

Restore Youthful Vascular Function

LifeExtension[®]

LifeExtension.com

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

May 2017

Oral Probiotic Promotes Healthy Gums and Teeth

Protect Against
Sugar Toxicity

Eat Before Your
Next Blood Test

Combat Statin Drug
Induced Diabetes

How Exercise Can
Improve Cognition

PLUS—

Drugs That Cause Heart Failure
Leukemia Cure Case Report
Annual Blood Test Sale



LOVE YOUR TUMMY

WITH
**ADVANCED
PROBIOTICS**

Non-GMO



1 bottle
4 bottles

Retail
Price

\$33

Your
Price

\$24.75
\$22.50 each

Item #02125 • 30 liquid veg. capsules

To order **FLORASSIST® GI with Phage Technology**,
call **1-800-544-4440** or visit www.LifeExtension.com

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

REPORTS

28 ARTERIAL PLAQUE RUPTURE

Sudden heart attack or stroke can be caused by acute **rupture** of **soft arterial plaque**. A human study published in **December 2016** corroborates previous clinical research showing dramatic **reductions** in markers of **atherosclerosis**, along with **stabilizing** rupture-prone **arterial plaque**.

49 RESEARCH UPDATE: COQ10 FIGHTS STATIN-INDUCED DIABETES

Cholesterol-lowering drugs known as **statins** can increase risk of type II **diabetes**. New findings reveal how **coenzyme Q10** can help protect against statin-induced **insulin resistance**.

54 COMBAT SUGAR TOXICITY

When **sugar** (glucose) reacts with the body's **proteins**, the resulting tissue **glycation** *accelerates* **aging**. There are a number of strategies that **reduce** toxic **glycation** reactions and help overcome their consequences.

66 THE RIGHT EXERCISE INHIBITS COGNITIVE DECLINE

Exercise *enhances* brain function as we age. Strength-training exercise can boost cognition and fight memory decline.

DEPARTMENTS

7 SHOULD YOU EAT BEFORE A BLOOD TEST?

Up until now, people have been told to **fast** for **8 to 12 hours** **prior** to having their blood drawn. Newly published medical data indicates a more realistic reading may be obtained when blood is drawn **2 to 6 hours** **after** a normal meal.

19 IN THE NEWS

Triglycerides increase kidney disease risk; vitamin D protects brain cells; painkillers linked to heart failure; resveratrol improves ulcerative colitis; and vitamin D deficiency ups risk of bladder cancer.

77 SUPER FOODS: OATS

Providing more soluble fiber than any other grain, **oats** have shown a vast range of health benefits that include lower LDL cholesterol, increased satiety, reduction in blood pressure, and a lower risk of colorectal cancer.

79 ASK THE DOCTOR: DR. SCOTT FOGLE— INNOVATIVE NEUROTRANSMITTER TEST

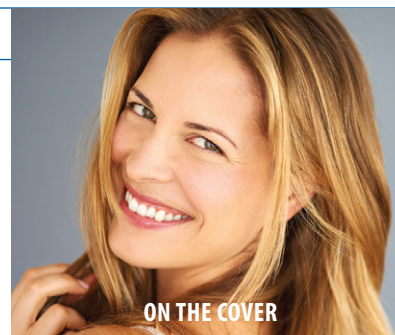
Healthy neurotransmitter levels ensure optimal brain function. In this interview, Dr. Scott Fogle describes an innovative new test that can measure neurotransmitter levels and how to help rebalance these valuable brain messengers.

87 WELLNESS PROFILE: MICHAEL RAY GARVIN— WORLD'S MOST JACKED ATHLETE

Former NFL player Michael Ray Garvin is a dedicated power-trainer who has been a supplement-user since the age of 14. In his books, *The World's Most Jacked Athlete* and *Jacked Athlete Supplement Manual*, trainer, author, and speaker Garvin describes his essential supplements for athletic health.

95 AUTHOR INTERVIEW: CASE REPORT ON SUCCESSFUL MULTIMODEL APPROACH TO FIGHTING LEUKEMIA

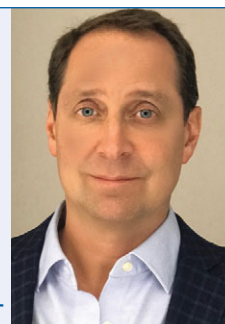
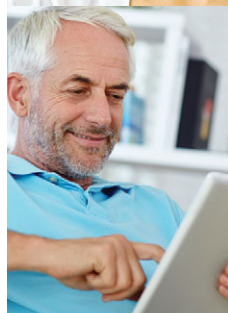
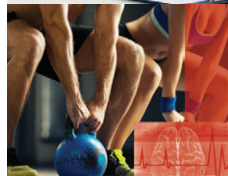
In his new book, *N of 1*, Glenn Sabin documents his remarkable journey from a bleak diagnosis of "incurable" chronic lymphocytic leukemia—through two decades of his unique program of diet, exercise, stress reduction, herbs, and supplements—to tests now showing no trace of leukemic cells at all.



ON THE COVER

38 PROBIOTIC LOZENGE PROMOTES ORAL HYGIENE

Brushing and flossing is not always enough to ward off tooth decay and gum disease. Targeted **oral probiotics** have been shown to **reduce** indicators of gum deterioration and tooth decay. **Probiotic** lozenges can help eliminate harmful bacteria for a healthier mouth.





Connect with Life Extension on the Web!



[Facebook.com/LifeExtension](https://www.facebook.com/LifeExtension)

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



[Twitter.com/LifeExtension](https://twitter.com/LifeExtension)

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

Customer care is available to take your calls
24 hours a day, 7 days a week.

Visit the Life Extension Nutrition Center Store

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



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

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

Publisher • LE Publications, Inc.

Editorial

Editor-in-Chief • Philip Smith
Executive Managing Editor • Renee Price
Medical Editor • Hernando Latorre, MD, MSc
Senior Copy Editor • Laurie Mathena
Senior Staff Writer • Michael Downey
Associate Writer • Garry Messick
Creative Director • Robert Vergara
Art Director • Alexandra Maldonado

Chief Medical Officer

Steven Joyal, MD

Scientific Advisory Board

Örn Adalsteinsson, PhD • John Boik, PhD • Aubrey de Grey, PhD
Frank Eichhorn, MD • Deborah F. Harding, MD • Steven B. Harris, MD
Peter H. Langsjoen, MD, FACC • Dipnarine Maharaj, MD • Ralph W. Moss, PhD
Michael D. Ozner, MD, FACC • Jonathan V. Wright, MD, Xiaoxi Wei, PhD

Director of Scientific Affairs

Anita Boddie

Contributors

Will Brink • Stuart Chan • Michael Downey • Scott Fogle, ND
Stephen Greene • Susan Merrill • Garry Messick • Jon Van Zile

Advertising

Vice President of Marketing • Rey Searles • rsearles@lifeextension.com
National Advertising Manager • Leslie Stockton • 404-347-1755

Vice President of Sales and Business Development

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

Circulation & Distribution

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

Customer Service: 800-678-8989

Email: customerservice@LifeExtension.com

Wellness specialists: 800-226-2370 • Wellness email: wellness@LifeExtension.com

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

Please mail your comments to *Life Extension Magazine*,
Attn: Letters to the Editor, PO Box 407198, Fort Lauderdale, FL 33340
or email us: LEmagazine@LifeExtension.com

LIFE EXTENSION (ISSN 1524-198X) Vol. 23, No. 5 ©2017 is published monthly except bi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. LE Publications, Inc. All rights reserved. Published 13 times a year. Subscription rate: \$40 per year in the United States. US \$47 in Canada. US \$60 in other countries. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Printed in USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional. LEGAL NOTICE: Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA approved qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. Life Extension[®] does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in Life Extension magazine[®] except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.

AGE LESS WITH GEROPROTECTORS AND ARTIFICIAL INTELLIGENCE

Longevity scientists have designed
Geroprotect™ Ageless Cell™
to combat **aging** at the cellular level.

By activating cell **signaling**
pathways, **geroprotectors**
represent a new way to advance
healthy aging strategies.



Proprietary Nutrient Formula
Utilizing **Insilico Medicine**
Deep-Learning AI Technology

Just one **Geroprotect™ Ageless Cell™**
softgel daily provides:

Myricetin	50 mg
N-Acetyl-L-Cysteine	450 mg
Epigallocatechin Gallate [EGCG]	100 mg
Gamma tocotrienol	25 mg

Geroprotect™ Ageless Cell™
Item #02119 • 30 softgels

	Retail Price	Your Price
1 bottle	\$40	\$30
4 bottles		\$27 each

To order **Geroprotect™ Ageless Cell™**,
call **1-800-544-4440** or visit **www.LifeExtension.com**

Consult your healthcare provider before use if you have a bleeding disorder, are taking anticoagulant or antiplatelet medications or beta-blockers such as Nadolol. Keep out of reach of children. Do not exceed recommended dose.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Scientific Advisory Board



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



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



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



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



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



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



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



Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP

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



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



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



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



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

IT'S SO PURE... IT'LL TOUCH YOUR HEART

Highly Purified Fish Oil From
Wild-Caught Alaska Pollock
For A Strong Healthy Heart.



Item #01982 • 120 softgels



	Retail Price	Your Price
1-bottle	\$32.00	\$24
4-bottle	—	\$21^{ea}

NON-GMO



Call 1-800-544-4440 toll-free • www.LifeExtension.com

AlaskOmega® is a registered trademark of Organic Technologies. IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc. For a complete list of ingredients, dosage and use, important cautions and references, go to www.LifeExtension.com.
Ratings based on results of the 2016 ConsumerLab.com Survey of Supplement Users. More information at www.consumerlab.com/survey2016.

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



BY WILLIAM FALOON

Should You Eat Before a Blood Test?

Annual **blood testing** is the most effective way of detecting imbalances in time to take corrective actions. Countless lives have been spared since people started checking their blood before serious illness develops.

Until recently, the consensus was that people had to **fast** for **8 to 12 hours** prior to having their blood drawn. Before describing studies indicating that fasting may not be required, let's look at this issue from a practical standpoint.

Most people **eat** throughout the day and are never in a **fasting** state. The only exception is the 8-12 hour period **prior** to a **blood test**. Results obtained when blood is drawn during this **fasting** period may not reflect what's in your blood under **normal** conditions. This can lead to a false sense of security.

For instance, **glucose** and **triglyceride** levels increase after you eat. As it relates to disease risk, how quickly they come down *after* you finish a meal is important.

Some data suggest that **after-meal** blood levels of **glucose** and **triglycerides** are more accurate predictors of disease risk.¹⁻⁴

Fasting and non-fasting blood sugar levels impact health and longevity. As you'll learn in this article, many aging individuals suffer sugar-inflicted damage despite fasting **glucose** being "normal."

Triglycerides rise in the blood after a meal and can remain dangerously **high** for many hours.

If one fasts 8-12 hours before a blood draw, **triglycerides** may appear artificially low compared to where they may be during typical non-fasting periods. This again can create a false sense of security regarding your cardiovascular risk.

Some people neglect having their blood tested because they cannot **fast** for an **8-12 hour** period.

The encouraging news is that for many individuals, a more realistic reading may be obtained when blood is drawn **2-6 hours** after a normal meal is consumed.

This article provides a novel rationale for what may become the new **optimal** time to have your blood drawn.



If you are a participant in a **clinical study** to assess the effects of a drug on blood fat or sugar levels, it is important for you to not eat for 8-12 hours before your scheduled blood draw.

The reason **fasting** is important in this instance is to provide researchers with consistent data on the compound they are testing amongst a large study group.

From the standpoint of optimizing **your** health, you are not part of a study group. Your purpose for having **blood tests** is to identify hidden risk factors that are correctable before you are stricken with illness or sudden death.

Some credentialed physicians have concluded that individuals do not need to **fast** before their blood is drawn. They point to studies showing that **cholesterol** and **LDL** levels are not significantly altered in most people based on when their blood is drawn (fasting or non-fasting).⁵⁻⁷

In addition, emerging data suggests that **after-meal** blood levels of **triglycerides** and **glucose** may be more important indicators of disease risk than corresponding **fasting** levels.¹⁻⁴

What Are Triglycerides?

Like other types of fats, **triglycerides** are carried in the bloodstream by lipoproteins. Triglyceride-rich lipoproteins contribute to the build-up of plaque in our arteries (atherosclerosis).

The **fats** we consume in our diet are mainly composed of **triglycerides**. Therefore, following a fatty meal, blood levels of triglycerides will rise.⁸

High triglyceride levels increase **heart attack** and ischemic **stroke** risk.^{9,10}



After-Meal Fat Damages Arterial Walls

Postprandial (after-meal) disorders are characterized by **fat** (and glucose) that persists in the bloodstream many hours after eating. Postprandial disorders are major causes of heart disease and stroke.^{11,12}

As you eat a meal of, say, steak, buttered rolls, and cream in your coffee, fats contained in these foods are **absorbed** into your circulatory system.

Six hours later, the remnants of your meal should be history. Clearance of fat present in your meal ought to be quick and efficient. After six hours, high levels of absorbed lipids should not be in your bloodstream.

In some people, however, meal remnants (lipoproteins) persist in the blood many hours later. The longer they stick around, the more opportunity they have to trigger growth of atherosclerotic plaque.

Clinical studies show that **postprandial triglyceride-rich lipoproteins** (like VLDL cholesterol) are powerful instigators of coronary plaque, carotid plaque, and aneurysms of the aorta.^{11,13,14}

Post-meal increases in lipids appear in the blood soon after you begin eating, but usually dissipate by the time your blood is drawn in a “fasting” state (8-12 hours later).

Postprandial disorders are therefore frequently overlooked, and rarely enter into a doctor’s assessment of vascular disease risk. Although their presence may not be apparent from a **fasting** blood sample, elevated increases in **postprandial lipoproteins** can be a critically important risk factor for vascular disease.

The danger of **after-meal** remnants remaining in your blood is one reason why **Life Extension®** is now suggesting that people consider having their blood drawn 2-6 hours after a normal meal, be it breakfast or lunch. The box on the next page describes some of the mechanisms by which high levels of **postprandial lipoproteins** damage our arteries.

After-Meal Triglycerides Affect Lipoproteins

Triglycerides are a principal component of **postprandial lipoproteins** like VLDL.²⁵

Elevated **fasting** triglycerides can serve as an indirect index of increased **postprandial lipoproteins**.²⁶

If fasting **triglycerides** are high, postprandial lipoproteins are likely to be present. If *after-meal* triglycerides are high, this is an even stronger indicator of greater postprandial lipoproteins.

Simply put, the *higher* your **triglycerides**, the more likely **postprandial lipoproteins** are also present, potentially putting you at risk for atherosclerotic disease.

However, **fasting** triglycerides may not be the best way of assessing your atherosclerotic risk. Some people can have **fasting triglyceride** levels of less than **100 mg/dL**, yet still have dangerously high daily levels of **postprandial lipoproteins**.²⁰

Having your blood drawn in a **non-fasting** state may provide a better snapshot of what your blood consists of on a normal day.

On blood samples drawn **4-6 hours after** a meal, **triglycerides** over **250 mg/dL** indicate a **postprandial lipoprotein** problem.^{27,28}

FDA's Absurd Position

We at **Life Extension®** have argued for the past four decades that **optimal** triglyceride levels are under **100 mg/dL**. The **American Heart Association** in recent years concurs with our position.

Until a **federal judge** intervened, the **FDA** was able to claim

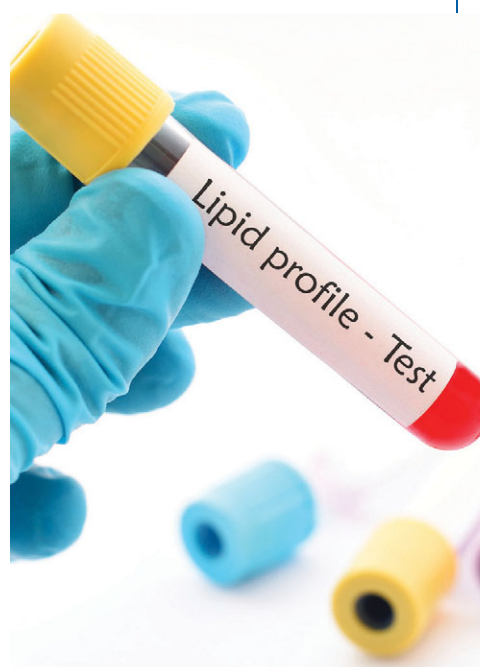
that **triglyceride** levels between **200-499 mg/dL** had not been proven to increase vascular disease risk.

I wrote a detailed rebuttal to the FDA's unscientific position in the **May 2016** edition of this publication. Relying on **federal government** health guidelines can be analogous to living in the medical **Dark Ages**.

A Hidden Cause of Vascular Disease

When **lipoproteins** like VLDL and chylomicrons linger in the blood for many hours after eating, they are afforded ample opportunity to exert damaging effects on vascular structures. Here are some mechanisms in which high *after-meal* fats (lipoproteins) accelerate atherosclerosis:

- **Postprandial lipoproteins** block the artery-relaxing agent known as **nitric oxide**, while increasing the artery constrictor called endothelin. This induces **endothelial dysfunction**,^{12,15} which contributes to the formation of atherosclerotic plaque.¹⁶
- **Postprandial lipoproteins** increase blood levels of cellular adhesion molecules, allowing **inflammatory** white blood cells to more readily adhere and gain entry to the arterial wall, which also leads to atherosclerotic plaque formation.¹⁷
- **Postprandial lipoproteins** activate blood clotting by increasing factors that both promote blood clotting (thrombosis) and inhibit clot breakdown.¹⁸
- **Postprandial lipoproteins** trigger the formation of a cascade of other abnormal lipoprotein particles that contribute to heart and vascular disease, such as small, dense lipoprotein (small LDL) particles.¹⁹
- **Postprandial lipoprotein** particles insert themselves into atherosclerotic plaque, fueling its growth.²⁰
- Carotid ultrasound studies show that people with elevated **postprandial** lipoproteins have more **carotid plaque** than people who do not, independent of their cholesterol values.^{21,22}
- **Postprandial lipoproteins** predict a greater likelihood of **coronary** atherosclerotic plaque. People with excessive **postprandial** (after-meal) abnormalities experience more rapid arterial plaque growth.²¹⁻²⁴



Impact of After-Meal Glucose

We've published many articles in *Life Extension Magazine*® about the lethal impact of high *after-meal* blood sugar levels.

When **blood sugar** spikes too high after eating and remains elevated, this presents a significant **mortality risk** factor.²⁹ These kinds of surges in *after-meal* glucose (sugar) are associated with prediabetes and diabetes.^{30,31}

Reducing *after-meal* glucose levels has the potential to help prevent many common aging disorders.

Elevated **glucose** promotes **cardiovascular** disease and is associated with an *increased* risk of **dementia**, **cancer**, worse outcomes in **cancer patients**, and **accelerated aging**.³²⁻⁴³

Researchers have found that *increased* two-hour postprandial (after-meal) **glucose** is an **independent** risk predictor for cardiovascular and all-cause death.²⁹ During this postprandial period, blood sugar spikes can acutely impair blood flow through vital arteries.⁴⁴ This can ultimately lead to heart attack or stroke.

After-meal surges in blood sugar directly impair the arteries' ability to respond to the heart's demand for an immediate increase in blood flow.^{12,45}

This is one reason that **diabetics** have such a high prevalence of cardiovascular disorders.⁴⁶ But even if you don't have diabetes, a "normal" **fasting** blood sugar measurement doesn't protect you against the harmful effects of *after-meal* glucose spikes.^{12,45,47,48}

People who have normal *fasting glucose*, but whose glucose levels remain high two-hours *after* a sugar-laden test drink are diagnosed with "**impaired glucose tolerance**." The risk for cardiovascular disease rises sharply in those with impaired glucose tolerance.^{12,49}

One study found that people with **impaired glucose tolerance** had a **34%** higher risk of dying from any form of cardiovascular disease, with a specific **28%** greater risk of dying from **coronary heart disease**.⁴⁸

Diabetic men with the highest *after-lunch* blood sugar levels are more than *twice* as likely to have a cardiovascular event, compared

with those with lower levels. In women, that figure rose to a startling **5.5-fold** increase.⁵⁰

In nondiabetic people with **metabolic syndrome**, every *increase* in *after-meal* blood sugar of **18 mg/dL** raised the risk of cardiovascular death by **26%**.²⁹

These data clearly show that assessing one's glucose status two or more hours *after* a normal meal provides critically important information as to one's underlying disease risk.

Cancer and Brain Shrinkage

High-normal blood **glucose** and elevated **insulin** increases risk of **breast cancer**.⁵¹⁻⁵⁷

Glucose provides fuel for rapidly dividing cancer cells, while **insulin** promotes tumor growth through multiple pathways.^{54,58}

In a 19-year study, researchers found that participants with impaired fasting glucose of **100 mg/dL** or greater had a **49%** greater risk of **cancer** death.⁵⁹

Those with *after-meal* glucose above **199 mg/dL** had **52%** *increased* cancer death risk. Elevated glucose levels markedly increase an individual's risk of dying from cancer.⁵⁹

Glucose levels deemed "high-normal" result in *reduced* **brain** volume. A study of 249 volunteers (age early 60s) demonstrated that blood glucose in the high-normal range results in significant **brain shrinkage**. This shrinkage occurs in regions of the brain involved in memory and other critical functions.⁶⁰

What may surprise you is that it did not require very "high" **glucose** levels to cause **brain shrinkage**. The people in this study classified as having "high" fasting blood sugar levels were *below*





110 mg/dL. This is the World Health Organization's threshold for **impaired fasting glucose**.⁶⁰ Said differently, glucose levels that mainstream medicine often accept as "normal" are quite hazardous.

In light of evidence linking high normal blood sugar levels with elevated risks of cardiovascular death, cancer, and brain shrinkage, protective steps to reduce glucose levels are critical.⁶¹

Those who follow strict **calorie restriction** diets avoid problems associated with elevated glucose and insulin. For the rest of us, there are steps we can take before meals to impede deadly glucose surges.

What measures you take, however, should begin with a comprehensive **blood test panel**. Consider not fasting prior to your blood draw. Instead, consume your normal meal/drink and then wait 2-6 hours to have your blood drawn. This will likely enable a more realistic analysis of your underlying disease risks and what can be done to protect your precious health.

What about Homocysteine?

As it relates to the majority of tests, whether your blood is drawn in a **fasting** or **non-fasting** state has little impact on the results. This includes sex hormones like **DHEA**, **testosterone**, **estrogen**, and **progesterone**.

Dangers of After-Meal Glucose Not Yet Fully Recognized

When people take blood tests to measure glucose levels, they are asked to **fast** for **8 to 12 hours**.

Doctors request this **fasting period** because they want a consistent baseline to measure glucose and lipids in comparison with the general population.

The problem with fasting is it can cover up the clinical picture of a person who suffers dangerously **high blood sugar** many hours **following** a typical meal.

In other words, a person may artificially drop their **fasting glucose** to a safe range after fasting 8-12 hours, but in their everyday life, they may never fast for this long.

Thus, a fasting glucose blood test can **mask** what may be a dangerous postprandial (after-meal) glucose spike.

Even tests that measure long-term glycemic control like **hemoglobin A1C (HbA1C)** may not adequately detect these post-meal **glucose surges**.

This means that many individuals are spending at least part of their day in an acute **diabetic state**. The impact of these multi-hour **glucose surges** is just now being understood.

To put this in perspective, a study was done where **after-meal** glucose spikes were **impeded** using a drug that blocks a digestive enzyme. People taking this drug (acarbose) dropped their **heart attack** risk by an astounding **91%**.⁶²

Blood cell counts and assessments of liver and kidney function are unlikely to be significantly affected based on when you ate prior to a blood draw.

When it comes to **homocysteine**, however, there may be an advantage to having your blood drawn several hours **after** you eat as opposed to an overnight fast.

The precursor to homocysteine in the blood is the amino acid **methionine**. Those who ingest red meat often have sharp spikes in **homocysteine** blood levels.

One study showed that men who consumed large amounts of methionine-rich protein had a steady rise in their **homocysteine** levels throughout the day, but returned to baseline levels the next morning (after an overnight fast).⁶³

This study has profound implications as it relates to assessing the vascular risk of homocysteine. Numerous studies associate high homocysteine with greater incidence of **heart attack**^{64,65} and **stroke**.⁶⁶⁻⁶⁸ Yet there are inconsistent findings when attempts to lower homocysteine are taken.

A huge overlooked confounding factor is that men who consume a lot of red meat may have elevated homocysteine throughout the day, but it drops to normal the next morning. This would drastically affect the findings of human studies whereby **blood draws** occur after an overnight **fast**.

In this case, men who suffered elevated homocysteine almost every day would show normal readings each morning. This

would seriously distort the study analysis because men with **elevated** homocysteine during the **day** would be placed in the same group whose homocysteine was lower all day. These men with high daily homocysteine are not in safe ranges. They merely measured artificially low because of the over-night **fast**.

For those who consume a lot of red meat, consider having your blood tested **2-6 hours** after the meal while also taking your usual homocysteine-lowering supplements such as **folate** (5-MTHF form) along with **vitamins B2, B6 and B12**.

What You Should Do

Standard **blood tests** are usually done in the **fasting** state.

Yet a number of studies show that elevated **after-meal** blood levels of **triglycerides** and **glucose** are dangerous.^{48,69} Ditto for **homocysteine** that may test normal after an overnight fast, but elevate during a day of high meat ingestion.

Fasting glucose levels alone do not identify individuals with an increased risk of glucose-related disease because they do not detect dangerous **after-meal** glucose spikes.^{70,71}

The current method of drawing blood only when “fasting” may not adequately measure an individual’s average glucose, triglyceride, homocysteine and post-prandial lipoprotein status over the course of a typical day.

By definition, fasting blood tests are conducted eight or more hours **after** your last meal. This method of only testing blood when in an artificial “fasting” state may not account for vital risk markers specific to you as an

individual. In other words, after each meal, your blood sugar and triglycerides will rise, but should return to normal several hours afterwards.

Depending on the consistency and frequency of meals consumed, an individual may silently sustain tissue injuries throughout a typical day that are not detected when blood is drawn after an **8-12 hour** fast.

Conventional dogma is difficult to change, even when **common sense** and compelling **science** indicates a better approach.

Based on an accumulating volume of data, consider having your next **blood draw** in a non-fasting state, as close as possible to what you typically eat and drink on most days (including physical exercise).

Blood Test Super Sale

In **1996**, we initiated a **low-cost** service whereby our members could directly request their own **blood tests**.

Once a year, we sharply discount the price of our comprehensive **Male or Female Blood Test Panels**. This enables readers of this magazine to ascertain their disease risk status and initiate pre-emptive measures before acute illness strikes.

Glucose, homocysteine, and triglycerides are included in these tests, along with a **hemoglobin A1C** test to help assess long-term glucose control.

As you can readily see on the next page, the large number of tests including **sex hormone** status provides a comprehensive review of one’s underlying health.

The retail price for these individual tests can be quite high at commercial labs. We offer them

for only **\$199** during the annual **Blood Test Super Sale**.

As with any purchase, blood tests qualify for **Reward Dollars** that lower your future cost of supplements.

Upon receiving your order, we immediately send a requisition and list of blood draw stations in your area. You can usually **walk in** for your blood draw at a time convenient to you. This year we are advising that most people consider having their blood draw done 2-6 hours after a typical meal.

We understand that many of you may want to continue having your blood drawn in a fasting state. The conclusion of a **2016** study showing that fasting is not routinely required prior to lipid testing stated:

“We recommend that non-fasting blood samples be routinely used for the assessment of plasma lipid profiles... non-fasting and fasting measurements should be complementary but not mutually exclusive.”⁷

Whether you have your blood drawn while fasting or non-fasting, our **Wellness Specialists** are available to assist you in understanding the results, which come back very quickly nowadays.

To order the **Male or Female Blood Test Panel** at these discounted prices, call **1-800-208-3444** (24 hours/day).

For longer life,



William Faloan

MALE AND FEMALE BLOOD TEST PANELS

Unlike commercial blood labs that test only a few risk factors, **Life Extension®**'s **Male and Female Blood Test Panels** measure a wide range of blood markers

that predispose people to age-related diseases. Just look at the **huge** number of parameters included in the **Male and Female Blood Test Panels**:

■ MALE PANEL

LIPID PROFILE

Triglycerides

Total Cholesterol

LDL (low-density lipoprotein)

HDL (high-density lipoprotein)

CARDIAC MARKERS

Homocysteine

C-Reactive Protein (high sensitivity)

METABOLIC PROFILE

Glucose

Hemoglobin A1c

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)

HORMONES

Free and Total Testosterone

DHEA-S

Estradiol (an estrogen)

TSH (thyroid function)

Vitamin D (25-hydroxyvitamin D)

■ FEMALE PANEL

LIPID PROFILE

Triglycerides

Total Cholesterol

LDL (low-density lipoprotein)

HDL (high-density lipoprotein)

CARDIAC MARKERS

Homocysteine

C-Reactive Protein (high sensitivity)

METABOLIC PROFILE

Glucose

Hemoglobin A1c

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

HORMONES

Progesterone

Estradiol (an estrogen)

Free and Total Testosterone

DHEA-S

TSH (thyroid function)

Vitamin D (25-hydroxyvitamin D)

■ Blood Test Super Sale • March 27 through June 5, 2017. ■

Retail price: \$400

Your Price: **\$199**

To obtain these comprehensive **Male or Female Panels** at these low prices, call **1-800-208-3444** to order your requisition forms.

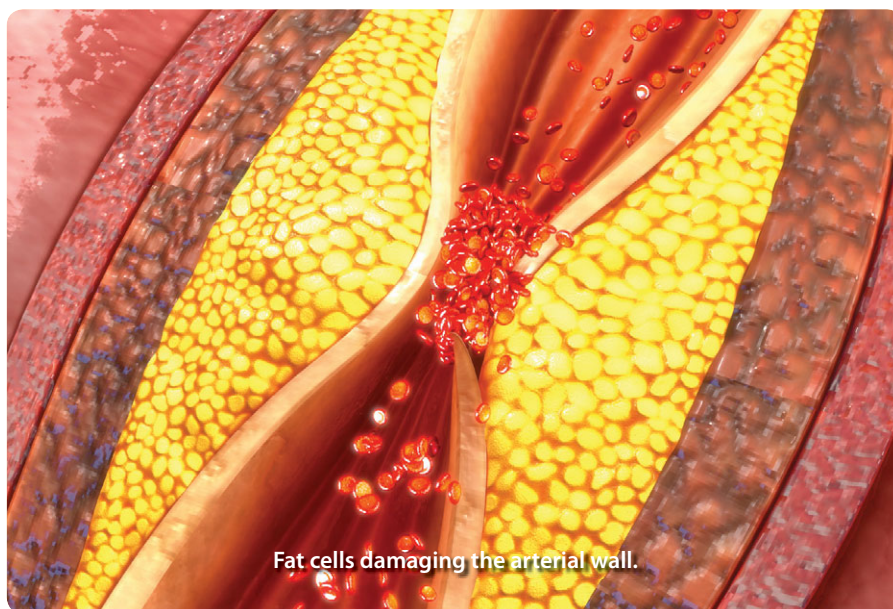
Then—at your convenience—you can visit one of the blood-drawing facilities provided by LabCorp in your area or at the **Life Extension Nutrition Center** in Ft. Lauderdale.

Blood testing services are available only in the continental United States and Anchorage, AK. Not available in Maryland. Restrictions apply for residents of MA, NY, NJ, RI, and PA.

LifeExtension®
National Diagnostics, Inc.

References

1. Langsted A, Freiberg JJ, Nordestgaard BG. Fasting and nonfasting lipid levels: influence of normal food intake on lipids, lipoproteins, apolipoproteins, and cardiovascular risk prediction. *Circulation*. 2008;118(20):2047-56.
2. Onat A, Can G, Cicek G, et al. Fasting, non-fasting glucose and HDL dysfunction in risk of pre-diabetes, diabetes, and coronary disease in non-diabetic adults. *Acta Diabetol*. 2013;50(4):519-28.
3. Moebus S, Gores L, Losch C, et al. Impact of time since last caloric intake on blood glucose levels. *Eur J Epidemiol*. 2011;26(9):719-28.
4. Sacks DB. A1C versus glucose testing: a comparison. *Diabetes Care*. 2011;34(2):518-23.
5. Sidhu D, Naugler C. Fasting time and lipid levels in a community-based population: a cross-sectional study. *Arch Intern Med*. 2012;172(22):1707-10.
6. Doran B, Guo Y, Xu J, et al. Prognostic value of fasting versus nonfasting low-density lipoprotein cholesterol levels on long-term mortality: insight from the National Health and Nutrition Examination Survey III (NHANES-III). *Circulation*. 2014;130(7):546-53.
7. Nordestgaard BG, Langsted A, Mora S, et al. Fasting is not routinely required for determination of a lipid profile: clinical and laboratory implications including flagging at desirable concentration cut-points—a joint consensus statement from the European Atherosclerosis Society and European Federation of Clinical Chemistry and Laboratory Medicine. *Eur Heart J*. 2016;37(25):1944-58.
8. Wojczynski MK, Glasser SP, Oberman A, et al. High-fat meal effect on LDL, HDL, and VLDL particle size and number in the Genetics of Lipid-Lowering Drugs and Diet Network (GOLDN): an interventional study. *Lipids Health Dis*. 2011;10:181.
9. Ninomiya JK, L'Italien G, Criqui MH, et al. Association of the metabolic syndrome with history of myocardial infarction and stroke in the Third National Health and Nutrition Examination Survey. *Circulation*. 2004;109(1):42-6.
10. Antonios N, Angiolillo DJ, Silliman S. Hypertriglyceridemia and ischemic stroke. *Eur Neurol*. 2008;60(6):269-78.
11. Boren J, Matikainen N, Adiels M, et al. Postprandial hypertriglyceridemia as a coronary risk factor. *Clin Chim Acta*. 2014;431:131-42.
12. Ceriello A, Taboga C, Tonutti L, et al. Evidence for an independent and cumulative effect of postprandial hypertriglyceridemia and hyperglycemia on endothelial dysfunction and oxidative stress generation: effects of short- and long-term simvastatin treatment. *Circulation*. 2002;106(10):1211-8.
13. Gronholdt ML, Nordestgaard BG, Nielsen TG, et al. Echolucent carotid artery plaques are associated with elevated levels of fasting and postprandial triglyceride-rich lipoproteins. *Stroke*. 1996;27(12):2166-72.
14. Watt HC, Law MR, Wald NJ, et al. Serum triglyceride: a possible risk factor for ruptured abdominal aortic aneurysm. *Int J Epidemiol*. 1998;27(6):949-52.
15. Jagla A, Schrezenmeir J. Postprandial triglycerides and endothelial function. *Exp Clin Endocrinol Diabetes*. 2001;109(4):S533-47.
16. Maggi FM, Raselli S, Grigore L, et al. Lipoprotein remnants and endothelial dysfunction in the postprandial phase. *J Clin Endocrinol Metab*. 2004;89(6):2946-50.
17. Ceriello A, Quagliaro L, Piconi L, et al. Effect of postprandial hypertriglyceridemia and hyperglycemia on circulating adhesion molecules and oxidative stress generation and the possible role of simvastatin treatment. *Diabetes*. 2004;53(3):701-10.
18. Silveira A. Postprandial triglycerides and blood coagulation. *Exp Clin Endocrinol Diabetes*. 2001;109(4):S527-32.
19. Ebenbichler CF, Kirchmair R, Egger C, et al. Postprandial state and atherosclerosis. *Curr Opin Lipidol*. 1995;6(5):286-90.
20. Twickler TB, Dallinga-Thie GM, Cohn JS, et al. Elevated remnant-like particle cholesterol concentration: a characteristic feature of the atherogenic lipoprotein phenotype. *Circulation*. 2004;109(16):1918-25.
21. Teno S, Uto Y, Nagashima H, et al. Association of postprandial hypertriglyceridemia and carotid intima-media thickness in patients with type 2 diabetes. *Diabetes Care*. 2000;23(9):1401-6.
22. Mori Y, Itoh Y, Komiya H, et al. Association between postprandial remnant-like particle triglyceride (RLP-TG) levels and carotid intima-media thickness (IMT) in Japanese patients with type 2 diabetes: assessment by meal tolerance tests (MTT). *Endocrine*. 2005;28(2):157-63.
23. Hyson D, Rutledge JC, Berglund L. Postprandial lipoproteins and cardiovascular disease. *Curr Atheroscler Rep*. 2003;5(6):437-44.
24. Karpe F, Steiner G, Uffelman K, et al. Postprandial lipoproteins and progression of coronary atherosclerosis. *Atherosclerosis*. 1994;106(1):83-97.
25. Nakajima K, Nakano T, Tokita Y, et al. Postprandial lipoprotein metabolism: VLDL vs chylomicrons. *Clin Chim Acta*. 2011;412(15-16):1306-18.
26. Brinton EA, Nanjee MN, Hopkins PN. Triglyceride-rich lipoprotein remnant levels and metabolism: time to adopt these orphan risk factors? *J Am Coll Cardiol*. 2004;43(12):2233-5.
27. Samson CE, Galia AL, Llave KI, et al. Postprandial Peaking and Plateauing of Triglycerides and VLDL in Patients with Underlying Cardiovascular Diseases Despite Treatment. *Int J Endocrinol Metab*. 2012;10(4):587-93.
28. Tiihonen K, Rautonen N, Alhoniemi E, et al. Postprandial triglyceride response in normolipidemic, hyperlipidemic and obese subjects - the influence of polydextrose, a non-digestible carbohydrate. *Nutr J*. 2015;14:23.
29. Lin HJ, Lee BC, Ho YL, et al. Postprandial glucose improves the risk prediction of cardiovascular death beyond the metabolic syndrome in the nondiabetic population. *Diabetes Care*. 2009;32(9):1721-6.



Fat cells damaging the arterial wall.

