ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO - 4 bottles of 100 caps	64.00	48.00		
00105	APPLE PECTIN POWDER - 227 grams of powder	14.75	11.06		
	APPLE PECTIN POWDER - 4 bottles of powder	55.00	41.25		
01012	ARGININE CAPS - 800 mg, 200 caps	26.50	19.88		
	ARGININE CAPS - 4 bottles of 200 caps	93.00	69.75		
01039	ARGININE/ORNITHINE CAPS - 500/250 mg, 100 caps	16.00	12.00		
	ARGININE/ORNITHINE CAPS - 4 bottles of 100 caps	58.00	43.50		
00038	ARGININE/ORNITHINE POWDER - 150 grams of powder	22.95	17.21		
	ARGININE/ORNITHINE POWDER - 4 bottles of powder	76.00	57.00		
01025	(L)-ARGININE FREE-FORM POWDER - 100 grams of powder	15.98	11.99		
	(L)-ARGININE FREE-FORM POWDER - 4 bottles of powder	57.24	42.93		
00040	(L)-ARGININE HCL - 1 kilogram of powder	118.00	88.50		
	(L)-ARGININE HCL - 4 bottles of powder	432.00	324.00		
01303	ARTHROMAX™ w/THEAFLAVINS - 120 veg. caps	44.00	33.00		
	ARTHROMAX™ w/THEAFLAVINS - 4 bottles of 120 veg. caps	160.00	120.00		
01404	ARTHRO-IMMUNE JOINT SUPPORT - 60 veg. caps	30.00	22.50		
	ARTHRO-IMMUNE JOINT SUPPORT - 4 bottles of 60 veg. caps	108.00	81.00		
00919	ARTICHOKE LEAF EXTRACT - 500 mg, 180 veg. caps	28.00	21.00		
	ARTICHOKE LEAF EXTRACT - 4 bottles of 180 veg. caps	101.52	76.14		
00086	(SUPER) ASCORBATE C POWDER - 8 oz of powder	26.99	20.24		
	(SUPER) ASCORBATE C POWDER - 4 bottles of powder	99.48	74.61		
00080	ASCORBIC ACID POWDER - 16 oz of powder vitamin C	38.00	28.50		
	ASCORBIC ACID POWDER - 4 bottles of powder vitamin C	139.72	104.79		
00082	ASCORBYL PALMITATE CAPSULES - 500 mg, 100 caps	22.50	16.88		
	ASCORBYL PALMITATE CAPSULES - 4 bottles of 100 caps	80.00	60.00		
00083	ASCORBYL PALMITATE POWDER - 100 grams of powder	32.00	24.00		
	ASCORBYL PALMITATE POWDER - 4 bottles of powder	120.00	90.00		
00888	(OPTIMIZED) ASHWAGANDHA EXTRACT - 60 veg. caps	10.00	7.50		
	(OPTIMIZED) ASHWAGANDHA EXTRACT - 4 bottles of 60 veg. caps	36.00	27.00		
00892	(LOW DOSE) ASPIRIN ENTERIC COATED - 81 mg, 500 tablets	10.00	7.50		
	(LOW DOSE) ASPIRIN ENTERIC COATED - 4 bottles of 500 tablets	36.00	27.00		
00708	ASTAXANTHIN - 2 mg, 30 softgels	10.25	7.69		

**SUB-TOTAL OF COLUMN 1**

JUNE 2010

No.		Retail	Member Price	Qty	Total
<b>B</b>					
01040	BELLY SLIM & TONE - 6 fl oz	\$42.00	\$31.50		
	BELLY SLIM & TONE - 4 bottles of 6 fl oz	152.00	114.00		
00920	BENFOTIAMINE W/ THIAMINE - 100 mg, 120 caps	19.95	14.96		
	BENFOTIAMINE W/ THIAMINE - 4 bottles of 120 caps	74.40	55.80		
00925	(MEGA) BENFOTIAMINE - 250 mg, 120 veg. caps	30.00	22.50		
	(MEGA) BENFOTIAMINE - 4 bottles of 120 veg. caps	108.00	81.00		
01206	BERRY COMPLETE - 30 veg. caps	21.00	15.75		
	BERRY COMPLETE - 4 bottles of veg. caps	74.68	56.00		
01406	(ENHANCED) BERRY COMPLETE w/R2D™ ACAI - 60 veg. caps	29.00	21.75		
	(ENHANCED) BERRY COMPLETE w/R2D™ ACAI - 4 bottles of veg. caps	104.00	78.00		
00664	BETA-CAROTENE - 25,000 IU, 100 softgels	10.98	8.24		
	BETA-CAROTENE - 4 bottles of 100 softgels	39.32	29.49		
00088	BETA-CAROTENE POWDER - 100 grams of powder	27.00	20.25		
	BETA-CAROTENE POWDER - 4 bottles of powder	100.00	75.00		
00653	BETTERWOMAN - 40 caps	40.00	30.00		
	BETTERWOMAN - 4 bottles of 40 caps	152.00	114.00		
00497	BILBERRY EXTRACT - 100 mg, 100 caps	28.00	21.00		
	BILBERRY EXTRACT - 4 bottles of 100 caps	100.00	75.00		
*01006	BIOSIL™ - 5 mg, 30 veg. caps	18.95	15.16		
*01007	BIOSIL™ - 30 fl ml	29.99	23.99		
00102	BIOTIN CAPSULES - 600 mcg, 100 caps	7.50	5.63		
	BIOTIN CAPSULES - 4 bottles of 100 caps	26.00	19.50		
00145	BIOTIN POWDER - 30 grams of powder	12.50	9.38		
	BIOTIN POWDER - 4 bottles of powder	44.00	33.00		
01037	BLACKCURRANT FREEZE DRIED EXTRACT - 60 veg. caps	21.95	16.46		
01034	BLACKCURRANT JUICE CONCENTRATE - 12 fl. oz	17.95	13.46		
01008	BLAST™ - 600 grams of powder	26.95	20.21		
70000	BLOOD PRESSURE MONITOR-ARM CUFF (medium)	99.95	64.97		
70001	BLOOD PRESSURE MONITOR-WRIST (travel size)	69.95	45.47		
01214	BLUEBERRY EXTRACT - 60 veg. caps	22.50	16.88		
	BLUEBERRY EXTRACT - 4 bottles of 60 veg. caps	80.00	60.00		
01338	BLUEBERRY EXTRACT w/POMEGRANATE & COCOAGOLD™ - 60 veg. caps	30.00	22.50		
	BLUEBERRY EXTRACT w/POMEGRANATE & COCOAGOLD™ - 4 bottles of 60 veg. caps	108.00	81.00		
00811	BONE RESTORE - 150 caps	22.50	16.88		
	BONE RESTORE - 4 bottles of 150 caps	78.00	58.50		
01211	BONE STRENGTH FORMULA w/KOACT™ - 120 caps	42.00	31.50		
	BONE STRENGTH FORMULA w/KOACT™ - 4 bottles of 120 caps	152.00	114.00		
00313	BONE-UP® - 240 caps (hydroxyapatite complex)	24.95	18.71		
	BONE-UP® - 4 bottles of 240 caps	90.00	67.50		
01079	BOOSTER - 60 softgels	48.00	36.00		
	BOOSTER - 4 bottles of 60 softgels	176.00	132.00		
01380	(SUPER) BOOSTER w/ADVANCED K2 COMPLEX - 60 softgels	42.00	31.50		
	(SUPER) BOOSTER w/ADVANCED K2 COMPLEX - 4 bottles of 60 softgels	152.00	114.00		
00621	BORON CAPS - 3 mg, 100 caps	5.95	4.46		
	BORON CAPS - 4 bottles of 100 caps	21.00	15.75		
00202	BOSWELLA - 100 caps	38.00	28.50		
	BOSWELLA - 4 bottles of 100 caps	120.00	90.00		
00258	BOSWELLA TOPICAL CREAM - 4 oz jar	15.00	11.25		
	BOSWELLA TOPICAL CREAM - 4 jars	52.00	39.00		
00253	BRANCHED CHAIN AMINO ACIDS - 90 caps	19.50	14.63		
	BRANCHED CHAIN AMINO ACIDS - 4 bottles of 90 caps	68.00	51.00		
00999	BREAST HEALTH FORMULA - 60 veg. caps	34.00	25.50		
	BREAST HEALTH FORMULA - 4 bottles of 60 veg. caps	120.00	90.00		
00893	BRITE EYES III - 2 vials, 5 ml each	34.00	25.50		
	BRITE EYES III - 4 boxes	128.00	96.00		

\* These products are not 25% off retail price.

**SUB-TOTAL OF COLUMN 2**

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

No.		Retail	Member Price	Qty	Total
00136	BROMELAIN POWDER - 100 grams of powder	\$21.00	\$15.75		
	BROMELAIN POWDER - 4 bottles of powder	75.00	56.25		
01203	(SPECIALY COATED) BROMELAIN - 500 mg, 60 enteric coated tablets	21.00	15.75		
	(SPECIALY COATED) BROMELAIN - 4 bottles of 60 tablets	76.00	57.00		
00884	BUTTERBUR EXT. W/ STANDARDIZED ROSMARINIC ACID - 60 softgels	44.00	33.00		
	BUTTERBUR EXT. W/ STANDARDIZED ROSMARINIC ACID - 4 bottles of 60 softgels	158.40	118.80		
<b>C</b>					
00058	CALCIUM CARBONATE POWDER - 1 kilogram of powder	\$13.95	\$10.46		
	CALCIUM CARBONATE POWDER - 4 bottles of powder	52.00	39.00		
01015	CALCIUM CITRATE - 300 caps	24.00	18.00		
	CALCIUM CITRATE - 4 bottles of 300 caps	85.00	63.75		
00535	CALCIUM D-GLUCARATE - 200 mg, 60 caps	18.00	13.50		
	CALCIUM D-GLUCARATE - 4 bottles of 60 caps	60.00	45.00		
00149	CALCIUM/MAGNESIUM POWDER - 1 kilogram of powder	21.00	15.75		
	CALCIUM/MAGNESIUM POWDER - 4 bottles of powder	75.00	56.25		
01419	CALORIE RESTRICTION MIMETIC FORMULA - 60 veg. caps	36.00	27.00		
	CALORIE RESTRICTION MIMETIC FORMULA - 4 bottles of 60 veg. caps	132.00	99.00		
00118	CAPSULE FILLER MACHINE FOR "00" CAPSULES	12.00	9.00		
	CAPSULE FILLER MACHINE FOR "00" CAPSULES - 4 machines	45.00	33.75		
00613	CAPSULE FILLER MACHINE FOR "0" CAPSULES	12.00	9.00		
	CAPSULE FILLER MACHINE FOR "0" CAPSULES - 4 machines	45.00	33.75		
00916	(OPTIMIZED) CARNITINE w/ GLYCOCARN® - 60 veg. caps	29.00	21.75		
	(OPTIMIZED) CARNITINE w/ GLYCOCARN® - 4 bottles of 60 veg. caps	104.40	78.30		
01041	L-CARNITINE CAPSULES - 500 mg, 30 caps	15.00	11.25		
	L-CARNITINE CAPSULES - 4 bottles of 30 caps	52.80	39.60		
00051	L-CARNITINE POWDER - 100 grams of powder	85.00	63.75		
	L-CARNITINE POWDER - 4 bottles of powder	295.00	221.25		
01258	CARNOSONTHE w/ PICROPROTECT™ - 60 veg. caps	29.95	22.46		
	CARNOSONTHE w/ PICROPROTECT™ - 4 bottles of 60 veg. caps	108.00	81.00		
01287	(SUPER) CARNOSINE CAPS - 500 mg, 90 caps	66.00	49.50		
	(SUPER) CARNOSINE CAPS - 4 bottles of 90 caps	240.00	180.00		
01011	CELLULITE SUPPRESS™ FORMULA - 6 fl. oz	58.00	43.50		
	CELLULITE SUPPRESS™ FORMULA - 4-6oz bottles	208.00	156.00		
00390	CDP CHOLINE CAPS - 250 mg, 60 caps	36.00	27.00		
	CDP CHOLINE CAPS - 4 bottles of 60 caps	136.00	102.00		
00998	CELL SENSOR-EMF DETECTION/MEASUREMENT METER	39.95	29.95		
01370	CHILDREN'S FORMULA MIX - 100 chewable tablets	18.00	13.50		
	CHILDREN'S FORMULA MIX - 4 bottles of 100 chewable tablets	64.00	48.00		
00216	CHITOSAN - 250 mg, 180 caps	28.00	21.00		
	CHITOSAN - 4 bottles of 180 caps	100.00	75.00		
	CHITOSAN - 10 bottles of 180 caps	230.00	172.50		
00369	CHITOSAN - 500 mg, 180 caps	55.00	41.25		
	CHITOSAN - 4 bottles of 180 caps	200.00	150.00		
00550	CHLORELLA - 500 mg, 200 tablets	23.50	17.63		
	CHLORELLA - 4 bottles of 200 tablets	84.00	63.00		
01048	CHLOROPHYLLIN w/ZINC - 100 mg, 100 caps	24.00	18.00		
	CHLOROPHYLLIN w/ZINC - 4 bottles of 100 caps	80.00	60.00		
01045	CHLOROPLEX - 100 caps	28.00	21.00		
	CHLOROPLEX - 4 bottles of 100 caps	98.00	73.50		
	CHLOROPLEX - 12 bottles of 100 caps	256.00	192.00		
01359	CHO-LESS - 90 capsules	32.50	24.38		
00142	CHOLINE BITARTRATE - 300 grams of powder	17.75	13.31		
	CHOLINE BITARTRATE - 4 bottles of powder	64.00	48.00		

