

DELAY BRAIN AGING BY ELEVEN YEARS

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April 2016

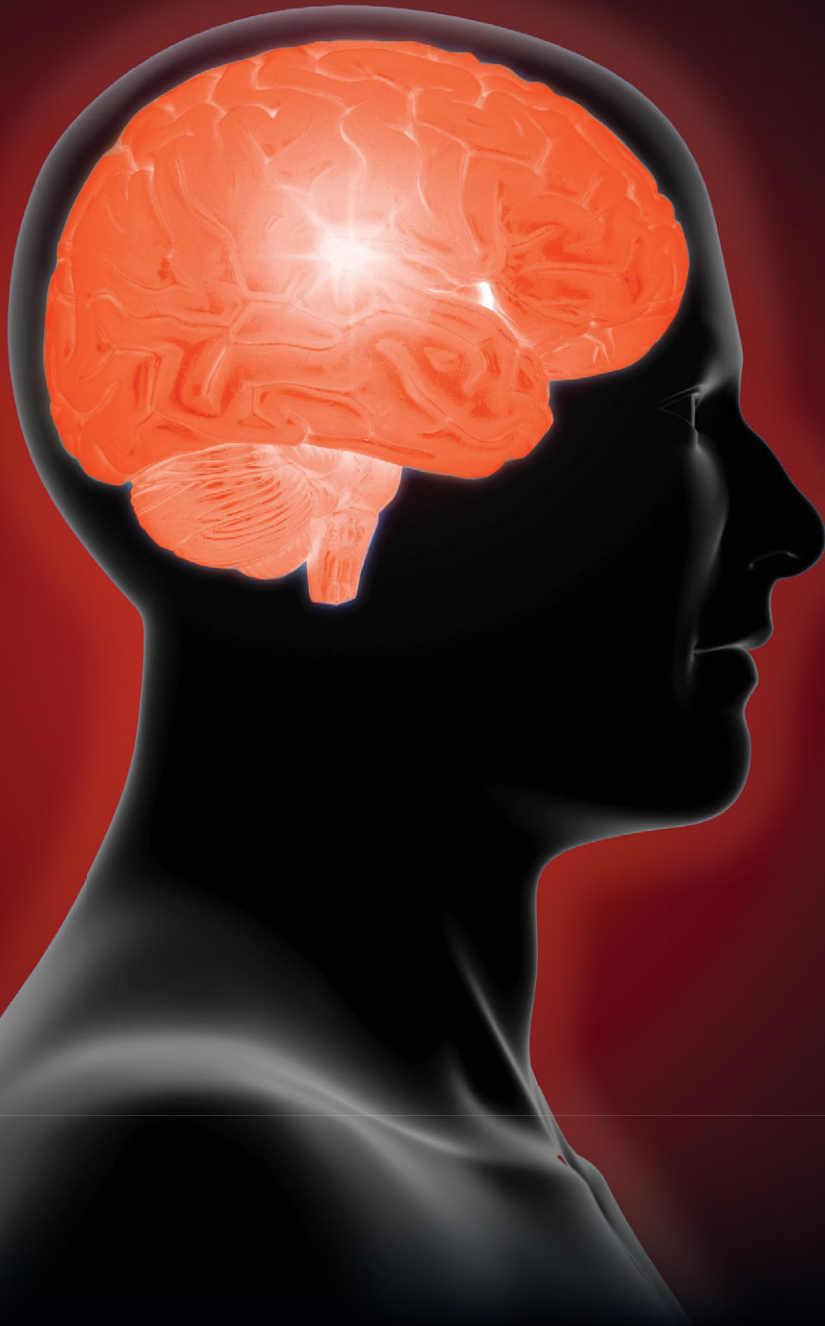
Reversal of ALZHEIMER'S Memory Loss

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**Impact of Diet on
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**Novel Fiber Boosts
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**Blueberries Reduce
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- Protect against free radical attack.

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References

1. *J Appl Physiol*. 2003; 95(4):1717-27.
2. *Curr Genomics*. 2012 Dec;13(8):589-602.
3. *Altern Med Rev*. 2004 Jun;9(2):136-156.
4. *J Nutr Biochem*. 2003 May;14(5):251-8.
5. *Toxicol In Vitro*. 2003 Feb;17(1):27-33.
6. *Br J Nutr*. 2011 May;105(10):1465-70.
7. *Int J Sport Nutr Exerc Metab*. 2006 Oct;16(5):494-509.