30. Blaak EE, Antoine JM, Benton D, et al. Impact of postprandial glycaemia on health and prevention of disease. *Obes Rev.* 2012;13(10):923-84.
31. Ceriello A, Colagiuri S. International Diabetes Federation guideline for management of postmeal glucose: a review of recommendations. *Diabet Med.* 2008;25(10):1151-6.
32. Barba M, Sperati F, Stranges S, et al. Fasting glucose and treatment outcome in breast and colorectal cancer patients treated with targeted agents: results from a historic cohort. *Ann Oncol.* 2012;23(7):1838-45.
33. Chan JM, Wang F, Holly EA. Sweets, sweetened beverages, and risk of pancreatic cancer in a large population-based case-control study. *Cancer Causes Control.* 2009;20(6):835-46.
34. Coutinho M, Gerstein HC, Wang Y, et al. The relationship between glucose and incident cardiovascular events. A metaregression analysis of published data from 20 studies of 95,783 individuals followed for 12.4 years. *Diabetes Care.* 1999;22(2):233-40.
35. de Vegt F, Dekker JM, Ruhe HG, et al. Hyperglycaemia is associated with all-cause and cardiovascular mortality in the Hoorn population: the Hoorn Study. *Diabetologia.* 1999;42(8):926-31.
36. Hanefeld M, Gagatay M, Petrowitsch T, et al. Acarbose reduces the risk for myocardial infarction in type 2 diabetic patients: meta-analysis of seven long-term studies. *Eur Heart J.* 2004;25(1):10-6.
37. Jee SH, Ohrr H, Sull JW, et al. Fasting serum glucose level and cancer risk in Korean men and women. *Jama.* 2005;293(2):194-202.
38. Lajous M, Willett W, Lazcano-Ponce E, et al. Glycemic load, glycemic index, and the risk of breast cancer among Mexican women. *Cancer Causes Control.* 2005;16(10):1165-9.
39. Michaud DS, Fuchs CS, Liu S, et al. Dietary glycemic load, carbohydrate, sugar, and colorectal cancer risk in men and women. *Cancer Epidemiol Biomarkers Prev.* 2005;14(1):138-47.
40. Monickaraj F, Aravind S, Gokulakrishnan K, et al. Accelerated aging as evidenced by increased telomere shortening and mitochondrial DNA depletion in patients with type 2 diabetes. *Mol Cell Biochem.* 2012;365(1-2):343-50.
41. Ott A, Stolk RP, van Harskamp F, et al. Diabetes mellitus and the risk of dementia: The Rotterdam Study. *Neurology.* 1999;53(9):1937-42.
42. Yaffe K, Blackwell T, Whitmer RA, et al. Glycosylated hemoglobin level and development of mild cognitive impairment or dementia in older women. *J Nutr Health Aging.* 2006;10(4):293-5.
43. Xu W, Qiu C, Winblad B, et al. The effect of borderline diabetes on the risk of dementia and Alzheimer's disease. *Diabetes.* 2007;56(1):211-6.
44. Nitenberg A, Cosson E, Pham I. Postprandial endothelial dysfunction: role of glucose, lipids and insulin. *Diabetes Metab.* 2006;32 Spec No2:2s28-33.
45. Kawano H, Motoyama T, Hirashima O, et al. Hyperglycemia rapidly suppresses flow-mediated endothelium-dependent vasodilation of brachial artery. *J Am Coll Cardiol.* 1999;34(1):146-54.
46. Reusch JE, Wang CC. Cardiovascular disease in diabetes: where does glucose fit in? *J Clin Endocrinol Metab.* 2011;96(8):2367-76.
47. Title LM, Cummings PM, Giddens K, et al. Oral glucose loading acutely attenuates endothelium-dependent vasodilation in healthy adults without diabetes: an effect prevented by vitamins C and E. *J Am Coll Cardiol.* 2000;36(7):2185-91.
48. Decode Study Group, the European Diabetes Epidemiology Group. Glucose tolerance and cardiovascular mortality: comparison of fasting and 2-hour diagnostic criteria. *Arch Intern Med.* 2001;161(3):397-405.
49. Leiter LA, Ceriello A, Davidson JA, et al. Postprandial glucose regulation: new data and new implications. *Clin Ther.* 2005;27 Suppl B:S42-56.
50. Cavalot F, Petrelli A, Traversa M, et al. Postprandial blood glucose is a stronger predictor of cardiovascular events than fasting blood glucose in type 2 diabetes mellitus, particularly in women: lessons from the San Luigi Gonzaga Diabetes Study. *J Clin Endocrinol Metab.* 2006;91(3):813-9.
51. Contiero P, Berrino F, Tagliabue G, et al. Fasting blood glucose and long-term prognosis of non-metastatic breast cancer: a cohort study. *Breast Cancer Res Treat.* 2013;138(3):951-9.
52. Lawlor DA, Smith GD, Ebrahim S. Hyperinsulinaemia and increased risk of breast cancer: findings from the British Women's Heart and Health Study. *Cancer Causes Control.* 2004;15(3):267-75.
53. Liao S, Li J, Wei W, et al. Association between diabetes mellitus and breast cancer risk: a meta-analysis of the literature. *Asian Pac J Cancer Prev.* 2011;12(4):1061-5.
54. Muti P, Quattrin T, Grant BJ, et al. Fasting glucose is a risk factor for breast cancer: a prospective study. *Cancer Epidemiol Biomarkers Prev.* 2002;11(11):1361-8.
55. Rapp K, Schroeder J, Klenk J, et al. Fasting blood glucose and cancer risk in a cohort of more than 140,000 adults in Austria. *Diabetologia.* 2006;49(5):945-52.
56. Sieri S, Muti P, Claudia A, et al. Prospective study on the role of glucose metabolism in breast cancer occurrence. *Int J Cancer.* 2012;130(4):921-9.
57. Kabat GC, Kim M, Caan BJ, et al. Repeated measures of serum glucose and insulin in relation to postmenopausal breast cancer. *Int J Cancer.* 2009;125(11):2704-10.
58. Arcidiacono B, Iiritano S, Nocera A, et al. Insulin resistance and cancer risk: an overview of the pathogenetic mechanisms. *Exp Diabetes Res.* 2012;2012:789174.
59. Hirakawa Y, Ninomiya T, Mukai N, et al. Association between glucose tolerance level and cancer death in a general Japanese population: the Hisayama Study. *Am J Epidemiol.* 2012;176(10):856-64.
60. Cherbuin N, Sachdev P, Anstey KJ. Higher normal fasting plasma glucose is associated with hippocampal atrophy: The PATH Study. *Neurology.* 2012;79(10):1019-26.
61. Kerti L, Witte AV, Winkler A, et al. Higher glucose levels associated with lower memory and reduced hippocampal microstructure. *Neurology.* 2013;81(20):1746-52.
62. Chiasson JL, Josse RG, Gomis R, et al. Acarbose treatment and the risk of cardiovascular disease and hypertension in patients with impaired glucose tolerance: the STOP-NIDDM trial. *Jama.* 2003;290(4):486-94.
63. Verhoeve P, van Vliet T, Olthoff MR, et al. A high-protein diet increases postprandial but not fasting plasma total homocysteine concentrations: a dietary controlled, crossover trial in healthy volunteers. *Am J Clin Nutr.* 2005;82(3):553-8.
64. Haim M, Tanne D, Goldbourt U, et al. Serum homocysteine and long-term risk of myocardial infarction and sudden death in patients with coronary heart disease. *Cardiology.* 2007;107(1):52-6.
65. Stampfer MJ, Malinow MR, Willett WC, et al. A prospective study of plasma homocyst(e)ine and risk of myocardial infarction in US physicians. *Jama.* 1992;268(7):877-81.
66. Iso H, Moriyama Y, Sato S, et al. Serum total homocysteine concentrations and risk of stroke and its subtypes in Japanese. *Circulation.* 2004;109(22):2766-72.
67. Casas JP, Bautista LE, Smeeth L, et al. Homocysteine and stroke: evidence on a causal link from mendelian randomisation. *Lancet.* 2005;365(9455):224-32.
68. Tanne D, Haim M, Goldbourt U, et al. Prospective study of serum homocysteine and risk of ischemic stroke among patients with preexisting coronary heart disease. *Stroke.* 2003;34(3):632-6.
69. Bansal S, Buring JE, Rifai N, et al. Fasting compared with nonfasting triglycerides and risk of cardiovascular events in women. *Jama.* 2007;298(3):309-16.
70. The DECODE study group on behalf of the European Diabetes Epidemiology Group. Glucose tolerance and mortality: comparison of WHO and American Diabetic Association diagnostic criteria. *The Lancet.* 1999;354(9179):617-21.
71. Nakagami T. Hyperglycaemia and mortality from all causes and from cardiovascular disease in five populations of Asian origin. *Diabetologia.* 2004;47(3):385-94.



FIVE EASY STEPS FOR ORDERING BLOOD TESTS:

1. Call **1-800-208-3444** to discuss and place your order with one of our knowledgeable Wellness Specialists. This order form can also be faxed to: **1-866-728-1050**. Online orders can also be placed at **www.LifeExtension.com/labtesting**
2. After your order is placed, you will be mailed either a requisition form to take to your local LabCorp Patient Service Center or a Blood Draw Kit, whichever is applicable. (Please note: If a blood draw kit is used, an additional local draw fee may be incurred.)
3. Have your blood drawn.
4. Your blood test results will be mailed, emailed, or faxed directly to you by Life Extension.
5. Take the opportunity to discuss the results with one of our knowledgeable Wellness Specialists by calling **1-800-226-2370**; or review the results with your personal physician.

**IT'S THAT SIMPLE!
DON'T DELAY! CALL TODAY!**

For Our Local Customers:

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

**5990 NORTH FEDERAL HIGHWAY,
FT. LAUDERDALE, FL, 33308-2633**

Terms and Conditions

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

LifeExtension ANNUAL Blood Test SUPER SALE March 27 - June 5, 2017

WHAT'S NEW FOR 2017

	RETAIL PRICE	SUPER SALE PRICE
<input type="radio"/> NEUROTRANSMITTER BASIC PANEL** (LC100058) Serotonin, Dopamine, Epinephrine, Norepinephrine, GABA, Glutamate. Alterations in these six neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, cravings, addictions, pain and more! Not available in NY.	\$265.33	\$149.25
<input type="radio"/> FOOD SAFE ALLERGY TEST – BASIC** (LCM73001) This test measures delayed (IgG) food allergies for 95 common foods.	\$264	\$148.50
<input type="radio"/> FOOD SAFE ALLERGY TEST – EXTENDED** (LCM73002) This test measures delayed (IgG) food allergies to an additional 95 foods.	\$264	\$148.50
<input type="radio"/> FOOD SAFE ALLERGY TEST – COMBO** (LCM73003) This test measures delayed (IgG) food allergies to all 190 foods found in our Basic and Extended panels.	\$500	\$281.25

NEW GENETIC TESTING

<input type="radio"/> DNA GENETIC CANCER RISK PROFILE** (LC100057) With only a saliva sample, you can identify your risk for 25 hereditary cancers by analyzing 98 genes from your DNA including the well-known BRCA1, BRCA2, TP53, and APC. Not available in FL, NY, and RI.	\$398.66	\$224.25
<input type="radio"/> APOE GENETIC TEST FOR ALZHEIMER'S AND CARDIAC RISK ** (LC100059) Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglycerides levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing Late Onset Alzheimer's disease. According to the National Institute of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer's disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele. In the cardiovascular system ApoE is involved in the transportation of fat molecules into your cells. E4 is associated with increased levels of cholesterol and triglycerides, which leads to atherosclerosis, heart disease and stroke.	\$198.66	\$111.75

CBC/CHEMISTRY PROFILE

<input type="radio"/> CBC/CHEMISTRY PROFILE (LC381822) Note: This CBC/Chemistry Profile is included in many Life Extension Panels. The following panels are included in the CBC/Chemistry Profile: CARDIOVASCULAR RISK PROFILE Total Cholesterol • HDL Cholesterol • LDL Cholesterol • Triglycerides Cholesterol/HDL Ratio • Estimated CHD Risk • Glucose LIVER FUNCTION PANEL AST (SGOT) • ALT (SGPT) • LDH • Total Bilirubin • Alkaline phosphatase KIDNEY FUNCTION PANEL BUN • Creatinine • BUN/Creatinine Ratio • Uric Acid BLOOD PROTEIN LEVELS Total Protein • Albumin • Globulin • Albumin/Globulin Ratio BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE Red Blood Cell Count • White Blood Cell Count • Eosinophils • Neutrophils (Absolute) Lymphs (Absolute) • Eos (Absolute) • Baso (Absolute) • RDW • Monocytes (Absolute) Monocytes • Lymphocytes • Platelet Count • Hemoglobin • Hematocrit • MCV • MCH MCHC • Neutrophils BLOOD MINERAL PANEL Calcium • Potassium • Sodium • Chloride • Iron	\$47	\$26
---	-------------	-------------

ANNUAL BLOOD TEST PANELS

	RETAIL PRICE	SUPER SALE PRICE		RETAIL PRICE	SUPER SALE PRICE
MALE LIFE EXTENSION PANEL (LC322582) CBC/Chemistry Profile • DHEA-S • PSA (prostate-specific antigen) Homocysteine • C-Reactive Protein (high-sensitivity) Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c	\$400	\$199	FEMALE LIFE EXTENSION PANEL (LC322535) CBC/Chemistry Profile • DHEA-S • Estradiol • Homocysteine C-Reactive Protein (high-sensitivity) • Progesterone • Free Testosterone Total Testosterone • TSH for thyroid function Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c	\$400	\$199
MALE HORMONE ADD-ON PANEL* (LCADDM) 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 steroid hormones.	\$160	\$90	FEMALE HORMONE ADD-ON PANEL* (LCADDF) 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 steroid hormones.	\$166.75	\$93.75
MALE ELITE PANEL (LC100016)* CBC/Chemistry Profile • Free and Total Testosterone Total Estrogens • Estradiol • DHEA-S • Progesterone • Pregnenolone HT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • Free and Total PSA IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • ferritin • Homocysteine	\$766.66	\$431.25	FEMALE ELITE PANEL (LC100017)* CBC/Chemistry Profile • Free and total Testosterone Total Estrogens • Estradiol • Estrone • DHEA-S • Progesterone Pregnenolone • DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • Ferritin • Homocysteine	\$766.66	\$431.25
MALE COMPREHENSIVE HORMONE PANEL (LC100010)* CBC/Chemistry Profile • DHEA-S, Estradiol • DHT • PSA Pregnenolone • Total and Free Testosterone • SHBG • TSH • Free T3 This panel now includes Free T4 and Cortisol with no increase in price!	\$398.66	\$224.25	FEMALE COMPREHENSIVE HORMONE PANEL (LC100011)* CBC/Chemistry Profile • DHEA-S, Estradiol • Total Estrogens Progesterone • Pregnenolone • Total and Free Testosterone • SHBG TSH • Free T3 This panel now includes Free T4 and Cortisol with no increase in price!	\$398.66	\$224.25
MALE BASIC HORMONE PANEL (LC100012) DHEA-S • Estradiol • Total and Free Testosterone • PSA	\$100	\$56.25	FEMALE BASIC HORMONE PANEL (LC100013) DHEA-S • Estradiol • Total and Free Testosterone • Progesterone	\$100	\$56.25
THYROID ADD-ON PANEL (LC1THYROID) Free T3 & Free T4.	\$73.33	\$36	WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028) CBC/Chemistry Profile • DHEA-S • Free and Total Testosterone Estradiol • Progesterone • Cortisol, TSH • Free T3 • Free T4 Reverse T3 • Insulin • Hemoglobin A1c • Vitamin D 25-hydroxy C-reactive protein (high sensitivity) • Ferritin	\$366.66	\$206.25
OMEGA CHECK™** (LCOMEGA) Provides valuable information on your risk of developing heart disease, sudden heart attack, and cardiac death. The Omega Check™ also includes your AA:EPA ratio, allowing you to determine and track a major factor in total body inflammation.	\$175	\$99	HEALTHY AGING PANEL-COMPREHENSIVE (LC100026)* CBC/Chemistry Profile • C-reactive protein (high sensitivity) Vitamin B12 • Folate • Homocysteine • Vitamin D 25-hydroxy • Hemoglobin A1c TSH • Free T3 • Free T4 • Ferritin • Urinalysis • Fibrinogen • Insulin	\$332	\$186.75
INSULIN (LC004333) Helpful to assess insulin resistance.	\$39.87	\$24.42	DIABETES MANAGEMENT PROFILE – COMPREHENSIVE (LC100040) Hemoglobin A1C • Glucose • Insulin • Lipid Panel • Glycomark	\$172	\$96.75
NMR LIPOPROFILE® (LC123810) The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.	\$132	\$74.25			
ADVANCED OXIDIZED LDL PANEL*(LC100035) This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase and Oxidized LDL.	\$380	\$213.75			

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



With **Your Healthy Rewards**, you earn **LE Dollars** back on every purchase you make — including blood tests!
See www.LifeExtension.com/Rewards for details.

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

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

TRI SUGAR SHIELD®

Maintain Healthy Blood Sugar Levels

Tri Sugar Shield® contains natural ingredients that help:

- Maintain already healthy blood sugar levels
- Promote insulin sensitivity
- Support healthy glucose metabolism



Tri Sugar Shield®

Item #01803

60 vegetarian capsules

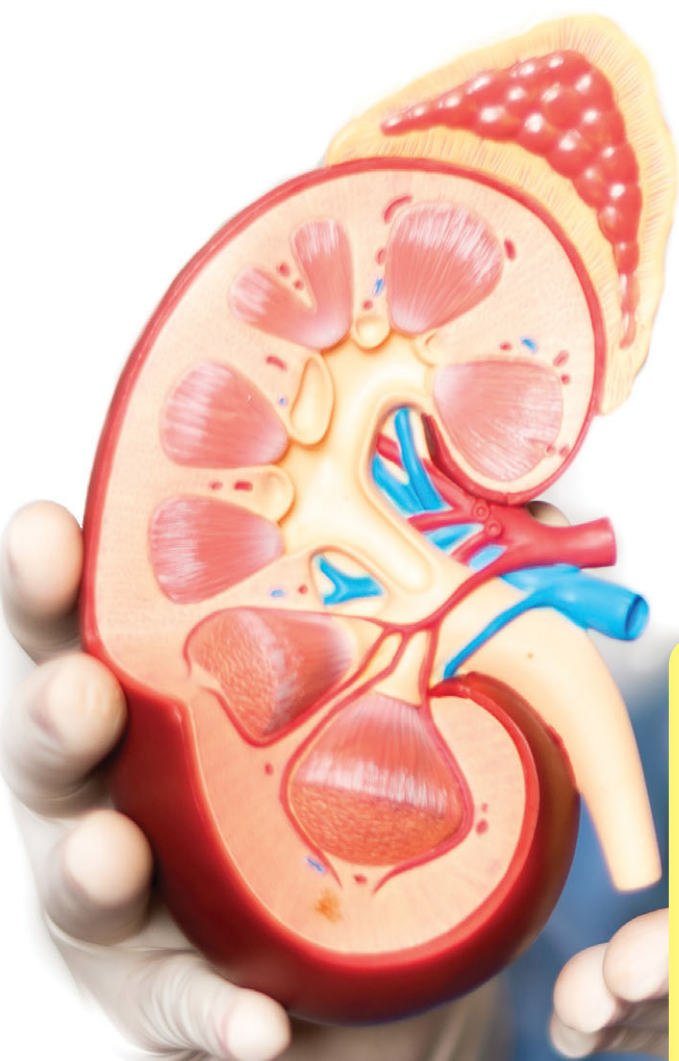
	Retail Price	Your Price
1 bottle	\$36	\$27
4 bottles		\$24 each

For additional product information
visit www.lifeextension.com/Vitamins-Supplements/item01803/Tri-Sugar-Shield



To order **Tri Sugar Shield®**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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



Kidney Disease Risk Raised by High Triglycerides and Low HDL

A study published online in *Diabetes Care* has found an association between high levels of **triglycerides**, low levels of **HDL** ("good" cholesterol) and increased risk of **diabetic kidney disease**.*

The observational retrospective study, conducted by a team headed by Giuseppina T. Russo, MD, PhD, of Italy's University of Messina, involved 15,362 diabetes patients. The subjects started at baseline with kidney function tests in the normal range and LDL cholesterol no higher than **130 mg/dL**.

The study found a correlation between high triglyceride levels at or above **150 mg/dL** and a **26%** increased risk of reduced kidney function as measured by low eGFR (estimated glomerular filtration rate).

In addition, scientists saw increased risk of kidney disease in those that had low levels of HDL (the good cholesterol). Individuals with lower-than-normal HDL experienced a **27%** increased risk of low eGFR.

Editor's Note: The study's authors state that, "In a large population of outpatients with diabetes, low HDL-C and high TG levels were independent risk factors for the development of diabetic kidney disease over four years."

* *Diabetes Care*. 2016 Dec;39(12):2278-87.

Low Vitamin D Linked to Cognitive Decline

Vitamin D has long been thought to protect against loss and damage of the brain's neurons, and new research confirms that idea.*

A study from Duke University has found an association between low levels of vitamin D and an increased risk of impairment and cognitive decline in elderly subjects.

More than 1,200 participants 60 years or older from the Chinese Longitudinal Health Longevity Survey were involved in the first large-scale prospective research in Asia. Baseline vitamin D levels were measured at the beginning of the study and cognitive abilities were observed over the next two years.

The results showed that those with lower vitamin D were about twice as likely to show significant indications of cognitive decline over the course of the study. Participants' gender and specific age had no bearing on the results.

Editor's Note: This study should prompt further research into the precise mechanism by which vitamin D protects neurons, as it could lead to the discovery of treatments and interventions to fight the growing rate of cognitive decline seen in the elderly.

* *J Gerontol A Biol Sci Med Sci.* 2016 Oct;71(10):1363-8.

Resveratrol has Benefits for Ulcerative Colitis

The Archives of Medical Research reported the outcome of a randomized pilot study that found a benefit for supplementing with **resveratrol** in adults with ulcerative colitis, a disease which causes painful inflammation and sores in the colon and rectum.*

The study included 56 participants diagnosed with active mild to moderate disease. Subjects were randomized to receive **500 mg** of resveratrol or a placebo daily for six weeks. At the end of the study, participants who received a placebo experienced a decrease in the antioxidant SOD (superoxide dismutase) and an elevation in MDA (malondialdehyde, a marker of oxidative stress) in comparison with levels measured prior to the intervention.

However, among those who received resveratrol, MDA was significantly lower and total antioxidant capacity and SOD were higher compared to pretreatment levels and to levels measured in the placebo group at the end of the study.

Treatment with resveratrol was associated with decreased disease activity and improved quality of life compared to the placebo group.

Editor's Note: Ulcerative colitis "can occur and develop notably as a result of oxidative stress by reactive oxygen species," according to the authors of the report.

* *Arch Med Res.* 2016 May;47(4):304-9.

Popular Painkillers Raise Risk of Heart Failure

A study based on healthcare databases in four countries has found that the use of over-the-counter **painkillers** such as piroxicam, diclofenac, and naproxen can lead to a significantly higher risk of being hospitalized with heart failure.*

Researchers analyzed medical records from Italy, Germany, the Netherlands and the United Kingdom of close to 10 million adults who had taken **nonsteroidal anti-inflammatory drugs** (NSAIDs). They found that those subjects' chances of being admitted to a hospital with heart failure were, on average, **19%** higher compared with people who avoided the medications.

Cardiology professor Gunnar Gislason of Copenhagen University Hospital observed, "Even a small increase in cardiovascular risk is a concern for public health... NSAIDs are widely available over the counter. This practice further fuels the common misconception that they are harmless drugs that are safe for everyone." Gislason believes access to NSAIDs should be restricted.

The medical director of the British Heart Foundation, Professor Peter Weissberg, recommends that patients only take "**the lowest effective dose for the shortest possible time.**"

Editor's Note: Although the evidence shows that these drugs should be used sparingly, it's worth noting that the most commonly used NSAID, ibuprofen, was associated in the study with a lower risk of hospitalization due to heart failure compared to other medicines.

* *BMJ*. 2016 Sep 28;354:i4857.



Decreased Vitamin D and Elevated Bladder Cancer Risk

The conclusion of a systematic review reported at the Society for Endocrinology annual conference in Brighton, England, adds evidence to an association between **vitamin D** deficiency and an increased risk of bladder cancer.*

Dr. Rosemary Bland and colleagues reviewed seven studies whose subjects ranged in number from 112 to 1,125. Five of the studies found associations between decreased serum 25-hydroxyvitamin D levels and a higher risk of bladder cancer. Additionally, higher vitamin D levels were associated with improved bladder cancer outcomes and survival.

To investigate their hypothesis, the team evaluated the expression of vitamin D signaling components and synthesis of the active form of vitamin D in human transitional epithelial cells, which line the bladder. They discovered that the cells have the capacity to activate and respond to vitamin D, which then stimulates an immune system response.

Editor's Note: "More clinical studies are required to test this association, but our work suggests that low levels of vitamin D in the blood may prevent the cells within the bladder from stimulating an adequate response to abnormal cells," Dr. Bland explained. "As vitamin D is cheap and safe, its potential use in cancer prevention is exciting and could potentially impact the lives of many people."

* Society for Endocrinology annual conference, Brighton, England. November 8, 2016.

ArthroMax[®]

Herbal Joint Formula

Promotes
Joint Comfort
and
Cartilage
Health



ArthroMax[®] Herbal Joint Formula contains plant extracts that have been shown to support the *comfort* of weight-bearing joints, such as hips and knees—and help support their cartilage *structure* as well.

Just two daily capsules of this new herbal formula provide:

Mobile-Ease[™] Proprietary Blend 900 mg
(white mulberry, Chinese skullcap, cutch tree)

ArthroMax[®] Herbal Joint Formula
Item #02108 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$40	\$30
4 bottles		\$27 each

To order **ArthroMax[®] Herbal Joint Formula**, call **1-800-544-4440** or visit **www.LifeExtension.com**

CAUTION: Consult your healthcare provider before use if you are taking medication or have a medical condition.
Do not use if pregnant, lactating, or under age 18.

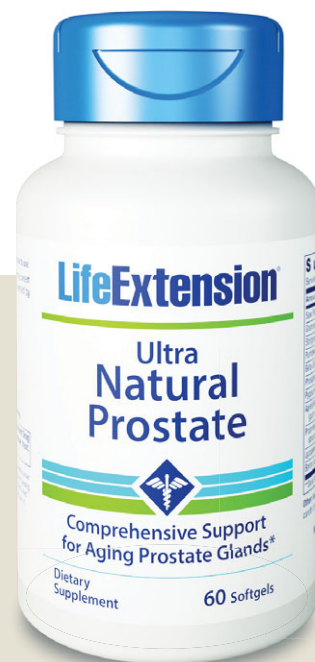
These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



PROSTATE HEALTH

The best way to keep
You in the picture.

As a man ages, maintaining a healthy prostate is key. We created Ultra Natural Prostate to help you maintain prostate health, so you can focus on what's important. With over a dozen natural ingredients, this supplement promotes healthy prostate function, supports easier urination, inhibits inflammatory factors, and encourages natural division of prostate cells. Ultra Natural Prostate. The most comprehensive prostate health supplement.



Item #01928 • 60 softgels



Retail
Price

**YOUR
PRICE**

1-bottle \$38.00

\$28.50

4-bottle —

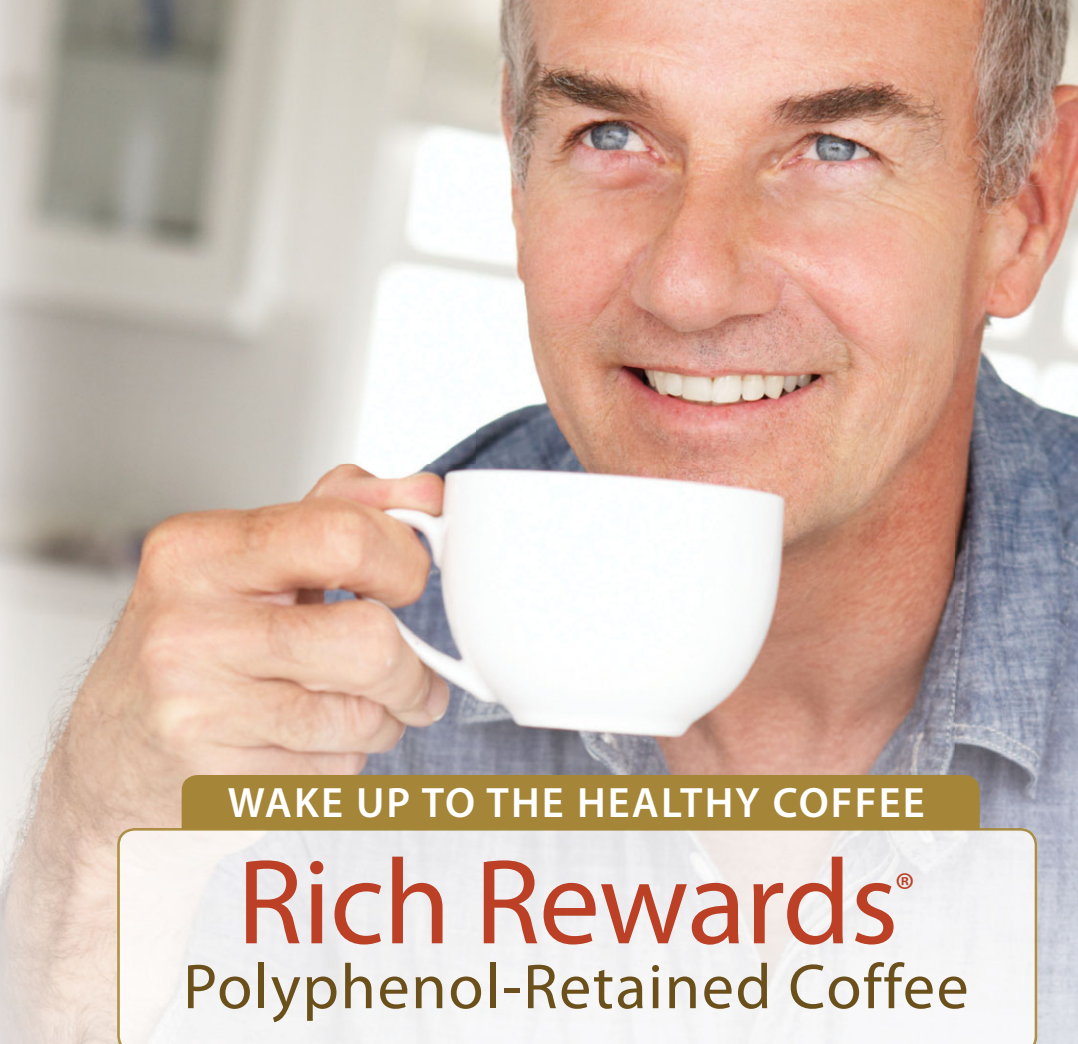
\$26.25^{ea}

Non-GMO

Call 1-800-544-4440 toll-free • www.LifeExtension.com

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

For a complete list of ingredients, dosage and use, important cautions and references, go to www.LifeExtension.com.



WAKE UP TO THE HEALTHY COFFEE

Rich Rewards®

Polyphenol-Retained Coffee

Most of a coffee bean's polyphenol content is **destroyed** during the roasting process. Among the most beneficial of these polyphenols is **chlorogenic acid**, a potent inhibitor of the **glucose-6-phosphatase** enzyme that stimulates excess **gluconeogenesis**.

A Patented Organic Roast

Life Extension's Rich Rewards® Breakfast Blend and Decaffeinated Roast are made using a patented, **100% natural** process called **HealthyRoast®**.^{*} Rich Rewards® consists of **100% USDA certified organic arabica** coffee beans.

Savory Taste Without Stomach Upset

The **HealthyRoast®** process also preserves special, naturally occurring compounds in coffee that soothe your stomach.

Tasty Decaf

With **Rich Rewards® Decaffeinated Roast**, you can limit your caffeine intake without compromising on flavor. The caffeine is removed through a chemical-free **water process**. It delivers the full flavor, aroma, and body of the *arabica* bean. **Rich Rewards® Breakfast Blend** contains up to **87% more chlorogenic acid** than conventional caffeinated coffees. **Rich Rewards® Decaffeinated Roast** contains up to **187% more chlorogenic acid** than conventional decaffeinated coffees.

Comparison of Conventional Coffee to Life Extension's Rich Rewards® Blend

Chlorogenic Acid		Chlorogenic Acid	
Conventional Coffee (Caffeinated)	92 mg	Rich Rewards® Coffee Blend (Caffeinated)	172 mg
Conventional Coffee (Decaffeinated)	46 mg	Rich Rewards® Coffee Blend (Decaffeinated)	132 mg

^{*} US Patent 6,723,368.



Rich Rewards® Breakfast Blend

Item #01609 • 12 oz bag

	Retail Price	Your Price
1 bag	\$13	\$9.75



Rich Rewards® Decaffeinated Roast

Item #01610 • 12 oz bag

	Retail Price	Your Price
1 bag	\$14	\$10.50

To order either of the **Rich Rewards® Antioxidant Coffees** call **1-800-544-4440** or visit **www.LifeExtension.com**

VITAMIN D3

For Heart Health,
Strong Bones, Skin Health,
and a Vital Immune System



Vitamin D3 • 1,000 IU

Item #01751 • 250 softgels

Ideal for smaller individuals who also obtain **2,000-3,000 IUs** in a multi-formula

	Retail Price	Your Price
1 bottle	\$12.50	\$9.38
4 bottles		\$8.44 each



Vitamin D3 • 5,000 IU

Item #01713 • 60 softgels

Ideal for most people who take a multi-formula that contains **2,000-3,000 IUs** of vitamin D

	Retail Price	Your Price
1 bottle	\$10	\$7.50
4 bottles		\$6.50 each



Vitamin D3 • 5,000 IU With Sea Iodine™

Item #01758 • 60 capsules

With **1,000 mcg** iodine, this is ideal for those who may be iodine-deficient due to a salt-restricted diet

	Retail Price	Your Price
1 bottle	\$14	\$10.50
4 bottles		\$9.38 each



Vitamin D3 • 7,000 IU

Item #01718 • 60 softgels

For individuals who need higher levels, including those who weigh over 180 pounds

	Retail Price	Your Price
1 bottle	\$14	\$10.50
4 bottles		\$9.45 each



Vitamin D3 • 2,000 IU (Natural Mint Flavor)

Item #01732 • 1 ounce

Great for traveling or for those who have trouble swallowing a softgel or capsule
(Also available without mint. Item #00864)

	Retail Price	Your Price
1 bottle	\$28	\$21
4 bottles		\$18.75 each

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

* If you have a thyroid condition or are taking anti-thyroid medications, do not use without consulting your health care practitioner.

Find the Formula That's Right for You!

A simple, cost-effective blood test can help you identify your individual vitamin D needs. Life Extension®'s huge selection of vitamin D supplements allows you to customize your dosage.

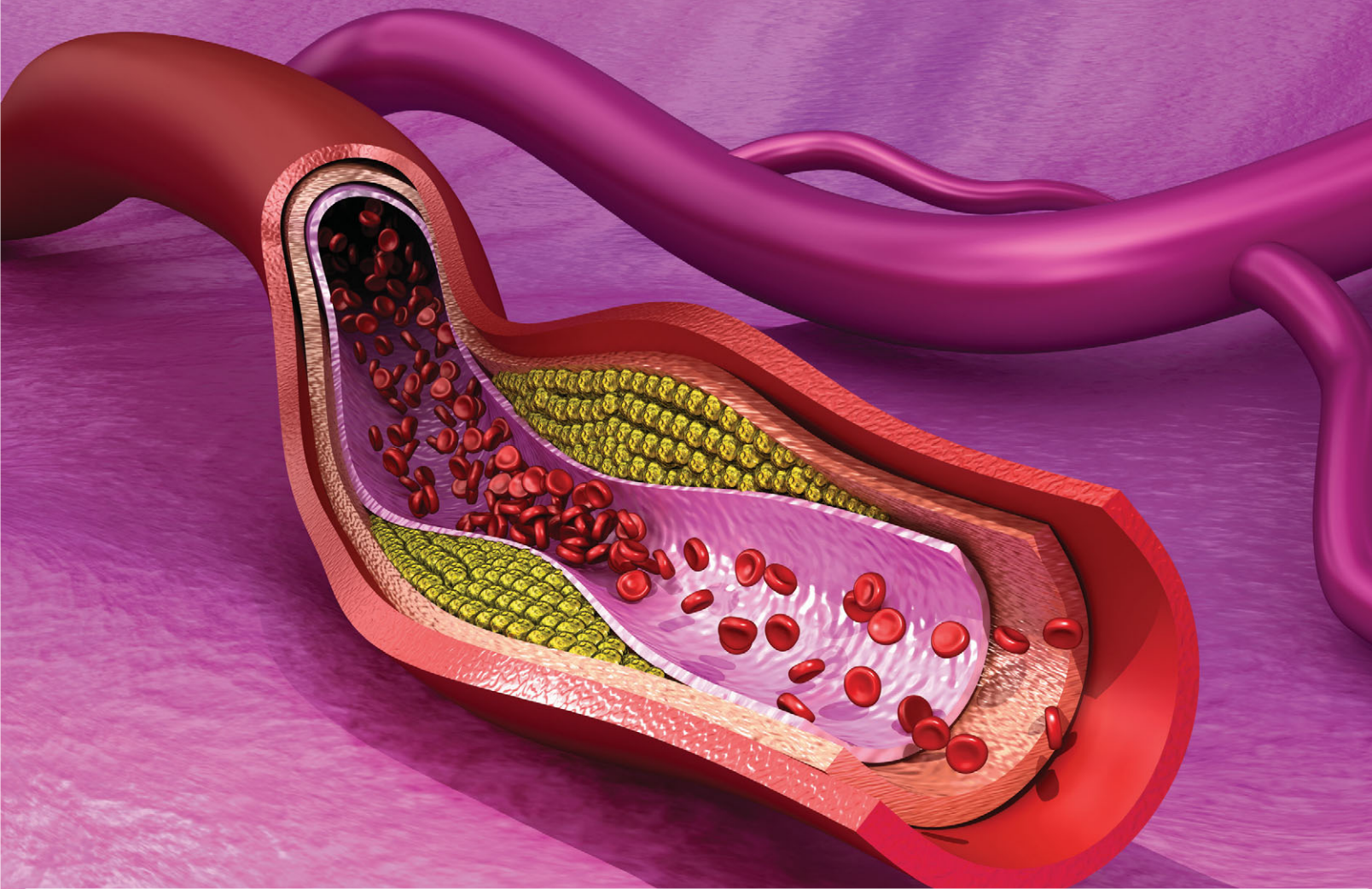
To order **Vitamin D3** supplements,
call **1-800-544-4440** or
visit **www.LifeExtension.com**



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

BY MICHAEL DOWNEY





Arterial Plaque *Rupture*

Most people are aware that a buildup of **plaque** in coronary arteries leads to **heart disease**, the cause of more American deaths than any other ailment.

But few know that not all arterial plaque is the same. There is **hard** (calcified) **plaque** and **soft** (noncalcified) **plaque**.

Although both pose a risk, the **soft** kind is a ticking time bomb. When **soft plaque** suddenly breaks loose, it can trigger a clot blockage large enough to cause acute heart attack or stroke.

Because soft plaque is unstable and causes no symptoms until it pops without warning, someone with atherosclerosis may feel fine, have a normal EKG, and pass a stress test—and later that same day have a plaque rupture, resulting in **sudden death**.

Researchers have identified two natural compounds that target **arterial plaque** and atherosclerosis. Together, they have been shown to boost **stability** of deadly **soft plaque** to help prevent a plaque rupture, while also slowing and even regressing the accumulation of soft and hard arterial plaque.¹

Arterial Plaque—The Hidden Killer

Rupture-prone arterial plaques are more common than people realize.

In one cadaver study, advanced lesions, defined as rupture plaque or at least one vulnerable plaque were present in **100%** of the hearts examined—*regardless* of the individuals' cause of death.^{2,3}

Arterial damage can initiate in childhood and slowly progress with normal aging.⁴ Atherosclerosis—from the Greek words for “hard paste”—is an inflammatory condition in which the interior of the arteries becomes stiff, clogged, damaged, and dysfunctional.⁵⁻⁷

When the delicate lining of the inner arteries becomes damaged, low-density lipoprotein (LDL) and fibrinogen adhere and begin to trap other components.

As it builds up, **plaque** may cause the arterial wall to remodel and ultimately internally rupture, allowing a blood clot to form.⁸ Arterial clots (thrombosis) can block local blood flow completely, or they may break free and cause dangerous blockages elsewhere.

Plaque Stability: A Key Factor in Preventing Fatalities

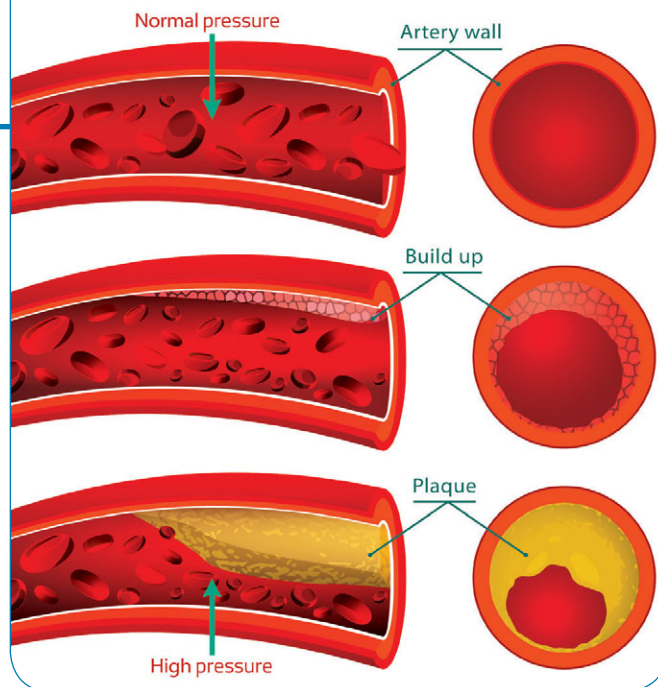
When seeking to reduce atherosclerotic risk, there is more to it than just prevention of plaque formation, as most of the danger posed by plaque occurs when it becomes unstable.

Early in this process, plaques are soft on the inside, making them vulnerable to rupture, like a kernel of corn being heated until it explodes into much larger popcorn. Fortunately, the surfaces of soft plaques are covered with hard fibrous caps that face the blood flow.

As long as these plaques remain thick, they are stable, meaning they are firm enough not to pose a major risk of rupturing.^{2,9} Over time, however, this cap begins to thin and weaken, making the plaque more vulnerable to rupturing. The result is a deadlier, much more unstable, softer type of plaque that may lead to ischemic stroke or heart attack.

The effects of atherosclerosis vary, depending on which arteries in the body narrow and become clogged with plaque. If the arteries that bring oxygen-rich blood to the heart are affected, the result can be coronary artery disease, chest pain, or heart attack. If the arteries to the brain are affected, the result can be a transient ischemic attack (TIA) or a stroke. If the arteries in the arms or legs are affected, peripheral artery disease can occur. And at any point in the body, a deadly bulge in the artery wall—an aneurysm—can develop.

This is why scientists have long sought a way to safely lower acute cardiovascular risk not only by reducing plaque but by **stabilizing** soft plaques.



The **December 2016** issue of the journal *Minerva Cardioangiologica* published a controlled clinical study demonstrating the **plaque stabilizing** effects of a **dual-extract** plant formula.

This study showed a standardized extract from the **French maritime pine** combined with an extract of the *Centella asiatica* plant **stabilized** soft plaques, boosting the odds that they will stay put and not suddenly **rupture**. These two nutrients also demonstrated reversal of the number and size of arterial plaque deposits that progress to atherosclerosis.¹

This **2016** study confirmed *earlier* evidence demonstrating the arterial protective properties of these two nutrients.