SUB-TOTAL OF COLUMN 3

No.		Retail	Member Price	Qty	Total
00541	CHOLINE CHLORIDE - 16 oz liquid	\$14.95	\$11.21		
	CHOLINE CHLORIDE - 4 bottles of 16 oz liquid	56.00	42.00		
00364	CHONDROITIN SULFATE CONCENTRATE - 400 mg, 60 tablets	19.95	14.96		
	CHONDROITIN SULFATE CONCENTRATE - 4 bottles of 60 tablets	72.00	54.00		
00169	CHROMIUM - 200 mcg polynicotinate, 365 caps	28.00	21.00		
	CHROMIUM - 4 bottles of 365 caps	104.00	78.00		
01071	CHROMIUM ULTRA - 100 veg. caps	24.00	18.00		
	CHROMIUM ULTRA - 4 bottles of 100 veg. caps	84.00	63.00		
00551	CILANTRO HERBAL EXTRACT - 1 oz	12.00	9.00		
	CILANTRO HERBAL EXTRACT - 4 bottles of 1oz	44.00	33.00		
01267	(ENHANCED) CINSULIN® W/ GLUCOSE MGMT PROP BLEND - 90 veg. caps	32.00	24.00		
	(ENHANCED) CINSULIN® W/ GLUCOSE MGMT PROP BLEND - 4 bottles of 90 veg. caps	120.00	90.00		
00223	CITRICHROME - 90 caps	22.95	17.21		
	CITRICHROME - 4 bottles of 90 caps	80.00	60.00		
00069	CITRUS BIOFLAVONOID - 100 caps	15.99	11.99		
	CITRUS BIOFLAVONOID - 4 bottles of 100 caps	59.28	44.46		
00818	(SUPER) CLA BLEND W/ SESAME LIGNANS - 1000 mg, 120 softgels	36.00	27.00		
	(SUPER) CLA BLEND W/ SESAME LIGNANS - 4 bottles of 120 softgels	132.00	99.00		
	(SUPER) CLA BLEND W/ SESAME LIGNANS - 10 bottles, 120 softgels	263.30	197.48		
00819	(SUPER) CLA BLEND W/ GUARANA & SESAME - 120 softgels	42.00	31.50		
	(SUPER) CLA BLEND W/ GUARANA & SESAME - 4 btl of 120 softgels	153.32	114.99		
00863	COCOA GOLD™ - 130 mg, 60 veg. caps	12.50	9.38		
	COCOA GOLD™ - 4 bottles of 60 veg. caps	44.00	33.00		
01285	COCOA GOLD™ W/ BETA-GLUCAN POWDER - 180 grams	20.00	15.00		
	COCOA GOLD™ W/ BETA-GLUCAN POWDER - 4 jars of 180 grams	72.00	54.00		
00050	COD LIVER OIL - 12 fl oz (355 ml) (Emulsified)	14.58	10.94		
	COD LIVER OIL - 4 bottles of 12 fl oz (355 ml)	49.08	36.81		
00293	COD LIVER OIL - 100 softgels (Emulsified)	9.95	7.46		
	COD LIVER OIL - 4 bottles of 100 softgels	37.52	28.14		
00922	COGNITEX W/ PREGNENOLONE & NEUROPROTECTION COMPLEX - 90 softgels	74.00	55.50		
	COGNITEX W/ PREGNENOLONE & NEUROPROTECTION COMPLEX - 4 btl of 90 softgels	266.40	199.80		
	COGNITEX W/ PREGNENOLONE & NEUROPROTECTION COMPLEX - 12 btl of 90 softgels	768.00	576.00		
00921	COGNITEX W/ O PREGNENOLONE W/ NEUROPROTECTION COMPLEX - 90 softgels	72.00	54.00		
	COGNITEX W/ O PREGNENOLONE W/ NEUROPROTECTION COMPLEX - 4 bottles of 90 softgels	256.00	192.00		
	COGNITEX W/ O PREGNENOLONE W/ NEUROPROTECTION COMPLEX - 12 bottles of 90 softgels	744.00	558.00		
00110	COMPLETE B-COMPLEX - 180 caps	21.50	16.13		
	COMPLETE B-COMPLEX - 4 bottles of 180 caps	72.00	54.00		
01374	COMPREHENSIVE NUTRIENT PACK - 30-day supply	189.00	141.75		
	COMPREHENSIVE NUTRIENT PACK - 120-day supply	684.00	513.00		
00119	COPPER CAPSULES - 2 mg, 100 caps	8.95	6.71		
	COPPER CAPSULES - 4 bottles of 100 caps	32.36	24.27		
00208	(ENHANCED) COQ10 (with Brewer's Yeast) - 30 mg, 100 caps	32.00	24.00		
	(ENHANCED) COQ10 (with Brewer's Yeast) - 4 bottles of 100 caps	108.00	81.00		
	(ENHANCED) COQ10 (with Brewer's Yeast) - 10 bottles of 100 caps	245.00	183.75		
00949	(SUPER ABSORBABLE) COQ10™ W/ d-LIMONENE - 50 mg, 60 softgels	25.00	18.75		
	(SUPER ABSORBABLE) COQ10™ W/ d-LIMONENE - 4 bottles of 60 softgels	88.00	66.00		
	(SUPER ABSORBABLE) COQ10™ W/ d-LIMONENE - 10 bottles of 60 softgels	200.00	150.00		
00950	(SUPER ABSORBABLE) COQ10™ W/ d-LIMONENE - 100 mg, 100 softgels	66.00	49.50		
	(SUPER ABSORBABLE) COQ10™ W/ d-LIMONENE - 4 bottles of 100 softgels	240.00	180.00		
	(SUPER ABSORBABLE) COQ10™ W/ d-LIMONENE - 10 bottles of 100 softgels	560.00	420.00		

SUB-TOTAL OF COLUMN 4

# Buyers Club Order Form

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No.		Retail	Member Price	Qty	Total
<b>C CONTINUED</b>					
01226	(SUPER UBIQUINOL) COQ10 - 100 mg, 60 softgels	\$56.00	\$42.00		
	(SUPER UBIQUINOL) COQ10 - 4 bot of 60 softgels	208.00	156.00		
	(SUPER UBIQUINOL) COQ10 - 10 bot of 60 softgels	480.00	360.00		
01426	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 100 mg, 60 softgels	62.00	46.50		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bot of 60 softgels	224.00	168.00		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 10 bot of 60 softgels	520.00	390.00		
01425	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 50 mg, 100 softgels	58.00	43.50		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bot of 100 softgels	212.00	159.00		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 10 bot of 100 softgels	500.00	375.00		
01427	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 50 mg, 30 softgels	20.00	15.00		
	(SUPER UBIQUINOL) COQ10 w/ENH MITOCHONDRIAL SUPPORT™ - 4 bot of 30 softgels	72.00	54.00		
01053	CORIOLUS VERSICOLOR SUPER STRENGTH - 600 mg, 150 veg. caps	99.95	74.96		
00857	COROMEGA CHILD BRAIN & BODY - (Lemon Lime) 30 packets	25.00	18.75		
	COROMEGA CHILD BRAIN & BODY - (Lemon Lime) 4 boxes of 30 packets	90.00	67.00		
80118	COSMESIS ANTI-AGING MASK - 2 oz bottle	66.60	49.95		
	COSMESIS ANTI-AGING MASK - 2-2 oz bottles	117.22	87.92		
80134	COSMESIS ANTI-GLYCATION SERUM - 1 oz bottle w/BLUEBERRY & POMEGRANATE EXTRACTS	24.00	18.00		
	COSMESIS ANTI-GLYCATION SERUM - 2-1 oz bottles w/BLUEBERRY & POMEGRANATE EXTRACTS	45.60	34.20		
80133	COSMESIS ANTI-OXIDANT FACIAL MIST - 2 oz bottle	29.95	22.46		
	COSMESIS ANTI-OXIDANT FACIAL MIST - 2-2 oz bottles	56.90	42.68		
80132	COSMESIS ANTI-OXIDANT FACIAL MIST - 4 oz bottle	39.95	29.96		
	COSMESIS ANTI-OXIDANT FACIAL MIST - 2-4 oz bottles	76.00	57.00		
80127	COSMESIS ANTI-OXIDANT REJUVENATING FOOT CREAM - 2 oz jar	39.95	29.96		
	COSMESIS ANTI-OXIDANT REJUVENATING FOOT CREAM - 2-2 oz jar	76.00	57.00		
80128	COSMESIS ANTI-OXIDANT REJUVENATING FOOT SCRUB - 2 oz jar	52.95	39.71		
	COSMESIS ANTI-OXIDANT REJUVENATING FOOT SCRUB - 2-2 oz jar	93.20	69.90		
80117	COSMESIS ANTI-OXIDANT REJUVENATING HAND CREAM - 2 oz jar	59.00	44.25		
	COSMESIS ANTI-OXIDANT REJUVENATING HAND CREAM - 2-2 oz jars	106.00	79.50		
80121	COSMESIS ANTI-OXIDANT REJUVENATING HAND SCRUB - 2 oz jar	52.95	39.71		
	COSMESIS ANTI-OXIDANT REJUVENATING HAND SCRUB - 2-2 oz jars	93.20	69.90		
80105	COSMESIS ANTI-REDNESS & BLEMISH LOTION - 1 oz	69.95	52.46		
	COSMESIS ANTI-REDNESS & BLEMISH LOTION - 2-1 oz bottles	123.12	92.34		
80120	COSMESIS CORRECTIVE CLEARING MASK - 2 oz jar	59.95	44.96		
	COSMESIS CORRECTIVE CLEARING MASK - 2-2 oz jars	105.52	79.14		
80108	COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 1 oz	71.60	53.70		
	COSMESIS ESSENTIAL PLANT LIPIDS REPARATIVE SERUM - 2-1 oz bottles	126.00	94.50		
80123	COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2 oz jar	65.00	48.75		
	COSMESIS FACE REJUVENATING ANTIOXIDANT CREAM - 2-2 oz jars	114.40	85.80		
80107	COSMESIS FINE LINE-LESS - 1 oz	69.95	52.46		
	COSMESIS FINE LINE-LESS - 2-1 oz bottles	123.12	92.34		
80131	COSMESIS HAIR SUPPRESS FORMULA - 4 oz bottle	53.75	40.31		
	COSMESIS HAIR SUPPRESS FORMULA - 2-4 oz bottles	94.60	70.95		
80115	COSMESIS HEALING MASK - 2 oz bottle	59.95	44.96		
	COSMESIS HEALING MASK - 2-2 oz bottles	105.52	79.14		
80109	COSMESIS HYALURONIC FACIAL MOISTURIZER - 1 oz	52.95	39.71		
	COSMESIS HYALURONIC FACIAL MOISTURIZER - 2 bottles of 1 oz	93.20	69.90		
80110	COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 1 oz	52.95	39.71		
	COSMESIS HYALURONIC OIL-FREE FACIAL MOISTURIZER - 2 botls of 1 oz	93.20	69.90		
80103	COSMESIS LIFTING & TIGHTENING COMPLEX - 1 oz	69.95	52.46		
	COSMESIS LIFTING & TIGHTENING COMPLEX - 2 bottles of 1 oz	123.12	92.34		
80135	COSMESIS MELATONIN CREAM - 1 oz jar	28.00	21.00		
	COSMESIS MELATONIN CREAM - 2 - 1 oz jars	46.00	34.50		

**SUB-TOTAL OF COLUMN 5**

JUNE 2010

No.		Retail	Member Price	Qty	Total
<b>D</b>					
01063	DERMA-VITS™ - 90 caps		\$14.99	\$11.24	
01313	DERMA WHEY- 400 mg, 60 caps		65.00	48.75	
	DERMA WHEY- 4 bottles of 60 caps		236.00	177.00	
00856	(BARLEAN'S KID'S) DHA (Fruit Punch Flavor) - 8 fl. oz		22.00	16.50	
	(BARLEAN'S KID'S) DHA (Fruit Punch Flavor) - 4 bottles of 8 fl. oz		80.00	60.00	
00995	DHA 240 - 240 mg, 60 softgels		19.00	14.25	
	DHA 240 - 4 bottles of 60 softgels		68.00	51.00	