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REPORTS

24 PQQ GROWS NEW NERVE CELLS

Studies show that **PQQ** triggers the growth of *new nerve cells* and *new mitochondria*. By improving brain energy metabolism, PQQ can help protect against cognitive decline, stroke, excitotoxicity, and the neuronal damage caused by high blood sugar.

36 HOW FIBER CAN IMPROVE IMMUNE FUNCTION

With almost **70%** of the immune system located in the gut, it should not be surprising that intestinal fiber fermentation is involved in immune health. Research has shown that three forms of fiber provide broad-spectrum benefits including protecting against the effects of **metabolic syndrome**, while improving **digestion** and **immune function**.

48 THE EYE-BRAIN CONNECTION

There are interesting anatomical similarities between our eyes and brain. This has led scientists to reevaluate the biological effects of **astaxanthin**, which was long ago shown to benefit eye health. What makes astaxanthin unique is its ability to cross the blood-brain barrier and help protect against neurodegeneration.

60 BETTER GLUCOSE MEANS A BETTER LIFE

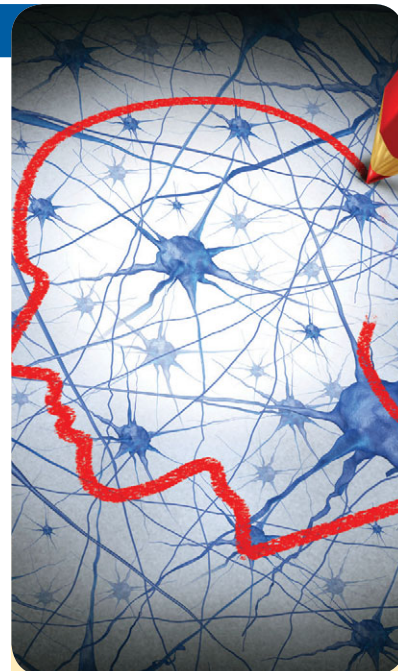
The *CR Way® to Great Glucose Control* program is an online adult education course that provides a proven method to lower the risk of diabetes and heart disease as well as improve longevity.

71 RESEARCH UPDATE: BLUEBERRIES PROTECT AGAINST FRAILTY

Life Extension® is aggressively pursuing **age reversal** research with the objective of correcting a degenerative medical disorder called **frailty**. This technology is several years away from being available in the clinical setting. Fortunately, researchers have discovered that **blueberries** can increase mobility and gait in the elderly, reducing the potential for fatal falls, and partially correcting the frailty that plagues the elderly.

78 NATURAL ENHANCEMENT OF EYELASHES

Ultraviolet radiation and age-associated changes lead to weaker, thinner, shorter eyelashes. Scientists have identified a blend of natural compounds that rebuilds lash follicles to produce longer, thicker, healthier eyelashes.



7 DELAY BRAIN AGING BY 11 YEARS

Human studies reveal that **foods** you eat play a huge role in how **fast** your **brain** ages. An intriguing new study finds that healthy dietary patterns reduce Alzheimer's risk up to **52%**. Credible researchers now proclaim that the proper lifestyle changes can **delay brain aging by 11 years**—and reverse memory loss associated with Alzheimer's disease.

DEPARTMENTS

17 IN THE NEWS

Aspirin slows prostate cancer progression; sugar increases breast cancer risk; low vitamin D-leukemia link; walnuts have fewer calories than originally thought; blocking testosterone linked to Alzheimer's; vitamin D improves surgery outcome; vitamin C lowers inflammation; drug enhances DNA repair; vitamin K improves arthritis; DHEA improves vaginal dryness; and omega-3 increases breast cancer survival.

87 BOOK REVIEW: FORTIFY YOUR LIFE

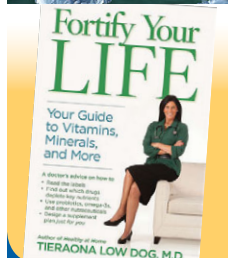
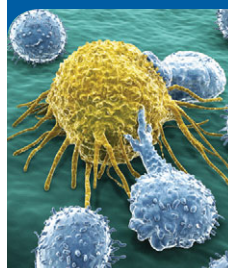
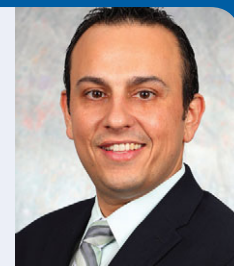
Citing data from the Centers for Disease Control, Dr. Tieraona Low Dog states many Americans are deficient in vital nutrients. In her book *Fortify Your Life*, Dr. Low Dog provides an enlightened guide to the supplements she hopes will help counter the CDC data.