Before examining this compelling clinical evidence, let's examine each compound separately.

Centella Asiatica Stabilizes Soft Plaque

Also known as **gotu kola**, *Centella asiatica* contains triterpenoid compounds that help stabilize soft plaque by improving the synthesis of **collagen**,¹⁰⁻¹³ a component of the thick caps that hold soft plaque in place.^{10,14} This Asian aquatic plant also helps stop the progression of plaque buildup by reducing the adhesion of monocytes, immune system cells that promote atherosclerosis.¹⁵

In a previous human study, participants with high-risk (soft) plaque took **60 mg** of an extract of *Centella asiatica* three times daily. After 12 months, their carotid-artery plaque was denser (harder) by an average of **30%**.¹⁴

Phase two of this same study used the same dose but in a randomized, placebo-controlled trial. Carotid-artery plaque **stability** significantly improved. MRI scans showed reduced blood flow to the brain in **17%** of controls but only in **7%** of the *Centella asiatica* group. And supplemented subjects experienced **41%** fewer cardiovascular events.¹⁴

A similar placebo-controlled study of individuals with high-risk (soft) plaque in their femoral (main leg) arteries found that **60 mg** of an extract of *Centella asiatica* three times daily produced a **63%** harder plaque—indicating a lower rupture risk—in just 12 months. Critically, plaque size increased **23%** in controls while supplemented patients showed **zero** plaque-size increase.¹⁰

Let's now examine standardized extract from the French maritime pine, a compound that reduces atherosclerosis progression.

French Maritime Pine Extract Inhibits Plaque Accumulation

Standardized extract from **French maritime pine** contains procyanidins and phenolic acids^{16,17} shown to slow atherosclerosis.¹⁸ It achieves this by reducing production of fat cells and inflammatory signaling molecules that contribute to plaque formation.^{19,20}

Lab studies show that standardized extract from French maritime pine improves arterial **endothelial function** by stimulating an enzyme (eNOS) that produces **nitric oxide**, the signaling molecule that maintains arterial elasticity. This increase in nitric oxide not only improves blood flow but also decreases platelet aggregation and stickiness to vessel walls, reducing the risks of blood clots and enlarging plaques.²¹

A placebo-controlled human trial demonstrated that **200 mg** of standardized extract from French maritime pine daily for eight weeks improved endothelial function in coronary artery disease patients, helping to limit atherosclerosis progression. Flow-mediated dilation—a measure of how much arteries dilate in response to blood-flow changes—was improved **32%**

in the supplemented group contrasting with no significant change in the controls. Also, only supplemented subjects experienced a **7%** drop in isoprostanes, a marker of how much oxidized fat is present and overall oxidative stress.²²

Scientists then studied individuals with only borderline issues with blood pressure, blood lipids, and blood sugar, with no obvious atherosclerotic changes in their blood vessels and no existing coronary artery disease—reflecting the situation of most people that have not developed any clinically relevant disease but had definitive risk factors, making them ideal candidates for a preventive intervention. All 93 volunteers continued any medical treatment for symptoms, but half also took **150 mg** of standardized extract from French maritime pine daily. Flow-mediated dilation in supplemented subjects improved **66%**—after only 12 weeks.²³

Scientists then produced a formulation combining standardized extracts from French maritime pine and *Centella asiatica*, leading to compelling clinical trials.

What You Need to Know

How to Prevent a Deadly Plaque Rupture

- While hard plaque in the arteries limits blood flow, soft or noncalcified plaque can suddenly break loose and cause a blood clot large enough to cause a deadly heart attack or stroke.
- The natural compound *Centella asiatica* stabilizes the hard, thick cap on atherosclerotic plaques, which slashes the risk of a plaque rupture. Standardized extract from French maritime pine slows progression of atherosclerotic plaques.
- Clinical research demonstrates that, when combined, these two supplements reduce the size, number, and instability of deadly soft plaques, while slowing and even regressing plaque accumulation.



Gotu kola (*Centella asiatica*)

Dual-Extract Formulation Targets Atherosclerosis

One clinical trial enlisted individuals ages 45 to 60 who appeared healthy with no cardiovascular risk factors or symptoms and with plaques that did not narrow their arteries more than **50%** (class IV). Each group was assigned a different supplement regimen daily along with lifestyle, diet, education, and exercise recommendations. Ultrasound was used to measure plaques that had progressed from class IV to class V (blocking over **50%** of an artery). After 30 months, the percentage of plaques progressing from class IV to V was:¹⁸

- **21.3%** in controls, which followed only diet and lifestyle recommendations. (This was the worst performing group as it showed more than 20% had progressive arterial narrowing.)
- **16.6%** with **100 mg** aspirin or ticlopidine (an antiplatelet drug) for aspirin-intolerant subjects,
- **8.4%** with **50 mg** standardized extract from French maritime pine alone,
- **5.3%** with **100 mg** standardized extract from French maritime pine alone,
- **4.0%** with **100 mg** standardized extract from French maritime pine plus **100 mg** aspirin (or ticlopidine), and



- **1.1%** with **100 mg** standardized extract from French maritime pine plus **100 mg** extract of *Centella asiatica*. (This was best performing group as it showed less than **2%** had progressive inner arterial narrowing.)

Plaque progression in volunteers taking both compounds was an impressive **95% lower** than in controls.¹⁸

Next, subjects with advanced atherosclerosis—at least one arterial lesion considered class V—but without symptoms were assigned to the same dosages as previously. Class V involves an instance of over-**50%** blockage without symptoms, while class VI also involves symptoms such as numbness, tingling, pain, or other, more serious cerebral or lower-limb symptoms. After 42 months, the percentage with plaques progressing from class V to VI was:²⁴

- **48%** in controls (worst performers in this study),
- **21%** with aspirin or ticlopidine,
- **11%** with **100 mg** standardized extract from French maritime pine plus aspirin,
- **10%** with **100 mg** standardized extract from French maritime pine alone, and
- **6.5%** with **100 mg** standardized extract from French maritime pine plus **100 mg** extract of *Centella asiatica* (best performers in this study).

Compared to controls, the standardized extracts from the **French maritime pine** plus ***Centella asiatica*** group showed a **7.4-fold reduction** in the risk of developing cardiovascular-disease symptoms—and a nearly **four-fold reduced** risk of being hospitalized for a full-blown cardiovascular event.²⁴

Latest Human Trial Results

The study published in **December 2016** added to the clinical evidence demonstrating the compelling effects of this dual-nutrient formula in **stabilizing** soft arterial plaques—to help prevent a potentially lethal **plaque rupture**—and in blocking the progression of **plaque accumulation** in aging arteries.¹

Scientists set out to evaluate the stability of carotid plaques, before and after three months of supplementation, in 50 symptom-free volunteers with arterial plaque stenosis of less than **50%** (class IV), high oxidative stress, and with a mean age of 61.5 years.

Blood Test May Detect Presence of Soft Plaque

Published data suggests an association between elevated high-sensitivity CRP and soft plaque burden.

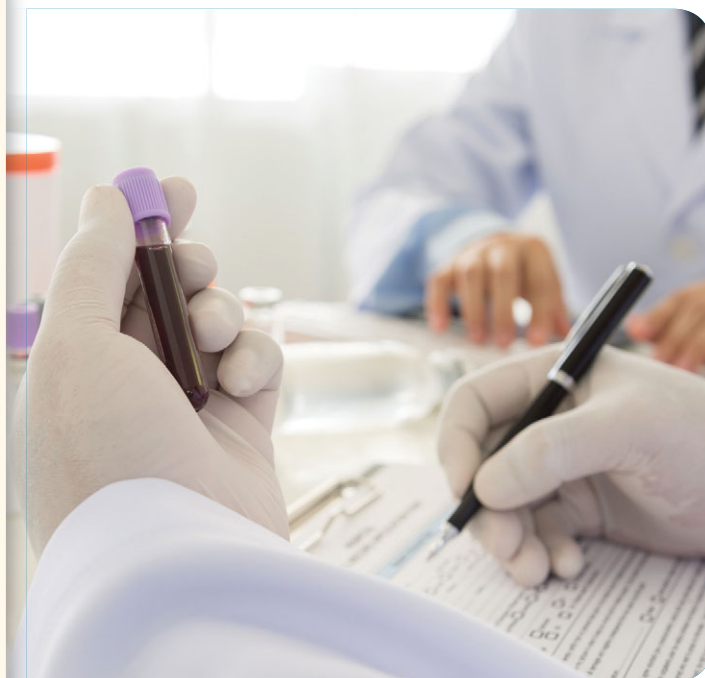
A low-cost blood test called **C-reactive protein** can help identify those at risk for soft, rupture-prone arterial plaque.

Life Extension® long ago published data showing that people with low CRP blood levels (that often correspond to reduced chronic inflammation) have markedly lower rates of cancer and stroke.^{27,28}

A high-sensitivity C-reactive protein (CRP) test is included in the Male and Female Blood Test Panels that many readers of this publication have performed annually.

These comprehensive blood tests can be ordered for just **\$199** during the annual **Blood Test Super Sale** that ends **June 5, 2017**.

To order these tests, call **1-800-208-3444** (24 hours) or log on to: LifeExtension.com/Sale



Half of the patients were given **150 mg** of standardized extract from **French maritime pine** along with **225 mg** of an extract of **Centella asiatica**, daily for three months. They also received standard management care, as did the control group.¹

Supplemented patients showed significant **improvement** on the **plaque stability index** compared to controls. They also experienced a substantial increase in the “white component” of their plaque based on ultrasound imaging, indicating improved plaque density and “a significant reduction in possible events.” Critically, their plaques were also decreased in length, height, and number. The scientists noted that free radicals in the supplemented group’s plasma were significantly reduced, indicating a decrease in oxidative stress. No supplement-related, adverse events were observed.

By contrast, there were no significant improvements in any of these endpoints for those receiving only standard plaque management.

The study concluded that these “... *plant extracts could be a safe option for prevention of cardiovascular events for patients with carotid plaques.*”¹

Summary

Not all arterial plaque is the same. Hard (calcified) plaque limits blood flow—but soft (noncalcified) plaque is a ticking time bomb that can suddenly break loose and trigger a clot large enough to cause a fatal heart attack or stroke.

Two natural compounds have been identified that target arterial plaque and atherosclerosis. Standardized extract from **French maritime pine** has been demonstrated to slow the progression of atherosclerotic plaques, while extracts of **Centella asiatica** have been found to preserve the hard, thick cap on atherosclerotic plaques—slashing the risk of a plaque rupture.

Clinical evidence now demonstrates that, taken together, these two supplements reduce the size, number, and instability of deadly soft plaques to help prevent plaque rupture—while also slowing and even regressing the accumulation of both soft and hard plaque. ●

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

References

1. Luzzi R, Belcaro G, Ippolito E. Carotid plaque stabilization induced by the supplement association Pycnogenol(R) and centella asiatica (Centellicum(R)). *Minerva Cardioangiol.* 2016;64(6):603-9.
2. Cheruvu PK, Finn AV, Gardner C, et al. Frequency and distribution of thin-cap fibroatheroma and ruptured plaques in human coronary arteries: a pathologic study. *J Am Coll Cardiol.* 2007;50(10):940-9.
3. Kolodgie FD, Burke AP, Farb A, et al. The thin-cap fibroatheroma: a type of vulnerable plaque: the major precursor lesion to acute coronary syndromes. *Curr Opin Cardiol.* 2001;16(5):285-92.
4. Osika W, Dangardt F, Gronroos J, et al. Increasing peripheral artery intima thickness from childhood to seniority. *Arterioscler Thromb Vasc Biol.* 2007;27(3):671-6.

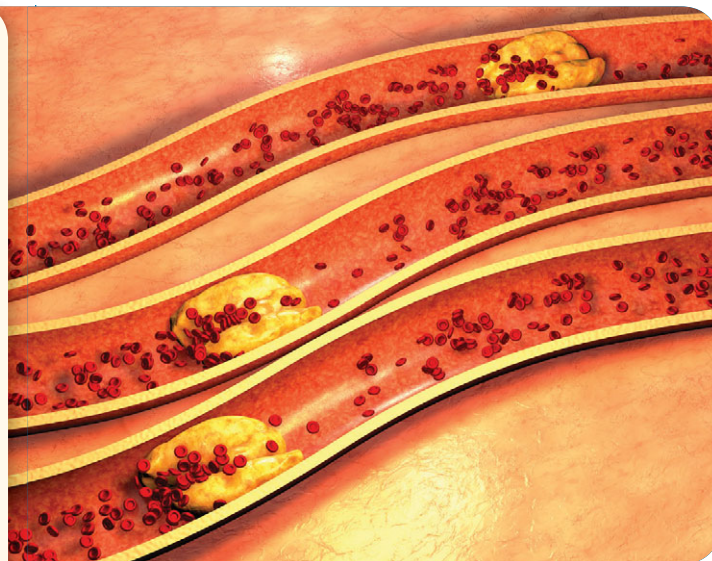
The Risk of Arterial Plaque

Years of elevated cholesterol, chronic inflammation, and other factors often result eventually in atherosclerosis—the thickening and narrowing of arteries that leads to coronary heart disease (heart attack), stroke, and peripheral vascular disease.⁸ Research in recent years has produced a vastly more sophisticated understanding of the processes leading up to devastating arterial blockage by plaque lesions.

The foundation of plaque lesions begin even before the teen years with the development of **fatty streaks**—regions of increased fat in the walls of arteries.^{8,25,26} Initially, the small damaged fatty-streak areas trigger a “healing” response—as if the streak areas were a wound—attracting inflammatory cells that ingest and store excess fats.²¹

Eventually, arterial plaque begins to take shape as a core of fats develops outside of inflammatory cells.^{8,26} These plaques become less stable over time, making them more vulnerable to rupture, which leads to heart attacks and strokes.

Whatever will slow the progression of early fatty deposits into complete plaque lesions is beneficial. Because soft plaques are unstable and can rupture, whatever can be done to stabilize these soft plaques makes the risk of a sudden catastrophic heart attack or stroke much less likely.



5. Tuttolomondo A, Di Raimondo D, Pecoraro R, et al. Atherosclerosis as an inflammatory disease. *Curr Pharm Des*. 2012;18(28):4266-88.
6. Available at: http://www.strokeassociation.org/STROKEORG/LifeAfterStroke/HealthyLivingAfterStroke/UnderstandingRisky-Conditions/Atherosclerosis-and-Stroke_UCM_310426_Article.jsp. Accessed November 29, 2016.
7. Libby P, Theroux P. Pathophysiology of coronary artery disease. *Circulation*. 2005;111(25):3481-8.
8. Bentzon JF, Otsuka F, Virmani R, et al. Mechanisms of plaque formation and rupture. *Circ Res*. 2014;114(12):1852-66.
9. Leskinen MJ, Kovanen PT, Lindstedt KA. Regulation of smooth muscle cell growth, function and death in vitro by activated mast cells—a potential mechanism for the weakening and rupture of atherosclerotic plaques. *Biochem Pharmacol*. 2003; 66(8):1493-8.
10. Incandela L, Belcaro G, Nicolaides AN, et al. Modification of the echogenicity of femoral plaques after treatment with total triterpenic fraction of Centella asiatica: a prospective, randomized, placebo-controlled trial. *Angiology*. 2001;52 Suppl 2:S69-73.
11. Incandela L, Cesarone MR, Cacchio M, et al. Total triterpenic fraction of Centella asiatica in chronic venous insufficiency and in high-perfusion microangiopathy. *Angiology*. 2001;52 Suppl 2:S9-13.
12. James JT, Dubery IA. Pentacyclic triterpenoids from the medicinal herb, Centella asiatica (L.) Urban. *Molecules*. 2009;14(10):3922-41.
13. Gohil KJ, Patel JA, Gajjar AK. Pharmacological Review on Centella asiatica: A Potential Herbal Cure-all. *Indian J Pharm Sci*. 2010;72(5):546-56.

14. Cesarone MR, Belcaro G, Nicolaides AN, et al. Increase in echogenicity of echolucent carotid plaques after treatment with total triterpenic fraction of Centella asiatica: a prospective, placebo-controlled, randomized trial. *Angiology*. 2001;52 Suppl 2:S19-25.
15. Ivanov V, Ivanova S, Kalinovskiy T, et al. Plant-derived micronutrients suppress monocyte adhesion to cultured human aortic endothelial cell layer by modulating its extracellular matrix composition. *J Cardiovasc Pharmacol*. 2008;52(1):55-65.
16. D'Andrea G. Pycnogenol: a blend of procyanidins with multifaceted therapeutic applications? *FitoTerapia*. 2010;81(7):724-36.
17. Rohdewald P. A review of the French maritime pine bark extract (Pycnogenol), a herbal medication with a diverse clinical pharmacology. *Int J Clin Pharmacol Ther*. 2002;40(4):158-68.
18. Belcaro G, Dugall M, Hosoi M, et al. Pycnogenol(R) and Centella Asiatica for asymptomatic atherosclerosis progression. *Int Angiol*. 2014;33(1):20-6.
19. Gu JQ, Ikuyama S, Wei P, et al. Pycnogenol, an extract from French maritime pine, suppresses Toll-like receptor 4-mediated expression of adipose differentiation-related protein in macrophages. *Am J Physiol Endocrinol Metab*. 2008;295(6):E1390-400.
20. Luo H, Wang J, Qiao C, et al. Pycnogenol attenuates atherosclerosis by regulating lipid metabolism through the TLR4-NF-kappaB pathway. *Exp Mol Med*. 2015;47:e191.
21. Fitzpatrick DF, Bing B, Rohdewald P. Endothelium-dependent vascular effects of Pycnogenol. *J Cardiovasc Pharmacol*. 1998;32(4):509-15.
22. Enseleit F, Sudano I, Periat D, et al. Effects of Pycnogenol on endothelial function in patients with stable coronary artery disease: a double-blind, randomized, placebo-controlled, cross-over study. *Eur Heart J*. 2012;33(13):1589-97.
23. Hu S, Belcaro G, Cornelli U, et al. Effects of Pycnogenol(R) on endothelial dysfunction in borderline hypertensive, hyperlipidemic, and hyperglycemic individuals: the borderline study. *Int Angiol*. 2015;34(1):43-52.
24. Belcaro G, Ippolito E, Dugall M, et al. Pycnogenol(R) and Centella asiatica in the management of asymptomatic atherosclerosis progression. *Int Angiol*. 2015;34(2):150-7.
25. Available at: <http://my.clevelandclinic.org/services/heart/disorders/coronary-artery-disease/understandingcad>. Accessed November 30, 2016.
26. Sakakura K, Nakano M, Otsuka F, et al. Pathophysiology of atherosclerosis plaque progression. *Heart Lung Circ*. 2013;22(6):399-411.
27. Available at: <http://www.lifeextension.com/Magazine/2014/5/Testing-For-C-reactive-Protein-May-Save-Your-Life/Page-0>. Accessed February 24, 2017.
28. Available at: http://www.lifeextension.com/Magazine/2005/4/report_stroke/Page-02. Accessed February 24, 2017.

The incredible health nutrient **CURCUMIN** in a super absorbable formula.

Curcumin is a critical part of a healthy longevity program. This extract of turmeric spice promotes a healthy inflammatory response in your joints, supports brain, breast, and colon health, and encourages healthy cell division — but is difficult to absorb.

So our **Super Bio-Curcumin®** formula delivers the patented turmeric extract BCM-95® Bio-Curcumin®, which is up to seven times more absorbable and lasts longer in your bloodstream, too.

Get the maximum health benefits of this incredible nutrient. Make Super Bio-Curcumin® part of your daily health regimen today.

NON-GMO

Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC.
U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.



Call 1-800-544-4440 toll-free
www.LifeExtension.com



Item #00407 • 400 mg • 60 veg. caps

	Retail Price	Your Price
1-bottle	\$38.00	\$28.50
4-bottle	—	\$26.25 ea

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

For a complete list of ingredients, dosage and use, important cautions and references, go to www.LifeExtension.com.

LIFE EXTENSION MIX™

Tablets, Capsules, or Powder...Your Choice!

Few people consistently eat enough **plant** foods to protect against common age-related decline.

Commercial multivitamins do not provide vital plant components needed for good health.¹⁻³

Life Extension Mix™ is superior to other multivitamins—partly because it provides a remarkably broad array of **fruit** and **vegetable** extracts.

Rounding out the superiority is a comprehensive list of **vitamins, minerals, amino acids**, and more.

When **Life Extension Mix™** was introduced in **1983**, it provided the most efficient way to obtain higher-potency nutrients. **Life Extension Mix™** has been upgraded over the past **33 years** to reflect many findings in the scientific literature.

Life Extension Mix™ is the most comprehensive, high-potency daily multivitamin.



LIFE EXTENSION MIX™
315 TABLETS • ITEM #02155

	RETAIL PRICE EACH BOTTLE	YOUR PRICE EACH BOTTLE
1 BOTTLE	\$80.00	\$60.00
4 BOTTLES		\$52.00
10 BOTTLES		\$43.75

The tablet version of Life Extension Mix™ contains **190 mg** of niacin and **1 mg** of copper. There is an extra-niacin version that provides **336 mg** of niacin at no additional charge (02157). Niacin maintains healthy cholesterol, triglyceride, and fibrinogen levels in those within normal ranges. Those with underlying liver disease sometimes cannot tolerate niacin. The suggested dose is 9 tablets per day in divided doses with meals.



LIFE EXTENSION MIX™
490 CAPSULES • ITEM #02154

	RETAIL PRICE EACH BOTTLE	YOUR PRICE EACH BOTTLE
1 BOTTLE	\$90.00	\$67.50
4 BOTTLES		\$58.00
10 BOTTLES		\$47.50

The encapsulated version of Life Extension Mix™ used by many customers provides **1 mg** of copper. These capsules are also available without copper (02164). The suggested dosage is 14 capsules per day in divided doses with meals.



LIFE EXTENSION MIX™
14.81 OZ POWDER • ITEM #02156

	RETAIL PRICE EACH BOTTLE	YOUR PRICE EACH BOTTLE
1 BOTTLE	\$80.00	\$60.00
4 BOTTLES		\$52.00
10 BOTTLES		\$43.75

The powder version of Life Extension Mix™ contains **1 mg** of copper. This powder version is also available without copper (02166). The suggested dose is three scoops per day in divided doses with meals.

To order your supply of LIFE EXTENSION MIX™, call 1-800-544-4440 or visit www.LifeExtension.com

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

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.

NEW LOWER PRICE!

Promote Healthy Circulation with **ARTERIAL PROTECT**

Arterial Protect provides a combination of *patented* and *tested* ingredients documented to support the body's ability to control arterial plaque formation.

When the ingredients in **Arterial Protect** were given to a **human** study group, progress of **arterial plaque** was *substantially reduced*.¹

Just one vegetarian capsule daily of **Arterial Protect** helps **stabilize** arterial plaque and promote healthy blood flow.

Arterial Protect - New Lower Price!

Item #02004 • 30 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$44	\$33
4 bottles		\$29 each

Non-GMO

Reference

1. *Int Angiol.* 2014 Feb;33(1):20-6.

Note: Do not change dosing or discontinue cardiovascular medications unless advised to do so by your physician.

Pycnogenol® and Centellicum® are registered trademarks of Horphag Research and the use of this product is protected by international patents.



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

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

BY STEPHEN GREENE



Oral Probiotics Combat Gum Disease

The human mouth is teeming with **bacteria** that can cause dental cavities and more serious gingivitis and periodontitis. Even good oral hygiene habits of brushing and flossing twice a day might not be enough to ward them off.

Nearly a third of US adults have untreated tooth decay, and nearly half of those 30 and older have periodontal (gum) disease.^{1,2}

Gum disease can be serious. As it progresses, it can lead to tooth loss, as well as **inflammation** that accelerates degenerative aging processes.³ Gum disease can lead to heart problems, cancer, Alzheimer's, lung and kidney disorders, and more.⁴⁻¹⁴

Scientists looking for a solution to gum disease and tooth decay have discovered an innovative way to reduce the risk through targeted oral **probiotic** lozenges.

The Oral Microbiome

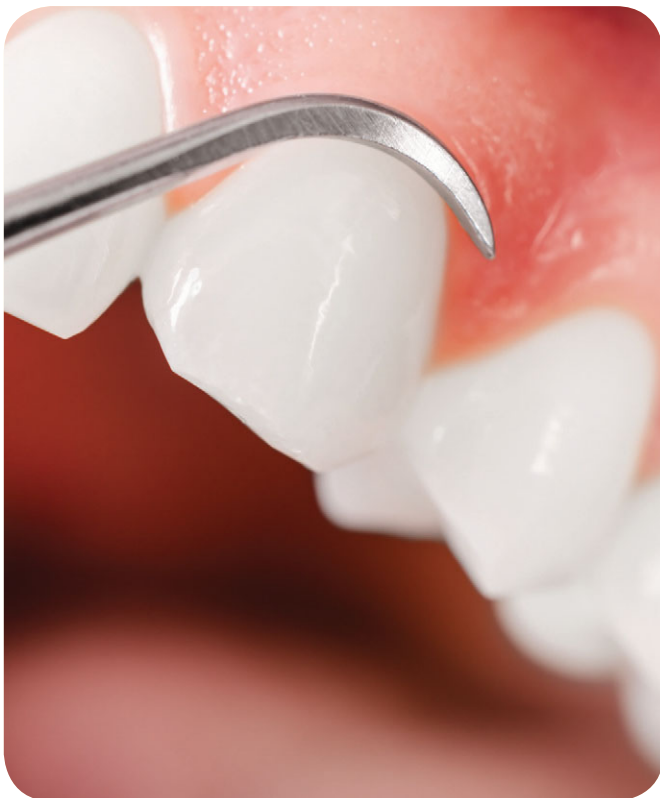
The natural community of microbes living in the mouth is called the **oral microbiome**. A healthy microbiome supports and protects the delicate mucous membranes as well as the surface of the teeth themselves.

When this community becomes disrupted and out of balance—whether by poor diet, lifestyle, drugs, or disease—it results in a state of microbial imbalance (called **dysbiosis**) that wreaks havoc on the normal immune system response.

Dysbiosis leads to numerous problems in the mouth, including **cavities** that arise from excessive acid-producing bacteria, and **gum disease** that contributes to tooth loss as well as inflammatory diseases throughout the body.

The need to restore a healthy oral microbiome led scientists to identify two strains of *good bacteria* that can combat gum disease on two fronts. The first one, ***L. plantarum* L-137**, boosts oral immune function and promotes healing. The second one, ***S. salivarius* M18**, kills harmful bacteria that live in the mouth, allowing itself to flourish.¹⁵⁻¹⁷

This **two-pronged** approach to gum disease prevention supports a healthy, balanced microbiome in the mouth, one that actively resists disease while promoting healing.



Harnessing Natural Immune Responses

One of the key problems with an imbalanced **oral** microbiome is that it *reduces* the mouth's natural **immune-fighting** abilities. This leaves us vulnerable to infections by bacteria that cause gum disease, such as *Porphyromonas gingivalis*.

Making matters worse, *P. gingivalis* diminishes the mouth's immune system even further by downregulating protective **IL-12** and upregulating pro-inflammatory **IL-6**, creating a vicious cycle that makes it nearly impossible for the body to heal itself.¹⁸⁻²⁰

In order to counteract this disease-promoting cycle, scientists searched for a way to boost local immune function. They found their answer in the harmless bacterium ***Lactobacillus plantarum***, strain L-137.¹⁷ When killed by heat treatment, this strain of *L. plantarum* has been found to increase production of the protective IL-12.

Treating periodontitis patients with this immune-boosting bacterium helps to overcome the impaired immune function in their mouths that occurs as a result of *P. gingivalis*. This assists in restoring the body's natural oral immune response, which in turn promotes healing of the diseased, inflamed gums.

In other words, ***L. plantarum*** essentially plugs the immune system "hole" induced by evasive *P. gingivalis* and other bacteria, allowing our bodies to *naturally resist* gum disease.¹⁷

The impact of this was seen in a clinical trial of people with chronic periodontitis.

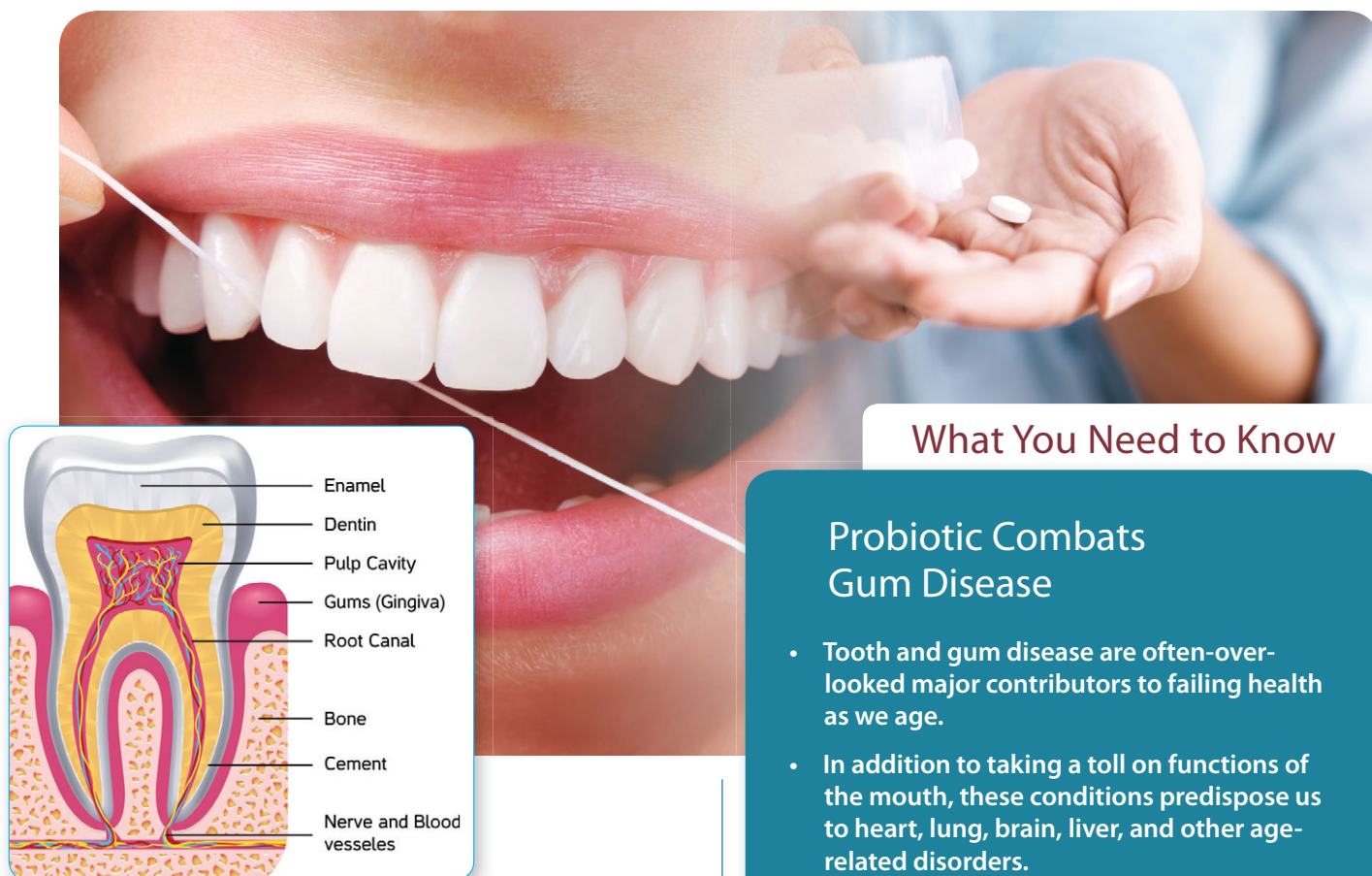
Clinical Trial

Researchers conducted a randomized trial that included 39 people with chronic **periodontitis**.¹⁷ The subjects were randomly assigned to receive either a placebo or the ***L. plantarum* L-137** supplement for 12 weeks.

Over the course of 12 weeks, researchers measured the **probing pocket depth**, which is the distance from the gum line to the bottom of the tiny "pocket" between gum and tooth root.¹⁷ A normal, healthy gum pocket is **3 mm** deep or less, and a depth of **4 mm** or more defines **periodontitis**.²¹ Deeper pockets are a clinical measure of **periodontal** disease.

After 12 weeks, subjects supplementing with ***L. plantarum* L-137** had a **64% greater improvement** in pocket depth compared with placebo recipients.¹⁷

This remarkable study showed that it's possible to improve periodontal disease through **modulation of the oral immune system**.



What You Need to Know

Probiotic Combats Gum Disease

- Tooth and gum disease are often-overlooked major contributors to failing health as we age.
- In addition to taking a toll on functions of the mouth, these conditions predispose us to heart, lung, brain, liver, and other age-related disorders.
- A balanced oral microbiome helps maintain a state of disease-resistance.
- An imbalanced, or dysbiotic, microbiome invites disaster by changing the elaborate natural immune and bacterial defenses against oral disease.
- Balancing a dysbiotic oral microbiome can restore natural disease resistance.
- HT-*L. plantarum* L-137 is a heat-treated strain of common *Lactobacillus* bacteria capable of inducing pro-healing cytokines in the mouth and boosting local immunity.
- *S. salivarius* M18 is a living probiotic strain that is armed with powerful *lantibiotics* that kill harmful bacteria.
- Adding these healthy bacteria to a regular routine of brushing and flossing can help make the mouth a safe place for protective microbes, which produces benefits throughout the body.

Improving pocket depth is one piece of the puzzle. It is equally important to restore balance to the mouth's microbial community. By doing so, we can prevent immune dysfunction and the resulting inflammatory changes before they set in. That's where an oral probiotic called ***S. salivarius* M18** comes to the rescue.

A Well-Armed Probiotic Oral Defense System

A disease-resistant oral microbiome includes a wide variety of microbes that provide important biological functions. A **dysbiotic** microbiome is one in which one or several harmful strains dominate, suppressing other beneficial organisms and creating a disease-permissive environment.

What the research is proving is that in order to restore oral health and avoid problems such as gum disease, it is necessary to support the colonization and growth of beneficial organisms.²²

The helpful organisms compete with the "**bad guys**," cutting their populations down to size and allowing a wider range of beneficial microbes to succeed.

S. salivarius M18 is one of the “good guys.” It competes with dangerous oral bacteria that cause or exacerbate periodontal disease, and has been shown to improve parameters of gingivitis and periodontitis.^{15,16}

A randomized, controlled trial was conducted to determine the impact of **S. salivarius M18** treatment on some of the most important clinical parameters of oral and gingival (gum) health.²³ The study included men and women aged 20-60 years with moderate or severe **gingivitis** (gingival index score of 2 or 3), and moderate **periodontitis** (less than **6 mm** probing pocket depth).

Half of the subjects received no treatment, and half received lozenges with 200 million *S. salivarius* M18 daily after brushing. The subjects took the lozenges for 30 days, and the researchers observed them for an additional 30 days to determine if the benefits would continue even after the subjects stopped taking the probiotic.

The results of the **S. salivarius** M18 group were favorable for all four measurements compared to the control group:²³

- The mean **plaque index** score was reduced by **44%** on day 30 (the last day of treatment), and by **37%** on day 60.
- The mean **gingival index** score was reduced by **42%** on day 30, and by **35%** on day 60.
- The **modified sulcus bleeding index** scores were reduced by **53%** on day 30, and by **51%** on day 60.
- Finally, **probing pocket depth** measurements were reduced by **20%** on day 30, and by **22%** on day 60.

Of note, the lowest scores for each index in the *S. salivarius* M18 group indicated a return to **near-normal** values of less than 1 for plaque index, gingival index, and modified sulcus bleeding index, and a probing pocket depth of just over **3 mm**. These values remained markedly abnormal in control subjects.²³

This study demonstrated the ability of the **probiotic lozenge** not only to significantly improve all four of the most important parameters of periodontal health, but also to *continue working long after supplementation ended*.

Previous clinical studies lend additional support to the use of *S. salivarius* M18 for oral health. In one, **88%** of *S. salivarius* M18 recipients maintained plaque scores lower than their baseline, pretreatment values at the end of a 3-month treatment period, compared with just **44%** of placebo recipients.¹⁵

How it Works

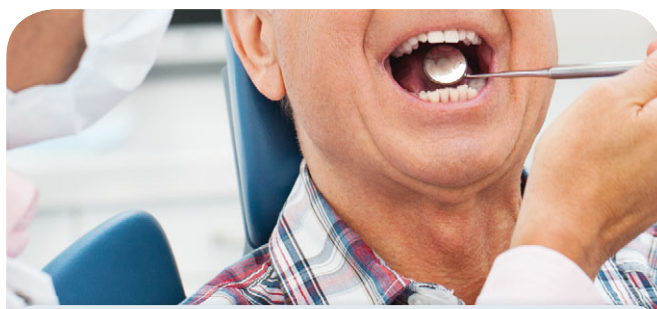
S. salivarius M18 works by several actions to help create a healthier oral environment. Unlike many probiotic formulations, *S. salivarius* M18 can specifically colonize the human mouth. This results in stable, reproducing colonies of this beneficial organism even after supplementation ends.¹⁶

S. salivarius M18 has also been shown to compete effectively with bacteria (such as *Streptococcus mutans*) that can cause cavities, helping to support healthy teeth and gums.¹⁵

S. salivarius M18 is an abundant producer of bacteria-suppressing weapons called **bacteriocins**.

Bacteriocins function similar to antibiotics, but are entirely natural, and appear to act only at the local level between different bacterial strains.²⁴

The specific bacteriocins that *S. salivarius* M18 produces are in a class called **lantibiotics** that use a mode of action that literally creates a hole, or pore, in the target organism's cell membrane leading to its destruction.^{25,26} In this fashion, *S. salivarius* M18 has been shown to inhibit the growth of several well-known tooth and gum disease-producing organisms, including *S. mutans*, *S. sobrinus*, and *Actinomyces naeslundii*.^{15,24,27,28}



Whole-Body Effects of Periodontal Disease

Periodontal (gum) disease can be painful, disfiguring, and even disabling when tooth loss and jawbone resorption occur.

But new science is showing that periodontal disease has far-reaching consequences that extend into most body systems, largely the result of inflammatory changes and other signaling pathway disruptions throughout the body.

Gum disease is now associated with disorders of the brain, heart, lungs, kidney, liver, and blood vessels—all of which promote aging and shorten lifespan.⁷⁻¹⁴

The good news is that reducing bacteria-laden plaque results in significant reductions in total-body inflammation.²⁹ This means that improving our tooth and gum health is vital not just for those oral structures, but also to preserve our health in practically all body systems.

In addition to its targeting of disease-causing organisms, *S. salivarius* M18 produces *enzymes* that help break down dental **plaque**, which is a main cause of tooth decay and gum disease. *S. salivarius* M18 also helps generate a neutral **pH** in the mouth that supports healthful bacteria, further balancing the oral microbiome and reducing disease risk.¹⁵

An additional research finding is that *S. salivarius* M18 reduces the presence of the pro-inflammatory cytokine **IL-6** which is associated with periodontal disease.¹⁵ This complements a beneficial overlap with the immune-modulating features of *L. plantarum* **L-137**, providing added protection against chronic gum **inflammation**.

Summary

Gum diseases are rampant, especially as we age past 30 years.

Tooth brushing and flossing are important, but are insufficient to restore a damaged **oral microbiome** to its natural, disease-resistant state.

Recent advances in the understanding of beneficial bacteria (probiotics) reveal a two-pronged approach to restoring a balanced microbiome and rejuvenating healthy immune function in the mouth.

L. plantarum **L-137** is a heat-treated preparation of beneficial *L. plantarum* bacteria that boosts oral immune function, reduces inflammation, and promotes healing.

S. salivarius **M18** is a proven oral probiotic capable of colonizing the human mouth, where it kills harmful bacteria.

These two **probiotics**, when taken as a daily **lozenge**, can work together to enhance not only oral, but total-body health. ●

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

References

1. Available at: http://www.cdc.gov/OralHealth/children_adults/adults.htm. Accessed October 25, 2016.
2. Available at: http://www.cdc.gov/oralhealth/periodontal_disease/. Accessed December 8, 2016.
3. Sampaio-Maia B, Caldas IM, Pereira ML, et al. The Oral Microbiome in Health and Its Implication in Oral and Systemic Diseases. *Adv Appl Microbiol.* 2016;97:171-210.
4. Saffi MA, Furtado MV, Polanczyk CA, et al. Relationship between vascular endothelium and periodontal disease in atherosclerotic lesions: Review article. *World J Cardiol.* 2015;7(1):26-30.
5. Yao QW, Zhou DS, Peng HJ, et al. Association of periodontal disease with oral cancer: a meta-analysis. *Tumour Biol.* 2014;35(7):7073-7.