**SUB-TOTAL OF COLUMN 6**

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

No.		Retail	Member Price	Qty	Total
00658	7-KETO® DHEA METABOLITE - 25 mg, 100 caps	\$28.00	\$21.00		
	7-KETO® DHEA METABOLITE - 4 bottles of 100 caps	96.00	72.00		
01271	7-KETO® DHEA METABOLITE - 100 mg, 60 veg. caps	40.00	30.00		
	7-KETO® DHEA METABOLITE - 4 bottles of 60 veg. caps	144.00	108.00		
00607	DHEA - 25 mg dissolve in mouth 100 tablets pharmaceutical-grade	14.00	10.50		
	DHEA - 4 bottles of 100 tablets pharmaceutical-grade	47.00	35.25		
01250	DHEA COMPLETE - 60 veg. caps	48.00	36.00		
	DHEA COMPLETE - 4 bottles of 60 veg. caps	172.80	129.60		
00335	DHEA - 25 mg, 100 caps	15.00	11.25		
	DHEA - 4 bottles of 100 caps	50.00	37.50		
00454	DHEA - 15 mg, 100 caps	12.00	9.00		
	DHEA - 4 bottles of 100 caps	40.00	30.00		
00882	DHEA - 50 mg, 60 caps	16.00	12.00		
	DHEA - 4 bottles of 60 caps	56.00	42.00		
00883	DHEA - 100 mg, 60 caps	22.50	16.88		
	DHEA - 4 bottles of 60 caps	76.00	57.00		
01358	DIGEST RC - 30 tablets	19.95	14.96		
	DIGEST RC - 4 boxes of 30 tablets	68.00	51.00		
01272	(ENHANCED SUPER) DIGESTIVE ENZYMES - 100 veg. caps	18.95	14.21		
	(ENHANCED SUPER) DIGESTIVE ENZYMES - 4 bottles of 100 veg. caps	64.00	48.00		
01273	(ENHANCED SUPER) DIGESTIVE ENZYMES w/PROBIOTICS - 100 veg. caps	24.00	18.00		
	(ENHANCED SUPER) DIGESTIVE ENZYMES w/PROBIOTICS - 4 bottles of 100 veg. caps	88.00	66.00		
**01042	(EUROPEAN LEG SOLUTION) DIOSMIN95 - 600 mg, 30 veg. tabs	20.00	15.00		
	(EUROPEAN LEG SOLUTION) DIOSMIN95 - 4 bottles of 30 veg. tabs	72.00	54.00		
00034	D,L-PHENYLALANINE CAPSULES - 500 mg, 100 caps	18.75	14.06		
	D,L-PHENYLALANINE CAPSULES - 4 bottles of 100 caps	64.00	48.00		
00033	D,L-PHENYLALANINE PLUS POWDER - 100 grams of powder	26.00	19.50		
	D,L-PHENYLALANINE PLUS POWDER - 4 bottles of powder	86.00	64.50		
00257	DMAE BITARTRATE - 150 mg, 200 caps	14.00	10.50		
	DMAE BITARTRATE - 4 bottles of 200 caps	42.00	31.50		
00022	DMAE POWDER (37% DMAE) - 100 grams of powder	24.00	18.00		
	DMAE POWDER (37% DMAE) - 4 bottles of powder	80.00	60.00		
00197	DMAE-GINKGO CAPSULES - 100 caps	36.00	27.00		
	DMAE-GINKGO CAPSULES - 4 bottles of 100 caps	120.00	90.00		
	DMAE-GINKGO CAPSULES - 8 bottles of 100 caps	220.00	165.00		
00059	DMG - 125 mg dimethylglycine, 60 tablets	18.50	13.88		
	DMG - 4 boxes of 60 tablets	68.00	51.00		
01052	DNA PROTECTION FORMULA - 60 veg. caps	28.00	21.00		
	DNA PROTECTION FORMULA - 4 bottles of 60 veg. caps	100.80	75.60		
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA - 2 oz	39.95	29.96		
	DR. PROCTOR'S ADVANCED HAIR FORMULA - 4 bottles	128.00	96.00		
00320	DR. PROCTOR'S HAIR FORMULA SHAMPOO - 8 oz bottle	24.95	18.71		
	DR. PROCTOR'S HAIR FORMULA SHAMPOO - 4 bottles	88.00	66.00		
00376	DR. TUNG'S TONGUE CLEANER	8.45	6.34		
	DR. TUNG'S TONGUE CLEANERS - 4 quantity	32.20	24.15		
00899	DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 2.4 net oz jar	39.95	29.96		
	DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE - 4 jars of 2.4 net oz	155.80	116.85		
00240	DUAL-C - 90 caps	12.00	9.00		
	DUAL-C - 4 bottles of 90 caps	42.00	31.50		

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

\*\* 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.

**SUB-TOTAL OF COLUMN 7**

No.		Retail	Member Price	Qty	Total
<b>E</b>					
00388	ECHINACEA - 250 mg, 60 caps	\$14.35	\$10.76		
	ECHINACEA - 4 bottles of 60 caps	50.00	37.50		
01024	EDTA - 500 mg, 100 caps	17.50	13.13		
01403	ELIGEN® B12 - 100 mcg 30 veg tablets	28.00	21.00		
	ELIGEN® B12 - 4 bottles of 30 veg tablets	100.00	75.00		
01497	ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 60 softgels	58.00	43.50		
	ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ - 4 bottles of 60 softgels	216.00	162.00		
01297	ENDOTHELIAL DEFENSE™ w/GLISODIN® and COCOAGOLD™ - 60 veg. caps	54.00	40.50		
	ENDOTHELIAL DEFENSE™ w/GLISODIN® and COCOAGOLD™ - 4 bottles of 60 veg. caps	192.00	144.00		
00048	(EMULSIFIED SUPER TWIN) EPA/DHA - 12 fl. oz.	22.45	16.84		
00625	(MEGA) EPA/DHA - 120 softgels	19.95	14.96		
	(MEGA) EPA/DHA - 4 bottles of 120 softgels	72.00	54.00		
<b>F</b>					
†01054	FACE MASTER® PLATINUM	\$199.00	\$199.00		
00965	FAST-ACTING JOINT FORMULA - 30 caps	39.00	29.25		
	FAST-ACTING JOINT FORMULA - 4 bottles of 30 caps	144.00	108.00		
20053	FEM DOPHILUS® - 30 caps	24.95	18.71		
20055	FEM DOPHILUS® - 60 caps	35.95	26.96		
01064	FEMMENESSENCE MACAPAUSE® - 120 veg. caps	34.99	26.24		
*01311	(ENHANCED) FERNBLOCK® w/SENDARA™ - 30 veg. caps	39.00	29.25		
	(ENHANCED) FERNBLOCK® w/SENDARA™ - 4 bottles of 30 veg. caps	140.00	105.00		
00229	FIBER FOOD CAPS - 200 caps	15.00	11.25		
	FIBER FOOD CAPS - 4 bottles of 200 caps	50.00	37.50		
	FIBER FOOD CAPS - 10 bottles of 200 caps	119.00	89.25		
00228	FIBER FOOD - 300 grams of powder	15.00	11.25		
	FIBER FOOD - 4 bottles of powder	50.00	37.50		
	FIBER FOOD - 10 bottles of powder	119.00	89.25		
01307	(ENHANCED) FIBER FOOD POWDER - 453 grams of powder	34.00	25.50		
	(ENHANCED) FIBER FOOD POWDER - 4 jars of powder	120.00	90.00		
00718	FIBRINOGEN RESIST FORMULA (NATTOKINASE) - 30 veg. caps	49.00	36.75		
	FIBRINOGEN RESIST FORMULA (NATTOKINASE) - 4 bottles of 30 caps	176.00	132.00		
00873	FLAXSEED POWDER (HI-LIGNAN NUTRI-FLAX) - 16 oz powder	9.95	7.46		
01200	FLORASTOR® - 250 mg, 50 caps	55.15	41.36		
01312	(OPTIMIZED) FOLATE (5-METHYLTETRAHYDROFOLATE) - 100 veg. caps	28.00	21.00		
	(OPTIMIZED) FOLATE (5-METHYLTETRAHYDROFOLATE) - 4 bottles of 100 veg. caps	100.00	75.00		
00347	FOLIC ACID + B12 CAPSULES - 200 caps	10.50	7.88		
	FOLIC ACID + B12 CAPSULES - 4 bottles of 200 caps	38.00	28.50		
00148	FOLIC ACID POWDER - 30 grams of powder	16.00	12.00		
	FOLIC ACID POWDER - 4 bottles of powder	55.00	41.25		
00300	FORSKOLIN - 10 mg, 60 caps of elemental forskolin	15.00	11.25		
	FORSKOLIN - 4 bottles of 60 caps of elemental forskolin	50.00	37.50		
00993	FUCOXANTHIN-SLIM™ - 90 softgels	44.00	33.00		
	FUCOXANTHIN-SLIM™ - 4 bottles of 90 softgels	156.00	117.00		
<b>G</b>					
00127	GABA POWDER - 100 grams of powder	\$23.75	\$17.81		
	GABA POWDER - 4 bottles of powder	90.00	67.50		
00559	GAMMA E TOCOPHEROL/TOCOTRIENOLS - 60 softgels	42.00	31.50		
	GAMMA E TOCOPHEROL/TOCOTRIENOLS - 4 bottles of 60 softgels	148.00	111.00		
00759	GAMMA E TOCOPHEROL W/SESAME LIGNANS - 60 softgels	32.00	24.00		
	GAMMA E TOCOPHEROL W/SESAME LIGNANS - 4 bottles of 60 softgels	116.00	87.00		
00612	GELATIN CAPSULES - Set of 1000 empty caps size "0"	15.00	11.25		
	GELATIN CAPSULES - 4 Sets	56.00	42.00		
00117	GELATIN CAPSULES - Set of 1000 empty caps size "00"	19.00	14.25		
	GELATIN CAPSULES - 4 Sets	72.00	54.00		
<b>SUB-TOTAL OF COLUMN 8</b>					

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail	Member Price	Qty	Total
<b>G CONTINUED</b>					
01301	GH PITUITARY SUPPORT DAY FORMULA - 120 vegetarian tabs	\$48.00	\$36.00		
	GH PITUITARY SUPPORT DAY FORMULA - 4 bottles of 120 veg. tabs	176.00	132.00		
01302	GH PITUITARY SUPPORT NIGHT FORMULA - 120 veg. caps	25.00	18.75		
	GH PITUITARY SUPPORT NIGHT FORMULA - 4 bottles of 120 veg. caps	90.00	67.50		
00778	GINKGO BILOBA CERTIFIED EXTRACT™ - 120 mg, 365 caps	46.00	34.50		
	GINKGO BILOBA CERTIFIED EXTRACT™ - 2 bottles of 365 caps	87.00	65.25		
00504	(SUPER) GINKGO EXTRACT - 120 mg, 100 caps	29.00	21.75		
	(SUPER) GINKGO EXTRACT - 4 bottles of 100 caps	106.00	79.50		
01032	(PANAX RED) GINSENG - 60 veg. caps	29.99	22.49		
00756	(MEGA) GLA WITH SESAME LIGNANS - 60 softgels	19.50	14.63		
	(MEGA) GLA WITH SESAME LIGNANS - 4 bottles of 60 softgels	72.00	54.00		
00345	(L) GLUTAMINE CAPSULES - 500 mg, 100 caps	14.95	11.21		
	(L) GLUTAMINE CAPSULES - 4 bottles of 100 caps	54.00	40.50		
00141	(L)-GLUTAMINE POWDER - 100 grams of powder	19.00	14.25		
	(L)-GLUTAMINE POWDER - 4 bottles of powder	67.52	50.64		
00522	GLUCOSAMINE/CHONDROITIN CAPSULES - 100 caps	38.00	28.50		
	GLUCOSAMINE/CHONDROITIN CAPSULES - 4 bottles of 100 caps	128.00	96.00		
00512	GLUCOFIT™ (COROSOLIC ACID) - 100 softgels	28.00	21.00		
	GLUCOFIT™ (COROSOLIC ACID) - 4 bottles of 100 softgels	100.00	75.00		
00113	GLUTATHIONE, C & CYSTEINE - 750 mg, 100 caps	18.00	13.50		
	GLUTATHIONE, C & CYSTEINE - 4 bottles of 100 caps	64.00	48.00		
00314	(MEGA) L-GLUTATHIONE - 250 mg, 60 caps	35.95	26.96		
	(MEGA) L-GLUTATHIONE - 4 bottles of 60 caps	129.44	97.08		
00795	GLYCINE CAPSULES - 1000 mg, 100 caps	12.00	9.00		
	GLYCINE CAPSULES - 4 bottles of 100 caps	43.20	32.40		
00128	GLYCINE POWDER - 300 grams of powder	18.00	13.50		
	GLYCINE POWDER - 4 bottles of powder	64.00	48.00		
01091	(WHOLE) GRAPE EXTRACT w/RESVERATROL - 60 veg. caps	36.00	27.00		
	(WHOLE) GRAPE EXTRACT w/RESVERATROL - 4 bottles of 60 veg. caps	136.00	102.00		
01411	GRAPE SEED EXTRACT w/RESVERATROL & PTEROSTILBENE-100 mg, 60 veg. caps	36.00	27.00		
	GRAPE SEED EXTRACT w/RESVERATROL & PTEROSTILBENE-4 bottles of 60 veg. caps	136.00	102.00		
00203	GREEN TEA LEAVES - 300 grams of powder	15.00	11.25		
	GREEN TEA LEAVES - 4 bottles of powder	50.00	37.50		
00953	(MEGA) GREEN TEA EXTRACT - lightly caffeinated - 100 veg. caps	28.00	21.00		
	(MEGA) GREEN TEA EXTRACT - 4 bottles of 100 veg. caps	106.00	79.50		
00954	(MEGA) GREEN TEA EXTRACT - decaffeinated - 100 veg. caps	28.00	21.00		
	(MEGA) GREEN TEA EXTRACT - 4 bottles of 100 veg. caps	106.00	79.50		
<b>H</b>					
00230	HCA - 90 caps	\$18.00	\$13.50		
	HCA - 4 bottles of 90 caps	62.00	46.50		
01405	HEALTHY HAIR SPRAY - 5 fl. oz (150 ml) 1 bottle	35.00	26.25		
	HEALTHY HAIR SPRAY - 4 bottles of 5 fl. oz	128.00	96.00		
00656	HEPATOPRO - 900 mg, 60 softgel	49.50	37.13		
	HEPATOPRO - 4 bottles of 60 softgel	188.00	141.00		
00138	HESPERIDIN COMPLEX POWDER - 300 grams of powder	19.00	14.25		
	HESPERIDIN COMPLEX POWDER - 4 bottles of powder	65.00	48.75		
00873	HI-LIGNAN NUTRI-FLAX - 16 oz powder	9.95	7.46		
00800	HOMOCYSTEINE RESIST - 100 caps	24.00	18.00		
	HOMOCYSTEINE RESIST - 4 bottles of 100 caps	86.40	64.80		
00067	HOODIA GORDONII - 60 caps	14.00	10.50		
00627	HUPERZINE A W/NATURAL VITAMIN E - 50 mcg, 60 caps	27.95	20.96		
	HUPERZINE A W/NATURAL VITAMIN E - 4 bottles of 60 caps	96.00	72.00		
00661	HYDRODERM® - 1 oz bottle	79.95	59.96		
	HYDRODERM® - 2 - 1 oz bottles	130.66	98.00		