93 ASK THE MEDICAL EDITOR

Life Extension® doctor Hernando Latorre, MD, MSc, details how to help prevent Alzheimer's disease by employing a multi-targeted plan that includes diet, nutritional supplements, and exercise.

99 PROFILE: David Kekich

Longevity science entrepreneur, founder of the Maximum Life Foundation, and 25-year Life Extension® supporter David Kekich collaborates with scientists, investors, and innovators to identify and support cutting-edge medical technologies to help reverse the aging process.





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CONTRIBUTORS

Meredith Averill • Chancellor Faloon • Gary Goldfaden, MD • Robert Goldfaden
Cheryl Hopkins • Henry Jenkins • Hernando Latorre, MD, MSc • Paul McGlothlin
Miles Mueller • Kyle Roderick • Kira Schmid, ND • Leslie Stanton

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

Advisors: 800-226-2370 • Advisory email: advisory@LifeExtension.com

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Magazine

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.

Anna M. Cabeca, DO, FACOG, ABAARM, is a board certified Gynecologist and Obstetrician, as well as board certified in Anti-Aging and Regenerative Medicine, an expert in Functional Medicine, and an expert in women's health. She specializes in bioidentical hormone replacement therapy and natural alternatives, successful menopause and age management medicine.

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

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

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

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

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

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

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

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

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

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

Maurice D. Marholin, 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, Montenapoleone Medical Center, Milan, Italy. Gastroenterologist and nutrigenomics expert with extensive international university experience. Consulting Professor, WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy. Hon. Res. Professor, Human Nutrition Dept, TWU, USA. Author of over 130 papers and 400 congress lectures.

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

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

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

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

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

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

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

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

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

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

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 immunology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis. 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.



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 anticancer drugs. He conducted his postdoctoral training at Stanford University Department of Statistics. He is currently president of New Earth BioMed, a nonprofit cancer research corporation that studies mixtures of natural products.



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



Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the 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), FRCPPath., 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.

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How to Delay Brain Aging by 11 Years



BY WILLIAM FALOON

At a lecture I attended two years ago, I was shown **age-reversal** case histories that I had never before witnessed.

The lecture was called “**Reversing Alzheimer’s**.” The medical case histories were compelling. Many of the underlying mechanisms of **reversing** dementia were long ago postulated in this magazine.

This lecture was not put on by a **neurologist**, but by a charity consisting of three educated women who volunteered their time. They presented evidence that unhealthy diets, nutrient/hormone deficits, inflammation, and avoidable toxins were causing people to needlessly develop **Alzheimer’s disease**.

Right around the time of this lecture, researchers from **UCLA** and the **Buck Institute for Research on Aging** announced the results of a study in which **nine out of 10 subjects diagnosed with dementia saw meaningful reversals of memory loss**.¹ The protocol used included many of the healthy dietary choices long advocated by this magazine (and by the three charitable women who presented at the lecture I had attended).

The unprecedented results from the **UCLA/Buck Institute** study drew widespread media coverage. No “drug” had ever achieved this level of **cognitive improvement**.

The **UCLA/Buck Institute** study author admitted, however, that the program’s downside is its complexity. While supplementing with **melatonin**, **fish oil**, **coenzyme Q10**, **methylcobalamin**, and **vitamin D3** were easy, the dietary/lifestyle changes were so difficult that none of the 10 participants were able to stick to the entire protocol.

That was year **2014**. Move forward to **2015** and the results of two larger **human trials** revealed easier methods to prevent Alzheimer’s and protect cognitive function even into our advanced years.

You are about to learn how even modest dietary changes can slash **Alzheimer’s** risk by **35%** when a healthy diet is consistently followed.



Normal aging is associated with **mild cognitive impairment** that too often progresses to full-blown **Alzheimer's**.

By the time a typical American reaches age **85**, their risk of displaying clinical indications of **Alzheimer's** rises to a startling **45%**.²

No one has yet ascertained how this nation's already strained health care resources will deal with this impending epidemic.