Gum Disease and the Adult Immune System

Dysbiosis (an imbalanced microbiome) in the mouth induces profound dysfunction of the immune system that is designed to protect the teeth and gums, and has two major effects on oral health:

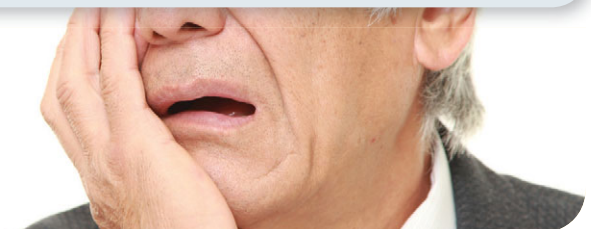
- First, oral dysbiosis and pathogenic bacteria (e.g., *P. gingivalis*) are associated with **increased** activity of inflammatory cytokines (signaling molecules), notably **IL-6**.¹⁸
- Second, dysbiosis **reduces** production of **IL-12**, a regulatory cytokine that supports healthy immune responses and healing after inflammation. This altered immune response contributes to persistent inflammation and slowed healing, a situation that the destructive microbes can exploit to promote their own growth.^{18,30,31}

IL-12 production decreases with aging, leaving a “hole” in immune responses in the mouth.³² This allows organisms like *P. gingivalis* to evade the immune system and become overgrown, and it ultimately causes gum disease.³⁰

Making matters worse, *P. gingivalis* itself also impairs host immune responses, specifically reducing beneficial IL-12 and upregulating pro-inflammatory IL-6.^{18-20,30} This permits overgrowth of *P. gingivalis* and other infection- and inflammation-producing microbes.³³

Additionally, when IL-6 levels remain high, and IL-12 levels low, it is nearly impossible for inflammation of the gums to resolve on its own. This leads to a chronic inflammatory state that eventually erodes the bony tooth socket, ultimately producing **tooth loss**.^{10,18-20}

In an elegant but destructive process, *P. gingivalis* releases chemical fragments that suppress the effects of certain immune cells, “disguising” itself as a normal, beneficial organism, while simultaneously invading the host’s tissues and suppressing its immune response towards other bacterial species as well.



What Dentists Look for To Measure Gum Health

All that probing and poking around in your mouth at the dentist's is no fun. But the dentist or hygienist is in fact looking carefully at multiple features of teeth and gums.

These have been standardized into several scores useful for measuring gum health, as well as for determining the best treatment option.

Those used in studies cited in this article are:

- The **Plaque Index** score: a zero to 3 rating, with zero being no plaque, and 3 being an abundance of plaque that extends below the gum line on the teeth.³⁴
 - The **Gingival Index** score: a zero to 3 rating, with zero being normal gums, and 3 indicating severe inflammation with swelling, ulceration, and a tendency to spontaneous bleeding.³⁴
 - The **Modified Sulcus Bleeding Index** score: a zero to 3 rating, with zero being no bleeding with gentle dental probing and 3 being ready bleeding, change of color, and gum swelling.³⁵
 - **Probing Pocket Depth**: using a calibrated probe marked in millimeters, the dentist or hygienist measures the depth of the pocket between the tooth root and the gum. Generally, the deeper the pocket, the worse the gum disease, with pockets 3 mm or less in depth considered normal, while those deeper than 4 mm indicate periodontitis.^{21,36}
6. Watts A, Crimmins EM, Gatz M. Inflammation as a potential mediator for the association between periodontal disease and Alzheimer's disease. *Neuropsychiatr Dis Treat*. 2008;4(5):865-76.
 7. Kamer AR, Pirraglia E, Tsui W, et al. Periodontal disease associates with higher brain amyloid load in normal elderly. *Neurobiol Aging*. 2015;36(2):627-33.
 8. Prasanna SJ. Causal relationship between periodontitis and chronic obstructive pulmonary disease. *J Indian Soc Periodontol*. 2011;15(4):359-65.
 9. Fisher MA, Taylor GW, West BT, et al. Bidirectional relationship between chronic kidney and periodontal disease: a study using structural equation modeling. *Kidney Int*. 2011;79(3):347-55.
 10. Hajishengallis G. Periodontitis: from microbial immune subversion to systemic inflammation. *Nat Rev Immunol*. 2015;15(1):30-44.
 11. Humphrey LL, Fu R, Buckley DI, et al. Periodontal disease and coronary heart disease incidence: a systematic review and meta-analysis. *J Gen Intern Med*. 2008;23(12):2079-86.
 12. Liu Z, Zhang W, Zhang J, et al. Oral hygiene, periodontal health and chronic obstructive pulmonary disease exacerbations. *J Clin Periodontol*. 2012;39(1):45-52.
 13. Scannapieco FA, Bush RB, Paju S. Associations between periodontal disease and risk for nosocomial bacterial pneumonia and chronic obstructive pulmonary disease. A systematic review. *Ann Periodontol*. 2003;8(1):54-69.
 14. Kshirsagar AV, Moss KL, Elter JR, et al. Periodontal disease is associated with renal insufficiency in the Atherosclerosis Risk In Communities (ARIC) study. *Am J Kidney Dis*. 2005;45(4):650-7.
 15. Burton JP, Drummond BK, Chilcott CN, et al. Influence of the probiotic *Streptococcus salivarius* strain M18 on indices of dental health in children: a randomized double-blind, placebo-controlled trial. *J Med Microbiol*. 2013;62(Pt 6):875-84.
 16. Burton JP, Wescombe PA, Macklaim JM, et al. Persistence of the oral probiotic *Streptococcus salivarius* M18 is dose dependent and megaplasmid transfer can augment their bacteriocin production and adhesion characteristics. *PLoS One*. 2013;8(6):e65991.
 17. Iwasaki K, Maeda K, Hidaka K, et al. Daily Intake of Heat-killed *Lactobacillus plantarum* L-137 Decreases the Probing Depth in Patients Undergoing Supportive Periodontal Therapy. *Oral Health Prev Dent*. 2016;14(3):207-14.
 18. Liang S, Krauss JL, Domon H, et al. The C5a receptor impairs IL-12-dependent clearance of *Porphyromonas gingivalis* and is required for induction of periodontal bone loss. *J Immunol*. 2011;186(2):869-77.
 19. Johnson RB, Serio FG. Interleukin-18 concentrations and the pathogenesis of periodontal disease. *J Periodontol*. 2005;76(5):785-90.
 20. Gemmell E, Seymour GJ. Immunoregulatory control of Th1/Th2 cytokine profiles in periodontal disease. *Periodontol*. 2004;35:21-41.
 21. Available at: <http://www.merckmanuals.com/professional/dental-disorders/periodontal-disorders/periodontitis>. Accessed February 1, 2017.
 22. Bonifait L, Chandad F, Grenier D. Probiotics for oral health: myth or reality? *J Can Dent Assoc*. 2009;75(8):585-90.
 23. Scariya L, Nagarathna DV, Varghese M. Probiotics in Periodontal Therapy. *Int J Pharm Bio*. 2015 Jan;6(1):242-50.
 24. Wescombe PA, Upton M, Renault P, et al. Salivaricin 9, a new lantibiotic produced by *Streptococcus salivarius*. *Microbiology*. 2011;157(Pt 5):1290-9.
 25. Bierbaum G, Sahl HG. Lantibiotics: mode of action, biosynthesis and bioengineering. *Curr Pharm Biotechnol*. 2009;10(1):2-18.
 26. Islam MR, Nagao J, Zendo T, et al. Antimicrobial mechanism of lantibiotics. *Biochem Soc Trans*. 2012;40(6):1528-33.
 27. Wescombe PA, Burton JP, Cadieux PA, et al. Megaplasms encode differing combinations of lantibiotics in *Streptococcus salivarius*. *Antonie Van Leeuwenhoek*. 2006;90(3):269-80.
 28. Wescombe PA, Upton M, Dierksen KP, et al. Production of the lantibiotic salivaricin A and its variants by oral streptococci and use of a specific induction assay to detect their presence in human saliva. *Appl Environ Microbiol*. 2006;72(2):1459-66.
 29. Fasula K, Evans CA, Boyd L, et al. Randomized trial of Plaque Identifying Toothpaste: Dental Plaque and Inflammation. *Am J Med*. 2016.
 30. Hajishengallis G, Shakhathreh MA, Wang M, et al. Complement receptor 3 blockade promotes IL-12-mediated clearance of *Porphyromonas gingivalis* and negates its virulence in vivo. *J Immunol*. 2007;179(4):2359-67.
 31. Li L, Hsu HC, Stockard CR, et al. IL-12 inhibits thymic involution by enhancing IL-7- and IL-2-induced thymocyte proliferation. *J Immunol*. 2004;172(5):2909-16.
 32. Banerjee C, Ulloor J, Dillon EL, et al. Identification of serum biomarkers for aging and anabolic response. *Immun Ageing*. 2011;8(1):5.
 33. Costalonga M, Herzberg MC. The oral microbiome and the immunobiology of periodontal disease and caries. *Immunol Lett*. 2014;162(2 Pt A):22-38.
 34. Loe H. The Gingival Index, the Plaque Index and the Retention Index Systems. *J Periodontol*. 1967;38(6):Suppl:610-6.
 35. Wei SH, Lang KP. Periodontal epidemiological indices for children and adolescents: I. Gingival and periodontal health assessments. *Pediatr Dent*. 1981;3(4):353-60.
 36. Available at: <http://www.draxelrad.com/what-do-the-probing-measurements-mean/>. Accessed 6 January, 2017.

HEALTHY TEETH AND GUMS *Naturally...*

Unlike commercial toothpastes containing chemicals such as triclosan, propylene glycol, fluoride and saccharine, **Life Extension® Toothpaste** promotes healthy teeth and gums with innovative **natural compounds** specifically formulated for optimal oral health.

Unique Ingredients in Life Extension® Toothpaste:

- Coenzyme Q10
- Green tea extract
- Hydrogen peroxide
- Aloe vera
- Xylitol
- Folic acid
- Lactoferrin



Life Extension® Toothpaste
Item #01278 • 4-ounce tube

	Retail Price	Your Price
1 tube	\$9.50	\$7.13
4 tubes		\$6.50 each

To order **Life Extension® Toothpaste**, call 1-800-544-4440 or visit www.LifeExtension.com

Not Eating Enough Veggies? No Problem!

Get Protective Benefits Of

Cruciferous Vegetables

with Apigenin

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

Triple Action Cruciferous Vegetable Extract combines vital plant **extracts** that have been shown to protect cellular DNA.

The formula provides optimal potencies of cruciferous extracts like **I3C** (*Indole-3-carbinol*) and **DIM** (*di-indolyl-methane*) to favorably modulate estrogen metabolism,^{1,5} along with **apigenin**.

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

1. *Biochem Pharm.* 2002; 64:393-404.
2. *Toxicol Appl Pharm.* 2001 Jul 15;174(2):146-52.
3. *In Vivo.* 2006 Mar-Apr;20(2):221-8.
4. *Cancer Detect Prevent.* 2004;28:72-9.
5. *Mol Carcinog.* 2012 Mar;51(3):244-56.

Triple Action Cruciferous Vegetable Extract

Item #01468 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$24	\$18
4 bottles		\$16.50 each

Non-GMO

Triple Action Cruciferous Vegetable Extract with Resveratrol

Item #01469 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$32	\$24
4 bottles		\$22.20 each

Non-GMO



A HEALTHY SMILE IS A HEALTHY YOU

BETTER
ORAL HEALTH
FROM
PROBIOTICS



	Retail Price	Your Price
1 bottle	\$20	\$15
4 bottles		\$13 each
Item #02120 • 30 lozenges		

To order **FLORASSIST® Oral Hygiene**, call **1-800-544-4440** or visit **www.LifeExtension.com**

Contains milk. Keep out of reach of children. Do not exceed recommended dose.

BLIS™ and BLIS M18™ are trademarks of Blis Technologies Limited and the subject of USA patent no. 7226590. Immuno-LP20® is a registered trademark of House Foods Group Inc.

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

Discover our Premium Rewards Program

PREMIER

**DOUBLE
REWARDS**



**GET REWARDS
TWICE AS FAST**

**FREE
SHIPPING**



UNLIMITED

**INSTANT
BONUS**



**PAYS FOR
ITSELF**

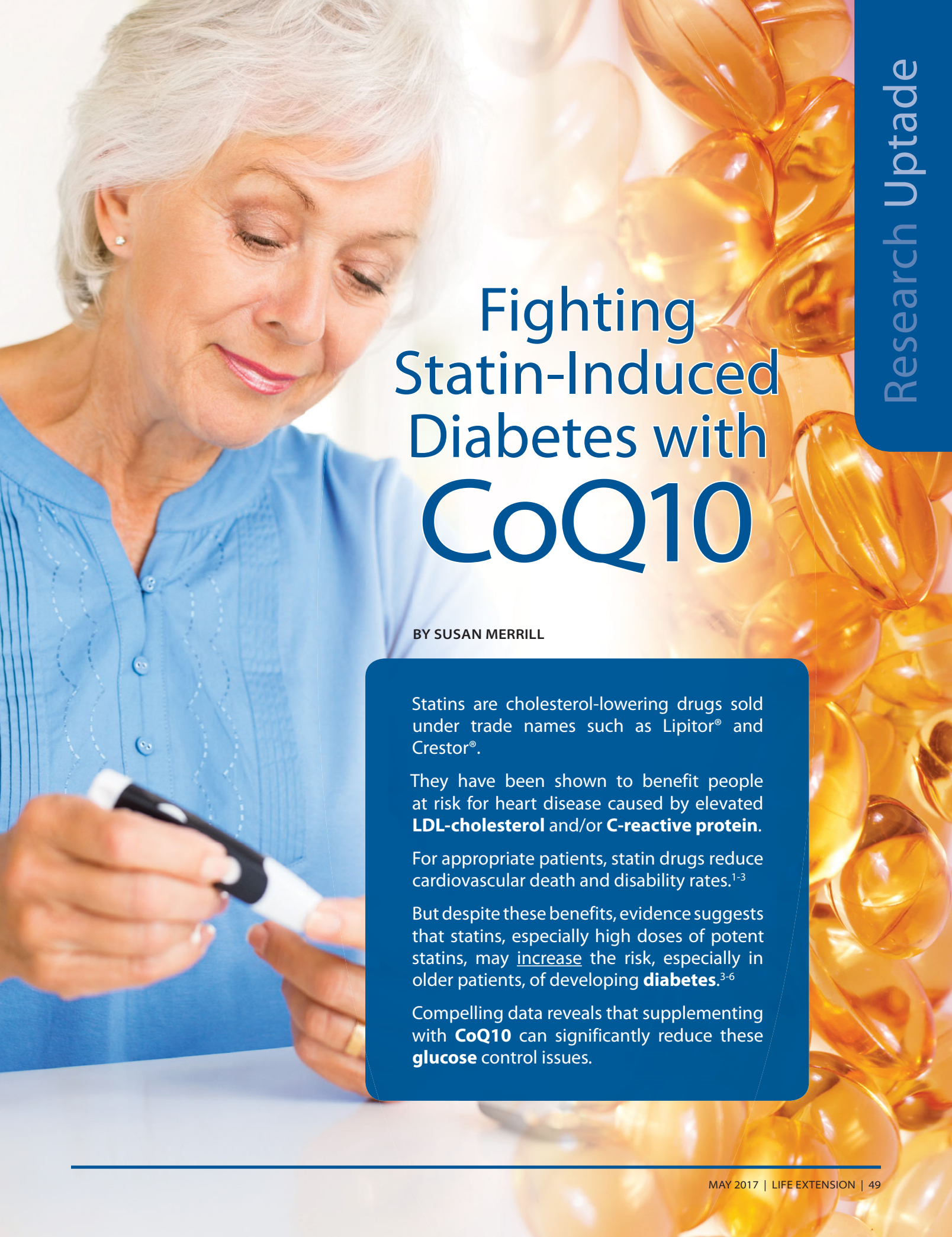
Explore Premier Today!

LifeExtension®
Stay Healthy, Live Better

1-866-542-9357

For details, visit
LifeExtension.com/YourPremier

You must mention Code YRX703A



Fighting Statin-Induced Diabetes with CoQ10

BY SUSAN MERRILL

Statins are cholesterol-lowering drugs sold under trade names such as Lipitor® and Crestor®.

They have been shown to benefit people at risk for heart disease caused by elevated **LDL-cholesterol** and/or **C-reactive protein**.

For appropriate patients, statin drugs reduce cardiovascular death and disability rates.¹⁻³

But despite these benefits, evidence suggests that statins, especially high doses of potent statins, may increase the risk, especially in older patients, of developing **diabetes**.³⁻⁶

Compelling data reveals that supplementing with **CoQ10** can significantly reduce these **glucose** control issues.



Facts about Statins and Diabetes

Studies show that some statins, such as rosuvastatin (Crestor®), are associated with a **27%** increased risk of developing new-onset type II diabetes.⁷ This is just one of many studies showing this harmful connection.^{4,6}

One meta-analysis that utilized results from 13 statin studies involving more than 91,000 participants demonstrated an across-the-board increased diabetes risk of **9%**,⁸ and found the highest risk in trials involving older subjects. Another meta-analysis showed that those taking higher doses of statins had a **12%** higher risk of developing diabetes compared with subjects receiving “moderate” doses.⁹

These two alarming studies have made it apparent that *older* patients on more intensive statin regimens are at the **greatest risk** of developing diabetes from their treatment.^{3,10} Naturally, this poses a dilemma for anyone who is on, or considering starting, statin therapy. Is lowering the risk of cardio-

vascular disease worth the risk of developing diabetes which in turn could, paradoxically, increase the risk of developing cardiovascular disease?⁶

Experts generally say it's a worthwhile gamble, because the benefits for cardiovascular disease outweigh the possibility of type II diabetes.^{8,11} Fortunately, by supplementing with **CoQ10**, you may be able to continue using statin drugs to lower cardiovascular risk, while minimizing the medication-induced risk of diabetes.

The CoQ10 Connection

One reason statins increase the risk of type II diabetes is because they deplete the body of CoQ10. When cells lack sufficient CoQ10, mitochondrial dysfunction sets in, leading to impaired insulin signaling, which may result in the chronically elevated glucose levels that define **diabetes**.³

By design, statins interfere with the production of new cholesterol molecules by blocking an enzyme called **HMG-CoA reductase**.^{4,12,13}

But in the process, they also block a precursor of CoQ10,^{3,4} interfering with its natural production and resulting in lower CoQ10 blood levels.³

Making matters worse, lowering LDL cholesterol impairs CoQ10 transport into cells. The combination of these effects has been shown to directly reduce blood levels of CoQ10 by as much as **54%**.³

Diabetic patients already have lower-than-normal CoQ10 levels. That's because their body uses up much of its CoQ10 stores in an effort to combat diabetes-induced oxidative stress.^{2,12} When diabetics are prescribed statin drugs (which is a common occurrence), the further depletion of CoQ10 can be especially harmful.

Supplementing with CoQ10 allows people to derive lipid- and inflammation-lowering benefits from statins while protecting the body against CoQ10 depletion.

Benefits of CoQ10 Supplementation

Experts are increasingly recommending that anyone on statin therapy begin supplementation with CoQ10 in order to reduce the risk and consequences of **diabetes**.

In addition to replacing depleted stores of CoQ10 in diabetic patients, supplementing with CoQ10 has been found to lower blood-sugar and hemoglobin A1C, a measure of long-term glucose exposure.¹⁴

Research also reveals that in fat cells exposed to statins, CoQ10 restores the normal glucose-uptake mechanism that is disrupted by statin therapy.¹⁵

CoQ10 has also been proven to reduce diabetes-induced cardiovascular risks. For example, studies

have shown that depleted CoQ10 can lead to loss of heart muscle function known as **diabetic cardiomyopathy**.^{12,16} Diabetics also have poor endothelial (blood vessel lining) function, which can be worsened by statin therapy, again as a result of CoQ10 depletion.¹⁷

Supplementing with **200 mg** of CoQ10 per day has been shown to significantly improve diabetes-induced loss of endothelial function, illustrating the protective effect of simple CoQ10 supplementation.¹⁷

In addition, previous studies have shown that lipophilic statins, such as simvastatin, reduce the GLUT4 protein levels in adipocytes, whereas hydrophilic statins (pravastatin) do not. GLUT4 plays an important role in controlling blood glucose. Reductions in the expression of GLUT4 can contribute to insulin resistance and consequently the onset of type II diabetes. In addition, previous studies have noted a reduction in CoQ10 levels when patients are using statins.

A **2013** study looked at the effects of simvastatin, pravastatin, and ezetimibe on GLUT4 in 3T3-L1 adipocytes. Compared to control, a significant decrease in relative intensity of GLUT4 protein by approximately **36%** was observed when adipocytes were treated with simvastatin. Pravastatin and ezetimibe did not statistically alter the relative intensity of GLUT4 protein, whereas ezetimibe + simvastatin significantly reduced the relative intensity of GLUT4 protein.¹⁵

This study suggests that lipophilic statins (simvastatin) reduce the GLUT4 protein levels in adipocytes, whereas hydrophilic statins (pravastatin) do not. Co-treatment with CoQ10 appears to prevent the reduction in GLUT4 protein levels caused by simvastatin.

Summary

While cholesterol-lowering statin drugs have been shown beneficial for reducing cardiovascular risk, use of high potency/ high dosage statin drugs in older patients appears to increase the risk of developing type II diabetes.

One reason statins increase the risk of diabetes is because they deplete the body of CoQ10. Fortunately, studies suggest that supplementing with CoQ10 may help reduce the metabolic risks associated with statin therapy.

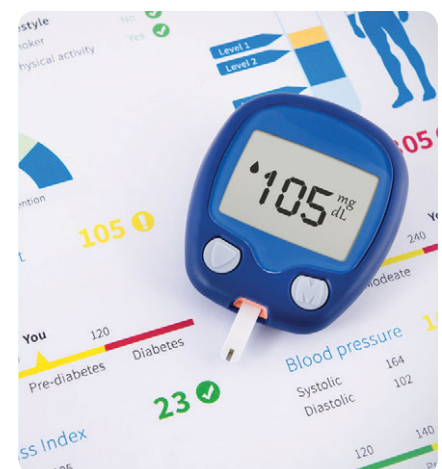
Diabetics who supplement with CoQ10 have also shown improvements in blood sugar and other measures, suggesting the multiple benefits of CoQ10 supplementation for statin users. ●

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

References

1. Cholesterol Treatment Trialists C, Baigent C, Blackwell L, et al. Efficacy and safety of more intensive lowering of LDL cholesterol: a meta-analysis of data from 170,000 participants in 26 randomised trials. *Lancet*. 2010;376(9753):1670-81.
2. Khalil MS, Khamis N, Al-Drees A, et al. Does coenzyme-Q have a protective effect against atorvastatin induced myopathy? A histopathological and immunohistochemical study in albino rats. *Histol Histopathol*. 2015;30(3):383-90.
3. Duan X, Chen CF. Does coenzyme Q10 play a role in the risk of new-onset diabetes due to statins? *Int J Cardiol*. 2016;225:260-1.
4. Brault M, Ray J, Gomez YH, et al. Statin treatment and new-onset diabetes: a review of proposed mechanisms. *Metabolism*. 2014;63(6):735-45.
5. Carter AA, Gomes T, Camacho X, et al. Risk of incident diabetes among patients treated with statins: population based study. *Bmj*. 2013;346:f2610.
6. Chan DC, Pang J, Watts GF. Pathogenesis and management of the diabetogenic effect of statins: a role for adiponectin and coenzyme Q10? *Curr Atheroscler Rep*. 2015;17(1):472.

7. Ridker PM, Danielson E, Fonseca FA, et al. Rosuvastatin to prevent vascular events in men and women with elevated C-reactive protein. *N Engl J Med*. 2008;359(21):2195-207.
8. Sattar N, Preiss D, Murray HM, et al. Statins and risk of incident diabetes: a collaborative meta-analysis of randomised statin trials. *Lancet*. 2010;375(9716):735-42.
9. Preiss D, Seshasai SR, Welsh P, et al. Risk of incident diabetes with intensive-dose compared with moderate-dose statin therapy: a meta-analysis. *JAMA*. 2011;305(24):2556-64.
10. Available at: http://www.heart.org/HEARTORG/Conditions/More/Diabetes/WhyDiabetesMatters/Cardiovascular-Disease-Diabetes_UCM_313865_Article.jsp. Accessed February 7, 2017.
11. Ridker PM, Pradhan A, MacFadyen JG, et al. Cardiovascular benefits and diabetes risks of statin therapy in primary prevention: an analysis from the JUPITER trial. *Lancet*. 2012;380(9841):565-71.
12. Miyake Y, Shouzu A, Nishikawa M, et al. Effect of treatment with 3-hydroxy-3-methylglutaryl coenzyme A reductase inhibitors on serum coenzyme Q10 in diabetic patients. *Arzneimittelforschung*. 1999;49(4):324-9.
13. Swerdlow DI, Preiss D, Kuchenbaecker KB, et al. HMG-coenzyme A reductase inhibition, type 2 diabetes, and bodyweight: evidence from genetic analysis and randomised trials. *Lancet*. 2015;385(9965):351-61.
14. Shen Q, Pierce JD. Supplementation of Coenzyme Q10 among Patients with Type 2 Diabetes Mellitus. *Healthcare (Basel)*. 2015;3(2):296-309.
15. Ganesan S, Ito MK. Coenzyme Q10 ameliorates the reduction in GLUT4 transporter expression induced by simvastatin in 3T3-L1 adipocytes. *Metab Syndr Relat Disord*. 2013;11(4):251-5.
16. Garrido-Maraver J, Cordero MD, Oropesa-Avila M, et al. Coenzyme q10 therapy. *Mol Syndromol*. 2014;5(3-4):187-97.
17. Hamilton SJ, Chew GT, Watts GF. Coenzyme Q10 improves endothelial dysfunction in statin-treated type 2 diabetic patients. *Diabetes Care*. 2009;32(5):810-2.



EUROPEAN MILK THISTLE

Ultimate Protection For Your Liver

Milk thistle extract—rich in **silymarin**—is one of nature's most powerful weapons to support liver health. Scientific studies demonstrate silymarin's ability to provide potent protection for your liver.^{1,2}

Life Extension®'s European Milk Thistle contains standardized, top-grade potencies of **silymarin**, **silybin**, **isosilybin A**, and **isosilybin B**, providing a full spectrum of liver-supportive compounds. This unique formula includes **phosphatidylcholine**, a nutrient that promotes better absorption of milk thistle extract.³

The **silymarin** contained in **European Milk Thistle** is absorbed nearly **5 times** better than silymarin alone, and its bioavailability to the liver is **10 times** better.

European Milk Thistle Advanced Phospholipid Delivery

Item #01922 • 60 Softgels

	Retail Price	Your Price
1 bottle	\$28	\$21
4 bottles		\$18.75 each

Non-GMO



References

1. Mol Nutr Food Res. 2009 Apr;53(4):460-6.
2. Environ Toxicol. 2007 Oct;22(5):472-9.
3. Altern.Med Rev. 2009;14(3):226-46.

SILIPHOS® is a registered trademark of Indena S.p.A., Italy.

To order **European Milk Thistle Advanced Phospholipid Delivery**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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

Pump Up Your Heart Health

UBIQUINOL CoQ10

BETTER ABSORPTION
WITH ADDED MITOCHONDRIAL SUPPORT

Non-GMO



Item # 01426

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

60 softgels • Retail Price is \$62 • **Your price is \$46.50** • 4 bottles are only \$39 each

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

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



How GLYCATION Accelerates Aging

Diabetics suffer accelerated **aging** and early-onset of degenerative illnesses.

An underlying culprit behind diabetic complications is tissue **glycation**.¹

Glycation occurs when blood **glucose** links to **proteins** in the body. The pathologic impact is formation of **advanced glycation end products** that wreak systemic havoc.²⁻⁹

Those with poor **sugar** control suffer dangerously high **glycation** levels. These same toxic glucose reactions occur in nondiabetics, but at a slower pace.

For the past **14** years, **Life Extension Magazine®** has advised readers to avoid or reduce intake of food cooked at **high temperatures**. The reason is, when you eat these heat-damaged proteins, they inflict **glycation damage** to your body's proteins. This is in addition to **glycation** that occurs as a result of life-long **glucose** exposure.

In this article, we provide a targeted strategy to defend against **glycation-induced** tissue damage.



What is Glycation?

Glycation is a process by which **sugar** molecules react chemically with **proteins** in the body, causing the proteins to cross-link and lose their functionality.²

Not only does this cross-linking prevent proteins from doing their intended jobs, it creates harmful molecules called **advanced glycation end products** (or **AGEs**).³

The acronym **AGEs** is appropriate considering these toxic protein reactions are a root cause of premature aging.

Ultimately, glycation causes **inflammation** that damages mitochondria, while **mitochondrial dysfunction** exacerbates glycation. This results in an age-accelerating cycle as **glycated proteins** accumulate in tissues throughout the body.^{4,5}

Mitochondria and Aging

The human body depends on **sugar** and **oxygen** to provide the energy that keeps its heart beating and brain thinking. Intracellular powerhouses called **mitochondria** work wonders by using glucose, fatty acids, and oxygen. The result is life-giving energy that powers every aspect of the body.

But, like other forms of energy generation, the process produces reactive molecules as byproducts that build up and damage the very cells, tissues, and organs the process is meant to support.

Glycation also damages molecules vital to life, like DNA, enzymes, and structural proteins.



Progressive glycation leads to reduced mitochondrial energy production and increased oxidative stress. Eventually, damaged mitochondria can stop functioning altogether, producing an **age-related energy crisis** that speeds up and worsens the aging process.⁶

This is one reason why, as we age, we not only move and think more slowly, but we also repair damage to cells and DNA more slowly, if at all. All of those actions require energy, which is in increasingly short supply.

Impact on the Body

Together, mitochondrial dysfunction and glycation have a disastrous effect on the body's systems, and are responsible for many symptoms of aging. Here is a partial list of the types of damage they wreak on the body:

- The accumulation of advanced glycation end products (AGEs) can contribute to kidney disease and renal failure. When AGEs accumulate in the filtering portions of kidneys, it reduces the ability to excrete waste.⁷
- AGEs can lead to neurodegenerative diseases like Alzheimer's and Parkinson's because they contribute to the formation of cross-linked proteins. These damaged proteins accumulate in cells, disabling and eventually killing brain cells.^{8,9}
- When glycation occurs in the skin, it sensitizes the skin to ultraviolet (UV) radiation, triggering oxidative stress that damages DNA and increases the risk of skin cancers.¹⁰
- AGEs damage joint cartilage, resulting in stiffening and loss of ability to handle stresses. AGEs are now recognized as major contributors to osteoarthritis.¹¹
- When similar AGE-related damage occurs in spinal discs, it can make disc injury and herniation ("slipped disc") more likely.¹²
- Glycation is especially damaging to our eyes. Not only does it lead to clouding of the lens (cataracts), it also causes retinal damage—both of which impair vision and ultimately produce blindness.^{13,14}
- The protein-rich walls of arteries, and even tiny capillaries, are especially vulnerable to glycation-induced damage.¹⁵ The resulting stiffening and inflammatory changes produce atherosclerosis, the cause of heart attacks, strokes, and other vascular disorders of aging.⁴



What You Need to Know

In short, glycation, linked to poor mitochondrial function, *accelerates every aspect of human aging*.

While we are exposed to **glycation** on a daily basis, we are not helpless in the face of its destructive effects. A huge volume of published data support the use of specific **nutrients** that work hand-in-hand to reduce glycation and its effects, while also supporting healthy, energy-producing mitochondria.

Antiglycation Nutrients

Four compounds have been identified to reduce the rate of glycation and control the consequences when it occurs.

The first is a fat-soluble form of vitamin B1 (thiamine) called **benfotiamine**.^{16,17} Lab studies have shown that benfotiamine can prevent **glycation**, and human studies have shown that it can help prevent the damage caused by glycation.^{16,18}

In a study of type II diabetics, benfotiamine helped prevent blood-vessel damage caused by glycation. For the study, subjects ate a meal high in AGEs (caused by high-heat cooking), then took benfotiamine for three days, and then ate the same high-AGE meal again.¹⁸

Initially, the AGE-rich meal reduced blood flow throughout the subjects' bodies as a result of the impact of AGEs on blood vessels. But after supplementing with **benfotiamine** for just three days, blood flow measurements *completely normalized*, demonstrating just how quickly benfotiamine exerts its powerful impact.

A later study of diabetic animals further demonstrated the ability of benfotiamine to improve heart and blood vessel function, while also reducing death and scarring of vital heart cells.¹⁹

Lab studies have given us insight into how benfotiamine works to prevent glycation itself, as well as the damage it can cause. Through at least three biochemical pathways, **benfotiamine** has now been shown to improve function of tiny capillaries in the retina, increase mitochondrial energy production in muscle cells, protect against kidney and other tissue damage in dialysis, and prevent DNA damage.^{17,20-24}

Glycation and Aging

- Humans' dependence on energy derived from using sugar molecules and oxygen comes at a cost: toxic and reactive molecules interact with essential proteins and fats, damaging cells' ability to function and accelerating their aging.
- Glycation, the binding of sugar molecules to cellular structures, triggers massive inflammation and releases chemically stressful small molecules, which in turn damage mitochondria.
- Mitochondria, our sole source of energy harvest from food, lose their efficiency and eventually fade away under this chemical onslaught.
- The combination of glycation and mitochondrial dysfunction and loss rapidly accelerates aging, leading to chronic disorders that shorten life and reduce its quality.
- Natural compounds have been identified that are capable of reversing this accelerated aging.
- Benfotiamine, luteolin, pyridoxal-5-phosphate, and carnosine block glycation and prevent its destructive consequences.
- PQQ, R-lipoic acid, and taurine enhance mitochondrial resistance to glycation-induced oxidative stress and promote formation of youthful new mitochondria.
- This combination of nutrients can be expected to rejuvenate cellular energy levels while reducing chemically-induced damage to cells, thereby reversing the age-accelerating trend.

Pyridoxal 5'-phosphate

Pyridoxal 5'-phosphate is an active form of vitamin B6²⁵ that is receiving growing attention as a natural complement to benfotiamine. Like benfotiamine, this active form of **vitamin B6** has the **dual benefit** of helping prevent glycation as well as its harmful effects (such as the buildup of gunked-up proteins and AGEs).^{26,27}

Pyridoxal 5'-phosphate is one of the most effective compounds known to inhibit glycation of **fats** (lipids) and proteins.²⁸ This is an important protective function, since **lipid glycation** is a major threat to the function of cell membranes, which is an underlying factor in numerous age-related conditions.^{29,30}

This metabolically active form of vitamin B6 (**pyridoxal 5'-phosphate**) works by essentially **trapping** glucose breakdown products before they can participate in dangerous glycation reactions.²⁵

Avoid Foods Cooked at High Temperatures

The way you cook your food can affect your chances of becoming diabetic.

A randomized, controlled trial looked at two groups of obese subjects.⁶⁸ The first group ingested a diet typically high in **advanced glycation end-products** (AGEs), which are proteins and lipids in foods that are often damaged by high temperature cooking.

The second group was required to eat food cooked at low temperatures (stewed, steamed or poached) and avoid food that was fried, baked or grilled.

In the group avoiding food cooked at a dry heat or high temperatures (low-AGE diet), insulin resistance significantly improved, and body weight was mildly reduced.

The high-AGE group's markers of insulin resistance, on the other hand, were at higher levels compared to baseline.

Head researcher Helen Vlassara, MD, remarked:

"While food AGEs are prevalent, particularly in Western diets, our study showed that avoiding foods high in AGEs could actually reverse the damage that had been done. This can provide us with new clinical approaches to prediabetes, potentially helping protect certain at-risk individuals from developing full diabetes and its devastating consequences."

Life Extension first warned about the dangers of eating foods cooked at high temperature in the May **2003** issue of this magazine.

Luteolin

Luteolin is a flavonoid found abundantly in many plants. Since one of the main consequences of glycation is inflammation, luteolin's anti-inflammatory properties make it an ideal natural complement to benfotiamine and **pyridoxal 5'-phosphate**. Inflammation is widely recognized for its association with cancer, atherosclerosis, and virtually all other chronic diseases.³¹

Luteolin works by suppressing the activation of the master inflammatory complex called **NF-kB**, which triggers the production of a wide variety of pro-inflammatory signaling molecules (cytokines).

The **anti-inflammatory** actions of **luteolin** have been demonstrated in tissues throughout the body, including the brain, blood vessel lining, skin, intestines, lungs, gums, and bone.³²⁻³⁹

A study published in the *American Journal of Respiratory and Critical Care Medicine* gives us insight into how monumental luteolin's anti-inflammatory impact truly is. When mice were exposed to a bacterial toxin, only **4.1%** of them survived. But when mice that were given luteolin were exposed to the same toxin, it promoted survival in **48%** of the mice.⁴⁰

Carnosine

Carnosine is a potent free-radical scavenger and anti-glycating agent that inhibits AGE formation and its cross-linked proteins, helping to keep them functioning properly.⁴¹⁻⁴⁴

Carnosine has powerful lipid glycation-preventing properties and profound impacts on fundamental AGE-signaling pathways, making it a highly promising anti-aging drug candidate.⁴⁵

Studies show that carnosine prevents protein cross-linking and the accumulation of the tangled protein clumps associated with Alzheimer's disease.^{46,47}



Carnosine has also been shown to lower blood-lipid levels, reduce the metabolic stress induced by high-fat diets, and, very importantly, to help stabilize atherosclerotic plaques, reducing their risk of rupturing and triggering a heart attack or stroke.^{15,48}

Finally, carnosine works in numerous ways to help protect mitochondria from the destructive effects of cellular oxidative stresses.⁴³

Nutrients that Enhance Mitochondrial Function

As we discussed earlier, preventing glycation is one piece of the puzzle. It is equally important to preserve **mitochondrial function** in the face of glycation-induced damage. Three unique compounds have been identified in the scientific literature that can lend new life to aging mitochondria.

Pyrroloquinoline quinone (PQQ)

Pyrroloquinoline quinone (PQQ) is a vitamin-like molecule that promotes the production of new mitochondria in cells, helping to restore cellular energy.^{6,49} The result of insufficient cellular PQQ is reduced numbers of **mitochondria**.⁴⁹

In a clever experiment, researchers treated animals with a toxic chemical that induces Parkinson's disease-like symptoms. They then fed the rats a probiotic made of bacteria that had been engineered to produce PQQ.⁶

Initially, the chemically-treated rats lost mitochondria and showed obvious evidence of oxidant damage in their organs. But after receiving the PQQ-supplying probiotic, those changes were **reversed**, new mitochondria formed, and the animals recovered from severe metabolic damage.

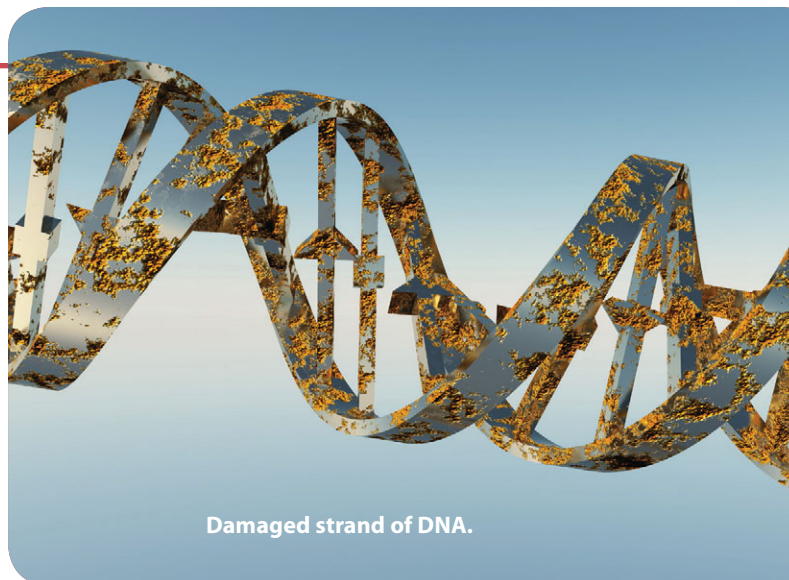
R-Lipoic Acid

R-lipoic acid is essential to enzyme systems involved in extracting energy from food.^{50,51} This makes it vital for efficient mitochondrial function.

Studies show that giving older animals R-lipoic acid leads to improved metabolic function, healthier mitochondria, and reduced production of oxidative stress-inducing byproducts.

In addition, animals supplemented with R-lipoic acid age more slowly than they otherwise would. This is because R-lipoic acid also protects liver, heart, and brain cells from mitochondria-induced oxidative stress.⁵²⁻⁵⁸

Due to these abilities, R-lipoic acid is emerging as a popular anti-aging supplement.



Damaged strand of DNA.