**SUB-TOTAL OF COLUMN 9**

No.		Retail	Member Price	Qty	Total
<b>I</b>					
01060	i26 HYPERIMMUNE EGG - 140 grams of powder	\$49.99	\$42.00		
01065	IDEAL BOWEL SUPPORT 299V - 30 veg. caps	21.95	16.46		
00955	IMMUNE PROTECT W/PARACTIN® - 30 veg. caps	29.50	22.13		
	IMMUNE PROTECT W/PARACTIN® - 4 bottles of 30 veg. caps	106.20	79.65		
01049	INNERPOWER™ W/SWEET STEVIA - Tropical Flavor Powder	42.00	31.50		
00155	INOSINE CAPSULES - 500 mg, 60 caps	22.95	17.21		
	INOSINE CAPSULES - 4 bottles of 60 caps	84.00	63.00		
00140	INOSINE POWDER - 100 grams of powder	52.00	39.00		
	INOSINE POWDER - 4 bottles of powder	180.00	135.00		
00109	INOSITOL CAPSULES - 500 mg, 100 caps	14.99	11.24		
	INOSITOL CAPSULES - 4 bottles of 100 caps	55.16	41.37		
00410	INOSITOL CAPSULES - 1000 mg, 360 caps	48.00	36.00		
	INOSITOL CAPSULES - 4 bottles of 360 caps	175.00	131.25		
00108	INOSITOL POWDER - 100 grams of powder	18.00	13.50		
	INOSITOL POWDER - 4 bottles of powder	67.52	50.64		
01021	INTACT™ DIGEST - 8 fl oz	29.95	22.46		
	INTACT™ DIGEST - 4 - 8 fl oz bottles	112.00	84.00		
01292	INTEGRA-LEAN® IRVINGIA - 150 mg, 60 veg. caps	44.00	33.00		
	INTEGRA-LEAN® IRVINGIA - 4 bottles of 60 veg. caps	160.00	120.00		
01002	IODORAL - 180 caps	50.00	37.50		
00563	IRON PROTEIN PLUS - 300 mg, 100 caps	24.00	18.00		
	IRON PROTEIN PLUS - 4 bottles of 100 caps	88.00	66.00		
01492	(OPTIMIZED) IRVINGIA W/PHASE 3™ - 120 veg. caps	64.00	48.00		
	(OPTIMIZED) IRVINGIA w/PHASE 3™ - 4 bottles of 120 veg. caps	240.00	180.00		
<b>J, K</b>					
00056	JARRO-DOPHILUS EPS™ - 60 veg. caps	\$19.95	\$14.96		
01224	(SUPER) K WITH ADVANCED K2 COMPLEX - 90 softgels	26.00	19.50		
	(SUPER) K WITH ADVANCED K2 COMPLEX - 4 bottles of 90 softgels	92.00	69.00		
01050	NKO KRILL OIL - 60 softgels	33.95	25.46		
00316	KYOLIC® GARLIC FORMULA 102 - 350 mg, 200 caps	23.95	17.96		
	KYOLIC® GARLIC FORMULA 102 - 4 bottles of 200 caps	82.00	61.50		
00214	KYOLIC® GARLIC FORMULA 105 - 200 caps	22.95	17.21		
	KYOLIC® GARLIC FORMULA 105 - 4 bottles of 200 caps	73.00	54.75		
00789	KYOLIC® RESERVE - 600 mg, 120 caps	24.75	18.56		
	KYOLIC® RESERVE - 4 bottles of 120 caps	85.80	64.36		
<b>L</b>					
00513	LACTOFERRIN (APOLACTOFERRIN) CAPS - 300 mg, 60 caps	\$40.00	\$30.00		
	LACTOFERRIN (APOLACTOFERRIN) CAPS - 4 bottles of 60 caps	144.00	108.00		
00017	LAVILIN UNDERARM DEODORANT - 12.5 grams of cream	15.00	11.25		
	LAVILIN UNDERARM DEODORANT - 4 jars of cream	55.00	41.25		
01003	LIFE EXTENSION CAT MIX - 100 grams of powder	15.00	11.25		
	LIFE EXTENSION CAT MIX - 4 bottles of powder	48.00	36.00		
00544	LIFE EXTENSION DOG MIX - 100 grams of powder	19.50	14.63		
	LIFE EXTENSION DOG MIX - 4 bottles of powder	64.00	48.00		
00010	LIFE EXTENSION HAIR CONDITIONER - 16 oz bottle	6.00	4.50		
	LIFE EXTENSION HAIR CONDITIONER - 4 bottles	18.00	13.50		
00020	LIFE EXTENSION LECITHIN GRANULES - 16 oz. jar	15.00	11.25		
	LIFE EXTENSION LECITHIN GRANULES - 4 jars	50.00	37.50		
00019	LIFE EXTENSION LECITHIN w/B5 AND BHA - 16 oz. jar	15.00	11.25		
	LIFE EXTENSION LECITHIN w/B5 AND BHA - 4 16 oz. 4 jars	50.00	37.50		
01455	LIFE EXTENSION MIX™ - 315 tablets	98.00	73.50		
	LIFE EXTENSION MIX™ - 4 bottles of 315 tablets	344.00	258.00		
	LIFE EXTENSION MIX™ - 10 bottles of 315 tablets	695.00	521.25		

**SUB-TOTAL OF COLUMN 10**

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

No.		Retail	Member Price	Qty	Total
01457	LIFE EXTENSION MIX™ w/EXTRA NIACIN - 315 tablets	\$98.00	\$73.50		
	LIFE EXTENSION MIX™ w/EXTRA NIACIN - 4 bottles of 315 tablets	344.00	258.00		
	LIFE EXTENSION MIX™ w/EXTRA NIACIN - 10 bottles of 315 tablets	695.00	521.25		
01454	LIFE EXTENSION MIX™ - 490 caps	110.00	82.50		
	LIFE EXTENSION MIX™ - 4 bottles of 490 caps	392.00	294.00		
	LIFE EXTENSION MIX™ - 10 bottles of 490 caps	850.00	637.50		
01456	LIFE EXTENSION MIX™ POWDER - 14.81 oz of powder	98.00	73.50		
	LIFE EXTENSION MIX™ POWDER - 4 bottles of powder	344.00	258.00		
	LIFE EXTENSION MIX™ POWDER - 10 bottles of powder	720.00	540.00		
01465	LIFE EXTENSION MIX™ - 315 tablets without copper	98.00	73.50		
	LIFE EXTENSION MIX™ - 4 bottles of 315 tablets without copper	344.00	258.00		
	LIFE EXTENSION MIX™ - 10 bottles of 315 tablets without copper	695.00	521.25		
01467	LIFE EXTENSION MIX™ W/EXTRA NIACIN 315 tablets w/o copper	98.00	73.50		
	LIFE EXTENSION MIX™ W/EXTRA NIACIN 4 bottles of 315 tablets w/o copper	344.00	258.00		
	LIFE EXTENSION MIX™ W/EXTRA NIACIN 10 bottles of 315 tablets w/o copper	695.00	521.25		
01464	LIFE EXTENSION MIX™ - 490 caps without copper	110.00	82.50		
	LIFE EXTENSION MIX™ - 4 bottles of 490 caps without copper	392.00	294.00		
	LIFE EXTENSION MIX™ - 10 bottles of 490 caps without copper	850.00	637.50		
01466	LIFE EXTENSION MIX™ POWDER - 14.81 oz of powder without copper	98.00	73.50		
	LIFE EXTENSION MIX™ POWDER - 4 bottles of powder without copper	344.00	258.00		
	LIFE EXTENSION MIX™ POWDER - 10 bottles of powder without copper	720.00	540.00		
01279	LIFE EXTENSION MOUTHWASH w/POMEGRANATE - 16 oz bottle	18.50	13.88		
	LIFE EXTENSION MOUTHWASH w/POMEGRANATE - 4 -16 oz bottle	68.00	51.00		
01401	LIFE EXTENSION ONE-PER-DAY - 60 veg. tablets	19.95	14.96		
	LIFE EXTENSION ONE-PER-DAY - 4 bottles of 60 veg. tablets	72.00	54.00		
00011	LIFE EXTENSION SHAMPOO - 16 oz bottle	6.00	4.50		
	LIFE EXTENSION SHAMPOO - 4 bottles	19.00	14.25		
01278	LIFE EXTENSION TOOTHPASTE MINT FLAVOR - 4 oz	9.50	7.13		
	LIFE EXTENSION TOOTHPASTE MINT FLAVOR - 4, 4 oz tubes	34.68	26.00		
01416	LIFE EXTENSION TWO-PER-DAY - 60 veg. tablets	9.95	7.46		
	LIFE EXTENSION TWO-PER-DAY - 4 bottles of 60 veg. tablets	36.00	27.00		
01415	LIFE EXTENSION TWO-PER-DAY - 120 veg. tablets	18.95	14.21		
	LIFE EXTENSION TWO-PER-DAY - 4 bottles of 120 veg. tablets	68.00	51.00		
00263	LIFE FLORA™ - 300 mg, 120 caps	20.50	15.38		
	LIFE FLORA™ - 4 bottles of 120 caps	75.00	56.25		
00032	LIFE MIX - 1 lb can of powder	25.00	18.75		
	LIFE MIX - 4 cans of powder	90.00	67.50		
00294	LIQUID EMULSIFIED VITAMIN A DROPS - 20,000 IU per drop	27.00	20.25		
	LIQUID EMULSIFIED VITAMIN A DROPS - 4 bottles	96.00	72.00		
00939	5-LOXIN® - 75 mg, 100 veg. caps	19.50	14.63		
	5-LOXIN® - 4 bottles of 100 veg. caps	69.00	51.75		
01013	L-LYSINE CAPSULES - 620 mg, 100 caps	9.00	6.75		
	L-LYSINE CAPSULES - 4 bottles of 100 caps	32.00	24.00		
00129	L-LYSINE POWDER - 300 grams of powder	16.00	12.00		
	L-LYSINE POWDER - 4 bottles of powder	55.00	41.25		
01017	LUSTRE™ - 90 tablets	17.50	13.13		
	LUSTRE™ - 4 bottles of 90 tablets	62.00	46.50		
01014	LUTEIN PLUS - 150 grams of powder	25.00	18.75		
	LUTEIN PLUS - 4 bottles of powder	88.00	66.00		
01028	LYCOPENE - 10 mg, 60 softgels	24.98	18.74		
00455	(MEGA) LYCOPENE EXTRACT - 15 mg, 90 softgels	35.00	26.25		
	(MEGA) LYCOPENE EXTRACT - 4 bottles of 90 softgels	120.00	90.00		

SUB-TOTAL OF COLUMN 11

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

No.		Retail	Member Price	Qty	Total
<b>M</b>					
01044	MAGNESIUM CAPS - 500 mg, 100 caps	\$9.50	\$7.13		
	MAGNESIUM CAPS - 4 bottles of 100 caps	32.00	24.00		
00502	MAGNESIUM CITRATE CAPS - 160 mg, 100 caps	9.00	6.75		
	MAGNESIUM CITRATE CAPS - 4 bottles of 100 caps	30.00	22.50		
00057	MAGNESIUM OXIDE POWDER - 1 kilogram of powder	14.00	10.50		
	MAGNESIUM OXIDE POWDER - 4 bottles of powder	52.52	39.39		
00704	MAITAKE™ SX-FRACTION - 90 veg. tablets	49.95	37.46		
00547	MELATONIN - 300 mcg, 100 caps	5.75	4.31		
	MELATONIN - 4 bottles of 100 caps	20.00	15.00		
00328	MELATONIN CAPSULES - 500 mcg, 200 caps	16.00	12.00		
	MELATONIN CAPSULES - 4 bottles of 200 caps	56.00	42.00		
00329	MELATONIN CAPSULES - 1 mg, 60 caps	5.00	3.75		
	MELATONIN CAPSULES - 4 bottles of 60 caps	18.52	13.89		
00330	MELATONIN CAPSULES - 3 mg, 60 caps	8.00	6.00		
	MELATONIN CAPSULES - 4 bottles of 60 caps	27.52	20.64		
00333	MELATONIN CAPSULES - 3 mg, 60 time-release caps	10.50	7.88		
	MELATONIN CAPSULES - 4 bottles of 60 time-release caps	37.52	28.14		
00331	MELATONIN CAPSULES - 10 mg, 60 caps	28.00	21.00		
	MELATONIN CAPSULES - 4 bottles of 60 caps	96.00	72.00		
00332	MELATONIN LOZENGES - 3 mg, 60 dissolve-in-mouth lozenges	8.00	6.00		
	MELATONIN LOZENGES - 4 bottles of 60 dissolve-in-mouth lozenges	27.52	20.64		
00546	MELATONIN TIME RELEASE - 300 mcg, 100 caps	6.25	4.69		
	MELATONIN TIME RELEASE - 4 bottles of 100 caps	22.52	16.89		
00540	MELATONIN TIME RELEASE - 750 mcg, 60 caps	5.75	4.31		
	MELATONIN TIME RELEASE - 4 bottles of 60 caps	20.00	15.00		
01009	MEMORY UPGRADE - 600 grams powder	26.95	20.21		
01047	MENOPAUSE SOLUTIONS - 120 tablets	49.95	37.46		
00536	METHYLCOBALAMIN - 1 mg, 60 dissolve-in-mouth lozenges (vanilla)	9.95	7.46		
	METHYLCOBALAMIN - 4 bottles of 60 dissolve-in-mouth lozenges	32.00	24.00		
00537	METHYLCOBALAMIN - 5 mg, 60 dissolve-in-mouth lozenges (vanilla)	32.00	24.00		
	METHYLCOBALAMIN - 4 bottles of 60 dissolve-in-mouth lozenges	100.00	75.00		
	METHYLCOBALAMIN - 10 bottles of 60 dissolve-in-mouth lozenges	230.00	172.50		
00130	L-METHIONINE POWDER - 100 grams of powder	22.00	16.50		
	L-METHIONINE POWDER - 4 bottles of powder	75.00	56.25		
00709	MIGRA-EEZE (BUTTERBUR) - 60 softgels	29.50	22.13		
	MIGRA-EEZE (BUTTERBUR) - 4 bottles of 60 softgels	105.32	79.00		
00623	MINERAL FORMULA FOR MEN - 100 caps	15.00	11.25		
	MINERAL FORMULA FOR MEN - 4 bottles of 100 caps	50.00	37.50		
	MINERAL FORMULA FOR MEN - 12 bottles of 100 caps	130.00	97.50		
00624	MINERAL FORMULA FOR WOMEN - 100 caps	15.00	11.25		
	MINERAL FORMULA FOR WOMEN - 4 bottles of 100 caps	50.00	37.50		
	MINERAL FORMULA FOR WOMEN - 12 bottles of 100 caps	130.00	97.50		
01315	(SUPER) MIRAFORTE w/STANDARDIZED LIGNANS - 120 caps	62.00	46.50		
	(SUPER) MIRAFORTE w/STANDARDIZED LIGNANS - 4 bottles of 120 caps	224.00	168.00		
01368	MITOCHONDRIAL ENERGY OPTIMIZER - 120 caps	86.00	64.50		
	MITOCHONDRIAL ENERGY OPTIMIZER - 4 bottles of 120 caps	312.00	234.00		
00803	MISTORAL III w/COQ10 - 2 fl oz bottle	28.00	21.00		
	MISTORAL III w/COQ10 - 4 bottles	101.32	75.99		
00065	MK-7 - 90 mcg, 60 softgels	28.00	21.00		
	MK-7 - 4 bottles of 60 softgels	100.00	75.00		
00451	MSM (METHYL-SULFONYL-METHANE) - 1000 mg, 100 caps	14.00	10.50		
	MSM (METHYL-SULFONYL-METHANE) - 4 bottles of 100 caps	47.80	35.85		

SUB-TOTAL OF COLUMN 12

JUNE 2010

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail	Member Price	Qty	Total
<b>N</b>					
00215	N-ACETYL CYSTEINE CAPSULES - 600 mg, 60 caps	\$14.00	\$10.50		
	N-ACETYL CYSTEINE CAPSULES - 4 bottles of 60 caps	54.00	40.50		
00168	NAPCA W/ALOE VERA - 8 fl oz bottle	10.00	7.50		
	NAPCA W/ALOE VERA - 4 bottles	36.60	27.45		
00066	NATTOKINASE - 60 softgels	24.98	18.74		
00718	NATTOKINASE (FIBRINOPEN RESIST FORMULA) - 30 caps	49.00	36.75		
	NATTOKINASE (FIBRINOPEN RESIST FORMULA) - 4 bottles of 30 caps	176.00	132.00		
00891	NATURAL APPETITE CONTROL - 90 softgels	28.00	21.00		
	NATURAL APPETITE CONTROL - 4 bottles of 90 softgels	100.80	75.60		
00984	NATURAL BP MANAGEMENT - 60 tablets	42.00	31.50		
	NATURAL BP MANAGEMENT - 4 bottles of 60 tablets	151.20	113.40		
00913	NATURAL ESOPHAGUARD - 10 softgels	19.95	14.96		
	NATURAL ESOPHAGUARD - 2 boxes of 10 softgels	38.00	28.50		
00712	NATURAL ESTROGEN W/POMEGRANATE EXTRACT - 60 caplets	38.00	28.50		
	NATURAL ESTROGEN W/POMEGRANATE EXTRACT - 4 bottles of 60 caplets	132.00	99.00		
01221	NATURAL FEMALE SUPPORT - 30 veg. caps	28.00	21.00		
	NATURAL FEMALE SUPPORT - 4 bottles of 30 veg. caps	96.00	72.00		
00698	NATURAL RELIEF 1222™ - 2 oz tube	28.00	21.00		
	NATURAL RELIEF 1222™ - 4, 2 oz tubes	100.00	75.00		
00990	NATURAL SLEEP - 3 mg, 60 caps	12.99	9.74		
	NATURAL SLEEP - 4 bottles of 60 caps	40.00	30.00		
00277	NATURAL SLEEP MELATONIN - 5 mg, 60 caps	18.00	13.50		
	NATURAL SLEEP MELATONIN - 4 bottles of 60 caps	64.00	48.00		
00987	NATURAL STRESS RELIEF - 30 veg. caps	28.00	21.00		
	NATURAL STRESS RELIEF - 4 bottles of 30 veg. caps	96.00	72.00		
01000	NEW FACE SOLUTION - 1.7 oz bottle	54.00	40.50		
	NEW FACE SOLUTION - 4 bottles of 1.7 oz	196.00	147.00		
00096	NIACIN (B-3) CAPSULES - 1000 mg, 100 caps	12.75	9.56		
	NIACIN (B-3) CAPSULES - 4 bottles of 100 caps	48.00	36.00		
00372	NIACIN (B-3) CAPSULES - 500 mg, 100 caps	7.65	5.74		
	NIACIN (B-3) CAPSULES - 4 bottles of 100 caps	26.60	19.95		
00373	NO-FLUSH NIACIN - 800 mg, 100 caps	19.00	14.25		
	NO-FLUSH NIACIN - 4 bottles of 100 caps	68.00	51.00		
00262	NUTRAFLORA - 500 grams of powder	46.00	34.50		
	NUTRAFLORA - 4 bottles of powder	160.00	120.00		
01035	NUTRIM POWDER - 170 grams powder	25.95	19.46		
00523	N-ZIMES® - 270 caps	23.90	17.93		
	N-ZIMES® - 4 bottles of 270 caps	88.00	66.00		
<b>O</b>					
00104	OCTACOSANOL - 8000 mcg, 60 caps	\$17.99	\$13.49		
	OCTACOSANOL - 4 bottles of 60 caps	62.96	47.22		
01483	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 60 softgels	18.00	13.50		
	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 4 bottles of 60 softgels	64.00	48.00		
01482	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 120 softgels	32.00	24.00		
	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 4 bottles of 120 softgels	112.00	84.00		
	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT - 10 bottles of 120 softgels	249.00	186.75		
01484	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT (ENTERIC COATED) - 120 softgels	34.00	25.50		
	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT (ENTERIC COATED) - 4 bottles of 120 softgels	124.00	93.00		
	(SUPER) OMEGA 3 EPA/DHA W/SESAME LIGNANS & OLIVE FRUIT EXTRACT (ENTERIC COATED) - 10 bottles of 120 softgels	280.00	210.00		
<b>SUB-TOTAL OF COLUMN 13</b>					

JUNE 2010

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

No.		Retail	Member Price	Qty	Total
<b>P</b>					
00717	ONLY TRACE MINERALS - 90 caps	\$15.00	\$11.25		
	ONLY TRACE MINERALS - 4 bottles of 90 caps	50.00	37.50		
00915	OPTIZINC® - 30 mg, 90 veg. caps	5.95	4.46		
	OPTIZINC® - 4 bottles of 90 veg. caps	20.00	15.00		
00043	L-ORNITHINE CAPSULES - 500 mg, 100 caps	24.95	18.71		
	L-ORNITHINE CAPSULES - 4 bottles of 100 caps	80.00	60.00		
<b>0</b>					
00107	PABA CAPS - 500 mg, 100 caps	\$13.99	\$10.49		
	PABA CAPS - 4 bottles of 100 caps	49.32	36.99		
00106	PABA POWDER - 100 grams of powder	15.00	11.25		
	PABA POWDER - 4 bottles of 100 grams of powder	55.00	41.25		
00073	PANCREATIN - 500 mg, 50 caps	11.99	8.99		
	PANCREATIN - 4 bottles of 50 caps	43.96	32.97		
00137	PAPAIN POWDER - 100 grams of powder	24.00	18.00		
	PAPAIN POWDER - 4 bottles of powder	80.00	60.00		
00923	PEAK ATP® WITH GLYCOCARN® - 60 tablets	59.00	44.25		
	PEAK ATP® WITH GLYCOCARN® - 4 bottles of 60 tablets	224.00	168.00		
00342	PECTA-SOL - One-month supply modified citrus pectin	99.95	74.96		
	PECTA-SOL - Four-month supply modified citrus pectin	382.80	287.10		
00872	PGX FIBER POWDER (SLIMSTYLES) - 6.4 oz powder	22.95	17.21		
00673	(WELLBETX) PGX SOLUBLE FIBER BLEND -180 caps	34.95	26.21		
00865	PHARMAGABA™ - 60 chewable tablets	29.95	22.46		
	PHARMAGABA™ - 4 bottles of 60 chewable tablets	108.00	81.00		
00131	L-PHENYLALANINE POWDER - 100 grams of powder	28.00	21.00		
	L-PHENYLALANINE POWDER - 4 bottles of powder	100.00	75.00		
00368	PHOSPHATIDYLSERINE CAPS - 100 mg, 100 caps	54.00	40.50		
	PHOSPHATIDYLSERINE CAPS - 4 bottles of 100 caps	192.00	144.00		
01050	PHOSPHOMEZA™ KRILL OIL - 60 softgels	33.95	25.46		
01016	PHYTO-FOOD - 80 grams of powder	46.00	34.50		
	PHYTO-FOOD - 4 bottles of powder	172.00	129.00		
00614	PILL CUTTER/GRINDER	11.95	8.96		
00561	POLICOSANOL - 10 mg, 60 tablets	24.00	18.00		
	POLICOSANOL - 6 bottles of 60 tablets	108.00	81.00		
00994	(SUPER) POLYPHENOL EXTRACT W/ COCOAGOLD™ - 30 veg caps	24.00	18.00		
	(SUPER) POLYPHENOL EXTRACT W/ COCOAGOLD™ - 4 bottles of 30 veg. caps	84.00	63.00		
01423	(FULL-SPECTRUM) POMEGRANATE™ - 30 softgels	24.00	18.00		
	(FULL-SPECTRUM) POMEGRANATE™ - 4 bottles of 30 softgels	84.00	63.00		
00956	POMEGRANATE EXTRACT - 30 veg. caps	19.50	14.63		
	POMEGRANATE EXTRACT - 4 bottles of 30 veg. caps	70.20	52.64		
01256	POMEGRANATE EXTRACT W/ COCOAGOLD™ - 30 veg caps	24.00	18.00		
	POMEGRANATE EXTRACT W/ COCOAGOLD™ - 4 bottles of 30 veg caps	84.00	63.00		
00957	POMEGRANATE JUICE CONCENTRATE - 16 oz. liquid	25.95	19.46		
	POMEGRANATE JUICE CONCENTRATE - 4 bottles of 16 oz liquid	96.00	72.00		
00577	POTASSIUM IODIDE - 1 box, 14 tablets	6.95	5.21		
	POTASSIUM IODIDE - 4 boxes, 14 tablets	21.00	15.75		
00302	PREGNENOLONE CAPSULES - 50 mg, 100 caps	24.00	18.00		
	PREGNENOLONE CAPSULES - 4 bottles of 100 caps	76.00	57.00		
00700	PREGNENOLONE CAPSULES - 100 mg, 100 caps	26.00	19.50		
	PREGNENOLONE CAPSULES - 4 bottles of 100 caps	90.00	67.50		
*01373	PRELOX® NATURAL SEX FOR MEN® - 60 tablets	50.00	37.50		
	PRELOX® NATURAL SEX FOR MEN® - 4 bottles of 60 tablets	180.00	135.00		
00571	PRIMAL DEFENSE® - 900 mg, 90 caplets	49.95	37.46		
	PRIMAL DEFENSE® - 4 bottles of 90 caplets	194.00	145.50		
01019	PRIMAL DEFENSE® - 180 caplets	78.95	59.21		
00525	PROBOOST THYMIC PROTEIN A™ - 4 mcg, 30 packets	72.00	54.00		
	PROBOOST THYMIC PROTEIN A™ - 4 boxes	280.00	210.00		
<b>SUB-TOTAL OF COLUMN 14</b>					

\* Product cannot be sold outside the USA.