Taurine

Taurine is an amino acid that has been found in extremely high concentrations inside mitochondria, where it regulates the enzymes responsible for harvesting energy from food molecules.⁵⁹

Because of this important function, taurine is found most abundantly in heart and skeletal muscle, brain tissues, and the retina—all of which have extremely high metabolic rates that burn out mitochondria.⁶⁰⁻⁶³

Insufficient taurine in these tissues produces an energy crisis that results in accelerated aging.^{64,65} The good news is that adding taurine back to such cells in crisis can reduce oxidative stress and maintain – and often restore – mitochondrial function in aging cells.^{62,63,66}

Indeed, taurine is one of the few nutrients capable of spurring brain cells to put out new shoots, called **neurites**, enhancing brain cell connections that preserve cognition and memory.⁶⁷

Summary

Glycation of our body's tissues is a normal consequence of aging. Those with poor blood **sugar** control suffer more glycation reactions and prematurely age.

Ultimately, glycation and mitochondrial dysfunction together produce ever-faster aging.

Fortunately, scientists have uncovered several nutrients that function to support healthy mitochondrial function while reducing glycation and its damaging effects.

These nutrients work together to rejuvenate cell energy levels while reducing tissue damage. ●

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

References

- Semba RD, Nicklett EJ, Ferrucci L. Does accumulation of advanced glycation end products contribute to the aging phenotype? *J Gerontol A Biol Sci Med Sci*. 2010;65(9):963-75.
- Yim MB, Yim HS, Lee C, et al. Protein glycation: creation of catalytic sites for free radical generation. *Ann N Y Acad Sci*. 2001;928:48-53.
- Krone CA, Ely JT. Ascorbic acid, glycation, glycohemoglobin and aging. *Med Hypotheses*. 2004;62(2):275-9.
- Ward MS, Fortheringham AK, Cooper ME, et al. Targeting advanced glycation endproducts and mitochondrial dysfunction in cardiovascular disease. *Curr Opin Pharmacol*. 2013;13(4):654-61.
- Hipkiss AR. Mitochondrial dysfunction, proteotoxicity, and aging: causes or effects, and the possible impact of NAD⁺-controlled protein glycation. *Adv Clin Chem*. 2010;50:123-50.
- Singh AK, Pandey SK, Saha G, et al. Pyrroloquinoline quinone (PQQ) producing *Escherichia coli* Nissle 1917 (EcN) alleviates age associated oxidative stress and hyperlipidemia, and improves mitochondrial function in ageing rats. *Exp Gerontol*. 2015;66:1-9.
- Fukami K, Yamagishi S, Ueda S, et al. Role of AGEs in diabetic nephropathy. *Curr Pharm Des*. 2008;14(10):946-52.
- Kikuchi S, Shinpo K, Takeuchi M, et al. Glycation--a sweet tempter for neuronal death. *Brain Res Brain Res Rev*. 2003;41(2-3):306-23.
- Hipkiss AR. Aging risk factors and Parkinson's disease: contrasting roles of common dietary constituents. *Neurobiol Aging*. 2014;35(6):1469-72.
- Wondrak GT, Roberts MJ, Jacobson MK, et al. Photosensitized growth inhibition of cultured human skin cells: mechanism and suppression of oxidative stress from solar irradiation of glycated proteins. *J Invest Dermatol*. 2002;119(2):489-98.
- Verzijl N, DeGroot J, Ben ZC, et al. Crosslinking by advanced glycation end products increases the stiffness of the collagen network in human articular cartilage: a possible mechanism through which age is a risk factor for osteoarthritis. *Arthritis Rheum*. 2002;46(1):114-23.
- Tsuru M, Nagata K, Jimi A, et al. Effect of AGEs on human disc herniation: intervertebral disc hernia is also effected by AGEs. *Kurume Med J*. 2002;49(1-2):7-13.
- Burd J, Lum S, Cahn F, et al. Simultaneous noninvasive clinical measurement of lens autofluorescence and rayleigh scattering using a fluorescence biomicroscope. *J Diabetes Sci Technol*. 2012;6(6):1251-9.
- Kessel L, Hougaard JL, Sander B, et al. Lens ageing as an indicator of tissue damage associated with smoking and non-enzymatic glycation--a twin study. *Diabetologia*. 2002;45(10):1457-62.
- Brown BE, Kim CH, Torpy FR, et al. Supplementation with carnosine decreases plasma triglycerides and modulates atherosclerotic plaque composition in diabetic apo E(-/-) mice. *Atherosclerosis*. 2014;232(2):403-9.
- Pomero F, Molinar Min A, La Selva M, et al. Benfotiamine is similar to thiamine in correcting endothelial cell defects induced by high glucose. *Acta Diabetol*. 2001;38(3):135-8.
- Schmid U, Stopper H, Heidland A, et al. Benfotiamine exhibits direct antioxidative capacity and prevents induction of DNA damage in vitro. *Diabetes Metab Res Rev*. 2008;24(5):371-7.
- Stirban A, Negrean M, Stratmann B, et al. Benfotiamine prevents macro- and microvascular endothelial dysfunction and oxidative stress following a meal rich in advanced glycation end products in individuals with type 2 diabetes. *Diabetes Care*. 2006;29(9):2064-71.
- Katare RG, Caporali A, Oikawa A, et al. Vitamin B1 analog benfotiamine prevents diabetes-induced diastolic dysfunction and heart failure through Akt/Pim-1-mediated survival pathway. *Circ Heart Fail*. 2010;3(2):294-305.
- Fraser DA, Hessvik NP, Nikolic N, et al. Benfotiamine increases glucose oxidation and downregulates NADPH oxidase 4 expression in cultured human myotubes exposed to both normal and high glucose concentrations. *Genes Nutr*. 2012;7(3):459-69.
- Tarallo S, Beltramo E, Berrone E, et al. Human pericyte-endothelial cell interactions in co-culture models mimicking the diabetic retinal microvascular environment. *Acta Diabetol*. 2012;49 Suppl 1:S141-51.
- Kihm LP, Muller-Krebs S, Klein J, et al. Benfotiamine protects against peritoneal and kidney damage in peritoneal dialysis. *J Am Soc Nephrol*. 2011;22(5):914-26.
- Balakumar P, Rohilla A, Krishan P, et al. The multifaceted therapeutic potential of benfotiamine. *Pharmacol Res*. 2010;61(6):482-9.
- Hammes HP, Du X, Edelstein D, et al. Benfotiamine blocks three major pathways of hyperglycemic damage and prevents experimental diabetic retinopathy. *Nat Med*. 2003;9(3):294-9.
- Nakamura S, Niwa T. Pyridoxal phosphate and hepatocyte growth factor prevent dialysate-induced peritoneal damage. *J Am Soc Nephrol*. 2005;16(1):144-50.
- Lehman TD, Ortwerth BJ. Inhibitors of advanced glycation end product-associated protein cross-linking. *Biochim Biophys Acta*. 2001;1535(2):110-9.
- Khatami M, Suldan Z, David I, et al. Inhibitory effects of pyridoxal phosphate, ascorbate and aminoguanidine on nonenzymatic glycosylation. *Life Sci*. 1988;43(21):1725-31.
- Miyazawa T, Nakagawa K, Shimasaki S, et al. Lipid glycation and protein glycation in diabetes and atherosclerosis. *Amino Acids*. 2012;42(4):1163-70.
- Nakagawa K, Ibusuki D, Yamashita S, et al. Glycation of plasma lipoprotein lipid membrane and screening for lipid glycation inhibitor. *Ann N Y Acad Sci*. 2008;1126:288-90.
- Suzuki K, Nakagawa K, Miyazawa T. Augmentation of blood lipid glycation and lipid oxidation in diabetic patients. *Clin Chem Lab Med*. 2014;52(1):47-52.
- Harris GK, Qian Y, Leonard SS, et al. Luteolin and chrysin differentially inhibit cyclooxygenase-2 expression and scavenge reactive oxygen species but similarly inhibit prostaglandin-E2 formation in RAW 264.7 cells. *J Nutr*. 2006;136(6):1517-21.
- Dequ Z, Kang L, Jiali Y, et al. Luteolin inhibits inflammatory response and improves insulin sensitivity in the endothelium. *Biochimie*. 2011;93(3):506-12.
- Kim JE, Son JE, Jang YJ, et al. Luteolin, a novel natural inhibitor of tumor progression locus 2 serine/threonine kinase, inhibits tumor necrosis factor- α -induced cyclooxygenase-2 expression in JB6 mouse epidermis cells. *J Pharmacol Exp Ther*. 2011;338(3):1013-22.
- Rezaei-Zadeh K, Ehrhart J, Bai Y, et al. Apigenin and luteolin modulate microglial activation via inhibition of STAT1-induced CD40 expression. *J Neuroinflammation*. 2008;5:41.
- Chen CY, Peng WH, Tsai KD, et al. Luteolin suppresses inflammation-associated gene expression by blocking NF- κ B and AP-1 activation pathway in mouse alveolar macrophages. *Life Sci*. 2007;81(23-24):1602-14.
- Zhu LH, Bi W, Qi RB, et al. Luteolin inhibits microglial inflammation and improves neuron survival against inflammation. *Int J Neurosci*. 2011;121(6):329-36.
- Gutierrez-Venegas G, Kawasaki-Cardenas P, Arroyo-Cruz SR, et al. Luteolin inhibits lipopolysaccharide actions on human gingival fibroblasts. *Eur J Pharmacol*. 2006;541(1-2):95-105.
- Chen HQ, Jin ZY, Wang XJ, et al. Luteolin protects dopaminergic neurons from inflammation-induced injury through inhibition of microglial activation. *Neurosci Lett*. 2008;448(2):175-9.
- Kim JS, Jobin C. The flavonoid luteolin prevents lipopolysaccharide-induced NF- κ B signalling and gene expression by blocking IkappaB kinase activity in intestinal epithelial cells and bone marrow derived dendritic cells. *Immunology*. 2005;115(3):375-87.
- Kotanidou A, Xagorari A, Bagli E, et al. Luteolin reduces lipopolysaccharide-induced lethal toxicity and expression of proinflammatory molecules in mice. *Am J Respir Crit Care Med*. 2002;165(6):818-23.
- Reddy VP, Garrett MR, Perry G, et al. Carnosine: a versatile antioxidant and antiglycating agent. *Sci Aging Knowledge Environ*. 2005;2005(18):pe12.
- Hipkiss AR. Would carnosine or a carnivorous diet help suppress aging and associated pathologies? *Ann N Y Acad Sci*. 2006;1067:369-74.
- Cheng J, Wang F, Yu DF, et al. The cytotoxic mechanism of malondialdehyde and protective effect of carnosine via protein cross-linking/mitochondrial dysfunction/reactive oxygen species/MAPK pathway in neurons. *Eur J Pharmacol*. 2011;650(1):184-94.

44. Baye E, Ukropcova B, Ukropec J, et al. Physiological and therapeutic effects of carnosine on cardiometabolic risk and disease. *Amino Acids*. 2016;48(5):1131-49.
45. Hipkiss AR, Baye E, de Courten B. Carnosine and the processes of ageing. *Maturitas*. 2016;93:28-33.
46. Hipkiss AR. Could carnosine or related structures suppress Alzheimer's disease? *J Alzheimers Dis*. 2007;11(2):229-40.
47. Babizhayev MA, Deyev AI, Yegorov YE. Olfactory dysfunction and cognitive impairment in age-related neurodegeneration: prevalence related to patient selection, diagnostic criteria and therapeutic treatment of aged clients receiving clinical neurology and community-based care. *Curr Clin Pharmacol*. 2011;6(4):236-59.
48. Stegen S, Stegen B, Aldini G, et al. Plasma carnosine, but not muscle carnosine, attenuates high-fat diet-induced metabolic stress. *Appl Physiol Nutr Metab*. 2015;40(9):868-76.
49. Chowanadisai W, Bauerly KA, Tchapanian E, et al. Pyrroloquinoline quinone stimulates mitochondrial biogenesis through cAMP response element-binding protein phosphorylation and increased PGC-1 α expression. *J Biol Chem*. 2010;285(1):142-52.
50. Goraca A, Huk-Kolega H, Piechota A, et al. Lipoic acid - biological activity and therapeutic potential. *Pharmacol Rep*. 2011;63(4):849-58.
51. Morikawa T, Yasuno R, Wada H. Do mammalian cells synthesize lipoic acid? Identification of a mouse cDNA encoding a lipoic acid synthase located in mitochondria. *FEBS Lett*. 2001;498(1):16-21.
52. Jiang T, Yin F, Yao J, et al. Lipoic acid restores age-associated impairment of brain energy metabolism through the modulation of Akt/JNK signaling and PGC1 α transcriptional pathway. *Aging Cell*. 2013;12(6):1021-31.
53. Suh JH, Moreau R, Heath SH, et al. Dietary supplementation with (R)- α -lipoic acid reverses the age-related accumulation of iron and depletion of antioxidants in the rat cerebral cortex. *Redox Rep*. 2005;10(1):52-60.
54. Suh JH, Wang H, Liu RM, et al. (R)- α -lipoic acid reverses the age-related loss in GSH redox status in post-mitotic tissues: evidence for increased cysteine requirement for GSH synthesis. *Arch Biochem Biophys*. 2004;423(1):126-35.
55. Suh JH, Shigeno ET, Morrow JD, et al. Oxidative stress in the aging rat heart is reversed by dietary supplementation with (R)- α -lipoic acid. *FASEB J*. 2001;15(3):700-6.
56. Hagen TM, Vinarsky V, Wehr CM, et al. (R)- α -lipoic acid reverses the age-associated increase in susceptibility of hepatocytes to tert-butylhydroperoxide both in vitro and in vivo. *Antioxid Redox Signal*. 2000;2(3):473-83.
57. Hagen TM, Ingersoll RT, Lykkesfeldt J, et al. (R)- α -lipoic acid-supplemented old rats have improved mitochondrial function, decreased oxidative damage, and increased metabolic rate. *FASEB J*. 1999;13(2):411-8.
58. Liu J, Head E, Gharib AM, et al. Memory loss in old rats is associated with brain mitochondrial decay and RNA/DNA oxidation: partial reversal by feeding acetyl-L-carnitine and/or R- α -lipoic acid. *Proc Natl Acad Sci U S A*. 2002;99(4):2356-61.
59. Hansen SH, Birkedal H, Wibrand F, et al. Taurine and regulation of mitochondrial metabolism. *Adv Exp Med Biol*. 2015;803:397-405.
60. Ripps H, Shen W. Review: taurine: a "very essential" amino acid. *Mol Vis*. 2012;18:2673-86.
61. Froger N, Moutsimilli L, Cadetti L, et al. Taurine: the comeback of a nutraceutical in the prevention of retinal degenerations. *Prog Retin Eye Res*. 2014;41:44-63.
62. De Luca A, Pierno S, Camerino DC. Taurine: the appeal of a safe amino acid for skeletal muscle disorders. *J Transl Med*. 2015;13:243.
63. Ramila KC, Jong CJ, Pastukh V, et al. Role of protein phosphorylation in excitation-contraction coupling in taurine deficient hearts. *Am J Physiol Heart Circ Physiol*. 2015;308(3):H232-9.
64. Gebara E, Udry F, Sultan S, et al. Taurine increases hippocampal neurogenesis in aging mice. *Stem Cell Res*. 2015;14(3):369-79.
65. Militante J, Lombardini JB. Age-related retinal degeneration in animal models of aging: possible involvement of taurine deficiency and oxidative stress. *Neurochem Res*. 2004;29(1):151-60.
66. Xu S, He M, Zhong M, et al. The neuroprotective effects of taurine against nickel by reducing oxidative stress and maintaining mitochondrial function in cortical neurons. *Neurosci Lett*. 2015;590:52-7.
67. Chou CT, Lin HT, Hwang PA, et al. Taurine resumed neuronal differentiation in arsenite-treated N2a cells through reducing oxidative stress, endoplasmic reticulum stress, and mitochondrial dysfunction. *Amino Acids*. 2015;47(4):735-44.
68. Vlassara H, Cai W, Tripp E, et al. Oral AGE restriction ameliorates insulin resistance in obese individuals with the metabolic syndrome: a randomised controlled trial. *Diabetologia*. 2016;59(10):2181-92.



OPTIMIZE Your Venous Blood Flow!

For those who find themselves sitting for long periods of time at the office, in daily commutes, or when traveling by plane, the proprietary blend of nutrients in **VenoFlow™** promotes healthy venous blood flow.

Just one capsule of **VenoFlow™** provides **nattokinase** (providing 2,000 fibrinolytic units) and **procyanidins** derived from French maritime pine bark (Pycnogenol®).

VenoFlow™

Item #02102 • 30 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$52	\$39
4 bottles		\$36 each



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

CAUTION: Consult your healthcare provider before use if taking medication (especially those affecting blood coagulation or blood pressure), being treated for a medical condition (especially bleeding disorders), under the age of 18, pregnant, or lactating.

Pycnogenol® is a registered trademark of Horphag Research Ltd.

TURN BACK THE CLOCK

*High-potency carnosine with R-lipoic acid,
benfotiamine, taurine, luteolin, and PQQ*



To order **Mitochondrial Energy Optimizer**, call **1-800-544-4440** or visit **www.LifeExtension.com**
Item # 01868 • 120 capsules • Retail Price is \$72 • **Your price is \$54** • 4 bottles are only \$48 each

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

Is SUGAR Aging You?



MEGA BENFOTIAMINE

DEFENDS AGAINST GLYCATION—
TISSUE DAMAGE CAUSED BY SIMPLE SUGARS

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

	Retail Price	Your Price
1 bottle	\$30	\$22.50
4 bottles		\$20.25 each
Item #00925 • 120 vegetarian capsules		

Non-GMO



Item # 00925

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

EYE HEALTH IN ONE SMALL SOFTGEL

NON-GMO



ITEM # 01992

To order **MacuGuard® Ocular Support with Saffron**, call 1-800-544-4440 or visit www.LifeExtension.com

Item # 01992 • 60 softgels • Non-GMO • Retail Price is \$25 • **Your price is \$18.75** • 4 bottles are only \$17.50 each

LuteinPlus® and Mz® are registered trademarks of NutriProducts Ltd., UK, licensed under U.S. Patent 8,623,428.

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

BY WILL BRINK





Resistance Exercise Reduces Cognitive Decline

When we think of the benefits of **exercise**, we tend to think of its ability to reduce cardiovascular disease, strengthen bones and muscles, and control weight.

Research is now proving that exercise is also crucial for preserving and enhancing **brain function** as we age.¹⁻⁸

Studies show that exercise inhibits neurodegenerative diseases and even promotes **neurogenesis**—*the creation of new brain cells*.¹⁻⁴

While most forms of exercise are associated with improved cognition, some forms may be superior to others in that respect. A newly released study demonstrates that **resistance exercise** or weight training, rather than aerobic exercise, has a greater impact on cognitive function.⁹

In this article, you will learn how exercise—especially strength-training exercise—can enhance cognition and memory and protect against age-related cognitive decline.

03 45 963 57

Enhanced Muscle Strength Provides Cognitive Protection

For aging individuals, exercise is associated with an array of benefits that support longer lifespan.¹⁰ One recent study supports its connection to protecting and enhancing brain function.

In October **2016**, scientists released the findings of a large randomized, double-blind, controlled trial that investigated the effects of resistance training on cognitive function in older adults.⁹ Resistance training, also called strength training, is exercise that uses weights, machines, bands, or other devices that work key muscle groups.

Previous studies had already shown the cognitive benefits of exercise, but this time the researchers wanted to determine whether the cognitive improvements occurred as a result of increased aerobic capacity or increased muscle strength.⁹

The study included 100 participants age 55 and over with **mild cognitive impairment**. Each was randomly assigned to either a sham version or a legitimate version of a progressive program of resistance training for two to three days per week. They also received computerized cognitive training.⁹

Although the program improved both whole-body muscle strength and aerobic capacity, the study team found that only the enhanced **strength** scores—but *not the enhanced aerobic scores*—were significantly associated with improvements in cognition.⁹

While the exact reason for these beneficial effects remains unknown, it is clear that it is the *strength-related* gains from resistance exercise that cause its cognitive benefits.⁹

This is an important finding that should change how the medical community approaches exercise. Most medical professionals recommend aerobic exercise, yet fail to understand the value and benefits of resistance exercise, especially in aging populations. This trial showing the superior cognitive benefits of strength training adds to a wealth of past evidence supporting the value of exercise in inhibiting sarcopenia, cognitive decline, and the onset of neurodegenerative disease.¹¹⁻¹³

Data now conclusively show that exercise—specifically resistance training—is not just essential for the health of your body, but is an essential component to the health of your brain.

Exercise and the Brain

Exercise has been shown to be crucial for preserving, and even enhancing, brain function as we age. A Mayo Clinic study on more than 1,300 subjects concluded that any frequency of moderate-intensity exercise performed in midlife or late life was associated with reduced risk of having mild cognitive impairment.⁸



Multiple mechanisms for this cognitive benefit have been identified:

- Exercise boosts blood flow in the brain,^{5,6} improving the delivery of oxygen and nutrients to critical brain cells.
- Exercise promotes *angiogenesis* (the formation of new blood vessels from pre-existing vessels) as well as *neurogenesis* (the formation of new neurons from stem cells) in the adult hippocampus.^{2,3} Angiogenesis is important for neurogenesis because the improved blood supply facilitates the growth of new neurons and their supporting structures.^{2,4}
- Exercise enhances the production of key neurotransmitters, such as serotonin, acetylcholine, and gamma-aminobutyric acid (GABA).¹⁴ Serotonin regulates mood and sleep; acetylcholine plays a role in cognition, memory, and learning; and GABA, the main inhibitory neurotransmitter in the brain.^{15,16}
- Exercise also increases the production of beneficial brain proteins called neurotrophins (a family of proteins that regulate neuron survival).^{1,7} Greater physical activity can increase the production of a specific neurotrophin that is associated with enhanced cognitive function and brain plasticity.^{2,14,17,18}

Inhibiting Sarcopenia

Another key benefit of exercise is its ability to inhibit **sarcopenia**, the age-related loss of muscle mass, strength, and functionality. Sarcopenia not only robs elderly people of the ability to perform even the most basic tasks of daily living, but also vastly heightens their risk of suffering devastating injuries and even death from sudden falls and other accidents.

This condition generally appears after age 40 and accelerates after age 75 and can be caused by suboptimal hormone levels, inadequate dietary protein, other nutritional imbalances, oxidative stress, and inflammation. Most often, it is seen in physically inactive people.^{19,20}

While all types of exercise are beneficial, scientists have determined that resistance or strength training provides superior protection against the advance of sarcopenia.

Resistance exercise stimulates the release of hormones that promote healthy muscle mass, including growth hormone (which is responsible for cell growth and regeneration throughout the body), as well as local growth factors such as *mechano growth factor* (which is important in helping muscles repair and grow).^{20,21} As an added benefit, these types of exercises can enhance the effects of other interventions, such as hormone replacement therapy.

While aerobic exercise is excellent for maintaining cardiovascular health and keeping body fat levels low, it is only mildly effective in preserving lean body mass. This explains why sarcopenia is not uncommon in endurance athletes as they age.

Resistance exercise, on the other hand, is essential for increasing—or even just preserving—lean body mass, which is especially critical for older adults. Strength training can also promote mobility, improve health-related fitness, and improve bone health.²²

Nutrients That Boost Muscle Mass and Strength

Any good exercise regimen should be supported by key nutrients that help our bodies build and maintain muscle mass. The following nutrients have been shown to enhance the strength-boosting effects of resistance exercise—which, as we have learned, enhances cognition and memory, protects against age-related cognitive decline, and helps prevent sarcopenia.⁹

What You Need to Know

Inhibit Cognitive Decline with Resistance Exercise

- Although best-known for its cardiovascular benefits, exercise is also critical for preserving brain function in later life and reducing the risk of neurodegenerative diseases.
- An exercise regimen even promotes the creation of new brain cells (neurogenesis).
- New evidence documents that it is the boost in *muscle strength* resulting from resistance training that is responsible for this potent cognitive protection in older adults.
- An array of natural supplements can enhance the powerful capacity of resistance training to preserve and enhance cognition.



Whey

Whey protein is especially effective at preserving lean body mass in older adults.²³ Whey protein augments the effects of resistance exercise training, especially if consumed shortly before or after exercise.²⁴ Men who supplemented with whey in combination with resistance training showed improvements in one or more measures of muscle strength as well as lean tissue mass, compared to placebo recipients.²⁵

Clinical studies indicate that older adults need greater amounts of high-quality protein than active, younger people, which means that the recommended daily protein intake may not be enough for older adults.²⁶⁻²⁹ So while the Institutes of Medicine recommends **0.8 grams per kilogram** of body weight (or **58 grams** for an aging adult weighing 160 pounds) for all adults, several studies suggest that healthy older adults need between **1.0-1.3 grams** of protein per kilogram of body weight,¹⁰⁻¹² (or **73-94 grams** for an aging adult weighing 160 pounds).³⁰⁻³²

Creatine

Athletes use creatine monohydrate to increase muscular force and power, reduce fatigue, and help increase muscle mass.^{33,34} Numerous studies have demonstrated

that creatine supplementation increases strength and lean body mass in older adults who are participating in resistance exercise training.³⁵⁻³⁷ This may be due to the fact that the muscle fibers most affected by creatine supplementation are the same “fast-twitch” (Type II) fibers that commonly atrophy in older adults.^{38,39}

Research suggests that when whey and creatine are taken together, they provide synergistic benefits that boost the effects of resistance training. In one study, men who supplemented with both whey and creatine showed greater gains in lean tissue mass and bench press strength than men who supplemented with whey alone or with placebo.²⁵

Branched Chain Amino Acids

Whey protein is packed with **branched chain amino acids** (BCAAs), but these potent compounds are also available separately for added muscle support.

Three specific BCAAs, leucine, isoleucine, and valine, are essential amino acids that play important metabolic roles during exercise and in the maintenance and growth of skeletal muscle.

BCAAs account for **35%** of the essential amino acids in muscle proteins and can serve as an energy source for muscle tissue during exercise. Leucine, the most metabolically active BCAA, has been well-documented to promote muscle tissue synthesis.⁴⁰⁻⁴³ Branched chain amino acids also reduce perceived exertion and mental fatigue during exercise.⁴⁴

Glutamine

Glutamine—the most abundant amino acid in the body—is highly concentrated in the skeletal muscles that make movement possible. When scientists gave **2,000 mg** of glutamine to nine healthy adults, eight out of the nine subjects experienced a **four-fold** increase in growth hormone output.⁴⁵ Evidence suggests that after intense exercise, glutamine helps replenish muscle stores of glycogen,⁴⁶ which serves as a ready source of fuel to power muscle action.

Vitamin D

Vitamin D helps preserve the same (Type II) muscle fibers that are prone to atrophy in aging adults. This suggests that low vitamin D levels in older individuals may contribute to poor muscle function (and bone formation). Supplemental vitamin D may reduce the incidence of sarcopenia (and osteoporosis)⁴⁷—and therefore may contribute to the cognitive protection now associated with greater muscle strength through resistance exercise.





Carnitine

Carnitine is an amino acid derivative that transports fatty acids to the mitochondria to be used as fuel for energy production. It works by prompting mitochondria to produce cellular energy quickly and efficiently—helping to combat the age-related decrease in cellular energy and critically supporting exercise recovery.

Carnitine formulations may promote healthy muscle mass in older adults prone to sarcopenia,⁴⁸ and it can protect against cognitive decline by boosting muscle strength. One novel form of carnitine known as propionyl-L-carnitine helps regulate levels of adenosine triphosphate (ATP)—the primary source of energy for all cellular processes—and can improve physical performance and reduce general fatigue.^{49,50}

Omega-3 Fatty Acids

The omega-3 fatty acid **EPA** (eicosapentaenoic acid) preserves muscle mass under various physiological conditions.⁵¹ Both EPA and the omega-3 fatty acid **DHA** (docosahexaenoic acid) have anti-inflammatory effects, which scientists believe may help manage sarcopenia.^{52,53} In **2016**, a placebo-controlled, double-blind trial concluded that **6 grams** daily of fish oil may alleviate muscle soreness experienced after resistance training.⁵⁴

D-Ribose

D-ribose is a naturally occurring carbohydrate molecule that facilitates the production of ATP, the body's energy currency.⁵⁵ In studies of healthy athletes, supplying fatigued muscle cells with D-ribose quickly restored ATP levels to normal.⁵⁶ By refilling depleted energy stores in muscle (and heart) tissue, D-ribose may help speed muscle recovery after high-intensity exercise.⁵⁵

Summary

As we age, regular exercise becomes crucial for maintaining brain function and helping to inhibit neurodegenerative diseases. Exercise even promotes neurogenesis—the creation of new brain cells.

A new study demonstrates that, in those regularly participating in resistance (vs. aerobic) exercise, it's the *muscle-strength gains* that mediate these cognitive benefits in aging individuals.

Various supplemental nutrients support the powerful benefits of resistance training to enhance cognition and memory and protect against age-related cognitive decline. ●

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

References

1. Ploughman M. Exercise is brain food: the effects of physical activity on cognitive function. *Dev Neurorehabil.* 2008;11(3):236-40.
2. Lista I, Sorrentino G. Biological mechanisms of physical activity in preventing cognitive decline. *Cell Mol Neurobiol.* 2010;30(4):493-503.
3. Van der Borght K, Kobor-Nyakas DE, Klauke K, et al. Physical exercise leads to rapid adaptations in hippocampal vasculature: temporal dynamics and relationship to cell proliferation and neurogenesis. *Hippocampus.* 2009;19(10):928-36.
4. Pereira AC, Huddleston DE, Brickman AM, et al. An in vivo correlate of exercise-induced neurogenesis in the adult dentate gyrus. *Proc Natl Acad Sci U S A.* 2007;104(13):5638-43.
5. Linkin P, Jorgensen LG, Olesen HL, et al. Dynamic exercise enhances regional cerebral artery mean flow velocity. *J Appl Physiol (1985).* 1995;78(1):12-6.
6. Querido JS, Sheel AW. Regulation of cerebral blood flow during exercise. *Sports Med.* 2007;37(9):765-82.
7. Floel A, Ruscheweyh R, Kruger K, et al. Physical activity and memory functions: are neurotrophins and cerebral gray matter volume the missing link? *Neuroimage.* 2010;49(3):2756-63.
8. Geda YE, Roberts RO, Knopman DS, et al. Physical exercise, aging, and mild cognitive impairment: a population-based study. *Arch Neurol.* 2010;67(1):80-6.
9. Mavros Y, Gates N, Wilson GC, et al. Mediation of Cognitive Function Improvements by Strength Gains After Resistance Training in Older Adults with Mild Cognitive Impairment: Outcomes of the Study of Mental and Resistance Training. *Journal of the American Geriatrics Society.* 2016.
10. Du J, Li G, Gao YL, et al. [Influencing factors on healthy life expectancy in adults in Beijing]. *Zhonghua Liu Xing Bing Xue Za Zhi.* 2016;37(8):1087-90.
11. Roth SM, Ferrell RF, Hurley BF. Strength training for the prevention and treatment of sarcopenia. *J Nutr Health Aging.* 2000;4(3):143-55.
12. Nagamatsu LS, Handy TC, Hsu CL, et al. Resistance training promotes cognitive and functional brain plasticity in seniors with probable mild cognitive impairment. *Arch Intern Med.* 2012;172(8):666-8.
13. Paillard T, Rolland Y, de Souto Barreto P. Protective Effects of Physical Exercise in Alzheimer's Disease and Parkinson's Disease: A Narrative Review. *J Clin Neurol.* 2015;11(3):212-9.
14. Ma Q. Beneficial effects of moderate voluntary physical exercise and its biological mechanisms on brain health. *Neurosci Bull.* 2008;24(4):265-70.

15. Available at: <http://www.health.harvard.edu/mind-and-mood/what-causes-depression>. Accessed February 6, 2017.
16. Jembrek MJ, Vlainic J. GABA Receptors: Pharmacological Potential and Pitfalls. *Curr Pharm Des*. 2015;21(34):4943-59.
17. Cotman CW, Berchtold NC. Exercise: a behavioral intervention to enhance brain health and plasticity. *Trends Neurosci*. 2002;25(6):295-301.
18. Komulainen P, Pedersen M, Hanninen T, et al. BDNF is a novel marker of cognitive function in ageing women: the DR's EXTRA Study. *Neurobiol Learn Mem*. 2008;90(4):596-603.
19. Leifke E, Gorenai V, Wichers C, et al. Age-related changes of serum sex hormones, insulin-like growth factor-1 and sex-hormone binding globulin levels in men: cross-sectional data from a healthy male cohort. *Clin Endocrinol (Oxf)*. 2000;53(6):689-95.
20. Goldspink G. Mechanical signals, IGF-I gene splicing, and muscle adaptation. *Physiology (Bethesda)*. 2005;20:232-8.
21. Mastorakos G, Pavlatou M, Diamanti-Kandarakis E, et al. Exercise and the stress system. *Hormones (Athens)*. 2005;4(2):73-89.
22. Available at: https://www.cdc.gov/physicalactivity/downloads/growing_stronger.pdf. Accessed February, 2017.
23. Dangin M, Boirie Y, Guillet C, et al. Influence of the protein digestion rate on protein turnover in young and elderly subjects. *J Nutr*. 2002;132(10):3228s-33s.
24. Hayes A, Cribb PJ. Effect of whey protein isolate on strength, body composition and muscle hypertrophy during resistance training. *Curr Opin Clin Nutr Metab Care*. 2008;11(1):40-4.
25. Burke DG, Chilibeck PD, Davidson KS, et al. The effect of whey protein supplementation with and without creatine monohydrate combined with resistance training on lean tissue mass and muscle strength. *Int J Sport Nutr Exerc Metab*. 2001;11(3):349-64.
26. Campbell WW, Crim MC, Dallal GE, et al. Increased protein requirements in elderly people: new data and retrospective reassessments. *Am J Clin Nutr*. 1994;60(4):501-9.
27. Karakelides H, Nair KS. Sarcopenia of aging and its metabolic impact. *Curr Top Dev Biol*. 2005;68:123-48.
28. Young VR. Amino acids and proteins in relation to the nutrition of elderly people. *Age Ageing*. 1990;19(4):S10-24.
29. Houston DK, Nicklas BJ, Ding J, et al. Dietary protein intake is associated with lean mass change in older, community-dwelling adults: the Health, Aging, and Body Composition (Health ABC) Study. *Am J Clin Nutr*. 2008;87(1):150-5.
30. Gaffney-Stomberg E, Insogna KL, Rodriguez NR, et al. Increasing dietary protein requirements in elderly people for optimal muscle and bone health. *J Am Geriatr Soc*. 2009;57(6):1073-9.
31. Morais JA, Chevalier S, Gougeon R. Protein turnover and requirements in the healthy and frail elderly. *J Nutr Health Aging*. 2006;10(4):272-83.
32. Morse MH, Haub MD, Evans WJ, et al. Protein requirement of elderly women: nitrogen balance responses to three levels of protein intake. *J Gerontol A Biol Sci Med Sci*. 2001;56(11):M724-30.
33. Smith SA, Montain SJ, Zientara GP, et al. Use of phosphocreatine kinetics to determine the influence of creatine on muscle mitochondrial respiration: an in vivo ³¹P-MRS study of oral creatine ingestion. *J Appl Physiol (1985)*. 2004;96(6):2288-92.
34. Allen PJ. Creatine metabolism and psychiatric disorders: Does creatine supplementation have therapeutic value? *Neurosci Biobehav Rev*. 2012;36(5):1442-62.
35. Chrusch MJ, Chilibeck PD, Chad KE, et al. Creatine supplementation combined with resistance training in older men. *Med Sci Sports Exerc*. 2001;33(12):2111-7.
36. Gotshalk LA, Volek JS, Staron RS, et al. Creatine supplementation improves muscular performance in older men. *Med Sci Sports Exerc*. 2002;34(3):537-43.
37. Brose A, Parise G, Tarnopolsky MA. Creatine supplementation enhances isometric strength and body composition improvements following strength exercise training in older adults. *J Gerontol A Biol Sci Med Sci*. 2003;58(1):11-9.
38. Kalyani RR, Corriere M, Ferrucci L. Age-related and disease-related muscle loss: the effect of diabetes, obesity, and other diseases. *Lancet Diabetes Endocrinol*. 2014;2(10):819-29.
39. Deschenes MR. Effects of aging on muscle fibre type and size. *Sports Med*. 2004;34(12):809-24.
40. Koopman R, Verdijk L, Manders RJ, et al. Co-ingestion of protein and leucine stimulates muscle protein synthesis rates to the same extent in young and elderly lean men. *Am J Clin Nutr*. 2006;84(3):623-32.
41. Dardevet D, Sornet C, Balage M, et al. Stimulation of in vitro rat muscle protein synthesis by leucine decreases with age. *J Nutr*. 2000;130(11):2630-5.
42. Katsanos CS, Kobayashi H, Sheffield-Moore M, et al. A high proportion of leucine is required for optimal stimulation of the rate of muscle protein synthesis by essential amino acids in the elderly. *Am J Physiol Endocrinol Metab*. 2006;291(2):E381-7.
43. Fujita S, Volpi E. Amino acids and muscle loss with aging. *J Nutr*. 2006;136(1 Suppl):277s-80s.
44. Matsumoto K, Koba T, Hamada K, et al. Branched-chain amino acid supplementation attenuates muscle soreness, muscle damage and inflammation during an intensive training program. *J Sports Med Phys Fitness*. 2009;49(4):424-31.
45. Welbourne TC. Increased plasma bicarbonate and growth hormone after an oral glutamine load. *Am J Clin Nutr*. 1995;61(5):1058-61.
46. Varnier M, Leese GP, Thompson J, et al. Stimulatory effect of glutamine on glycogen accumulation in human skeletal muscle. *Am J Physiol*. 1995;269(2 Pt 1):E309-15.
47. Montero-Odasso M, Duque G. Vitamin D in the aging musculoskeletal system: an authentic strength preserving hormone. *Mol Aspects Med*. 2005;26(3):203-19.
48. Malaguarnera M, Cammalleri L, Gargante MP, et al. L-Carnitine treatment reduces severity of physical and mental fatigue and increases cognitive functions in centenarians: a randomized and controlled clinical trial. *Am J Clin Nutr*. 2007;86(6):1738-44.
49. Brevetti G, Perna S, Sabba C, et al. Propionyl-L-carnitine in intermittent claudication: double-blind, placebo-controlled, dose titration, multicenter study. *J Am Coll Cardiol*. 1995;26(6):1411-6.
50. Vermeulen RC, Scholte HR. Exploratory open label, randomized study of acetyl- and propionylcarnitine in chronic fatigue syndrome. *Psychosom Med*. 2004;66(2):276-82.
51. Tisdale MJ. Clinical anticachexia treatments. *Nutr Clin Pract*. 2006;21(2):168-74.
52. Roubenoff R. Catabolism of aging: is it an inflammatory process? *Curr Opin Clin Nutr Metab Care*. 2003;6(3):295-9.
53. Fritsche K. Fatty acids as modulators of the immune response. *Annu Rev Nutr*. 2006;26:45-73.
54. Tinsley GM, Gann JJ, Huber SR, et al. Effects of Fish Oil Supplementation on Postresistance Exercise Muscle Soreness. *J Diet Suppl*. 2016;1-12.
55. Dodd SL, Johnson CA, Fernholz K, et al. The role of ribose in human skeletal muscle metabolism. *Med Hypotheses*. 2004;62(5):819-24.
56. Hellsten Y, Skadhauge L, Bangsbo J. Effect of ribose supplementation on resynthesis of adenosine nucleotides after intense intermittent training in humans. *Am J Physiol Regul Integr Comp Physiol*. 2004;286(1):R182-8.

Maintain Healthy Lean Muscle Mass

NEW ZEALAND Whey Protein CONCENTRATE



New Zealand Whey Protein Concentrate

is uniquely derived from grass-fed, free-range cows living healthy lives in New Zealand and not treated with growth hormone (rBST). Its naturally high content of branched-chain amino acids (BCAAs), lactoferrin, and immunoglobulins is ideal for those who wish to:¹⁻⁵

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

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

References

1. *Altern Med Rev.* 2004 Jun;9(2):136-156.
2. *J Nutr Biochem.* 2003 May;14(5):251-8.
3. *Toxicol In Vitro.* 2003 Feb;17(1):27-33.
4. *Br J Nutr.* 2011 May;105(10):1465-70.
5. *Int J Sport Nutr Exerc Metab.* 2006 Oct;16(5):494-509.

Contains milk.
Non-GMO

New Zealand Whey Protein Concentrate (Vanilla)

Item #01770 • 500 grams

	Retail Price	Your Price
1 bottle	\$30	\$22.50
4 bottles		\$19.95 each



New Zealand Whey Protein Concentrate (Chocolate)

Item #01771 • 640 grams

	Retail Price	Your Price
1 bottle	\$30	\$22.50
4 bottles		\$19.95 each



To order **New Zealand Whey Protein Concentrate**,
call **1-800-544-4440** or visit **www.LifeExtension.com**

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

Tremendous Value in One Softgel

HEALTH BOOSTER

Provides Important Nutrients Missing from Multivitamins

- **Alpha-carotene** and **saffron** to promote eye health.



- **Vitamin K2** is the active form that keeps calcium in bones and out of arteries.



- **Vitamin K1** is rapidly absorbed and partially converts to vitamin K2 in the body.



- **Zeaxanthin, lutein, and meso-zeaxanthin** to support healthy vision.



- **Sesame lignans** to boost gamma tocopherol activity.



- **Blueberry** extract to sustain healthy **neurological** function.



Non-GMO

- **Gamma tocopherols** to quench oxidation missed by conventional **vitamin E**.



- **Lycopene** to promote prostate health.



- **Chlorophyllin** to protect against environmental DNA damage.



- **Black currant extract** to promote eye health.



- **Methylcobalamin** form of **B12** to better support healthy nerve function.



*The same nutrients
sold separately would cost
2-3 times more money!*

Caution: Avoid use during pregnancy. Consult your healthcare practitioner before using this product if you are taking anti-coagulant or anti-platelet medications or have a bleeding disorder.

Lyc-O-Mato® is a registered trademark of Lycored, LTD.
LuteinPlus® and **Mz®** are registered trademarks of NutriProducts Ltd., UK, licensed under U.S. Patent 8,623,428.

	Retail Price	Your Price
1 bottle	\$54	\$40.50
4 bottles		\$38 each
Item #01991 • 60 softgels (two-month supply)		

To order **Once-Daily Health Booster**, call
1-800-544-4440 or visit **www.LifeExtension.com**

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

BOOST BRAIN PERFORMANCE

Cognitex® with Pregnenolone & Brain Shield®

Cognitex® is designed to improve cerebral performance and protect against neurological problems over the long term.

Scientifically formulated **Cognitex®** contains validated ingredients shown at two weeks to improve:*

- **Spatial short-term memory 42%**
- **Recall 15%**
- **Recognition 11%**
- **Attention 12%**
- **Visual learning 33%**
- **Activities of daily living by over 10%**

Cognitex® with Pregnenolone & Brain Shield® (Gastrodin)

Item #01897 • 90 softgels

	Retail Price	Your Price
1 bottle	\$62	\$46.50
4 bottles		\$39.75 each



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

Non-GMO

Caution: Do not take this product if you have breast cancer, prostate cancer, or other hormone-sensitive diseases. If you are taking anti-coagulant or anti-platelet medications, or have a bleeding disorder, consult with your health care provider before taking this product.

Leucoselect® is a registered trademark of Indena S.p.A.

Perlucan® 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® is a registered trademark of Enzymotec Ltd.

To order **Cognitex®**
with **Pregnenolone & Brain Shield®**,
call 1-800-544-4440 or
visit www.LifeExtension.com

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

OPTIMIZE DIGESTION —and— INTESTINAL BALANCE

Digestive enzymes are essential to the body's **absorption** and optimal utilization of food and all its nutrients.^{1,2}

The body's production of digestive enzymes decreases with age, leading to poor digestion and bloating, as well as other discomforts—especially after eating a large meal.

Enhanced Super Digestive Enzymes provides specific **enzymes** required to support the natural reactions that break down food proteins, fats, carbohydrates, and other nutrients.

Enhanced Super Digestive Enzymes with Probiotics provides the same enzymes that are in **Enhanced Super Digestive Enzymes**—but with the added benefits of the **probiotic** *B. coagulans*.

This **probiotic** creates a natural protective shield that resists digestion in the stomach allowing it to fully colonize in the intestines to support digestive health and suppress less beneficial bacteria to improve digestive comfort.^{3,4}

To order **Enhanced Super Digestive Enzymes** or **Enhanced Super Digestive Enzymes with Probiotics**, call 1-800-544-4440 or visit www.LifeExtension.com



Enhanced Super Digestive Enzymes

Item #02021 • 60 vegetarian capsules

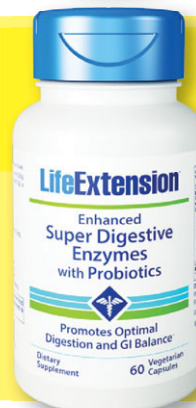
	Retail Price	Your Price
1 bottle	\$22	\$16.50
4 bottles		\$15 each



Enhanced Super Digestive Enzymes with Probiotics

Item #02022 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$28	\$21
4 bottles		\$18 each



References

1. *Altern Med Rev.* 2008 Dec;13(4):307-14.
2. *JOP.* 2005 May 10;6(3):206-15.
3. Available at: <http://www.sabinsa.com/newsroom/articles/bacillus-coagulans-probiotic-of-choice-nutracos-march-april-2012.pdf>. Accessed September 30, 2015.
4. Available at: http://www.sabinsa.com/newsroom/WhitePapers/Probiotics_For_Health_And_Well_Being_Nutra.pdf. Accessed September 30, 2015.

Non-GMO. Lactospore® is a registered trademark of Sabinsa Corp.

Oats

Oats are a grain commonly eaten in the form of oatmeal, cereal or bread. As you're about to see, oats have a number of remarkable health benefits, but you should be careful when buying this super food in some of its more popular forms, such as instant oatmeal, which often has large amounts of sugar mixed in. As a general rule, always check ingredients lists before buying even purportedly healthy foods.

Cholesterol

Due to containing more soluble fiber (in the form of beta glucan) than any other grain, oat intake can help cut levels of LDL cholesterol.¹ This in turn can reduce the risk of cardiovascular disease.²

Weight Control

Research shows that eating oat-based foods regularly is correlated with lower body mass index.³ This may be due to the grain's ability to reduce hunger and provide satiety.⁴

Blood Pressure

Evidence indicates that diets that emphasize whole grains such as oats can lower both systolic and diastolic blood pressure.⁵

Colorectal Cancer

Extensive research has found that a diet high in fiber derived from whole grains, including oats, is linked with lowered risk of colorectal cancer. And the level of risk is reduced in direct relation to dosage intake, with every additional **10 grams** of total dietary fiber per day leading to an additional **10%** reduction in colorectal cancer risk.⁶

References

1. Available at: <http://www.webmd.com/diet/oatmeal-benefits>. Accessed February 8, 2017.
2. *Br J Nutr.* 2016;116(8):1369-82.
3. *Nutr Res.* 2015;35(12):1052-9.
4. *Br J Nutr.* 2014;112 Suppl 2:S1-3.
5. *Am J Clin Nutr.* 1995;61(2):366-72.
6. *Bmj.* 2011;343:d6617.

THE MOST COMPLETE VITAMIN K FORMULA

Supports:

- Bone Density
- Heart Health
- Youthful Arterial Elasticity

Just one daily softgel of Super K formula provides:

Vitamin K2 (MK-7)	200 mcg
Vitamin K2 (MK-4)	1,000 mcg
Vitamin K1	1,500 mcg

Vitamin K1, vitamin K2 (MK-4), and vitamin K2 (MK-7) can also be found in Life Extension® Once-Daily Health Booster (formerly Super Booster). If you take Once-Daily Health Booster, you do not need additional Super K with Advanced K2 formula.

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

Super K with Advanced K2 Complex

Item #01834 • 90 softgels • Non-GMO

	Retail Price	Your Price
1 bottle	\$30	\$22.50
4 bottles		\$20.25 each

Each bottle lasts for three months.



*Optimize your vitamin K
and help keep calcium in your bones
and out of blood vessels.*

To order **Super K with Advanced K2 Complex** or **Once-Daily Health Booster**,
call 1-800-544-4440 or visit www.LifeExtension.com

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

Innovative Neurotransmitter Testing

BY SCOTT FOGLE, ND



LE: **Life Extension®** has always been at the forefront of presenting innovative lab tests that aren't always available from mainstream doctors. Are there any new tests on the horizon?

Dr. Fogle: Yes. We are pleased to introduce neurotransmitter testing, an innovative test that looks at the balance of chemical messengers in your brain. The results from this urinary test can offer important insight into numerous health issues that may be difficult to assess by standard blood testing.

LE: What are neurotransmitters, and why are they important?

Dr. Fogle: Neurotransmitters are powerful chemical messengers, just like hormones. When neurotransmitters are out of balance, it affects mood, cognition, attitude, coping skills, energy, sleep, overall health, and more. At **Life Extension**, we have always encouraged people to balance their sex hormones, such as testosterone, estrogen, progesterone, DHEA, and pregnenolone. We receive positive feedback from customers around the world that balancing sex hormones has helped change their lives. These customers report improvements in mood and well-being as well as healthy changes on blood testing markers. Now people can do the same thing with neurotransmitters! This scientific approach to wellness is something that very few doctors offer to their patients. Yet clinical experience has shown that balancing both sex hormones and neurotransmitters is a strategy for feeling great, functioning optimally, managing stress better, promoting longevity, and just feeling more vibrant and healthy.



LE: Who should have this type of neurotransmitter test done?

Dr. Fogle: It is especially important to get your neurotransmitters tested if you are experiencing issues such as mood disorders, depression, anxiety, adrenal issues, fatigue, insomnia, loss of mental focus, ADD, ADHD, brain fog, addiction, poor impulse control, hormonal imbalances, cravings, irritable bowel syndrome (IBS), headaches, cognitive dysfunction, chronic pain, and insulin resistance, to name a few.

But in general, this test is also beneficial for anyone who is not feeling optimal. If you wake up feeling fantastic and go to sleep easily, then your neurotransmitters are probably well-balanced and you don't need to bother testing them. If you do not feel that way, then it is a good idea to test and see how balancing your neurotransmitters can help bring those positive attributes back into your life.

LE: Why don't more doctors check neurotransmitters?

Dr. Fogle: From my experience, doctors are overwhelmed with information these days and too often reach for the prescription pad rather than think outside the

box. If I could change the healthcare industry, I would make it so everyone gets both sex hormones and neurotransmitters tested every year. By balancing both of these important and vital chemical communicators in the body, many diseases could be prevented, saving pain, heartache, and billions of healthcare dollars, and ultimately enhancing lifespan.

LE: What neurotransmitters are included in the test?

Dr. Fogle: This test measures serotonin, dopamine, epinephrine plus glutamate, norepinephrine, and GABA. These are the most important neurotransmitters, and they represent both the excitatory and inhibitory aspects of neurotransmitters. Think of neurotransmitters like the gas pedal and brake pedal on your car. Your nervous system needs a balance of both excitatory (the gas pedal) and inhibitory (the brake pedal) neurotransmitters to function optimally. One of the biggest problems in today's society is that too many people are pressing down too heavily on the gas pedal, yet barely touching the brakes. This leads to elevated epinephrine, norepinephrine, and glutamate (the excitatory neurotransmitters) and low GABA

(the primary inhibitory one) and low serotonin. This imbalance makes you feel depressed, irritated, negative, and tired, but at the same time, you cannot sleep or rest well because the excitatory neurotransmitters are too high. That person will continue to struggle with these symptoms until neurotransmitters are brought back into balance. Making matters worse, out-of-balance neurotransmitters can often push hormones out of balance as well.

LE: Have you seen neurotransmitter testing work in clinical practice?

Dr. Fogle: Since I saw such good results with hormone testing, I was one of the first doctors to start doing specialty neurotransmitter testing many years ago. I tried it out on my staff first. A young female staff member was gaining weight, feeling irritable and anxious, had low libido, no energy, no desire to exercise, and craved carbs nearly every evening. Her results showed major imbalances in her neurotransmitters, especially with low serotonin. We targeted those imbalances with the appropriate nutrients to support serotonin

and GABA, and within a week her mood picked up dramatically, she felt more positive, slept better, experienced increased libido, was less irritable, and had more willpower to resist the carbs in the evening. In another week, she was feeling so much better that she was motivated to start working out and losing weight. I have since used this test with many patients and have been impressed with the results. I'm amazed these tests are not utilized more widely to help restore people back to good health.

LE: Should people do neurotransmitter testing in place of sex hormones?

Dr. Fogle: Ideally, people should test both since they are different types of chemical messengers that communicate with the body. If someone already has done hormone testing and treatment but still thinks they could feel even better, then neurotransmitter testing is the next step to discovering more about how to balance their individual biochemistry for optimal health. Testing both neurotransmitters and sex hormones provides a much more comprehensive view of the body's functional neuroendocrine status, and it brings to light additional factors that may be contributing to symptoms. For example, low estrogen can lead to low dopamine in a woman and can cause serotonin receptors to be less responsive. Low progesterone can contribute to low GABA receptor activity. Serotonin is involved in the release of ACTH and proper cortisol response. The connections between hormones and neurotransmitters could fill a book. Only by testing both can you get a more complete picture of your individual biochemistry.

LE: How are sex hormones different from neurotransmitters?

Dr. Fogle: Both are powerful chemical messengers. They differ in their molecular structure in that sex hormones have a steroid base and neurotransmitters are more amino acid based. Hormones act more globally on tissues, and especially on DNA in the nucleus of our cells. This makes sex hormones very powerful and important because they interact with our DNA to turn on and off important genes. On the other hand, neurotransmitters act in the synapses of the nerves, such as in the central nervous system (CNS). Since the CNS/brain drive communication to the rest of the body through hormones, it makes physiological sense to balance both. Neurotransmitter and hormones work together, and if they aren't working together you will feel the negative effects.

LE: So, like sex hormones, the neurotransmitter testing helps provide a targeted approach customized to your unique biochemistry?

Dr. Fogle: Exactly. Some people need more support for the excitatory neurotransmitters while others need more inhibitory support. People need different natural ingredients to support balance in their individual neurotransmitter pattern. The same natural support that can make one person feel fantastic can make another person feel worse. Hence, the importance of testing them just like testing hormones.

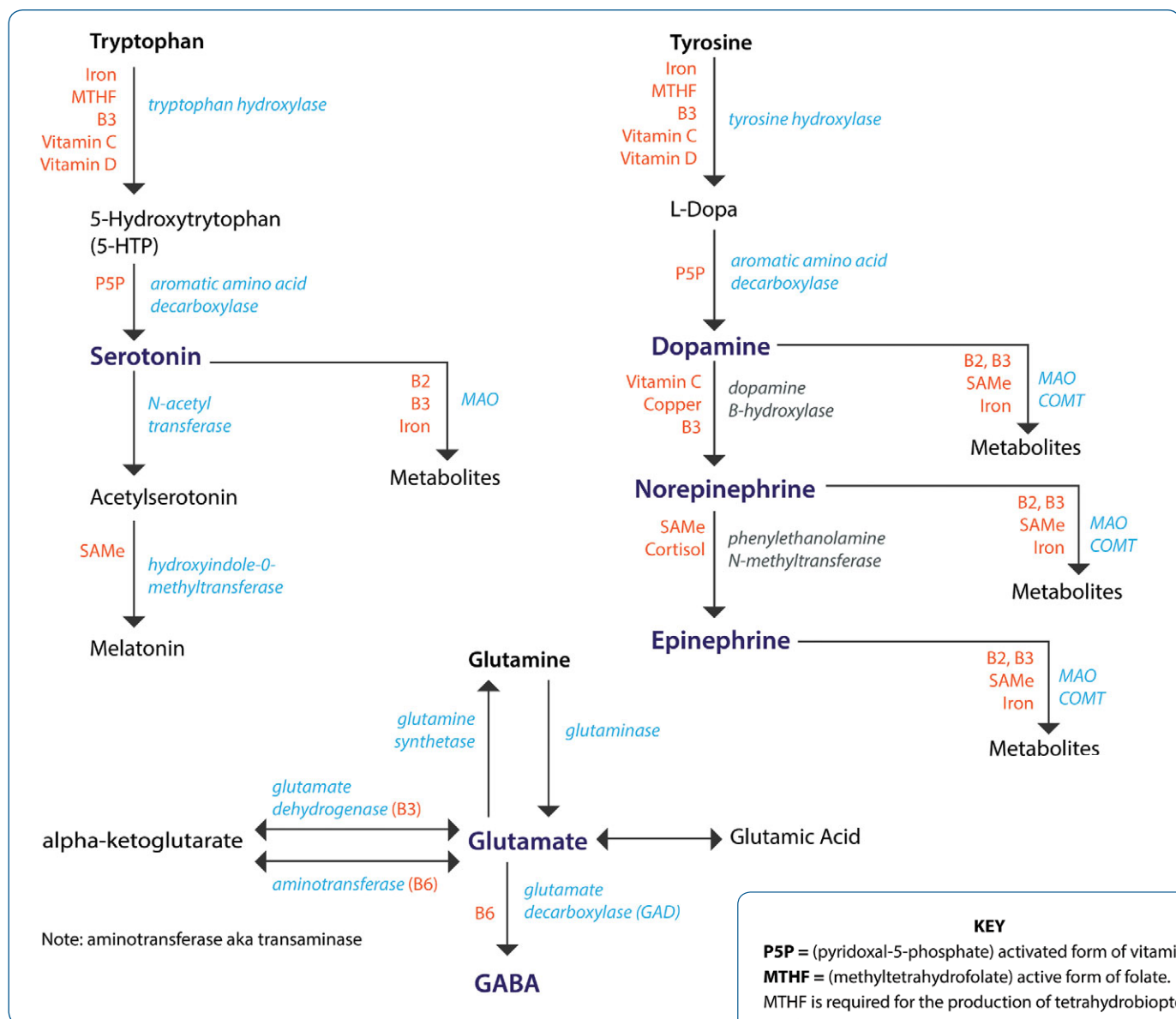
LE: Some drugs work via neurotransmitters right?

Dr. Fogle: Correct. Antidepressant drugs like Prozac inhibit the reuptake of serotonin in the synapses to help prolong its effect. Barbiturates and benzodiazepines both bind to

GABA receptors to augment GABA-mediated responses. Wellbutrin acts as a relatively weak inhibitor of the neuronal uptake of norepinephrine, serotonin, and dopamine, thus keeping more of those specific neurotransmitters in the neural synapse longer. I have seen all these drugs work effectively for some people, but I have also seen them cause unpleasant side effects in other people. Also, due to genetics, people metabolize these drugs differently, which helps explain why some medications might be life-changing for one person, but can cause a negative reaction in another person.

LE: That leads me to my next question. Are there natural ingredients that can help support neurotransmitters?

Dr. Fogle: Amino acids, plant extracts, vitamins, hormones, and other natural ingredients can support healthy neurotransmitter levels. For example, tryptophan or 5-HTP helps with serotonin formation. Tyrosine supports the formation of the catecholamines such as dopamine and epinephrine. Plant extracts such as saffron, the Chinese orchid *Gastrodia elata*, curcumin, adaptogenic herbs like rhodiola, and more can benefit neurotransmitter balance. In addition, cofactors such as vitamins are important for the transformation of precursors into neurotransmitters. For example, if someone has low dopamine, insufficient activated vitamin B6 (P5P) could be to blame since it is a necessary cofactor needed for dopamine formation. Testing allows you to see which neurotransmitters need support, and then identify specific amino acids, cofactors, and other natural ingredients to help restore balance. A targeted approach based on testing dramatically increases success.



LE: Do you recommend combining conventional treatment with natural alternatives?

Dr. Fogle: If you're already being treated for a condition, it's important to work with your doctor, especially if you are on a prescription medication. However, more doctors are becoming open to working with educated patients, especially if they have lab results showing their neurotransmitter levels are out of balance.

One of the first patients I tested was a woman on an antidepressant medication. She complained of weight gain and low libido, both known side effects of her medication. When I tested her neurotransmitters, she had extremely low serotonin levels. We did a therapeutic trial of natural serotonin support, and I monitored her carefully. She responded great, and she worked with the doctor who prescribed the antide-

pressant to slowly wean her off it as she improved. Her mood and libido improved, and she felt more motivated to work out, which is another powerful way to improve mood and health. I love to see vicious negative cycles broken and replaced by positive changes that

lead to more and more improvements in someone's health, and I have seen hormone and neurotransmitter testing do just that.

LE: We have talked about how neurotransmitters and hormones influence each other. What other factors could cause an imbalance in neurotransmitters?

Dr. Fogle: Many seemingly unrelated conditions can have a profound impact on neurotransmitter balance. For example, chronic inflammation can cause depression through the neuromodulating effects of inflammatory molecules called cytokines. These same cytokines are the ones that make you feel lethargic and anti-social when you have the flu. In chronic inflammation, the brain has to contend with a continuous onslaught of mood-altering cytokines leading to melancholy and anxiety. For example, the inflammatory cytokines interferon regulatory factor (IRF), interferon-alpha (INF-a), and NF-kB can activate an enzyme that breaks down tryptophan, the precursor to serotonin, thus leading to depleted brain levels of this important mood-supporting neurotransmitter. This effect of lowering serotonin explains why being sick makes us feel terrible, depressed, and moody.

Gut inflammation resulting from imbalances between beneficial bacteria and harmful microbes, poor food choices, or food allergies can also impact neurotransmitters. To underline the importance of beneficial bacteria on mood, human studies on the combined administration of two unique probiotics, *Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175, have demonstrated a **50%**

decrease in depression scores and a **55%** improvement in anxiety scores.^{1,2}

Traumatic brain injury (TBI), such as incurred in many contact sports, can also have long-lasting and detrimental impacts on brain health and neurotransmitter function. Victims of TBI may later suffer from memory and cognitive defects, depression, and anxiety. The chronic aftermath of TBI correlates with reduced acetylcholine, norepinephrine, and dopamine activity. Similarly, emotional trauma can lead to undesirable emotional states. Although grief, sadness, and fear can be normal, individuals often find themselves stuck in these types of responses. In cases of physical and emotional trauma, neurotransmitter testing can be an invaluable tool to feeling better again.

LE: How can people get this test?

Dr. Fogle: Some forward-thinking doctors already do these tests; unfortunately, most mainstream doctors are not even aware that they exist. In most cases, doctors order these tests through specialty labs. For our neurotransmitter testing, we collaborate with a lab in Portland, Oregon, that was founded by two doctors, one an MD and the other an ND, which is a great combination of knowledge and clinical experience. Their lab uses liquid chromatography combined with tandem mass spectrometry (LC-MS/MS), which is considered a gold standard in laboratory testing for its accuracy, and **Life Extension** is now pleased to offer this neurotransmitter test to customers.

LE: After someone gets tested, what do they do with that information?

Dr. Fogle: They can work directly with their doctor or call in to speak with one of our trained wellness specialists who can give them helpful information and customized suggestions. Our team of wellness specialists enjoys seeing people benefit from their suggestions. The information they provide helps people have more detailed conversations with their own doctor as well. ●

Dr. Scott Fogle is the Executive Director of Clinical Information and Laboratory Services at Life Extension®, where he oversees scientific and medical information as well as its laboratory division.

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

References

1. Messaoudi M, Lalonde R, Violle N, et al. Assessment of psychotropic-like properties of a probiotic formulation (*Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175) in rats and human subjects. *Br J Nutr*. 2011;105(5):755-64.
2. Messaoudi M, Violle N, Bisson JF, et al. Beneficial psychological effects of a probiotic formulation (*Lactobacillus helveticus* R0052 and *Bifidobacterium longum* R0175) in healthy human volunteers. *Gut Microbes*. 2011;2(4):256-61.



Achieve Even Skin Tone

*Inhibit
Appearance of
Uneven Skin*



Skin Tone Equalizer

Item #80164 • Net Wt. 0.4 fl. oz. (12 ml)

	Retail Price	Your Price
1 syringe	\$59	\$44.25
4 syringes		\$39 each

Skin Tone Equalizer is formulated with three novel compounds to inhibit age spot color intensity and improve the appearance of unsightly dark spots, age spots, and uneven pigmentation.

Skin Tone Equalizer is applied with a topical syringe to enable precise application to small and large spots.

Each syringe provides an approximately **30-** to **45-**day supply of Skin Tone Equalizer.

To order **Skin Tone Equalizer**, call 1-800-544-4440 or visit www.LifeExtension.com

Keep out of reach of children. For external use only.
Avoid contact with eyes. If product contacts eyes,
rinse thoroughly with water. If rash or irritation occurs,
please discontinue use.

Don't Weight Around

Maintain
Optimal
Hormone
Levels



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

	Retail Price	Your Price
1 bottle	\$48	\$36
4 bottles		\$32.40 each

Item #01478 • 60 vegetarian capsules



This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results may vary and are not guaranteed.

7-Keto® brand is a registered trademark of InterHealth N.I. U.S. Patent 7,199,116. Bio-Curcumin® and BCM-95® are registered trademarks of Dolcas-Biotech, LLC. U.S. Patent Nos. 7,883,728, 7,736,679 and 7,879,373.

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

NUTRITIONAL SUPPORT FOR A HEALTHY URINARY TRACT

OPTIMIZED CRAN-MAX[®]

WITH ELLIROSE[™]

Life Extension[®]'s Optimized Cran-Max[®] with Ellirose[™] uniquely complements whole cranberry's effectiveness for urinary tract health.

Optimized Cran-Max[®] provides benefits similar to seven 8-oz glasses of Ocean Spray[®] Cranberry Juice Cocktail in each daily dose, but without the simple sugars and empty calories.

Optimized Cran-Max[®] with Ellirose[™] • Non-GMO
Item #01424 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$18	\$13.50
4 bottles		\$12 each



To order **Optimized Cran-Max[®] with Ellirose[™]**,
call **1-800-544-4440** or
visit **www.LifeExtension.com**

Caution: Avoid use during pregnancy.

Cran-Max[®] and Bio-Shield[®] are registered trademarks of Pharmachem Laboratories, Inc. Ellirose[™] is a trademark of Naturex, Inc.

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

A full-body photograph of Michael Ray Garvin, a professional athlete, standing against a black background. He is wearing a black sleeveless Nike shirt, black shorts, and black sneakers. He has a very low body fat percentage, showing his abdominal muscles. He is holding a basketball in his left hand and a silver football helmet with a red and blue logo in his right hand. He has tattoos on his left arm, including one that says "Roman".

Michael Ray Garvin

Author of
World's Most Jacked Athlete
and *Jacked Athlete*
Supplement Manual

BY JON VAN ZILE

Michael Ray Garvin earned his nickname—the “World’s Most Jacked Athlete”—in 4.2 blazing seconds during the 2009 NFL draft, when he ran the fastest 40-yard dash in the country and a photo of him running the race went viral.

The picture showed a world-class athlete in peak condition as he covered almost 10 yards a second. This was no fluke: a driven athlete, Garvin was already a two-sport all-American athlete in football and track, and during his high school years at Don Bosco was ranked the fourth best football player in the state.

Later that year, Garvin would be signed by the NFL’s Arizona Cardinals, where he averaged 30 yards on four kickoff returns in his first preseason game. Unfortunately, Garvin tore his meniscus that season and required surgery. He was released by the Cardinals and signed that same year by the Detroit Lions, where he played with the practice squad, then played with the Canadian Football League.

Throughout his professional career, Garvin wasn't only known for his explosive speed. That famous picture—the one of him leaning forward, heavy veins in his chest and forehead snaking under his skin like cables, his eight-pack abs etched in sharp relief—continued to spread across the Internet. Fitness companies and trainers used it to promote themselves, and everywhere people wanted to know: “How can I get results like those? Do I have to take steroids?”

No, says Garvin emphatically. In fact, Garvin has never taken any type of illegal performance-enhancing drugs.

Today, Garvin has reinvented himself as a trainer, author, speaker, and unwavering advocate for natural health. A dedicated supplement user since he was 14 years old, Garvin has written two books: *World's Most Jacked Athlete*, and 2016's follow-up, *Jacked Athlete Supplement Manual*. In his books, Garvin details his own

sports history and shares the training and supplements secrets that made it possible for him to build and maintain an incredible physique.

Smashing the Stereotypes

A dedicated student of health and supplementation, Garvin is eager to share his knowledge with the rest of the world. According to Garvin, the key to success as an athlete and supplement user is to remain disciplined, but stay flexible.

“All supplements have some type of benefit, but it depends on how different people metabolize them,” he said. “One of the first laws of training is the law of individual differences. Some people may not receive a benefit from a supplement and have to take more, while others may need to take less. Start small and work your way up.”

One thing that isn't required, however, is illegal performance-enhancing drugs.

“I never felt any pressure at all to use them, even in professional football,” Garvin said. “I always did my studying and knew I could be great naturally. There was no need to take illegal, performance-enhancing drugs.”

At the same time, Garvin questioned where some of the substances came from—especially not-natural-to-the-body testosterone used in steroids. As he learned more, and found out how the synthetic hormone and steroid industry actually operates, he became even more convinced to stick with natural supplementation.

Learning, he says, is crucial. Garvin relies on **Life Extension®** to help provide legitimate, deeply researched information as he creates the supplement stacks and programs he recommends.

Protect Your Brain!

Garvin stresses that his supplement manual isn't only for professional or even hardcore athletes. In fact, weekend warriors and occasional gym rats can also benefit from intelligent supplementation with products that are designed to enhance muscle mass, improve heart function and blood sugar sensitivity, and increase cellular energy.

He also has worked hard to develop a protocol to reduce the damage caused by concussions. In recent years, the NFL has come under significant pressure to reduce the number of concussions players suffer. According to an investigation by the PBS documentary series *Frontline*, over the last two seasons alone, more than 300 players have suffered some





type of traumatic brain injury on the field. Emerging data is showing that these players are at significantly increased risk for memory and cognition problems later in life, as well as increased rates of depression and suicide.

The problem isn't limited to the NFL. A **2016** study published by FAIR Health found that the rate of concussion diagnosis for people under the age of 22 increased by a staggering **500%** between 2010 and 2014, with the highest numbers coming during high school football season.

According to Garvin, the key to mitigating concussion damage is to provide the brain with rapid support to help increase cellular energy in the damaged brain tissue and speed healing.

"Concussion trauma triggers progressive degeneration of the brain tissue, including the build-up of an abnormal protein called tau," he said. "Very high levels of abnormal tau protein in the brain can cause slower recovery after a

concussion. In order to decrease brain degeneration and tissue damage, we need to trigger neurogenesis, or the growth of new brain cells."

This can be accomplished by taking supplements immediately after a head injury that increase levels of nerve growth factor and neurotrophic growth factor; with a particular focus on velvet deer antler, alpha GPC, lion's mane mushrooms, and L-tyrosine and glutamine.

"I suffered the worst concussion of my career while playing in the Canadian Football League," he said. "I had a serious headache and stumbled toward the sidelines. After about three minutes, I became more coherent and aware of my surroundings, partly because I took a supplement that contained an amino acid complex right after my concussion. I supplemented with deer antler after the game. I recovered quickly from my brain injury and have not had any symptoms."

Garvin recommends that any athletes who engage in sports that increase the risk of concussion should keep these supplements readily available during game time.

The Essential Supplements

While the concussion supplements are for special use, the heart of Garvin's program is the group of supplements he calls the "essentials." This custom program is designed to support athletes before, during and after training or games. He recommends rotating supplements and finding what works best for you. These essential supplements include:

- **Whey protein isolate.** Whey protein really forms the foundation of a solid training program, Garvin says. It provides a lean form of protein, plus nonessential amino acids and branched chain amino acids. These are important not only in creating and maintaining muscle mass but also in helping synthesize neurotransmitters, joint support, and post-workout recovery. The best whey proteins, according to Garvin, come from cows that were raised on grass-fed diets without hormones or antibiotics. The product should be free of sweeteners and artificial ingredients. Garvin recommends between **30 and 50 grams** of whey protein a day for active athletes, taken within 30 minutes of exercises, but "never before."
- **Creatine.** Garvin says he's been taking creatine since he was 15 years old, starting with a creatine monohydrate and later switching to effervescent creatine because "it's more bioavailable and less harsh." Creatine, he says, is a great way to build explosive power



during exercise or activity because it increases cellular energy. He recommends that athletes take **5 grams** of creatine a day on an empty stomach.

- **Green Superfood Complex.**

The supplement called “the most important supplement for athletes” is a powerful blend of antioxidants and detoxifying ingredients that would benefit anybody. Garvin recommends superfood complexes with wheat-grass juice powder, alfalfa juice, spirulina and chlorella algae, spinach, probiotics, milk thistle, turmeric, and other ingredients. Together, these help maintain a healthy pH level, remove toxins and lactic acid build-up, and promote immunity and better health.

- **Glutamine.** Garvin recommends the amino acid glutamine to help prevent muscle breakdown, to boost the immune system, and for

its powerful free radical scavenging properties. “Glutamine is essential for muscle recovery and wound healing,” he said. “Glutamine has helped me in so many different ways. There have been days where I was nauseated and took glutamine to ease my stomach. It has helped me before, during, and after my intense workouts.”

Garvin also recommends that male athletes do everything they can to naturally boost testosterone. He says this is possible by taking supplements that have been proven to boost testosterone levels, as well as monitoring your DHEA levels and supplementing with additional DHEA if necessary.

“I have at one point taken three different natural testosterone boosters at the same time, because each one contained certain ingredients,” he said. “If you try to take each one by itself, I believe it would be a waste of time.”

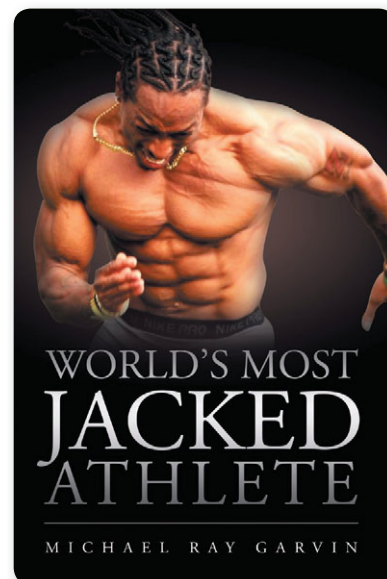
Finally, Garvin says it’s crucial to read as much as you can about supplements and find credible information.

“I’ve learned a lot from *Life Extension*®,” he said. “It’s unbiased information and tells people what they need to know about how to use supplements.” ●

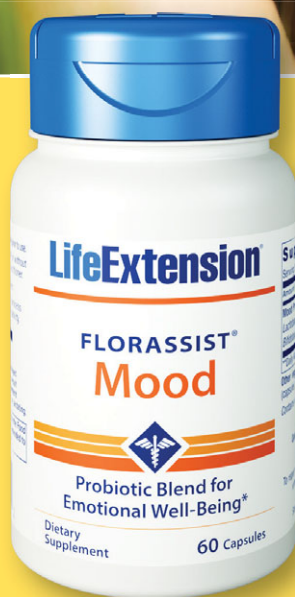
For more information
or to follow Michael Ray Garvin
on Twitter, go to:
<https://twitter.com/MichaelRGarvin>

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

To purchase a copy of
World’s Most Jacked Athlete,
visit www.amazon.com



Probiotic Blend Supports Positive **MOOD** and **RELAXATION**



Research suggests specific **probiotics** positively influence biochemical signaling between the gastrointestinal tract and the nervous system—resulting in positive effects on mood.¹

FLORASSIST® Mood provides **3 billion** colony-forming units of *Lactobacillus helveticus* strain R0052 and *Bifidobacterium longum* strain R0175.

Human clinical research conducted on this dual-probiotic combination demonstrated improvements in mood, reduction in perceived stress, and promotion of relaxation.^{2,3}

Two daily capsules of **FLORASSIST® Mood** naturally promote relaxation and improve mood.

FLORASSIST® Mood

Item #02000 • 60 capsules

	Retail Price	Your Price
1 bottle	\$33	\$24.75
4 bottles		\$22.50 each

Non-GMO

Contains milk and soybeans.

References

1. *Cell*. 2015 Apr 9;161(2):193-4.
2. *Gut Microbes*. 2011 Jul-Aug;2(4):256-61.
3. *Br J Nutr*. 2011 Mar;105(5):755-64.

To order **FLORASSIST® Mood**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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

Ready Set GO!

RACE TO BETTER HEALTH

Boost cellular NAD+ to
support cell lifespan,
an essential component
of a longevity plan.



To order **NAD+ Cell Regenerator™**, call **1-800-544-4440**
or visit **www.LifeExtension.com**

NIAGEN® is a registered trademark of ChromaDex, Inc. Patents see: www.ChromaDexPatents.com.

	Retail Price	Your Price
1 bottle	\$34	\$25.50
4 bottles		\$19.50 each
Item #01904 • 30 vegetarian capsules		

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

'C' TO THE MAX

Humans don't manufacture **vitamin C** internally, so it must be obtained through dietary sources or supplements.

Vitamin C is water soluble and needs to be constantly replenished.¹

Fortunately, a *flavonoid* known as *dihydroquercetin* functions as a **vitamin C** "supercharger" that helps maintain its concentration throughout the body.^{2,3}

References

1. *PLoS Med.* 2005 Sep;2(9):e307;author reply e309.
2. *Am J Clin Nutr.* 1988 Sep;48(3):601-4.
3. *J Food Tech.* 1969;4:255-67.

Vitamin C

Item #00927 • 250 vegetarian tablets

	Retail Price	Your Price
1 bottle	\$27	\$20.25
4 bottles		\$18 each

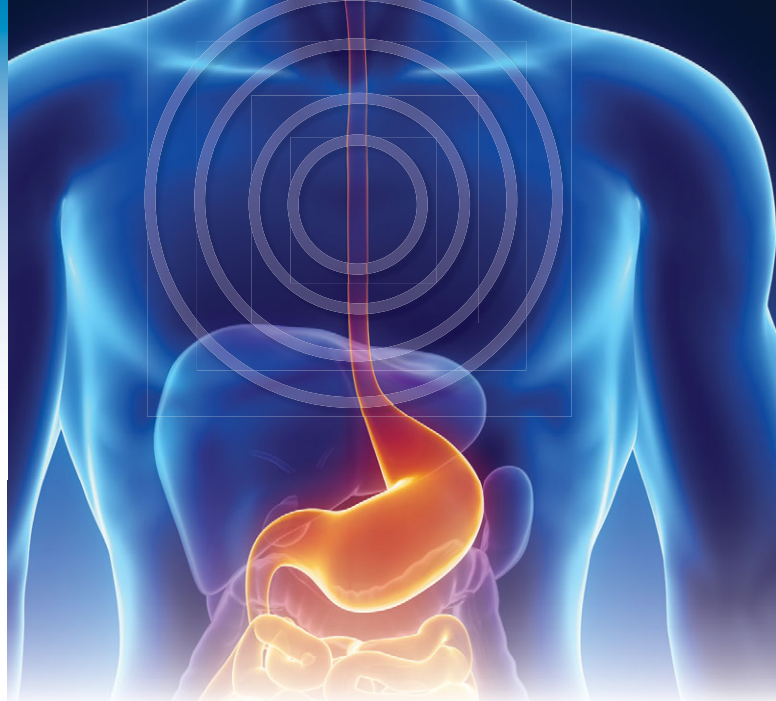
Non-GMO



To order **VITAMIN C with Dihydroquercetin**,
call **1-800-544-4440** or visit **www.LifeExtension.com**

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

2 WAYS to RAPID GASTRO- ESOPHAGEAL RELIEF



ESOPHAGEAL GUARDIAN

AND

ESOPHACOOl™

Esophageal Guardian provides a *protective shield* for your upper digestive tract!

This pleasant tasting, raft-forming alginate formula helps defend esophageal structures from harsh stomach contents.

Experience rapid relief that lasts up to 4 hours.



Esophageal Guardian

Item #01737 • 60 chewable tablets

	Retail Price	Your Price
1 bottle	\$36	\$27
4 bottles		\$24 each

Non-GMO

EsophaCool™ works rapidly to provide soothing relief to the upper digestive tract!

This unique formula utilizes two acid-neutralizers along with proprietary licorice GutGard™. Natural flavors such as **stevia** enable a pleasant taste with no simple sugars.

Only two **EsophaCool™** tablets provide soothing relief – fast!



EsophaCool™

Item #02009 • 120 chewable tablets

	Retail Price	Your Price
1 bottle	\$20	\$15
4 bottles		\$13.50 each

To order Life Extension® **Esophageal Guardian** Natural Berry Flavor or **EsophaCool™**, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: If taken in high doses, magnesium may have a laxative effect. Due to potential interactions, take at least 4 hours apart from prescription medications. If you have an estrogen-dependent cancer, consult a healthcare professional before use. Do not take if pregnant or lactating.

GutGard is a trademark of Natural Remedies PVT. LTD

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.

Glenn Sabin

BY GARRY MESSICK

In 1991, Glenn Sabin was a happy and apparently healthy 28-year-old newlywed. He was energetic, big into exercise, and felt fine—so he was totally floored when the results of routine bloodwork showed he had chronic lymphocytic **leukemia** (CLL).

Doctors told him treatment could alleviate the symptoms and perhaps extend his life to a degree, but there was no dependable cure—he was suffering from a fatal disease.

Despite this grim prognosis, Sabin refused to accept that he had no chance to recover. Since mainstream medicine couldn't help him reach that goal, he resolved to find another way. He didn't turn his back on his doctors, but rather, working in collaboration with them, he did extensive research and essentially became, in the parlance of medical studies, *n of 1*, meaning a group of subjects consisting of only one person—himself.

It was a long, hard struggle, but in 2012 there was a near-miraculous result. A biopsy at Harvard showed Sabin had no trace of leukemic cells in his bone marrow. Against all odds, his “incurable” cancer had been cured.