**SUB-TOTAL OF COLUMN 14**

No.		Retail	Member Price	Qty	Total
00869	PRO FEM CREAM - 2 oz jar, Progesterone Cream	\$26.00	\$19.50		
	PRO FEM CREAM - 4, 2 oz jars, Progesterone Cream	96.00	72.00		
01020	PROGREENS® - 15 stick pack	22.50	16.88		
00396	PRO M - 500 mg, 100 caps	28.00	21.00		
	PRO M - 4 bottles of 100 caps	104.00	78.00		
*01495	(ULTRA NAT) PROSTATE FORMULA W/ 5-LOXIN® STAND. LIGNANS-60 softgels	38.00	28.50		
	(ULTRA NAT) PROSTATE FORMULA W/ 5-LOXIN® STAND. LIGNANS-4 bot of 60 softgels	140.00	105.00		
	(ULTRA NAT) PROSTATE FORMULA W/ 5-LOXIN® STAND. LIGNANS-12 bot of 60 softgels	384.00	288.00		
01092	(ENHANCED LIFE EXTENSION) PROTEIN (VANILLA) - 1 kg. of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (VANILLA) - 4 bot of powder	144.00	108.00		
01093	(ENHANCED LIFE EXTENSION) PROTEIN (CHOCOLATE) - 1 kg of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (CHOCOLATE) - 4 bot of powder	144.00	108.00		
01094	(ENHANCED LIFE EXTENSION) PROTEIN (NATURAL) - 1 kg of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (NATURAL) - 4 bot of powder	144.00	108.00		
01095	(ENHANCED LIFE EXTENSION) PROTEIN (BERRY) - 1 kg of powder	38.00	28.50		
	(ENHANCED LIFE EXTENSION) PROTEIN (BERRY) - 4 bot of powder	144.00	108.00		
00290	(DESIGNER WHEY) PROTEIN - Vanilla 2 lbs of powder	41.95	31.46		
	(DESIGNER WHEY) PROTEIN - 4 bottles of Vanilla powder	152.00	114.00		
00282	(DESIGNER WHEY) PROTEIN - Chocolate 2 lbs of powder	41.95	31.46		
	(DESIGNER WHEY) PROTEIN - 4 bottles of Chocolate powder	152.00	114.00		
00283	(DESIGNER WHEY) PROTEIN - Natural 2 lbs of powder	41.95	31.46		
	(DESIGNER WHEY) PROTEIN - 4 bottles of Natural powder	152.00	114.00		
01056	PURE-GAR® - 200 caps	24.95	18.71		
	PURE-GAR® - 4 bottles of 200 caps	84.00	63.00		
01209	(WATER-SOLUBLE) PUMPKIN SEED EXTRACT - 60 veg. caps	20.00	15.00		
	(WATER-SOLUBLE) PUMPKIN SEED EXTRACT - 4 bottles 60 veg. caps	72.00	54.00		
01210	(WATER-SOLUBLE) PUMPKIN SEED EXT W/SOY ISOFLAVONES - 60 veg. caps	22.00	16.50		
	(WATER-SOLUBLE) PUMPKIN SEED EXT W/SOY ISOFLAVONES - 4 bottles 60 veg.	80.00	60.00		
01031	PYCGNOGENOL® - 60 veg. caps	86.95	65.21		
01207	PYRIDOXAMINE CAPS - 50 mg, 60 veg. caps	22.00	16.50		
	PYRIDOXAMINE CAPS - 4 bottles of 60 veg. caps	79.20	59.40		
<b>Q, R</b>					
01309	(OPTIMIZED) QUERCETIN - 250 mg, 60 veg. caps	\$18.00	\$13.50		
	(OPTIMIZED) QUERCETIN - 4 bottles of 60 veg. caps	68.00	51.00		
01030	RED YEAST RICE (Bluebonnet) - 600 mg, 60 veg. caps	16.95	12.71		
00979	RED YEAST RICE (Nature's Plus) - 600 mg, 60 veg. caps	23.20	17.40		
00060	RED YEAST RICE EXTENDED RELEASE (Nature's Plus) - 30 veg. tablets	20.55	15.41		
00605	REGIMINT® - 60 enteric-coated caps	19.95	14.96		
	REGIMINT® - 4 bottles of 60 caps	74.68	56.01		
00448	REJUVENEX® BODY LOTION - 6 oz tube	24.00	18.00		
	REJUVENEX® BODY LOTION - 4 tubes	79.20	59.40		
	REJUVENEX® BODY LOTION - 8 tubes	136.00	102.00		
00918	REJUVENEX® FACTOR - 1.7 oz Airless pump bottle	65.00	48.75		
	REJUVENEX® FACTOR - 2 bottles	120.00	90.00		
	REJUVENEX® FACTOR - 4 bottles	220.00	165.00		
	REJUVENEX® FACTOR - 8 bottles	399.28	299.46		
01220	(ULTRA) REJUVENEX® - 2 oz jar	52.00	39.00		
	(ULTRA) REJUVENEX® - 2 jars	96.00	72.00		
	(ULTRA) REJUVENEX® - 4 jars	176.00	132.00		
	(ULTRA) REJUVENEX® - 8 jars	319.44	239.38		
00676	(ULTRA) REJUVENIGHT (DREAM CREAM) - 2 oz jar	39.95	29.96		
	(ULTRA) REJUVENIGHT (DREAM CREAM) - 4 jars	144.00	108.00		
00706	(ULTRA) REJUVENIGHT W/PROGESTERONE - 2 oz jar	42.00	31.50		
	(ULTRA) REJUVENIGHT W/PROGESTERONE - 4 jars	152.00	114.00		

SUB-TOTAL OF COLUMN 15

No.		Retail	Member Price	Qty	Total
01413	RESVERATROL w/PTEROSTILBENE - 20 mg, 60 veg. caps	\$24.00	\$18.00		
	RESVERATROL w/PTEROSTILBENE - 4 bottles of 60 veg. caps	88.00	66.00		
01410	RESVERATROL w/PTEROSTILBENE - 100 mg, 60 veg. caps	36.00	27.00		
	RESVERATROL w/PTEROSTILBENE - 4 bottles of 60 veg. caps	128.00	96.00		
01409	(OPTIMIZED) RESVERATROL w/PTEROSTILBENE - 250 mg, 60 veg. caps	46.00	34.50		
	(OPTIMIZED) RESVERATROL w/PTEROSTILBENE - 4 bottles of 60 veg. caps	165.32	124.00		
00889	RHODIOLA EXTRACT - 250 mg, 60 veg. caps	11.75	8.81		
	RHODIOLA EXTRACT - 4 bottles of 60 veg. caps	42.32	31.74		
00972	(D) RIBOSE POWDER - 150 grams of powder	27.50	20.63		
	(D) RIBOSE POWDER - 4 jars of 150 grams	99.00	74.25		
00973	(D) RIBOSE CAPS - 120 veg. caps	32.00	24.00		
	(D) RIBOSE CAPS - 4 bottles of 120 veg. caps	115.20	86.40		
01208	(SUPER) R-LIPOIC ACID - 300 mg, 60 veg. caps	49.00	36.75		
	(SUPER) R-LIPOIC ACID - 4 bottles of 60 veg. caps	180.00	135.00		
00070	RNA CAPSULES - 500 mg, 100 caps	17.95	13.46		
	RNA CAPSULES - 4 bottles of 100 caps	64.64	48.48		
00143	RNA POWDER - 100 grams of powder	24.00	18.00		
	RNA POWDER - 4 bottles of powder	80.00	60.00		
00917	ROSMARINIC ACID EXTRACT - 60 veg. caps	38.00	28.50		
	ROSMARINIC ACID EXTRACT - 4 bottles of 60 veg. caps	144.00	108.00		
00139	RUTIN POWDER - 100 grams of powder	15.50	11.63		
	RUTIN POWDER - 4 bottles of powder	55.00	41.25		
<b>S</b>					
**00573	SAMBU GUARD - 175 ml	\$17.49	\$13.99		
00358	SAME (S-ADENOSYL-METHIONINE) - 200 mg, 20 enteric coated tablets	18.95	14.21		
	SAME (S-ADENOSYL-METHIONINE) - 8 boxes of 20 enteric coated tablets	132.80	99.60		
00453	SAME (S-ADENOSYL-METHIONINE) - 200 mg, 50 enteric coated tablets	45.00	33.75		
	SAME (S-ADENOSYL-METHIONINE) - 4 bottles of 50 enteric coated tablets	156.00	117.00		
00557	SAME (S-ADENOSYL-METHIONINE) - 400 mg, 20 enteric coated tablets	35.00	26.25		
	SAME (S-ADENOSYL-METHIONINE) - 6 boxes of 20 enteric coated tablets	168.00	126.00		
01043	SEA-IODINE™ - 1000 mcg, 60 veg. caps	8.00	6.00		
	SEA-IODINE™ - 4 bottles of 60 veg. caps	28.80	21.60		
00046	SELENIUM - 2 oz dropper bottle	9.45	7.09		
	SELENIUM - 4 bottles of 2 oz bottle	36.00	27.00		
00567	SE-METHYLELENOCYSTEINE - 200 mcg, 100 caps	12.00	9.00		
	SE-METHYLELENOCYSTEINE - 4 bottles of 100 caps	44.00	33.00		
00318	SERRAFLAZYME - 100 tablets	18.00	13.50		
	SERRAFLAZYME - 4 bottles of 100 tablets	64.00	48.00		
00339	SHARK-A CARTILAGE - 750 mg, 270 caps	68.00	51.00		
	SHARK-A CARTILAGE - 4 bottles of 270 caps	255.00	191.25		
00284	SHARK LIVER OIL (NORWEGIAN) - 1000 mg, 30 softgels	18.00	13.50		
	SHARK LIVER OIL (NORWEGIAN) - 4 bottles of 30 softgels	64.00	48.00		
00184	SILYMARIN - 100 mg, 50 caps	9.25	6.94		
	SILYMARIN - 4 bottles of 50 caps	33.00	24.75		
00702	(MEGA) SILYMARIN WITH ISOSILYBIN B - 100 caps	42.00	31.50		
	(MEGA) SILYMARIN WITH ISOSILYBIN B - 4 bottles of 100 caps	152.00	114.00		
00872	SLIMSTYLES PGX® - 6.4 oz powder	22.95	17.21		
00961	SODZYME® W/GLISODIN® AND WOLFBERRY - 90 veg. caps	28.00	21.00		
	SODZYME® W/GLISODIN® AND WOLFBERRY - 4 bottles of 90 veg. caps	96.00	72.00		
00657	SOLARSHIELD SUNGLASSES - 1 pair smoke color	12.99	9.74		
	SOLARSHIELD SUNGLASSES - 2 pair smoke color	23.00	17.25		
01097	(ULTRA) SOY EXTRACT - 600 veg. caps	349.00	261.75		
	(ULTRA) SOY EXTRACT - 4 bottles of 600 veg. caps	1260.00	945.00		

SUB-TOTAL OF COLUMN 16

\* Product cannot be sold outside the USA.

\*\* These products are not 25% off retail price.

# Buyers Club Order Form

To order call: 1.954.766.8433 or 1.800.544.4440

No.		Retail	Member Price	Qty	Total
00304	SOY POWER POWDER - 300 grams of powder	\$31.50	\$23.63		
	SOY POWER POWDER - 4 bottles of powder	114.00	85.50		
00286	SOY PROTEIN POWDER (concentrated soy protein) - 16 oz of powder	12.00	9.00		
	SOY PROTEIN POWDER - 4 bottles of powder	42.50	31.87		
00432	STEVIA EXTRACT - 100 packets, 1 gram each	9.95	7.46		
	STEVIA EXTRACT - 4 boxes of 100 packets	36.00	27.00		
00351	ST. JOHN'S WORT EXTRACT - 300 mg, 60 caps	10.98	8.24		
	ST. JOHN'S WORT EXTRACT - 4 bottles of 60 caps	40.00	30.00		
00327	ST. JOHN'S WORT EXTRACT (PLANETARY) - 600 mg, 60 tablets	16.75	12.56		
	ST. JOHN'S WORT EXTRACT (PLANETARY) - 4 bottles of 60 tablets	55.40	41.55		
00971	SUN PROTECTION SPRAY W/BETA GLUCAN - SPF30 - 6 oz bottle	14.95	11.21		
	SUN PROTECTION SPRAY W/BETA GLUCAN - SPF30 - 4 bottles, 6 oz	54.00	40.50		
00747	(OVERCAST POLARIZED) SUNGLASSES - gray color, large	27.00	20.25		
	(OVERCAST POLARIZED) SUNGLASSES - 2 pairs, gray color	42.00	31.50		
00748	(OVERCAST POLARIZED) SUNGLASSES - gray color, medium	27.00	20.25		
	(OVERCAST POLARIZED) SUNGLASSES - 2 pairs, gray color	42.00	31.50		
00758	SUPER ABSORBABLE SOY ISOFLAVONES - 60 caps	28.00	21.00		
	SUPER ABSORBABLE SOY ISOFLAVONES - 4 bottles of 60 caps	100.00	75.00		
01408	SUPER SAW PALMETTO/NETTLE ROOT W/BETA-SITOSTEROL 60 softgels	28.00	21.00		
	SUPER SAW PALMETTO/NETTLE ROOT w/BETA-SITOSTEROL 4 bottles of 60 softgels	104.00	78.00		
	SUPER SAW PALMETTO/NETTLE ROOT w/BETA-SITOSTEROL One-year supply	288.00	216.00		
01407	SUPER SAW PALMETTO W/BETA-SITOSTEROL - 30 softgels	15.00	11.25		
	SUPER SAW PALMETTO W/BETA-SITOSTEROL - 12 bottles of 30 softgels	144.00	108.00		
00578	SUPER SELENIUM COMPLEX - 200 mcg, 100 caps	12.00	9.00		
	SUPER SELENIUM COMPLEX - 4 bottles of 100 caps	40.00	30.00		
	SUPER SELENIUM COMPLEX - 12 bottles of 100 caps	108.00	81.00		
00674	SYTRINOL™ - 60 softgels	32.00	24.00		
	SYTRINOL™ - 4 bottles of 60 softgels	112.00	84.00		
<b>T</b>					
	TAL-SHI™ COSMETICS • For information please call 1-800-544-4440 or visit <a href="http://www.lifeextension.com">www.lifeextension.com</a>				
01062	TART CHERRY (FRUIT ADVANTAGE) - 600 mg, 60 caps	\$18.95	\$14.21		
00199	TAURINE CAPSULES - 1000 mg, 50 caps	8.95	6.71		
	TAURINE CAPSULES - 4 bottles of 50 caps	32.00	24.00		
00133	TAURINE POWDER - 300 grams, powder	20.00	15.00		
	TAURINE POWDER - 4 bottles of powder	67.52	50.64		
01304	THEAFLAVIN STANDARDIZED EXTRACT - 30 veg. caps	18.00	13.50		
	THEAFLAVIN STANDARDIZED EXTRACT - 4 bottles of 30 veg. caps	64.00	48.00		
00555	(L) THEANINE - 100 mg, 60 caps	24.00	18.00		
	(L) THEANINE - 4 bottles of 60 caps	82.00	61.50		
01038	ATHERALAC - 30 caps	44.95	33.71		
00224	THYMIC IMMUNE FACTORS - 100 caps	18.00	13.50		
	THYMIC IMMUNE FACTORS - 4 bottles of 100 caps	56.00	42.00		
00668	(METABOLIC ADVANTAGE) THYROID FORMULA - 100 caps	17.95	13.46		
00349	TMG - 50 grams of powder	14.00	10.50		
	TMG - 4 bottles of powder	44.00	33.00		
00359	TMG TABLETS - 500 mg, 180 tablets	18.00	13.50		
	TMG TABLETS - 4 bottles of 180 tablets	62.00	46.50		
00366	TOCOTRIENOLS - 50 mg, 60 softgel caps	39.95	29.96		
	TOCOTRIENOLS - 4 bottles of 60 softgel caps	144.00	108.00		
00781	TOCOTRIENOLS WITH SESAME LIGNANS - 60 softgels	38.00	28.50		
	TOCOTRIENOLS WITH SESAME LIGNANS - 4 bottles of 60 softgels	144.00	108.00		
01400	(SUPER-ABSORBABLE) TOCOTRIENOLS - 60 softgels	30.00	22.50		
	(SUPER-ABSORBABLE) TOCOTRIENOLS - 4 bottles of 60 softgels	112.00	84.00		