Sabin cautions other cancer patients, however, that what worked for him will not work for everyone. For that reason, he doesn't encourage anyone to abandon conventional treatment or to copy his diet or supplement protocols. Rather, he encourages others to get the help they need to develop protocols tailored to their particular needs.

In this interview with **Life Extension**®, Glenn Sabin discusses the incredible medical journey he describes in his book titled ***N of 1***, and its implications for cancer treatment.

LE: You were first diagnosed with chronic lymphocytic leukemia in 1991. Tell us about the circumstances surrounding that diagnosis.

GS: (At that time) it wasn't unusual for me to put in long days at a media company that my father had founded. Shortly after I got married, my father's health had begun to fail, and I found myself running more and more of the operation.

Despite my long workdays, I did not neglect my body. Exercise was planned into my schedule. I worked out almost every day, usually lifting weights. I snuck in occasional unplanned cardio... I honestly can't recall being fatigued at that time. I felt like a tank. Indestructible.

So when I showed up at the doctor's office for my "routine maintenance," I expected that last errand of the day to end with a nice slap on the back, and a "See you next year." Instead, the doctor came into the exam room wearing an uncharacteristically solemn expression. My blood tests showed a problem, he told me. Something serious.

I had a disease, he said. Leukemia. He looked me in the eye. The disease was fatal.

LE: What was your initial treatment?

GS: I was surprised to hear that I needed an operation for a blood problem.

The unceasing production of abnormal cells is the hallmark of cancer. The body makes attempts to control the disease, but when these attempts fail, or are overwhelmed, symptoms occur. In my case, the leukemic cells had lodged in and overwhelmed my spleen. It was so enlarged Dr. Kressel (my hematologist) could easily palpate it, a firm mass distending the upper part of my abdomen. A healthy spleen weighs only two pounds. Mine weighed seven. It was packed with five pounds of leukemic cells. Not only was my spleen no longer functioning, it was fragile. It could rupture and cause me to bleed to death. Dr. Kressel said it had to come out, and soon.

Once that surgery was done, he said, I might want to consider a bone marrow transplant.

LE: You ultimately decided against that, even though doctors thought it was the only thing that offered even the slim chance of a cure.

GS: I immediately backed away when Dr. Lee Nadler (a renowned expert in chronic lymphocytic leukemia) told me that **20%** of patients who underwent the procedure died. Not of leukemia, but of complications from the bone marrow transplant. I'm no math whiz, but I recognized those odds. They were about the same as Russian roulette.

Editor's note: Other studies show much higher long term mortality from an allogenic bone marrow transplant where bone marrow is donated by another person.

LE: Were you presented with another option?

GS: To my great disappointment, it was "watchful waiting." Dr. Nadler must have seen my face fall, because he was quick to point out that on the plus side, delaying treatment meant I could take advantage of whatever scientific discoveries lay in the future.

LE: You weren't happy with that option either, so you decided to exercise and eat healthily while forgoing a transplant. What happened then?

GS: Despite the vast improvements in my diet, my blood counts remained abnormal. Not by much, but it was clear I still had chronic lymphocytic leukemia. I had cleaned up my diet, eating vegetables and fruits almost exclusively, avoiding pesticide-sprayed foods, and taking supplements and exercising daily. I explained this new regime to Dr. Kressel, and he heartily encouraged my healthy new



lifestyle. However, when I pressed him about the effect of my new way of living on leukemia, Dr. Kressel admitted that he didn't think it was likely to help. There was simply no scientific evidence that lifestyle had any effect on leukemia.

LE: In 1998, you went on to investigate an alternative pharmacy in Bethesda, Maryland, called The Apothecary. What did you gain from it?

GS: At the epicenter of The Apothecary was Dr. Irv Rosenberg. Both pharmacist and nutritionist, Rosenberg was working with scores of patients, many with cancer, and using natural agents to complement their conventional care.

LE: Did he add to the supplements you were already taking?

GS: Before I list those details, do be warned that this list is not meant to be construed as a treatment for cancer. Using this list... in lieu of seeking personal guidance from your own medical professional could cost you your life. So now that you understand that this program was built for me specifically, that it is therefore unsuitable for anyone else, and that you should work with your own health professional to develop a program that fits your needs, I'll proceed to share with you what Dr. Rosenberg recommended to me, and me alone.

One of Dr. Rosenberg's top recommendations for me was a proprietary version of vitamin C, calcium ascorbate with bioflavonoids added to enhance absorption. I was also to take a tablet containing a mixture of four yellow and red plant pigments: carotene, lycopene, lutein, and zeaxanthin.

A third recommendation for me was d-alpha tocopherol, part of the vitamin E family.

Irv also suggested I use a fermented mushroom extract containing "active hexose correlated compound" (AHCC).

Irv also recommended a soy extract called genistein, a vegetable extract called inositol hexaphosphate, and colostrum, an antibody-rich secretion of the bovine mammary gland produced at the time of birth.

LE: So had you turned away from mainstream medicine at this point?

GS: I never have, and never will. During the years I was experimenting with supplementation...I saw my local specialist, Dr. Kressel, regularly, for blood tests and examinations. Every few years I returned to Harvard's Dana-Farber Cancer Institute for an exam by Dr. Nadler. Every year or two, I submitted to painful bone marrow biopsy.

LE: You felt fine for a while until 2003, when you had flu-like symptoms and underwent tests that showed your leukemia was getting worse, and Dr. Kressel recommended chemotherapy. I understand you asked for a second opinion.

GS: Dr. Kressel quickly arranged one for me at the renowned Johns Hopkins Hospital in Baltimore. I drove to Baltimore to meet with Dr. Richard Ambinder.

LE: After testing, what was the upshot?

GS: He began with the fact that my red blood cell count was dangerously low, and there was no question about the cause: chronic lymphocytic leukemia. My immune system had been hijacked by the chronic lymphocytic leuke-

mia. The hijacker had turned my own immune system against my red blood cells.

Dr. Ambinder explained his proposed plan. First, he said, the hemolytic anemia should be treated with an immune-suppressing drug called prednisone. Then, once the hemolysis was under control, several chemotherapy drugs would be given. Every detail of Dr. Ambinder's plan concurred with Dr. Kressel's advice. I realized that the moment I dreaded was finally here. The doctors were unanimous—I needed chemotherapy. Not "curative" chemotherapy, but a palliative Band-Aid to get me out of the danger zone and buy some time.

I reviewed my predicament. Chronic lymphocytic leukemia was considered terminal. Though some people lived for a number of years with this disease, there was no cure. And then it occurred to me—there was another choice, a very obvious one. This other choice would require the services of another type of healer... I had already met him. It was me. I would have to learn how to treat myself.

LE: From there, you proposed a sort of research partnership?

GS: I proposed that together, Dr. Kressel and I monitor the anemia. I would revisit and reinforce my home-cobbled program, and would show up twice a week at his office for blood work...We'd know for certain whether I was getting better or worse. Dr. Kressel was game.

Over the next few weeks, as often as I could, I swam. I stretched too, one muscle group at a time, and I could feel the strength and spring return to my step. To me, exercise was a healing form of meditation. Although the walks and swims were short, at least for the first month or so, they still happened every day.

I stayed the course. I proceeded with my self-directed program of activity, declining conventional treatment. I went to Dr. Kressel regularly for blood tests, as he and I agreed. And then, during the third week, Dr. Kressel and I got a surprise.

There was a measurable improvement in my counts. That initial result was good, Dr. Kressel explained, but caution was needed. To prove this result was a trend, we'd need three consecutive tests showing improvement. I was to return a week later, for the second of the three tests.

The following week, another test...

When I heard the result, I joyfully blurted out, "Another improvement!"

The fourth and fifth week's blood tests confirmed we had a trend. The anemia was definitely improving. Although my red cell levels were not back to normal, they were definitely on their way. And the improvement was happening without prednisone or chemotherapy.

And then, after a few more weeks, the fevers went away and my night sweats vanished. My blood counts completely normalized. I had faced down the leukemia. It had backed off. I was out of immediate danger!

Dr. Kressel was pleased by the complete turnaround in my condition, although he could not explain what had happened. He recommended we take a closer look at my blood using a technique called flow cytometry. This investigation would tell us if leukemic cells were still lurking among the normal blood cells. Within a few days I got the results. They nearly floored me. There were no leukemic cells in my blood. None.

It seemed to me that there was a powerful, synergistic effect between the nutraceutical compounds, my diet, physical activity and my improving health. Perhaps consistent daily exercise contributed to an increased metabolic rate, and maybe my stress hormones were kept in check through all of these things. Ultimately, my body's innate healing capacity was activated. I can't know exactly how this came about. I can only speculate that my lifestyle played a big part. Whatever the molecular details, I knew I had accomplished something important.

LE: At that point you went back to see Dr. Nadler. What was his reaction?

GS: Dr. Nadler pulled up the report from my previous visit in summer of 2003, when I'd been so ill. He told me that in his 30 years as a doctor, he had never encountered a patient with chronic lymphocytic leukemia who had done so well. There was no evidence of leukemia on any of the tests, he told me.

It seemed to me that Dr. Nadler thought my remission must have been attributable to one thing in my protocol. One supplement or one botanical had to be responsible for the stunning turnaround in my health. Dr. Nadler wanted to know exactly which one it was.

I was more than happy to spend the next 45 minutes explaining to Dr. Nadler all the things I had done: my incredibly healthy diet, the meditative walks, the long swims, the weight workouts, and the nutraceuticals program. The nutraceuticals caught Dr. Nadler's attention. He made me go over them several times, while he took notes and asked questions about formulations, dosages and sched-

ules. I told Dr. Nadler, point blank, that I thought looking for one active agent responsible for my recovery was the wrong approach. In my opinion, the secret formula was the combination of diet, exercise, mind-body work, and nutraceuticals.

Deep down in my heart, clear marrow was what I wanted. I wanted to be free of leukemia once and for all. If I wanted to know I was indeed cured, I would have to take the only test that would tell me what was happening deep in my bones—another bone marrow biopsy.

LE: So what were the results?

GS: Leukemic cells were still there, lurking deep in my marrow. The news was a brutal kick to the stomach.

LE: From there, you read about *epigallocatechin-3-gallate*, or EGCG, which is an alkaloid in green tea that had been shown to kill cancer cells in a test tube. You made it part of your regimen, but not long afterward, you found out your leukemia was no longer in remission. Under the care of integrative medicine advocate Dr. Keith Block, part of your response was to increase your EGCG intake. What was the result?

GS: By March 2011, my white blood cell count began to drop. At 30 thousand, it was still high, but for the first time in a year, there was some improvement... I continued full steam ahead on every aspect of my lifestyle regimen. By the end of May 2011, my white blood cells had decreased to 19,000... By mid-July, my white blood cell count had fallen to 9,400, which was within normal range. By November 2011, about a year after increasing the dose of



EGCG, my white blood cell count was 5,600, at the low end of normal! In addition to the dramatic decrease in my white blood cells, every single number in my terrain report had returned to within the normal range. A complete blood count and flow cytometry of the blood found no chronic lymphocytic leukemia cells. My blood was normal.

I was in clinical remission. Again.

LE: At this point, you wanted a bone marrow biopsy done to see if, amazingly enough, you could possibly have been cured. But doctors considered that extremely unlikely, and were reluctant to perform the test. Still, you went back to Dr. Nadler and insisted, correct?

GS: Unlike me, Dr. Nadler was always a gentleman, and was helpful whenever possible. Or perhaps on that occasion he just wanted to shut me up. By the end of the phone call, he had agreed to do the bone marrow biopsy for me.

LE: What happened when you got the results?

GS: As I scanned the report, a chill shot up my spine. Was I reading it accurately? Was it saying what I thought it was saying? It took me a moment to translate (the report) from medical-ese to English. The two most important words were “not seen.” What exactly was not seen? Leukemia. There was no sign that I had ever had it. My marrow was stone cold normal.

I could not wrap my mind around this astonishing fact. ... These wonderful results occurred without conventional treatment... Was synergy between several factors at work? Dr. Nadler suggested looking into EGCG... To my mind, that was one possible answer. Rather than one component of my program, such as EGCG, being entirely responsible for my recovery, was it possible that the various elements of my program had worked together to improve my health?

LE: So how are you today?

GS: My most recent blood tests, including flow cytometry, could find no evidence that I’ve ever had chronic lymphocytic leukemia. Only time will tell if I am truly cured.

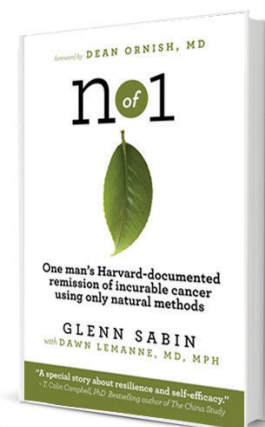
LE: Anything you’d like to say in closing?

GS: I call on conventional physicians and investigators to put serious resources to work looking at cases like mine, where an unexpected recovery occurs. Please, conduct the rigorous research needed to learn how best to use diet, exercise, stress reduction techniques, herbs, and supplements to help people with serious illness. The time is now for this approach to become a major thrust of research.

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

To order a copy of *N of 1*, call 1-800-544-4440 or visit www.LifeExtension.com

**Item #34125
Retail Price \$16.99
Your Price \$12.74**



Mediterranean Diet POLYPHENOLS IN A CAPSULE!

- Mediterranean diet is rich in plant **polyphenols**
- Polyphenols key factor for **cardiovascular** protection
- Unique **water-extraction** concentrates polyphenols
- **Mediterranean Whole Food Blend** delivers polyphenols

Mediterranean Whole Food Blend provides standardized potencies of:

- Grape extract (seed)
- Olive extract (leaf)
- Pomegranate extract (fruit)
- Black walnut extract
- Pecan extract
- Artichoke extract (fruit)
- Lentil extract (bran)

(Daily dose is 1 to 3 capsules)



Mediterranean Whole Food Blend

Item #02109 • 90 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$44	\$33
4 bottles		\$30 each

To order **Mediterranean Whole Food Blend**,
call **1-800-544-4440** or visit **www.LifeExtension.com**

The PhytoClean™ Method is a patented bioactive extraction method.

CAUTION: If you have gallstones or a biliary tract obstruction, do not use this product. Do not take if pregnant or lactating. Contains tree nuts (walnut, pecan). Keep out of reach of children. Do not exceed recommended dose. **Non-GMO**

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



Jarrow
FORMULAS®

THE PROBIOTIC FOR WOMEN

CLINICALLY TESTED  PATENTED

Jarro-Dophilus® Women contains four clinically documented, vaginal probiotic *Lactobacilli* strains: *L. crispatus* LbV 88, *L. jensenii* LbV 116, *L. gasseri* LbV 150N and *L. rhamnosus* LbV 96.*

All four strains were originally isolated from the vaginal tracts of pregnant women and are the dominant *lactobacilli* of healthy vaginal microbiota. They have been clinically tested for efficacy in helping maintain protective, healthy vaginal flora and promote urinary tract health.*

When choosing an effective probiotic, documented strains matter.™

Choose science.

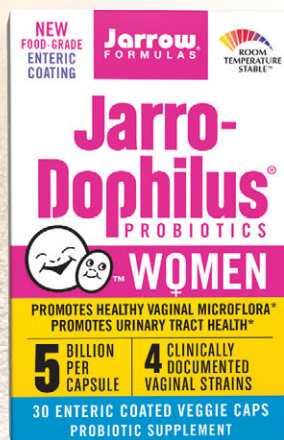
Choose Jarro-Dophilus® Probiotics.

FOUR CLINICALLY DOCUMENTED
LACTOBACILLUS STRAINS*

CONTAINS THE PREVALENT AND DOMINANT
SPECIES OF THE HEALTHY VAGINAL MICROBIOTA*

PROMOTES
URINARY TRACT HEALTH*

PROMOTES
HEALTHY VAGINAL MICROFLORA*



**Jarro-Dophilus®
Women**

**5 Billion Per Capsule
30 Veggie Cap**

Item # 52142 • Retail Price \$27.95

Your Price \$20.96

To order Jarro-Dophilus®,
call 1-800-544-4440

or visit www.LifeExtension.com

AVAILABLE IN EITHER ENTERIC-COATED (SHELF-STABLE, 5 BILLION)
OR NON-COATED (REQUIRES REFRIGERATION, 10 BILLION) OPTIONS

Jarro-Dophilus® Women provides the clinically tested Astarte® strains which are protected by European Patent 2,509,610 and U.S. Patent 8,846,027. Astarte® is owned by HSO Health Care GmbH, Vienna, Austria, and licensed in the U.S. to Jarrow Formulas, Inc. Other international patents pending.

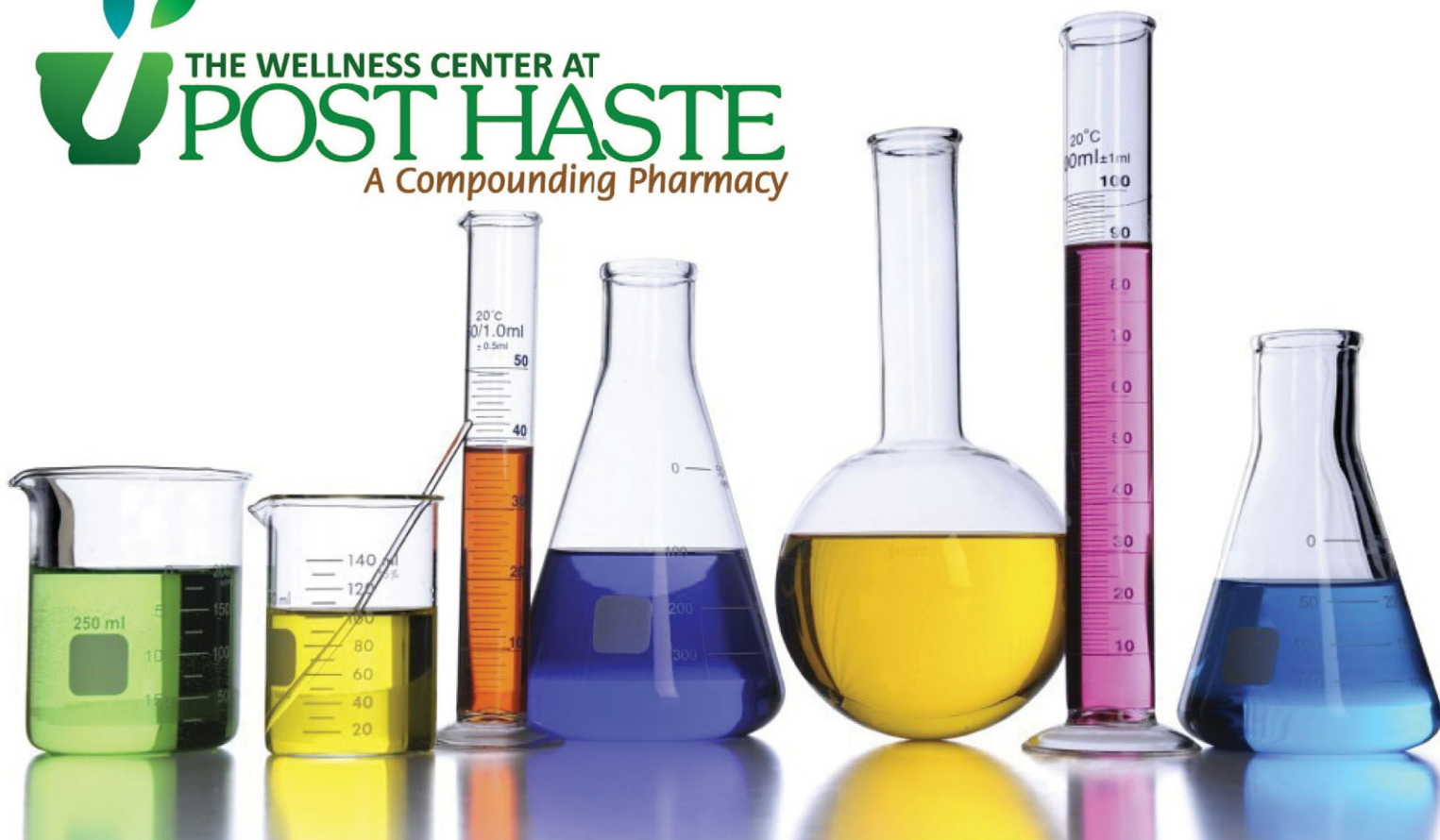


ASTARTE

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

Visit us at www.jarrow.com for more product information.

© 2017 **Jarrow FORMULAS®**



Now Delivering into California!

- Full Compounding Lab
- Full Retail Pharmacy
- Bio-Identical Hormone Replacement Therapy
- Free Standard Delivery/Shipping
- Durable Medical Equipment
- Trilingual (English, Spanish, French)
- Licensed to Ship into 42 States

Quality, Reliability, Integrity

*Lowest Prices: Ask for
Customer Discount Pricing*

*Providing Trusted Prescription
Compounding for Over 45 Years!*

Proud Members of



PCCA
Professional Compounding
Centers of America, Inc.

Renew Rx's online to
RECEIVE \$1 OFF EACH Rx
(Cash Rx's only)

Did you know we carry a full line of
PET products? Mention this ad to

RECEIVE 10% OFF
your first order

(877) 877-9700

Phone: (954) 989-6524 | Fax: (866) 892-3432

4401 Sheridan St. Hollywood, FL 33021

www.PostHastePharmacy.com

INTRODUCING THE HIGHEST-POTENCY AHCC® KINOKO® PLATINUM AHCC®



Item #24404
Retail Price \$84.95
Your Price \$63.71

NOW AVAILABLE WITH LIFE EXTENSION®!

Quality of Life's AHCC products stand as the most clinically-researched immune support supplements available.* Backed by over 20 human clinical studies conducted at some of the finest research institutions worldwide, including Ivy League universities and major health centers, AHCC provides you with immune support in times of need, and in times of maintenance.*

Kinoko Platinum is the ultimate choice as it delivers 750 mg of AHCC per vegicap — the highest potency available anywhere — making it easier to achieve the 3-gram amount recommended for advanced immune system support.*

TO ORDER, PLEASE CALL 1-800-544-4440 OR VISIT WWW.LIFEEXTENSION.COM



QUALITY OF LIFE | 877-937-2422 | www.QualityOfLife.net
f Facebook.com/QualityOfLifeLabs | @QOLsupplements

Quality of Life is proud to have taken the Natural Products Foundation's "Truth in Advertising Pledge," a formal commitment to disseminating only truthful, non-misleading, and substantiated information.

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

Amino Acids

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

Blood Pressure & Vascular Support

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

Bone Health

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

Brain Health

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

Cholesterol Management

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

Digestion Support

Artichoke Leaf Extract
Digest RC®
Effervescent Vitamin C - Magnesium Crystals
Enhanced Super Digestive Enzymes
Enhanced Super Digestive Enzymes
w/Probiotics
EsophaCool™
Esophageal Guardian
Extraordinary Enzymes

Fem Dophilus
Fiber-Immune Support
Gastro-Ease™
Ginger Force®
Pancreatin
Regimint
Tranquil Tract™
TruFiber™
WellBetX PGX plus Mulberry

Energy Management

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

Eye Health

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

Fish Oil & Omegas

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

Food

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

Glucose Management

CinSulin® with InSea2® and Crominex® 3+
Mega Benfotiamine
Tri Sugar Shield®

Heart Health

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

Hormone Balance

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

Immune Support

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

Inflammation Management

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

Joint Support

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

Kidney & Bladder Support

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

Liver Health & Detoxification

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

Longevity & Wellness

Ageless Cell™
Alpha-Lipoic Acid
AMPK Activator
AppleWise Polyphenol Extract
Berry Complete
Blueberry Extract
Blueberry Extract with Pomegranate

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

Men's Health

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

Minerals

Boron
Extend-Release Magnesium
Ionic Selenium
Iron Protein Plus
Magnesium (Citate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Vanadyl Sulfate
Zinc Caps

Miscellaneous

Potassium Iodide
Solarshield® Sunglasses

Mood & Stress Management

5 HTP
L-Theanine
Natural Cortisol Balance
Natural Stress Relief
SAME (S-Adenosyl-Methionine)

Multivitamins

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

Personal Care

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

Life Extension Toothpaste
Sinus Cleanser
Venotone
Xyliwhite Mouthwash

Pet Care

Cat Mix
Dog Mix

Probiotics

Bifido GI Balance
FLORASSIST® Balance
FLORASSIST® GI with Phage Technology
FLORASSIST® Heart Health
FLORASSIST® Mood
FLORASSIST® Oral Hygiene
FLORASSIST® Throat Health
Jarro-Dophilus® for Women
Theralac® Probiotics
TruFlora® Probiotics

Skin Care

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

Sleep

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

Sports Performance

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

Vitamins

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

Weight Management

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

Women's Health

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

		YOUR PRICE					
ITEM No.	PRODUCT	Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
A							
01524	ACETYL-L-CARNITINE • 500 mg, 100 veg. caps	34.00	25.50	22.50			
01874	ACETYL-L-CARNITINE ARGINATE • 90 veg. caps	52.00	39.00	35.00			
01628	ADRENAL ENERGY FORMULA • 60 veg. caps	24.00	18.00	16.50			
01630	ADRENAL ENERGY FORMULA • 120 veg. caps	46.00	34.50	31.50			
01828	ADVANCED LIPID CONTROL • 60 veg. caps	30.00	22.50	20.25			
02119	AGELESS CELL™ • 30 softgels	40.00	30.00	27.00			
00681	AHCC® • 500 mg, 30 caps	59.98	44.99				
24404	AHCC® (KINOKO® PLATINUM) • 750 mg, 60 veg. caps	84.95	63.71				
29727	AHCC® (KINOKO® GOLD) • 500 mg, 60 veg. caps	74.95	52.47				
00457	ALPHA-LIPOIC ACID W/BIOTIN • 250 mg, 60 caps	37.00	27.75	24.00			
01907	AMPK ACTIVATOR • 90 veg. caps	48.00	36.00	33.00			
01509	ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN® (Advanced) • 60 veg. caps	39.00	29.25	27.00			
02140	ANTI-ALCOHOL w/HEPATOPRO COMPLEX • 60 caps	22.00	16.50	15.00			
01625	APPLEWISE POLYPHENOL EXTRACT 600 mg, 30 veg. caps	21.00	15.75	14.25			
01039	ARGININE/ORNITHINE • 500/250, 100 caps	17.99	13.49				
00038	ARGININE/ORNITHINE POWDER • 150 grams	22.95	17.21	14.25			
01624	(L)-ARGININE CAPS • 700 mg, 200 veg. caps	26.50	19.88	17.44			
02004	ARTERIAL PROTECT • 30 veg. caps	44.00	33.00	29.00			
01617	ARTHROMAX® W/THEAFLAVINS & APRÈSFLEX® 120 veg. caps	44.00	33.00	30.00			
01618	ARTHROMAX® ADVANCED W/UC-II® & APRÈSFLEX® 60 caps	36.00	27.00	24.00			
02108	ARTHROMAX® HERBAL JOINT FORMULA • 60 veg. caps	40.00	30.00	27.00			
01404	ARTHRO-IMMUNE JOINT SUPPORT • 60 veg. caps	32.00	24.00	21.00			
00919	ARTICHOKE LEAF EXTRACT • 500 mg, 180 veg. caps	30.00	22.50	21.00			
01533	ASCORBYL PALMITATE • 500 mg, 100 veg. caps	22.50	16.88	15.00			
00888	ASHWAGANDHA EXTRACT (Optimized) • 60 veg. caps	10.00	7.50	6.75			
01805	ASIAN ENERGY BOOST • 90 veg. caps	24.00	18.00	16.50			
01066	ASPIRIN • 81 mg, 300 enteric coated tablets	6.00	4.50	4.00			
01923	ASTAXANTHIN WITH PHOSPHOLIPIDS • 4 mg, 30 softgels	16.00	12.00	10.50			
B							
00920	BENFOTIAMINE W/ THIAMINE • 100 mg, 120 veg. caps	19.95	14.96	13.95			
00925	BENFOTIAMINE (Mega) • 250 mg, 120 veg. caps	30.00	22.50	20.25			
01206	BERRY COMPLETE • 30 veg. caps	21.00	15.75	14.00			
01496	BERRY COMPLETE W/ACAI (Enhanced) • 60 veg. caps	29.00	21.75	19.50			
00664	BETA-CAROTENE • 25,000 IU, 100 softgels	11.50	8.63				
01622	BIFIDO GI BALANCE • 60 veg. caps	20.00	15.00	13.50			
01873	BILBERRY EXTRACT • 100 mg, 90 veg. caps	36.00	27.00	24.00			
01512	BIOACTIVE MILK PEPTIDES • 30 caps	18.00	13.50	12.00			
01631	BIO-COLLAGEN W/PATENTED UC-II® • 40 mg, 60 small caps	36.00	27.00	24.00			
*01006	BIOSIL™ • 5 mg, 30 veg. caps	19.99	15.99				
*01007	BIOSIL™ • 1 fl oz	31.99	25.59				
00102	BIOTIN • 600 mcg, 100 caps	7.50	5.63	4.88			
01709	BLACK CUMIN SEED OIL • 60 softgels	16.00	12.00	10.50			
01710	BLACK CUMIN SEED OIL W/BIO-CURCUMIN® • 60 softgels	32.00	24.00	22.50			
SUBTOTAL OF COLUMN 1							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
01008	BLAST™ • 600 grams of powder	26.95	20.21				
02025	BLOOD PRESSURE (Dual Action) • 60 veg. tabs	44.00	33.00	28.00			
70000	BLOOD PRESSURE MONITOR (ACCUFIT™) • med/lg cuff	79.99	49.99				
70004	BLOOD PRESSURE MONITOR • Digital wrist cuff	69.95	52.46				
02024	BLOOD PRESSURE (Triple Action AM/PM) • 60 veg. tabs	44.00	33.00	28.00			
01214	BLUEBERRY EXTRACT • 60 veg. caps	22.50	16.88	15.00			
01438	BLUEBERRY EXTRACT W/ POMEGRANATE • 60 veg. caps	30.00	22.50	20.25			
01506	BONE FORMULA (DR. STRUM'S INTENSIVE) • 300 caps	56.00	42.00	37.50			
01726	BONE RESTORE • 120 caps	22.00	16.50	14.25			
01727	BONE RESTORE W/VITAMIN K2 • 120 caps	24.00	18.00	16.50			
01725	BONE STRENGTH FORMULA W/KOACT® • 120 caps	45.00	33.75	30.00			
00313	BONE-UP® • 240 caps	28.95	21.71	20.41			
01661	BORON • 3 mg, 100 veg. caps	5.95	4.46	3.94			
00202	BOSWELLA • 100 caps	38.00	28.50	22.50			
01802	BRAIN SHIELD® GASTRODIN • 300 mg, 60 veg. caps	33.00	24.75	22.50			
01253	BRANCHED CHAIN AMINO ACIDS • 90 caps	19.50	14.63	12.75			
01942	BREAST HEALTH FORMULA • 60 caps	34.00	25.50	22.50			
00893	BRITE EYES III • 2 vials, 5 ml each	34.00	25.50	24.00			
01203	BROMELAIN (Specially-coated) 500 mg, 60 enteric coated tablets	21.00	15.75	14.25			
C							
01653	CALCIUM CITRATE W/VITAMIN D • 300 caps	24.00	18.00	15.94			
01651	CALCIUM D-GLUCARATE • 200 mg, 60 veg. caps	18.00	13.50	11.25			
*01823	CALREDUCE SELECTIVE FAT BINDER 120 mint chewable tablets	45.00	33.75	28.50			
01700	CARDIO PEAK™ w/STANDARDIZED HAWTHORN & ARJUNA 120 veg. caps	36.00	27.00	24.00			
00916	CARNITINE W/GLYCOCARN® (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01532	L-CARNITINE • 500 mg, 30 veg. caps	15.00	11.25	9.90			
01829	CARNOSINE • 500 mg, 60 veg. caps	36.00	27.00	24.00			
02020	CARNOSINE (Super) • 500 mg, 60 veg. caps	40.00	30.00	27.00			
01932	CAT MIX • 100 grams powder	14.00	10.50	8.25			
01899	CHILDREN'S FORMULA LIFE EXTENSION MIX™ 100 chewable tablets	20.00	15.00	13.50			
00550	CHLORELLA • 500 mg, 200 tablets	23.98	17.99				
01571	CHLOROPHYLLIN • 100 mg, 100 veg. caps	24.00	18.00	15.00			
01359	CHO-LESS™ • 90 capsules	35.00	26.25				
01910	CHOL-SUPPORT™ • 60 liquid veg. caps	48.00	36.00	32.00			
01504	CHROMIUM W/CROMINEX® 3+ (Optimized) 500 mcg, 60 veg. caps	9.00	6.75	6.00			
01503	CINSULIN® W/INSEA2® AND CROMINEX® 3+ • 90 veg. caps	38.00	28.50	25.50			
01906	CISTANCHE (Standardized) • 30 veg. caps	20.00	15.00	12.00			
01818	CITRIMAX® (Super) • 180 veg. caps	40.00	30.00	28.50			
00818	CLA BLEND W/SESAME LIGNANS (Super) 120 softgels	36.00	27.00	24.75	19.75		
00819	CLA BLEND W/GUARANA & SESAME LIGNANS (Super) 120 softgels	42.00	31.50	28.75			
01896	COGNITEX® W/BRAIN SHIELD® • 90 softgels	60.00	45.00	39.00	36.00		
SUBTOTAL OF COLUMN 2							

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
01897	COGNITEX® W/PREGNENOLONE & BRAIN SHIELD® 90 softgels	62.00	46.50	39.75	37.50		
01421	COGNITEX® BASICS • 60 softgels	38.00	28.50	26.25	24.00		
01659	COGNIZIN® CDP CHOLINE CAPS • 250 mg, 60 veg. caps	36.00	27.00	25.50			
01945	COMPLETE B-COMPLEX (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02198	COMPREHENSIVE NUTRIENT PACKS ADVANCED • 30 packs	90.00	67.50	61.50			
01949	COQ10 w/d-LIMONENE (Super-Absorbable) • 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
01948	COQ10 w/d-LIMONENE (Super-Absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25		
01951	COQ10 w/d-LIMONENE (Super-Absorbable) 100 mg, 60 softgels	30.00	22.50	15.00			
01929	COQ10 (Super Ubiquinol) • 100 mg, 60 softgels	56.00	42.00	36.00	33.00		
01733	COQ10 w/BIOPQQ® (Super Ubiquinol) • 100 mg, 30 softgels	54.00	40.50	33.00	30.00		
01426	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 100 mg, 60 softgels	62.00	46.50	39.00	36.00		
01425	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 100 softgels	58.00	43.50	34.50	31.50		
01427	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 50 mg, 30 softgels	20.00	15.00	12.00			
01431	COQ10 w/ENH MITOCHONDRIAL SUPPORT™ (Super Ubiquinol) • 200 mg, 30 softgels	62.00	46.50	39.00	36.00		
00862	CRAN-MAX® • 500 mg, 60 veg. caps	17.50	13.13	11.25			
01424	CRAN-MAX® WITH ELLIROSE™ (Optimized) • 60 veg. caps	18.00	13.50	12.00			
01529	CREATINE CAPSULES • 120 veg. caps	10.95	8.21	6.94			
01746	CREATINE WHEY GLUTAMINE POWDER • 454 grams (vanilla)	30.00	22.50	19.50			
01429	CR MIMETIC LONGEVITY FORMULA • 60 veg. caps	39.00	29.25	27.00			
00407	CURCUMIN® (Super Bio) • 400 mg, 60 veg. caps	38.00	28.50	26.25			
01924	CURCUMIN® W/GINGER & TURMERONES (Advanced Bio) 30 softgels	30.00	22.50	20.25			
01804	CYTOKINE SUPPRESS™ W/EGCG • 30 veg. caps	30.00	22.50	20.25			
COSMESIS							
80157	ADVANCED ANTI-GLYCATION PEPTIDE SERUM • 1 oz	53.00	39.75	34.50			
80154	ADVANCED LIGHTENING CREAM • 1 oz	65.00	48.75	42.75			
80155	ADVANCED PEPTIDE HAND THERAPY • 4 oz	46.00	34.50	29.25			
80152	ADVANCED TRIPLE PEPTIDE SERUM • 1 oz	65.00	48.75	42.75			
80140	ADVANCED UNDER EYE SERUM W/STEM CELLS • .33 oz	49.00	36.75	31.50			
80139	AMBER SELF MICRODERMABRASION • 2 oz	49.00	36.75	31.50			
80158	ANTI-AGING FACE OIL • 1 oz	59.00	44.25	39.00			
80118	ANTI-AGING MASK • 2 oz	72.00	54.00	47.52			
80151	ANTI-AGING REJUVENATING FACE CREAM • 2 oz	65.00	48.75	42.75			
80153	ANTI-AGING REJUVENATING SCALP SERUM • 2 oz	46.00	34.50	29.25			
80134	ANTI-GLYCATION SERUM W/BLEUBERRY & POMEGRANATE EXTRACTS • 1 oz	33.00	24.75	23.51			
80133	ANTIOXIDANT FACIAL MIST • 2 oz	32.00	24.00	22.80			
80127	ANTIOXIDANT REJUVENATING FOOT CREAM • 2 oz	45.00	33.75	32.10			
80105	ANTI-REDNESS & ADULT BLEMISH LOTION • 1 oz	74.50	55.88	49.17			
80147	BIOFLAVONOID CREAM • 1 oz	46.00	34.50	29.25			
80144	BROCCOLI SPROUT CREAM • 1 oz	46.00	34.50	29.25			
80156	COLLAGEN BOOSTING PEPTIDE SERUM • 1 oz	59.00	44.25	39.00			
80120	CORRECTIVE CLEARING MASK • 2 oz	64.50	48.38	42.57			
SUBTOTAL OF COLUMN 3							

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

ITEM No.	PRODUCT	Retail Each \$	YOUR PRICE			QTY	Total
			1 Unit Each	4 Unit Each	10 Unit Each		
80141	DNA REPAIR CREAM • 1 oz	49.00	36.75	31.50			
80108	ESSENTIAL PLANT LIPIDS REPARATIVE SERUM • 1 oz	74.95	56.21	49.46			
80163	EYE LIFT CREAM • 0.5 fl oz	59.00	44.25	39.00			
80123	FACE REJUVENATING ANTIOXIDANT CREAM • 2 oz	69.50	52.13	45.87			
80107	FINE LINE-LESS • 1 oz	74.50	55.88	49.17			
80131	HAIR SUPPRESS FORMULA • 4 oz	59.00	44.25	38.94			
80137	HEALING FORMULA ALL-IN-ONE CREAM • 1 oz	53.00	39.75	34.07			
80115	HEALING MASK • 2 oz	64.50	48.38	42.57			
80102	HEALING VITAMIN K CREAM • 1 oz	79.50	59.63	52.47			
80109	HYALURONIC FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28			
80110	HYALURONIC OIL-FREE FACIAL MOISTURIZER • 1 oz	58.00	43.50	38.28			
80138	HYDRATING ANTIOXIDANT FACE MIST • 4 oz	39.95	29.96	28.50			
80103	LIFTING & TIGHTENING COMPLEX • 1 oz	74.50	55.88	49.17			
80146	LYCOPENE CREAM • 1 oz	28.00	21.00	19.05			
80135	MELATONIN CREAM • 1 oz	33.00	24.75	20.33			
80114	MILD FACIAL CLEANSER • 8 fl. oz	59.00	44.25	38.94			
80159	MULTI STEM CELL SKIN TIGHTENING COMPLEX • 1 oz	59.00	44.25	39.00			
80122	NECK REJUVENATING ANTIOXIDANT CREAM • 2 oz	64.00	48.00	42.24			
80111	PIGMENT CORRECTING CREAM • 1/2 oz	74.00	55.50	48.84			
80106	REJUVENATING SERUM • 1 oz	74.50	55.88	49.17			
80150	RENEWING EYE CREAM • 1/2 oz	65.00	48.75	42.75			
80142	RESVERATROL ANTI-OXIDANT SERUM • 1 oz	46.00	34.50	29.25			
80112	SKIN LIGHTENING SERUM • 1/2 oz	85.00	63.75	56.10			
80130	SKIN STEM CELL SERUM • 1 oz	74.00	55.50	51.75			
80164	SKIN TONE EQUALIZER • 0.4 fl oz	59.00	44.25	39.00			
80143	STEM CELL CREAM W/ALPINE ROSE • 1 oz	66.00	49.50	43.50			
80148	TIGHTENING & FIRMING NECK CREAM • 2 oz	39.00	29.25	26.25			
80161	TRIPLE ACTION VITAMIN C CREAM • 1 oz jar	59.00	44.25	39.00			
80162	ULTIMATE MICRODERMABRASION • 8 fl. oz	39.00	29.25	26.25			
80160	ULTRA EYELASH BOOSTER • 0.25 oz (2 units \$39)	59.00	44.25				
80116	ULTRA LIP PLUMPER • 1/3 oz	64.00	48.00	42.24			
80101	ULTRA WRINKLE RELAXER • 1 oz	89.95	67.46	59.82			
80113	UNDER EYE REFINING SERUM • 1/2 oz	74.50	55.88	49.17			
80104	UNDER EYE RESCUE CREAM • 1/2 oz	74.50	55.88	49.17			
80129	VITAMIN C SERUM • 1 oz	85.00	63.75	56.10			
80136	VITAMIN D LOTION • 4 oz	36.00	27.00	25.25			
80145	VITAMIN E-ESSENTIAL CREAM • 1 oz	28.00	21.00	19.50			
80149	YOUTH SERUM • 1 oz	65.00	48.75	42.75			
D							
00658	7-KETO® DHEA METABOLITE • 25 mg, 100 caps	28.00	21.00	18.00			
01479	7-KETO® DHEA METABOLITE • 100 mg, 60 veg. caps	40.00	30.00	27.00			
01640	DHA (Vegetarian) • 30 veg. softgels	20.00	15.00	13.50			
00607	DHEA • 25 mg, 100 tablets (Dissolve in mouth)	14.00	10.50	8.81			
01478	DHEA COMPLETE • 60 veg. caps	48.00	36.00	32.40			
00335	DHEA • 25 mg, 100 caps	16.00	12.00	11.00			
00454	DHEA • 15 mg, 100 caps	14.00	10.50	9.00			
SUBTOTAL OF COLUMN 4							