**SUB-TOTAL OF COLUMN 17**

JUNE 2010

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

No.		Retail	Member Price	Qty	Total
01274	TOTAL SUN PROTECTION CREAM W/BETAGLUCANS - SPF 30, 4 oz Tube & PHOTO-AGING RECOVERY COMPLEX	\$28.00	\$21.00		
	TOTAL SUN PROTECTION CREAM W/BETAGLUCANS - 4-4 oz Tubes & PHOTO-AGING RECOVERY COMPLEX	100.80	75.60		
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT - 60 veg. caps	24.00	18.00		
	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT-4 bot 60 veg. caps	88.00	66.00		
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL -60 veg. caps	32.00	24.00		
	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT W/RESVERATROL - 4 bottles	118.40	88.80		
01046	TRIPLE ACTION UNDER EYE REJUVENATOR - 0.5 oz pump	24.00	18.00		
	TRIPLE ACTION UNDER EYE REJUVENATOR - 4 boxes	88.00	66.00		
00866	TRYPTOPURE® L-TRYPTOPHAN - 500 mg, 90 veg. caps	38.00	28.50		
	TRYPTOPURE® L-TRYPTOPHAN - 4 bottles of 90 veg. caps	136.00	102.00		
01202	(OPTIMIZED) TRYPTOPURE® PLUS - 90 veg. caps	40.00	30.00		
	(OPTIMIZED) TRYPTOPURE® PLUS - 4 bottles of 90 veg. caps	144.00	108.00		
00036	L-TYROSINE POWDER - 100 grams of powder	22.50	16.88		
	L-TYROSINE POWDER - 4 bottles of powder	80.00	60.00		
00326	L-TYROSINE TABLETS - 500 mg, 100 tablets	12.50	9.38		
	L-TYROSINE TABLETS - 4 bottles of 100 tablets	45.68	34.26		
00035	L-TYROSINE PLUS POWDER - 100 grams of powder	28.00	21.00		
	L-TYROSINE PLUS POWDER - 4 bottles of powder	98.00	73.50		
<b>U</b>					
* 00310	UDO'S CHOICE® - 17 oz liquid (omega fatty acids)	\$27.49	\$21.99		
* 00311	UDO'S CHOICE® - 1000 mg, 180 caps	33.79	27.03		
* 00322	UDO'S CHOICE® WHOLESOME FAST FOOD - 1 lb bottle	27.49	21.99		
01061	ULTIMATE FLORA ADVANCED IMMUNITY - 30 caps	29.99	22.49		
<b>V</b>					
00213	VANADYL SULFATE - 7.5 mg, 100 tablets	\$15.00	\$11.25		
	VANADYL SULFATE - 4 bottles of 100 tablets	50.00	37.50		
01018	VASCULAR PROTECT - 120 vegetarian caps	48.00	36.00		
	VASCULAR PROTECT - 4 bottles of 120 vegetarian caps	180.00	135.00		
00252	VELVET DEER ANTLER - 250 mg, 30 caps	36.00	27.00		
	VELVET DEER ANTLER - 4 bottles of 30 caps	136.00	102.00		
00408	VENOTONE - 60 caps	18.95	14.21		
	VENOTONE - 4 bottles of 60 caps	64.00	48.00		
00427	VINPOCETINE - 5 mg, 100 tablets	18.00	13.50		
	VINPOCETINE - 4 bottles of 100 tablets	56.00	42.00		
01033	VISION OPTIMIZER - 90 caps	29.95	22.46		
01098	VITAL GREENS MIX - 319.5 grams of powder	48.00	36.00		
	VITAL GREENS MIX - 4 jars of powder	176.00	132.00		
00091	VITAMIN B1 CAPS - 500 mg, 100 caps	16.99	12.74		
	VITAMIN B1 CAPS - 4 bottles of 100 caps	60.68	45.51		
00090	VITAMIN B1 POWDER - 100 grams of powder (Thiamin)	18.00	13.50		
	VITAMIN B1 POWDER - 4 bottles of powder	67.52	50.64		
00093	VITAMIN B2 CAPS - 100 mg, 100 caps	12.99	9.74		
	VITAMIN B2 CAPS - 4 bottles of 100 caps	47.52	35.64		
00092	VITAMIN B2 POWDER - 30 grams of powder	10.50	7.88		
	VITAMIN B2 POWDER - 4 bottles of powder	37.52	28.14		
00096	VITAMIN B3 (NIACIN) - 1000 mg, 100 caps	12.75	9.56		
	VITAMIN B3 (NIACIN) - 4 bottles of 100 caps	48.00	36.00		
00372	VITAMIN B3 (NIACIN) - 500 mg, 100 caps	7.65	5.74		
	VITAMIN B3 (NIACIN) - 4 bottles of 100 caps	26.60	19.95		
00094	VITAMIN B3 POWDER - 300 grams of powder	15.00	11.25		
	VITAMIN B3 POWDER - 4 bottles of powder	56.00	42.00		

\* These products are not 25% off retail price.

**SUB-TOTAL OF COLUMN 18**

No.		Retail	Member Price	Qty	Total
00098	VITAMIN B5 CAPS - 500 mg, 100 caps (Pantothenic Acid)	\$10.50	\$7.88		
	VITAMIN B5 CAPS - 4 bottles of 100 caps	37.52	28.14		
00097	VITAMIN B5 POWDER - 100 grams of powder	15.25	11.44		
	VITAMIN B5 POWDER - 4 bottles of powder	55.00	41.25		
00556	VITAMIN B6 CAPS - 250 mg, 100 caps	12.50	9.38		
	VITAMIN B6 CAPS - 4 bottles of 100 caps	44.00	33.00		
00099	VITAMIN B6 POWDER - 100 grams of powder	24.50	18.38		
	VITAMIN B6 POWDER - 4 bottles of powder	88.00	66.00		
00361	VITAMIN B12 TABLETS - 500 mcg, 100 dissolve-in-mouth tablets	8.75	6.56		
	VITAMIN B12 TABLETS - 4 bottles of 100 dissolve-in-mouth tablets	29.00	21.75		
00144	VITAMIN B12 POWDER - 100 grams of powder	12.00	9.00		
	VITAMIN B12 POWDER - 4 bottles of powder	42.52	31.89		
00927	VITAMIN C WITH DIHYDROQUERCETIN - 1000 mg, 250 tablets	25.50	19.13		
	VITAMIN C WITH DIHYDROQUERCETIN - 4 bottles of 250 tablets	93.00	69.75		
00084	(BUFFERED) VITAMIN C POWDER - 454.6 grams of powder	23.95	17.96		
	(BUFFERED) VITAMIN C POWDER - 4 bottles of powder	88.00	66.00		
00864	VITAMIN D - 2000 IU, 1 fl oz	28.00	21.00		
	VITAMIN D - 4 bottles of 1 fl oz	100.00	75.00		
00251	VITAMIN D3 CAPS - 1000 IU, 250 caps	12.50	9.38		
	VITAMIN D3 CAPS - 4 bottles of 250 caps	45.00	33.75		
00713	VITAMIN D3 CAPS - 5000 IU, 60 caps	11.00	8.25		
	VITAMIN D3 CAPS - 4 bottles of 60 caps	39.60	29.70		
01418	VITAMIN D3 CAPS - 7000 IU, 60 caps	14.00	10.50		
	VITAMIN D3 CAPS - 4 bottles of 60 caps	50.40	37.80		
01371	VITAMIN D3 w/SEA-IODINE - 1000 IU, 250 veg. caps	22.00	16.50		
	VITAMIN D3 w/SEA-IODINE - 4 bottles of 250 veg. caps	80.00	60.00		
01372	VITAMIN D3 w/SEA-IODINE - 5000 IU, 60 veg. caps	14.00	10.50		
	VITAMIN D3 w/SEA-IODINE - 4 bottles of 60 veg. caps	50.00	37.50		
00063	VITAMIN E CAPS (NATURAL) - 400 IU, 100 caps	18.75	14.06		
	VITAMIN E CAPS (NATURAL) - 4 bottles of 100 caps	69.00	51.75		
	VITAMIN E CAPS (NATURAL) - 10 bottles of 100 caps	150.00	112.50		
00062	VITAMIN E POWDER (SYNTHETIC) - 300 grams of powder	28.95	21.71		
	VITAMIN E POWDER (SYNTHETIC) - 4 bottles of powder	100.00	75.00		
01225	(LOW-DOSE) VITAMIN K2 (MK-7) - 45 mcg, 90 softgels	18.00	13.50		
	(LOW-DOSE) VITAMIN K2 (MK-7) - 4 bottles of 90 softgels	64.00	48.00		
<b>Z</b>					
00986	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN - 60 softgels	\$22.00	\$16.50		
	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN - 4 bottles	79.20	59.40		
01286	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN - 60 softgels PLUS ASTAXANTHIN	42.00	31.50		
	(SUPER) ZEAXANTHIN W/LUTEIN & MESO-ZEAXANTHIN PLUS ASTAXANTHIN - 4 bottles of 60 softgels	152.00	114.00		
00152	ZINC GLUCONATE POWDER - 100 grams of powder	8.00	6.00		
	ZINC GLUCONATE POWDER - 4 bottles of powder	27.50	20.62		
00061	ZINC LOZENGES WITH VITAMIN C - 75 lozenges	9.50	7.13		
	ZINC LOZENGES WITH VITAMIN C - 4 bottles of 75 lozenges	27.00	20.25		
01051	ZYFLAMEND - 120 softgels	60.95	45.71		
01029	ZYFLAMEND EASYCAPS - 180 caps	31.95	23.96		

**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](http://www.lef.org) 3. Fax back to **1-866-728-1050** 4. Mail to: Life Extension Foundation® • PO Box 407198 Ft. Lauderdale, FL 33340-7198 • Local Number: **954-766-8433**

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SUB-TOTAL COLUMN 7	
SUB-TOTAL COLUMN 8	
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SUB-TOTAL COLUMN 11	
SUB-TOTAL COLUMN 12	
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SUB-TOTAL COLUMN 14	
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SUB-TOTAL COLUMN 19	

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UPS OVERNIGHT add \$16, UPS 2nd DAY AIR add \$7. For Puerto Rico, US Virgin Islands, Alaska & Hawaii, add \$7. CANADA UPS EXPRESS Flat rate \$17.50, UK Flat rate \$25 USD. ALL OTHER INTERNATIONAL AIR WILL BE ADDED.	
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		Retail	Member Price	Qty	Total
<b>LIFE EXTENSION MEDIA</b>					
33820	YOUR BLOOD DOESN'T LIE! • by Sergey Dzugan, MD, PhD	2010	\$24.95	\$17.47	
33819	BRAIN SURGEON • by Keith Black, MD	2010	\$24.99	\$18.74	
33816	FDA: FAILURE, DECEPTION, ABUSE • by Life Extension Foundation	2010	\$20.00	\$15.00	
33818	STAY YOUNG & SEXY WITH BIO-IDENTICAL HORMONE REPLACEMENT • by Jonathan Wright, MD	2010	\$19.95	\$14.96	
33815	KNOCKOUT • by Suzanne Somers	2009	\$25.99	\$17.00	
33814	CHEATING DEATH • by Sanjay Gupta, MD	2009	\$24.99	\$17.49	
33813	TIMESHIP • by Stephen Valentine	2009	\$45.00	\$33.75	
33812	LIFE OVER CANCER • by Keith Block, MD (hardcover)	2009	\$25.00	\$17.50	
33800	TEXTBOOK OF BIO-IDENTICAL HORMONES • by Edward Lichten, MD	2007	\$49.95	\$37.46	
33811	THE GREAT AMERICAN HEART HOAX • by Michael Ozner, MD, FACC, FAHA	2009	\$24.95	\$17.47	
33810	THE ULTRAMIND SOLUTION • by Mark Hyman, MD	2009	\$27.50	\$19.25	
33809	TESTOSTERONE FOR LIFE • by Abraham Morgentaler, MD	2008	\$16.95	\$11.87	
33808	BREAKTHROUGH: EIGHT STEPS TO WELLNESS • by Suzanne Somers	2008	\$25.95	\$18.17	
33599	YOUNGER YOU • by Eric Braverman, MD	—	\$24.95	\$15.75	
33598	AGELESS • by Suzanne Somers	2006	\$25.00	\$17.50	
33666	ULTRAMETABOLISM: THE SIMPLE PLAN FOR AUTOMATIC WEIGHT LOSS • by Mark Hyman, MD	2006	\$25.00	\$15.35	
33422	BRAIN LONGEVITY • by Dharma Singh Khalsa, MD, with Cameron Stauth	1997	\$14.95	\$11.21	
33017	CANCER THERAPY • by Ralph W. Moss, PhD	1995	\$19.95	\$15.00	
33677	DANGEROUS DOSES • by Katherine Eban	2005	\$25.00	\$16.25	
33600	DISEASE PREVENTION AND TREATMENT, EXPANDED FOURTH EDITION (hardcover)	2003	\$49.95	\$37.46	
	Price per book when 4 books purchased	—	\$44.00	\$33.00	
33594	THE EDGE EFFECT • by Eric Braverman, MD (paperback)	2004	\$12.95	\$9.71	
33700	ENDING AGING • by Aubrey DeGrey with Michael Rae	2007	\$28.94	\$17.75	
33488	FEMALE AND FORGETFUL • by Elisa Lottor, PhD, ND, and Nancy P. Bruning	2002	\$18.99	\$14.24	
33388	THE FIRST IMMORTAL • by James L. Halperin	1998	\$6.99	\$6.00	
33557	FOREVER AGELESS • by Ron Rothenberg, MD, and Kathleen Becker, MA, RN	2001	\$24.95	\$18.71	
33696	LIFE EXTENSION REVOLUTION • by Philip Lee Miller, MD (paperback)	—	\$16.00	\$12.00	
33387	MAXIMIZE YOUR VITALITY & POTENCY • by Jonathan Wright, MD	1999	\$14.95	\$11.00	
33010	MELATONIN • by Russ Reiter, PhD and Jo Robinson, MD	1996	\$22.95	\$15.00	
33180	THE MELATONIN AND AGING SOURCEBOOK • by Roman Rozencwajg, MD, and Hasnain Walji, PhD	1997	\$79.95	\$59.95	
33011	THE MELATONIN MIRACLE • by Walter Pierpaoli, MD, PhD, and William Regelson, MD	1995	\$6.80	\$5.10	
33637	THE METABOLIC PLAN • by Stephen Cherniske, MS	—	\$14.95	\$11.21	
33805	MIAMI MEDITERRANEAN DIET WITH 300 RECIPES • by Michael D. Ozner, MD, FACC, FAHA (hardcover)	2008	\$24.95	\$16.25	
33906	THE MIGRAINE CURE • by Sergey Dzugan, MD, PhD	2006	\$24.00	\$15.60	
33026	MIND FOOD & SMART PILLS • by Ross Pelton, PhD	1989	\$13.95	\$11.95	
33569	OVERDOSE • by Jay Cohen, MD	—	\$24.95	\$16.95	
33680	PRESCRIPTION FOR DISASTER DVD • by Gary Null	2005	\$18.00	\$12.00	
33670	A PRIMER ON PROSTATE CANCER (2nd edition) • by Stephen B. Strum, MD, and Donna Pogliano	2005	\$28.95	\$21.71	
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33676	THE SIDE EFFECTS BIBLE • by Frederic Vagnini, MD and Barry Fox, PhD	—	\$16.95	\$11.53	
33399	VOCAL EXCERPTS FROM SCIENTIFIC STUDIES • Audio Tape	—	\$6.00	\$3.50	
33695	WE BECOME SILENT • DVD by Kevin Miller	—	\$24.98	\$18.74	
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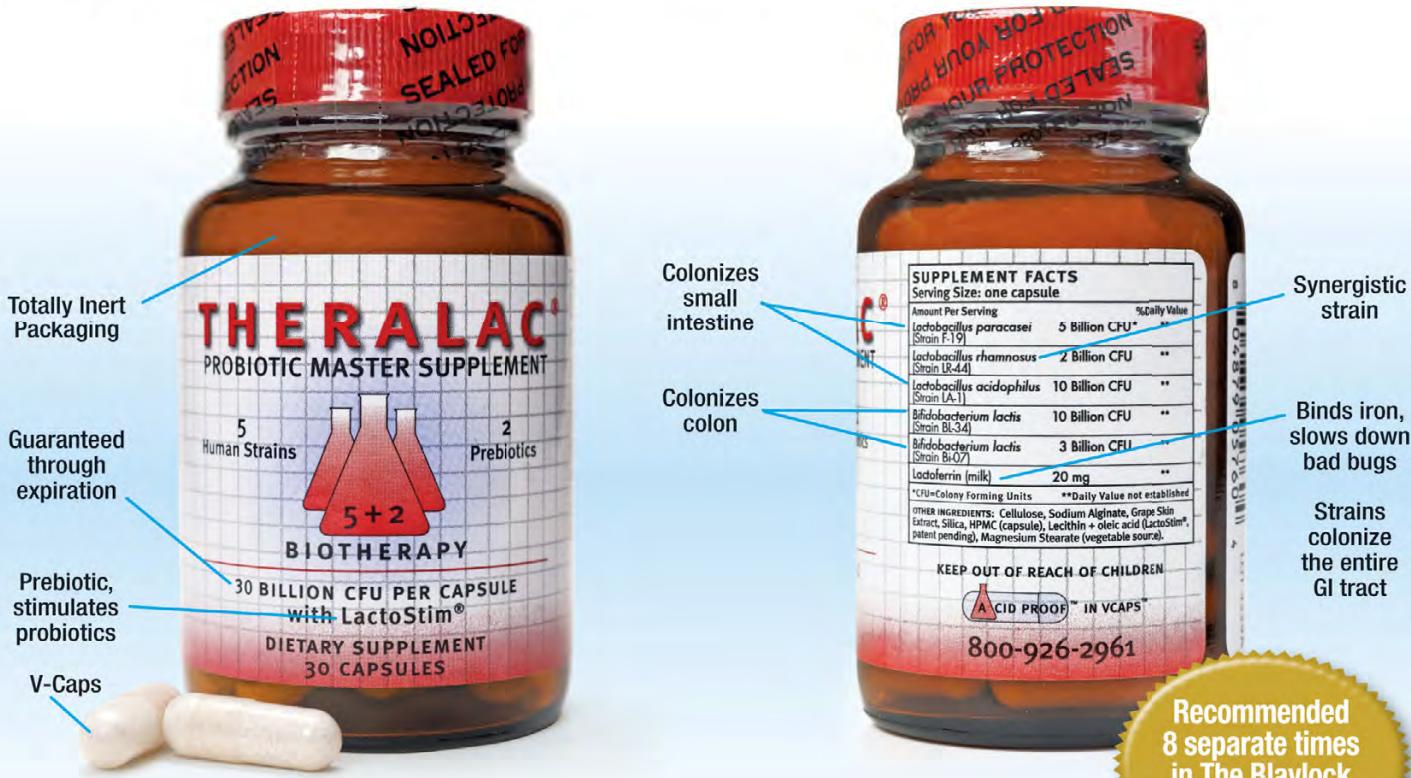
state of **dysbiosis**, often results: an unhealthy condition characterized by indigestion, cramping, bloating and discomfort.

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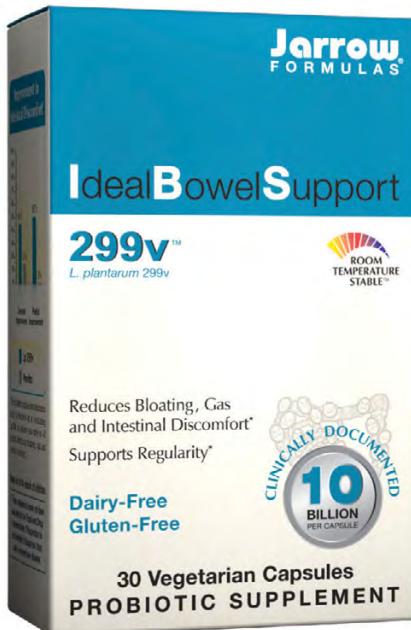
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# PROTECT EYE HEALTH AND FIGHT TIRED EYES

By absorbing blue-light, **carotenoids** protect delicate **photo-receptor cells** in the retina's macula from light damage. The *density* of your macular pigment (composed of lutein, zeaxanthin, and meso-zeaxanthin) is essential to proper vision. Unfortunately, this density declines naturally over time. Some aging people also lose their ability to convert lutein into **meso-zeaxanthin** inside their macula.

Eating lots of lutein- and zeaxanthin-containing vegetables can help maintain the structural integrity of their macula. However, since **meso-zeaxanthin** is not part of the typical diet, it cannot be replaced except in supplement form.

**Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin** gives you therapeutic doses of **all three carotenoids** to help protect your precious eyesight *plus* a special ingredient that's scientifically proven to help fight tired eyes.

## Fight Tired Eyes With Astaxanthin

If you're one of the more than 72 million people in America who use a computer daily at work,<sup>1</sup> you're probably familiar with eye fatigue. Staring at a fixed-distance object such as a computer screen for a long period of time can cause the muscles that focus your eyes (called the ciliary body) to tire or go into spasm. This can result in physical symptoms such as head discomfort, sensitivity to glare, tiredness, soreness, dryness, and blurry vision.



Item #01286

**Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin** contains a potent dose of **astaxanthin**, a carotenoid found in a red algae called *Haematococcus pluvialis*. Studies show that taking **astaxanthin** with other carotenoids protects against free-radical induced DNA damage, repairs UVA-irradiated cells, and inhibits inflammatory cell infiltration.<sup>2-5</sup> Astaxanthin also helps support vascular health within the eye and improves visual acuity.<sup>4</sup> Its fat-soluble nature offers protection to sensitive cells inside the eye.<sup>6</sup>

With its special combination of ingredients that targets eyestrain and protects visual acuity, **Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin** is truly an exciting breakthrough in eye care.

The retail price for a bottle containing 60 softgels of **Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin** is \$42. If a member buys four bottles, the price is reduced to just **\$28.50** per bottle.

To order **Super Zeaxanthin with Lutein & Meso-zeaxanthin Plus Astaxanthin**,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

### References:

1. Report by the National Telecommunications and Information Administration of the US Department of Commerce. 2001 Sep.
2. *J Photochem Photobiol B*. 2007 Jul 27;88(1):1-10.
3. *J Photochem Photobiol B*. 2006 Dec 1;85(3):205-15.
4. *Ophthalmology*. 2008 Feb;115(2):324-333.e2.
5. *Invest Ophthalmol Vis Sci*. 2008 Apr;49(4):1679-85.
6. *Biochimica et Biophysica Acta*. 2001;1512: 251-8.

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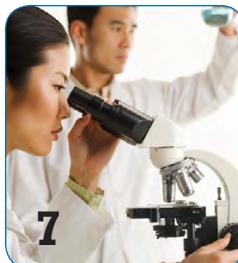
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## WHAT'S INSIDE

# LifeExtension® Magazine

### EPIDEMIC DEFICIENCY OF TESTOSTERONE



7

Life Extension members suffer *alarming* rates of testosterone deficiency. Blood testing can reveal *free* testosterone levels, enabling aging men to restore it to youthful ranges.

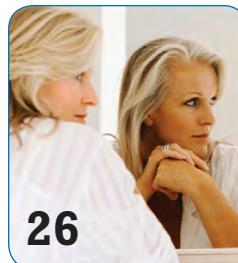
### SCIENTISTS REVERSE AGING OF HUMAN CELLS



58

A study partially funded by the **Life Extension Foundation®** demonstrates that aging of human cells can be reversed. Dr. Michael West explains the results of this unprecedented breakthrough.

### A REVOLUTION IN NATURAL MENOPAUSE RELIEF



26

Women facing menopause have few safe options. A unique adaptogen can relieve most menopausal symptoms by operating at the *neurological* level.

### TOPICAL VITAMIN D PROTECTS AGING SKIN



72

As you age, your skin loses 75% of its ability to make vitamin D. Topical application of vitamin D may help preserve the skin's youthful appearance.

## PLUS

THE SECRET BEHIND AÇAÍ  
DOES TESTOSTERONE THERAPY WORK?  
SELENIUMWARDS OFF DIABETES  
SOY PROTECTS AGAINST LUNG CANCER

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