ITEM No.	PRODUCT	YOUR PRICE					QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	1 Unit Each		
00882	DHEA • 50 mg, 60 caps	19.00	14.25	12.75				
01689	DHEA • 100 mg, 60 veg. caps	24.00	18.00	16.50				
01358	DIGEST RC® • 30 tablets	19.95	14.96	12.75				
02021	DIGESTIVE ENZYMES (Enhanced Super) • 60 veg. caps	22.00	16.50	15.00				
02022	DIGESTIVE ENZYMES w/PROBIOTICS (Enhanced Super) • 60 veg. caps	28.00	21.00	18.00				
01671	D, L-PHENYLALANINE • 500 mg, 100 veg. caps	18.75	14.06	12.00				
01540	DMAE BITARTRATE • 150 mg, 200 veg. caps	18.00	13.50	11.25				
01570	DNA PROTECTION FORMULA • 60 veg. caps	34.00	25.50	24.00				
01931	DOG MIX • 100 grams powder	18.00	13.50	11.25				
02006	DOPA-MIND™ • 60 veg. tabs	44.00	33.00	28.00				
00321	DR. PROCTOR'S ADVANCED HAIR FORMULA • 2 oz	39.95	29.96	24.00				
00320	DR. PROCTOR'S HAIR SHAMPOO • 8 oz	24.95	18.71	16.50				
E								
01528	ECHINACEA EXTRACT • 250 mg, 60 veg. caps	14.35	10.76	9.38				
01997	ENDOTHELIAL DEFENSE™ w/POMEGRANATE COMPLETE AND CORDIART™ • 60 softgels	68.00	51.00	46.50				
00997	ENDOTHELIAL DEFENSE™ w/GLISODIN® • 60 veg. caps	54.00	40.50	36.00				
01937	EPA/DHA (Mega) • 120 softgels	20.00	15.00	13.50				
02009	ESOPHACOL™ • 120 chewable tablets	20.00	15.00	13.50				
01737	ESOPHAGEAL GUARDIAN (Berry flavor) • 60 chewable tablets	36.00	27.00	24.00				
01042	EUROPEAN LEG SOLUTION DIOSMIN 95 600 mg, 30 veg. tabs	20.00	15.00	13.50				
01706	EXTRAORDINARY ENZYMES • 60 caps	26.00	19.50	18.00				
02008	(CALIFORNIA ESTATE) EXTRA VIRGIN OLIVE OIL • 500 ml (16.9 fl. oz)	33.00	24.75	22.50				
01514	EYE PRESSURE SUPPORT W/MIRTOGENOL® • 30 veg. caps	38.00	28.50	25.50				
F								
*01054	FACE MASTER® PLATINUM • Facial Toning System	199.00	199.00					
00965	FAST-ACTING JOINT FORMULA • 30 caps	39.00	29.25	27.00				
01717	FAST-C® W/DIHYDROQUERCETIN • 120 veg. tabs	26.00	19.50	18.00				
20053	FEM DOPHILUS® • 30 caps	25.95	19.46					
20055	FEM DOPHILUS® • 60 caps	39.95	29.96					
01064	FEMMENESSENCE MACAPAUSE® • 120 veg. caps	34.99	26.24					
02007	FIBER-IMMUNE SUPPORT (Apple Cinnamon) • 235 grams	34.00	25.50	23.50				
02125	FLORASSIST® GI w/PHASE TECHNOLOGY • 30 liquid veg. caps	33.00	24.75	22.50				
01821	FLORASSIST® HEART HEALTH • 60 veg. caps	32.00	24.00	21.00				
02120	FLORASSIST® ORAL HYGIENE • 30 lozenges	20.00	15.00	13.00				
01825	FLORASSIST® BALANCE • 30 liquid veg. caps	32.00	24.00	21.00				
02000	FLORASSIST® MOOD • 60 caps	33.00	24.75	22.50				
01920	FLORASSIST® THROAT HEALTH • 30 lozenges	20.00	15.00	13.50				
01913	FOLATE HIGH POTENCY (Optimized) • 5,000 mcg, 30 veg. tablets	25.00	18.75	16.50				
01939	FOLATE (Optimized) • 1,000 mcg, 100 veg. tablets	19.00	14.25	12.75				
01842	FOLATE + VITAMIN B12 (BioActive) • 90 veg. caps	12.00	9.00	8.00				
01544	FORSKOLIN • 10 mg, 60 veg. caps	16.00	12.00	10.50				
01513	FUCOIDAN W/MARITECH® 926 (Optimized) • 60 veg. caps	36.00	27.00	24.75				
G								
02070	GAMMA E MIXED TOCOPHEROL/TOCOTRIENOLS • 60 softgels	40.00	30.00	27.00				
02075	GAMMA E MIXED TOCOPHEROL w/ENHANCED SESAME LIGNANS • 60 softgels	32.00	24.00	21.75				
01394	GARLIC (Optimized) • 200 veg. caps	24.95	18.71	15.75				
SUBTOTAL OF COLUMN 5								

ITEM No.	PRODUCT	YOUR PRICE					QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	1 Unit Each		
02100	GASTRO-EASE™ • 60 veg. caps	44.00	33.00	30.00				
*01122	GINGER FORCE® • 60 liquid caps	34.95	26.21					
01658	GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps	50.00	37.50	33.00				
00756	GLA WITH SESAME LIGNANS (Mega) • 60 softgels	19.50	14.63	13.50				
00345	(L-) GLUTAMINE CAPSULES • 500 mg, 100 veg. caps	14.95	11.21	10.13				
00141	(L-) GLUTAMINE POWDER • 100 grams	22.00	16.50	15.00				
00522	GLUCOSAMINE/CHONDROITIN CAPSULES • 100 caps	38.00	28.50	24.00				
01541	GLUTATHIONE, CYSTEINE & C • 100 veg. caps	20.00	15.00	13.50				
01669	GLYCINE • 1,000 mg, 100 veg. caps	12.00	9.00	8.10				
01411	GRAPE SEED EXTRACT W/RESVERATROL & PTEROSTILBENE 100 mg, 60 veg. caps	36.00	27.00	25.50				
01620	GREEN COFFEE EXTRACT COFFEEGENIC® 400 mg, 90 veg. caps	32.00	24.00	21.00				
00953	GREEN TEA EXTRACT (Mega) • lightly caffeinated, 100 veg. caps	30.00	22.50	18.00				
00954	GREEN TEA EXTRACT (Mega) • decaffeinated, 100 veg. caps	30.00	22.50	18.00				
H								
01074	5 HTP • 100 mg, 60 caps	27.95	20.96					
*02002	HAIR, SKIN & NAIL REJUVENATION FORM W/VERISOL® 90 tabs	32.00	24.00	22.00				
01738	HCA (Garcinia) • 90 veg. caps	17.00	12.75	11.25				
29754	HCACTIVE™ GARCINIA CAMBOGIA EXTRACT • 90 caps	30.00	22.50					
01393	HEPATOPRO • 900 mg, 60 softgels	50.00	37.50	34.50				
01527	HUPERZINE A • 200 mcg, 60 veg. caps	40.00	30.00	27.00				
00661	HYDRODERM® • 1 oz	79.95	59.96	49.00				
I								
01704	IMMUNE MODULATOR W/TINOFEND® • 60 veg. caps	17.00	12.75	11.25				
00955	IMMUNE PROTECT W/PARACTIN® • 30 veg. caps	29.50	22.13	19.91				
02005	IMMUNE SENESCENCE PROTECTION FORMULA™ • 60 veg. tabs	40.00	30.00	27.00				
01049	INNERPOWER™ • 530 grams powder	42.00	31.50					
01674	INOSITOL CAPSULES • 1,000 mg, 360 veg. caps	62.00	46.50	43.50				
01292	INTEGRA-LEAN® AFRICAN MANGO IRVINGIA 150 mg, 60 veg. caps	28.00	21.00	18.00				
30731	IONIC SELENIUM • 2 oz, 300 mcg	13.69	10.27					
01677	IRON PROTEIN PLUS • 300 mg, 100 caps	28.00	21.00	19.50				
01492	IRVINGIA W/PHASE 3™ CALORIE CONTROL COMPLEX (Optimized African Mango) • 120 veg. caps	56.00	42.00	36.00				
J, K, L								
52142	JARRO-DOPHILUS® PROBIOTIC FOR WOMEN 30 enteric-coated veg. caps	27.95	20.96					
00056	JARRO-DOPHILUS EPS® • 60 veg. caps	23.95	17.96					
01834	K W/ADVANCED K2 COMPLEX (Super) • 90 softgels	30.00	22.50	20.25				
01600	KRILL HEALTHY JOINT FORMULA • 30 softgels	32.00	24.00	21.75				
01050	KRILL OIL (Jarrow) • 60 softgels	33.95	25.46					
00316	KYOLIC® GARLIC FORMULA 102 • 200 veg. caps	27.45	20.59					
00789	KYOLIC® RESERVE • 600 mg, 120 caps	28.95	21.71					
01681	LACTOFERRIN • 60 caps	44.00	33.00	30.00				
00020	LECITHIN • 16 oz granules	18.00	13.50	12.00				
02155	LIFE EXTENSION MIX™ • 315 tablets	80.00	60.00	52.00	43.75			
SUBTOTAL OF COLUMN 6								

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
02157	LIFE EXTENSION MIX™ W/EXTRA NIACIN • 315 tablets	80.00	60.00	52.00	43.75		
02154	LIFE EXTENSION MIX™ • 490 caps	90.00	67.50	58.00	47.50		
02156	LIFE EXTENSION MIX™ POWDER • 14.81 oz	80.00	60.00	52.00	43.75		
02165	LIFE EXTENSION MIX™ • 315 tablets w/o copper	80.00	60.00	52.00	43.75		
02164	LIFE EXTENSION MIX™ • 490 caps w/o copper	90.00	67.50	58.00	47.50		
02166	LIFE EXTENSION MIX™ POWDER • 14.81 oz w/o copper	80.00	60.00	52.00	43.75		
01608	LIVER EFFICIENCY FORMULA • 30 veg. caps	18.00	13.50	12.00			
01639	5-LOX INHIBITOR W/APRÈSFLEX® • 100 mg, 60 veg. caps	22.00	16.50	15.00			
01678	L-LYSINE • 620 mg, 100 veg. caps	9.00	6.75	6.00			
00455	LYCOPENE (Mega) • 15 mg, 90 softgels	35.00	26.25	22.50			
M							
01992	MACUGUARD® OCULAR SUPPORT w/SAFFRON • 60 softgels	25.00	18.75	17.50			
01993	MACUGUARD® OCULAR SUPPORT w/SAFFRON & ASTAXANTHIN • 60 softgels	44.00	33.00	30.00			
01459	MAGNESIUM CAPS • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	MAGNESIUM (CITRATE) • 160 mg, 100 veg. caps	12.00	9.00	7.50			
02107	(EXTEND-RELEASE) MAGNESIUM • 60 veg. caps	13.00	9.75	8.75			
01908	MEDITERRANEAN TRIM WITH SINETROL™-XPUR 60 veg. caps	18.00	13.50	12.00			
02109	MEDITERRANEAN WHOLE FOOD BLEND • 90 veg. caps	44.00	33.00	30.00			
01668	MELATONIN • 300 mcg, 100 veg. caps	5.75	4.31	3.75			
01083	MELATONIN • 500 mcg, 200 veg. caps	18.00	13.50	12.00			
00329	MELATONIN • 1 mg, 60 caps	5.00	3.75	3.47			
00330	MELATONIN • 3 mg, 60 veg. caps	8.00	6.00	5.16			
00331	MELATONIN • 10 mg, 60 veg. caps	28.00	21.00	18.00			
00332	MELATONIN • 3 mg, 60 veg. lozenges	8.00	6.00	5.16			
01734	MELATONIN (Fast-Acting Liquid) • 2 fl. oz (Citrus-Vanilla)	12.00	9.00	8.25			
01787	MELATONIN TIMED RELEASE • 300 mcg, 100 veg. tabs	12.00	9.00	8.25			
01788	MELATONIN TIMED RELEASE • 750 mcg, 60 veg. tablets	8.00	6.00	5.25			
01786	MELATONIN TIMED RELEASE • 3 mg, 60 veg. tabs	12.00	9.00	8.25			
02101	MEMORY PROTECT • 36 day supply	24.00	18.00	16.00			
01536	METHYLCOBALAMIN • 1 mg, 60 veg. lozenges (vanilla)	9.95	7.46	6.00			
01537	METHYLCOBALAMIN • 5 mg, 60 veg. lozenges (vanilla)	32.00	24.00	18.75	17.25		
00709	MIGRA-EEZE™ (Butterbur) • 60 softgels	33.00	24.75	22.00			
01522	MILK THISTLE (European) • 60 veg. caps	34.00	25.50	22.50			
01922	MILK THISTLE (European) • 60 softgels	28.00	21.00	18.75			
01925	MILK THISTLE (European) • 120 softgels	44.00	33.00	30.00			
01940	MIRAFORTE w/STANDARDIZED LIGNANS (Super) • 120 veg caps	62.00	46.50	42.00			
01869	MITOCHONDRIAL BASICS W/BIOPQQ® • 30 caps	44.00	33.00	30.00			
01868	MITOCHONDRIAL ENERGY OPTIMIZER w/BIOPQQ® • 120 caps	72.00	54.00	48.00			
00065	MK-7 • 90 mcg, 60 softgels	28.00	21.00	18.75			
00451	MSM (Methylsulfonylmethane) • 1,000 mg, 100 caps	14.00	10.50	8.96			
N							
01534	N-ACETYL-L-CYSTEINE • 600 mg, 60 veg. caps	14.00	10.50	9.25			
01904	NAD+ CELL REGENERATOR™ • 100 mg, 30 veg. caps	34.00	25.50	19.50			
01807	NATURAL APPETITE SUPPRESS (Advanced) • 60 veg. caps	38.00	28.50	25.50			
00984	NATURAL BP MANAGEMENT • 60 tablets	44.00	33.00	30.00			
SUBTOTAL OF COLUMN 7							

RECEIVE 25% OFF THE RETAIL PRICE OF ALL PRODUCTS

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
02012	NATURAL CORTISOL BALANCE • 30 veg. caps	45.00	33.75	30.00			
01892	NATURAL ESTROGEN • 60 veg. tabs	38.00	28.50	25.50			
01626	NATURAL SEX FOR WOMEN® 50+ (Advanced) • 90 veg. caps	59.00	44.25	34.00			
01444	NATURAL SLEEP® • 60 veg. caps	13.00	9.75	7.50			
01551	NATURAL SLEEP® w/ MELATONIN (Enhanced) • 30 caps	22.00	16.50	15.00			
01511	NATURAL SLEEP® W/O MELATONIN (Enhanced) • 30 caps	20.00	15.00	13.50			
01445	NATURAL SLEEP® MELATONIN • 5 mg, 60 veg. caps	18.00	13.50	12.00			
00987	NATURAL STRESS RELIEF • 30 veg. caps	28.00	21.00	18.00			
01603	NEURO-MAG® MAGNESIUM L-THREONATE • 90 veg. caps	40.00	30.00	27.00			
01602	NEURO-MAG® MAGNESIUM L-THREONATE w/CALCIUM & VITAMIN D3 • 25 grams • Lemon flavor	40.00	30.00	27.00			
01990	NITROVASC w/CORDIART™ • 30 veg. caps	18.00	13.50	12.00			
01903	NK CELL ACTIVATOR™ • 30 veg. tablets	45.00	33.75	31.50			
00373	NO FLUSH NIACIN • 800 mg, 100 caps	19.00	14.25	12.75			
O							
01824	OLIVE LEAF VASCULAR SUPPORT w/CELERY SEED EXTRACT (Advanced) • 60 veg. caps	36.00	27.00	24.00			
01988	OMEGA-3 PLUS EPA/DHA w/SESAME LIGNANS, OLIVE EXTRACT, KRILL & ASTAXANTHIN (SUPER) • 120 softgels	45.00	33.75	31.50	24.75		
01983	OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 softgels	18.00	13.50	12.00	9.38		
01982	OMEGA-3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 softgels	32.00	24.00	21.00	17.05		
01984	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 120 enteric coated softgels	34.00	25.50	23.25	18.00		
01985	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 60 enteric coated softgels	20.00	15.00	13.50	10.50		
01986	OMEGA 3 EPA/DHA w/SESAME LIGNANS & OLIVE EXTRACT (Super) • 240 small softgels	32.00	24.00	21.00	17.25		
01991	ONCE-DAILY HEALTH BOOSTER • 60 softgels	54.00	40.50	38.00			
02113	ONE-PER-DAY • 60 tablets	22.00	16.50	15.00			
01328	ONLY TRACE MINERALS • 90 veg. caps	15.00	11.25	9.38			
P							
01789	PALMETTOGUARD® SAW PALMETTO w/BETA-SITOSTEROL 30 softgels	15.00	11.25	10.50	9.00		
01790	PALMETTOGUARD® SAW PALMETTO/ NETTLE ROOT w/BETA-SITOSTEROL • 60 softgels	28.00	21.00	19.50	18.00		
01323	PEAK ATP® WITH GLYCOCARN® • 60 veg. caps	54.00	40.50	37.50			
*00342	PECTA SOL-C® MODIFIED CITRUS PECTIN • 454 grams powder	109.95	93.46				
*01080	PECTA SOL-C® MODIFIED CITRUS PECTIN • 270 veg. caps	79.95	67.96				
01811	PEONY IMMUNE • 60 veg. caps	36.00	27.00	24.00			
**00673	PGX® PLUS MULBERRY (WellBetX®) • 180 veg. caps	34.95	26.21				
01953	POMEGRANATE COMPLETE • 30 softgels	24.00	18.00	15.75			
00956	POMEGRANATE FRUIT EXTRACT • 30 veg. caps	19.50	14.63	13.16			
*-01837	POMI-T® • 60 veg. caps	35.00	26.25	24.00			
00577	POTASSIUM IODIDE • 130 mg, 14 tabs	6.95	5.21	3.94			
01500	PQQ CAPS W/BIOPQQ® • 10 mg, 30 veg. caps	24.00	18.00	13.50	12.00		
01647	PQQ CAPS W/BIOPQQ® • 20 mg, 30 veg. caps	40.00	30.00	24.00	21.00		
00302	PREGNENOLONE • 50 mg, 100 caps	26.00	19.50	16.50			
00700	PREGNENOLONE • 100 mg, 100 caps	30.00	22.50	20.25			
**01373	PRELOX® NATURAL SEX FOR MEN® • 60 tablets	52.00	39.00	36.00			
SUBTOTAL OF COLUMN 8							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
00525	PROBOOST™ THYMIC PROTEIN A • 30 packets	66.60	49.95				
01441	PROGESTA-CARE® • 4 oz cream	36.39	27.29	25.72			
01928	PROSTATE FORMULA (Ultra NAT) • 60 softgels	38.00	28.50	26.25	24.00		
01909	PROSTAPOLLEN™ (Triple strength) • 30 softgels	28.00	21.00	18.75			
01742	PROTEIN-ISOLATE (Whey) Vanilla • 403 grams	30.00	22.50	19.50			
01743	PROTEIN-ISOLATE (Whey) Chocolate • 437 grams	30.00	22.50	19.50			
01770	PROTEIN CONCENTRATE (New Zealand Whey) Vanilla 500 grams	30.00	22.50	19.95			
01771	PROTEIN CONCENTRATE (New Zealand Whey) Chocolate 640 grams	30.00	22.50	19.95			
01812	PROVINAL® PURIFIED OMEGA-7 • 30 softgels	27.00	20.25	18.00			
01676	PS CAPS (Phosphatidylserine) • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01508	PTEROPURE® Pterostilbene • 50 mg, 60 veg. caps	32.00	24.00	22.50			
01209	PUMPKIN SEED EXTRACT (Water-soluble) • 60 veg. caps	20.00	15.00	13.50			
01637	PYCNOGENOL® FRENCH MARITIME PINE BARK EXTRACT 100 mg, 60 veg. caps	64.00	48.00	45.00			
01217	PYRIDOXAL 5'-PHOSPHATE • 100 mg, 60 veg. caps	22.00	16.50	14.85			
Q, R							
01309	QUERCETIN (Optimized) • 250 mg, 60 veg. caps	22.00	16.50	15.00			
01030	RED YEAST RICE (Bluebonnet) • 600 mg, 60 veg. caps	18.08	13.56				
00605	REGIMINT • 60 enteric-coated caps	19.95	14.96	14.00			
01708	REISHI EXTRACT MUSHROOM COMPLEX • 60 veg. caps	30.00	22.50	20.25			
01448	REJUVENEX® BODY LOTION • 6 oz	24.00	18.00	14.85	12.75		
01621	REJUVENEX® FACTOR FIRING SERUM • 1.7 oz	65.00	48.75	37.50			
01220	REJUVENEX® (Ultra) • 2 oz	52.00	39.00	33.00	29.25		
00676	REJUVENIGHT® (Ultra) • 2 oz	39.95	29.96	27.00			
01410	RESVERATROL W/PTEROSTILBENE • 100 mg, 60 veg. caps	36.00	27.00	24.00			
02031	RESVERATROL W/NICOTINAMIDE RIBOSIDE (Optimized) • 30 veg. caps	42.00	31.50	27.00			
02030	RESVERATROL (Optimized) • 60 veg. caps	46.00	34.50	31.00			
00889	RHODIOLA EXTRACT • 250 mg, 60 veg. caps	14.00	10.50	9.00			
01900	RIBOGEN™ FRENCH OAK WOOD EXTRACT 200 mg, 30 veg. caps	36.00	27.00	24.75			
00972	(D) RIBOSE POWDER • 150 grams	27.50	20.63	18.56			
01473	(D) RIBOSE TABLETS • 100 veg. tabs	32.00	24.00	21.00			
01609	RICH REWARDS® BREAKFAST GROUND COFFEE • 12 oz. bag	13.00	9.75				
01730	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Mocha • 12 oz. bag	15.00	11.25	10.50			
01729	RICH REWARDS® BREAKFAST BLEND GROUND COFFEE Natural Vanilla • 12 oz. bag	15.00	11.25	10.50			
01612	RICH REWARDS® BREAKFAST BLEND WHOLE BEAN COFFEE 12 oz. bag	13.00	9.75				
01610	RICH REWARDS® DECAFFEINATED ROAST GROUND COFFEE 12 oz. bag	14.00	10.50				
01208	R-LIPOIC ACID (Super) • 240 mg, 60 veg. caps	49.00	36.75	33.75			
00070	RNA CAPSULES • 500 mg, 100 caps	17.95	13.46	12.12			
S							
01432	SAFFRON W/SATIEREAL® (Optimized) • 60 veg. caps	36.00	27.00	24.00			
01935	SAMe (S-ADENOSYL-METHIONINE) 200 mg, 30 enteric coated tablets	25.00	18.75	16.50			
SUBTOTAL OF COLUMN 9							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
01933	SAMe (S-ADENOSYL-METHIONINE) 400 mg, 30 enteric coated tablets	36.00	27.00	24.00			
01934	SAMe (S-ADENOSYL-METHIONINE) 400 mg, 60 enteric coated tablets	66.00	49.50	45.00			
01740	SEA-IODINE™ • 1,000 mcg, 60 veg. caps	8.00	6.00	5.40			
01879	SE-METHYL L-SELENOCYSTEINE • 200 mcg, 90 veg. caps	11.00	8.25	7.50			
00318	SERRAFLAZYME • 100 tablets	18.00	13.50	12.00			
01938	SHADE FACTOR • 120 veg. caps	44.00	33.00	30.00			
01884	SILYMARIN • 100 mg, 90 veg. caps	14.00	10.50	9.50			
01249	SINUS CLEANSER • 4 oz. bottle	25.00	18.75				
01596	SKIN RESTORING PHYTCERAMIDES w/LIPOWHEAT® 30 liquid veg. caps	25.00	18.75	17.25			
00961	SODZYME® w/GLISODIN® & WOLFBERRY • 90 veg. caps	28.00	21.00	18.00			
00657	SOLARSHIELD® SUNGLASSES • Smoke color	12.99	9.74	8.63			
01649	SOY ISOFLAVONES (SUPER ABSORBABLE) • 60 veg. caps	28.00	21.00	18.75			
00432	STEVIA™ (Better) • 100 packets, 1 gram each	9.95	7.46				
00438	STEVIA™ ORGANIC LIQUID SWEETENER (Better) • 2 oz	11.00	8.25				
01476	STRONTIUM • 750 mg, 90 veg. caps	20.00	15.00	13.50			
01778	SUPER SELENIUM COMPLEX • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
T							
02023	TART CHERRY W/CHERRYPURE® 60 veg. caps	20.00	15.00	14.00			
01827	TAURINE • 1,000 mg, 90 veg. caps	13.00	9.75	9.00			
01918	TEAR SUPPORT w/MAQUIBRIGHT® • 60 mg, 30 veg. caps	18.00	13.50	12.00			
00133	L-TAURINE POWDER • 300 grams	20.00	15.00	12.66			
*13685	TEN MUSHROOM FORMULA® • 120 veg. caps	39.95	33.96				
01304	THEAFLAVIN STANDARDIZED EXTRACT • 30 veg. caps	18.00	13.50	12.00			
01683	(L) THEANINE • 100 mg, 60 veg. caps	24.00	18.00	15.38			
**01038	THERALAC® PROBIOTICS • 30 caps	47.95	35.96				
00668	THYROID FORMULA (Metabolic Advantage™) • 100 caps	21.95	16.46				
00349	TMG POWDER • 50 grams	14.00	10.50	8.25			
01859	TMG • 500 mg, 60 liquid veg. caps	13.00	9.75	9.00			
01400	TOCOTRIENOLS (Super-absorbable) • 60 softgels	30.00	22.50	21.00			
01278	TOOTHPASTE • 4 oz (Mint) tube	9.50	7.13	6.50			
01917	TRANQUIL TRACT™ • 60 veg. caps	52.00	39.00	34.50			
01468	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT 60 veg. caps	24.00	18.00	16.50			
01469	TRIPLE ACTION CRUCIFEROUS VEGETABLE EXTRACT w/RESVERATROL • 60 veg. caps	32.00	24.00	22.20			
02003	TRIPLE ACTION THYROID • 60 veg. caps	36.00	27.00	24.00			
01803	TRI SUGAR SHIELD® • 60 veg. caps	36.00	27.00	24.00			
01386	TRUFIBER™ • 180 grams	32.95	24.71				
01389	TRUFLOA® PROBIOTICS • 32 veg. caps	42.95	32.21				
01722	L-TRYPTOPHAN • 500 mg, 90 veg. caps	33.00	24.75	22.50			
01721	TRYPTOPHAN PLUS (Optimized) • 90 veg. caps	32.00	24.00	21.75			
02116	TWO-PER-DAY • 60 tablets	10.50	7.88	7.13			
02115	TWO-PER-DAY • 120 tablets	20.00	15.00	13.50			
02114	TWO-PER-DAY • 120 caps	22.00	16.50	15.00			
00326	L-TYROSINE • 500 mg, 100 tablets	13.50	10.13				
SUBTOTAL OF COLUMN 10							

		YOUR PRICE					
ITEM No.	PRODUCT	Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	QTY	Total
U, V							
01921	URIC ACID CONTROL • 60 veg. caps	24.00	18.00	16.50			
00213	VANADYL SULFATE • 7.5 mg, 100 veg. tablets	15.00	11.25	9.38			
02102	VENOFLOW™ • 30 veg. caps	52.00	39.00	36.00			
00408	VENOTONE • 60 caps	18.95	14.21	12.00			
01327	VINPOCETINE • 10 mg, 100 veg. tablets	18.00	13.50	10.50			
00372	VITAMIN B3 NIACIN • 500 mg, 100 caps	7.65	5.74	4.99			
02028	VITAMIN B5 • 500 mg, 100 veg. caps (Pantothenic Acid)	11.00	8.25	7.50			
01535	VITAMIN B6 • 250 mg, 100 veg. caps	12.50	9.38	8.25			
00361	VITAMIN B12 • 500 mcg, 100 lozenges	8.75	6.56	5.44			
01634	VITAMIN C w/DIHYDROQUERCETIN 1,000 mg, 60 veg. tablets	10.00	7.50	6.75			
00927	VITAMIN C w/DIHYDROQUERCETIN 1,000 mg, 250 veg. tablets	27.00	20.25	18.00			
00084	VITAMIN C POWDER (BUFFERED) • 454 grams	23.95	17.96	16.50			
01736	VITAMIN C-MAGNESIUM CRYSTALS (EFFERVESCENT) 180 grams	20.00	15.00	13.50			
01732	VITAMIN D3 • 2,000 IU, 1 fl. oz, Mint flavor	28.00	21.00	18.75			
01753	VITAMIN D3 • 1,000 IU, 90 softgels	7.00	5.25	4.50			
01751	VITAMIN D3 • 1,000 IU, 250 softgels	12.50	9.38	8.44			
01713	VITAMIN D3 • 5,000 IU, 60 softgels	10.00	7.50	6.50			
01718	VITAMIN D3 • 7,000 IU, 60 softgels	14.00	10.50	9.45			
01758	VITAMIN D3 W/SEA-IODINE™ • 5,000 IU, 60 caps	14.00	10.50	9.38			
00864	VITAMIN D3 LIQUID • 2,000 IU, 1 fl. oz	28.00	21.00	18.75			
01840	VITAMINS D AND K W/SEA-IODINE™ • 60 caps	24.00	18.00	16.50			
01863	VITAMIN E (Natural) • 400 IU, 90 softgels	28.00	21.00	19.50	18.00		
01936	VITAMIN K2 (Low dose) • 45 mcg, 90 softgels	18.00	13.50	12.00			
W							
01902	WAIST-LINE CONTROL™ • 120 veg. caps	42.00	31.50	28.50			
X, Y							
01919	X-R SHIELD • 90 veg. caps	15.00	11.25	9.75			
00409	XYLIWHITE™ MOUTHWASH • 16 oz	10.00	7.50				
Z							
01813	ZINC HIGH POTENCY • 50 mg, 90 veg. caps	7.95	5.96	5.25			
01561	ZINC LOZENGES • 60 veg. lozenges	9.00	6.75	6.00			
01961	ZINC LOZENGES (Enhanced) • 30 veg. lozenges	12.00	9.00	6.00			
**01051	ZYFLAMEND® WHOLE BODY • 120 liquid veg. caps	72.95	54.71				
BOOKS							
34002	THE 30-DAY HEART TUNE-UP by Steven Masley, MD • 2016	17.59	13.19				
33999	THE MENOPAUSE CURE by Jill D. Davey & Sergey Dzigan, MD • 2016	17.32	12.99				
33998	THE RIGHT TO TRY by Darcy Olsen • 2016	26.99	20.24				
33840	THE CRWAY® TO GREAT GLUCOSE CONTROL CD by Paul McGlothlin and Meredith Averill • 2016	189.00	189.00				
33890	FORTIFY YOUR LIFE by Tieraona Low Dog, MD • 2016	28.89	21.67				
33885	THE BLUE ZONES SOLUTION by Dan Buettner • 2015	26.00	19.50				
SUBTOTAL OF COLUMN 11							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
33880	OUTSTANDING HEALTH: THE 6 ESSENTIAL KEYS TO MAXIMIZE YOUR ENERGY AND WELL BEING by Michael Galtzer, MD & Larry Trivieri Jr. • 2015	24.95	18.71				
33878	TESTOSTERONE REPLACEMENT THERAPY by Dr. John Crisler • 2015	19.99	14.99				
33877	THE TRUTH ABOUT MEN AND SEX by Abraham Morgentaler, MD, FACS • 2015	16.99	12.74				
33876	TOX-SICK • by Suzanne Somers • 2015	26.00	19.50				
33875	DOCTORED: THE DISILLUSIONMENT OF AN AMERICAN PHYSICIAN • by Sandeep Jauhar • 2015	26.00	19.50				
33874	MISSING MICROBES • by Martin J. Blaser, MD • 2014	28.00	21.00				
33873	EATING ON THE WILD SIDE • by Jo Robinson • 2014	16.00	12.00				
33872	GET SERIOUS • by Brett Osborn, MD • 2014	24.95	18.71				
33868	TOXIN TOXOUT: GETTING HARMFUL CHEMICALS OUT OF OUR BODIES AND OUR WORLD • by Bruce Lourie and Rick Smith • 2014	25.99	19.49				
33867	THE COMPLETE MEDITERRANEAN DIET by Michael Ozner, MD • 2014	19.95	14.96				
33869	UNLEASH THE POWER OF THE FEMALE BRAIN by Daniel Amen, MD • 2014	16.00	12.00				
33870	MAGNIFICENT MAGNESIUM by Dennis Goodman, MD • 2014	14.95	11.21				
DPT05	DISEASE PREVENTION AND TREATMENT, EXPANDED FIFTH EDITION (Hardcover) • 2014	69.95	39.95	36.00			
33865	THE RESTORATION OF THE HUMAN BODY [IN 7 PARTS] by Sergey A. Dzigan, MD, PhD • 2014	29.95	22.46				
33862	I'M TOO YOUNG FOR THIS • by Suzanne Somers • 2013	26.00	19.50				
33835	PHARMOCRACY • by William Faloon • 2011	24.00	9.60	8.00			
33958	THE VITAMIN D SOLUTION by Michael F. Holick, PhD, MD (Paperback) • 2013	16.00	12.00				
33838	YOUR GUIDE TO HEALTHY SKIN THE NATURAL WAY by Gary Goldfaden, MD • 2012	26.00	15.00				
33815	KNOCKOUT • by Suzanne Somers • 2009	25.99	17.00				
33809	TESTOSTERONE FOR LIFE by Abraham Morgentaler, MD • 2008	16.95	11.87				
33696	LIFE EXTENSION REVOLUTION by Philip Lee Miller, MD (Paperback)	16.00	12.00				
33803	WHAT YOUR DOCTOR MAY NOT TELL YOU ABOUT DIABETES by Steven V. Joyal, MD • 2008	14.99	10.49				
SUBTOTAL OF COLUMN 12							

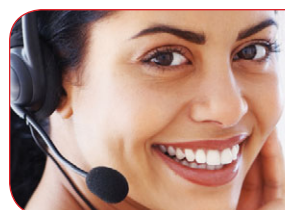
* These products are not 25% off retail price.

** Due to license restrictions, this product is not for sale to customers outside of the USA.

*** Due to license restrictions, this product is not for sale to Canada.

† Due to license restrictions, this product is not for sale to customers outside of the USA and Canada.

†† These products are not 25% off retail price. Due to license restrictions this product is not for sale to customers outside of the USA.



Not sure exactly which supplements you need?
Talk to a
Wellness Specialist
toll-free at
1-800-226-2370

ORDER SUBTOTALS

SUBTOTAL COLUMN 1

SUBTOTAL COLUMN 2

SUBTOTAL COLUMN 3

SUBTOTAL COLUMN 4

SUBTOTAL COLUMN 5

SUBTOTAL COLUMN 6

SUBTOTAL COLUMN 7

SUBTOTAL COLUMN 8

SUBTOTAL COLUMN 9

SUBTOTAL COLUMN 10

SUBTOTAL COLUMN 11

SUBTOTAL COLUMN 12

ORDER TOTALS

SUBTOTAL OF COLUMNS 1 - 12

POSTAGE & HANDLING (Any size order, in the U.S., includes Alaska & Hawaii)

\$5.50

C.O.D.s (ADD \$7 FOR C.O.D. ORDERS)

UPS OVERNIGHT add \$16, UPS 2nd DAY AIR add \$7. For Puerto Rico, US Virgin Islands, add \$7. CANADA UPS EXPRESS Flat rate \$17.50, UK Flat rate \$25 USD. ALL OTHER INTERNATIONAL AIR WILL BE ADDED.

SHIPPING

GRAND TOTAL (MUST BE IN U.S. DOLLARS)

PLEASE MAIL TO: Life Extension

P.O. Box 407198 • Ft. Lauderdale, Florida 33340-7198
Or Call Toll Free 1-800-544-4440 • Fax: 866-728-1050



PREMIER Order Over \$50?

Get a year of unlimited
FREE shipping and
double rewards for only \$0.

There's no catch: just apply your instant \$50 bonus at checkout. Your orders ship free for 12 months, you earn double (4%) rewards back all year long, and the cost of enrollment is offset by your instant bonus.* This makes Premier the *only* rewards program that more than pays for itself!

Premier. Simply. More.

Just \$49.95 | \$59.95 for international customers

Call **1-888-224-8239** to enroll

Visit www.LifeExtension.com/Premier
for details • Mention code **YRX618D**

LifeExtension®

No auto-renewal, no commitments.

*Certain restrictions apply. For complete terms and conditions please visit www.LifeExtension.com/Premier

BILL TO ADDRESS

NAME E-MAIL

ADDRESS

CITY/STATE/ZIP-POSTAL CODE COUNTRY

PHONE FAX

VISA/MASTERCARD/AMEX/DISCOVER #

EXP. DATE

SIGNATURE

SHIP TO ADDRESS

NAME E-MAIL

ADDRESS

CITY/STATE/ZIP-POSTAL CODE

COUNTRY

PHONE FAX

SIGNATURE

Prices subject to change without notice.
Please notify Life Extension of any address change.

AMPK

PROMOTES LONGEVITY FACTORS

Importance of AMPK

Studies show **increased** AMPK activity supports:

- Reduced fat storage,¹
- New mitochondria production,²
- The promotion of healthy blood glucose and lipids already within normal range.³

AMPK Activator provides nutrients shown to significantly **boost** AMPK activity.

Gynostemma Pentaphyllum

In one study, researchers documented a 1-inch reduction in **abdominal circumference** in overweight individuals who took **450 mg** daily of *G. pentaphyllum* extract for 12 weeks.⁴

Trans-Tiliroside

Trans-tiliroside promotes healthy blood glucose levels and body weight already within normal range.⁵

AMPK Activator

Item #01907 • 90 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$48	\$36
4 bottles		\$33 each

Non-GMO

ActivAMP® is a registered trademark of Gencor.

This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results are not guaranteed and results may vary.



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

References

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



WHAT'S INSIDE

Visit us at www.LifeExtension.com

LifeExtension®

Magazine



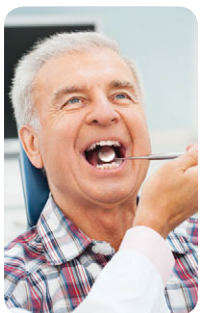
7 SHOULD YOU EAT BEFORE A BLOOD TEST?

Up until now, people have been told to **fast** 8 to 12 hours **prior** to having a blood test. New data indicates a more accurate reading may be obtained when blood is drawn 2 to 6 hours **after** a normal meal.



28 ARTERIAL PLAQUE RUPTURE

A human study published in **December 2016** corroborates previous clinical research showing dramatic **reductions** in markers of **atherosclerosis**, along with **stabilization** of rupture-prone **arterial plaque**.



38 PROBIOTIC LOZENGE PROMOTES ORAL HYGIENE

Targeted **oral probiotics** can reduce gum deterioration and tooth decay by eliminating harmful bacteria for a healthier mouth.



49 COQ10 FIGHTS STATIN-INDUCED DIABETES

New findings reveal how **coenzyme Q10** can help protect against statin-induced **insulin resistance**.



54 COMBAT SUGAR TOXICITY

When **sugar** (glucose) reacts with the body's **proteins**, toxic **glycation** reactions **accelerate aging**. Fortunately, there are ways to impede **glycation** by cooking at lower temperature and neutralizing formation of advanced glycation end products.



66 THE RIGHT EXERCISE INHIBITS COGNITIVE DECLINE

Strength-training exercise can boost cognition and fight memory decline.