The fantastic news is that decades of human and animal research has led to **nutritional** approaches that aging individuals can adopt to drastically reduce their senility risk. This means that nursing homes don't need to fill up with demented individuals who have lost their cognitive and functional independence.

Powerful Role of Diet on Brain Health

Diet is a powerful environmental factor that affects our **thinking abilities** in youth and impacts whether we develop **dementia** as we age.

Study data published in **2015** corroborates the **brain-boosting** benefits that occur in response to healthier dietary choices.³⁻⁵ I suspect most of you reading this have been following at least some of these beneficial eating patterns.

What impressed us about these new clinical studies is that they showed **reversals** of cognitive dysfunction mostly in the elderly. These individuals would have been expected to already suffer permanent **neurodegeneration** that was considered "incurable."

In one study conducted at Rush University, the average age of the subjects was **81**, showing that it may never be too late to alter one's dietary patterns to protect brain function.

The Rush University Project

Researchers at Rush University studied over 900 participants, ages 58 to 98 years, and followed them on average for 4.5 years. Three different dietary interventions were evaluated, including the **Mediterranean diet**, the **DASH diet**, and a hybrid of the Mediterranean-DASH diets

called the **MIND diet**. The researchers then looked at the effects of these three diets on the risk of **Alzheimer's disease**.⁶

The MIND diet emphasized the nutritional components linked to neuroprotection and dementia prevention, uniquely specifying the consumption of **polyphenols** from berries and green leafy vegetables.

Researchers at Rush University *comprehensively* adjusted for potential confounding factors in their dietary intervention study analysis such as age, sex, education, APOE4 (genetic risk factor for Alzheimer's disease), pre-existing cardiovascular problems, physical activity, and total dietary energy intake.

Results of their study analysis showed remarkable benefits for each of the diets, in particular for those subjects who closely followed the **MIND diet** with its emphasis upon polyphenols from **berries** and **green vegetables**.

The **highest** level of compliance with the **MIND diet** conferred a highly significant **52% reduction** in the rate of developing **Alzheimer's disease** compared with participants with the lowest level of MIND dietary compliance.





Benefits Found for Other Healthy Diets

Although not as highly significant as the results achieved with the MIND diet, participants with the **highest** level of compliance with the **Mediterranean diet** also had a significant reduction in **Alzheimer's** risk in comparison with the lowest level of Mediterranean diet compliance. For the DASH diet, the highest level of compliance resulted in a **40% reduction** in Alzheimer's disease risk that very nearly achieved statistical significance.

Even study subjects with "middle-of-the-road" compliance with the **MIND diet**, such as ingesting just some of the constituents of a brain-healthy diet like **berries**, had their dementia risk reduced by **35%**.⁶

These huge risk reductions in response to **healthier eating** patterns represent **game changers** as it relates to the dire predictions of tens of millions of Americans suffering agonizing dementia-related deaths.

The problem is that relatively few people can stick solely

to healthy dietary patterns. The encouraging news is that it may not matter because just ingesting some of the constituents of the **MIND** diet was shown to confer considerable protection against **neurodegenerative disease**.

These findings are revolutionary and physicians should wake up to the fact that dementia is not always an irreversible disorder.

Brain-Destroying Eating Patterns

It took many decades for the multiple dangers of **tobacco** smoking to be realized, along with its economic costs to society.

The carnage from making the wrong **dietary** choices may exceed that of tobacco. Yet there is little talk of banning the advertising of toxic foods and no requirement to warn consumers that ingesting them increases **dementia risk**.

It is up to individuals to educate themselves about which foods protect against neurodegenerative diseases and the dietary patterns that contribute to brain destruction.

The Magnitude of the Difference

Certain foods like polyphenol-rich **berries** (blueberries, strawberries) and leafy green vegetables provide benefits for the brain.⁶⁻¹⁷ Foods typically consumed in Western diets, as you will see on the next page, are proving harmful.¹⁸⁻²¹

The new studies I discuss in this editorial corroborate previous reports showing the devastating impact of poor dietary patterns throughout the body.²²⁻²⁵

What is remarkable, however, is the **magnitude of protection** conferred when following the proper nutritional program. By adhering to healthy dietary patterns, one researcher was quoted as saying during a **2015** scientific presentation:

"It was about the equivalent of being 11 years younger in age."^{6,26,27}

This represents an enormous percentage of cognitively proficient time that elderly individuals can enjoy.

Constituents of the MIND Diet

When creating the “**MIND**” diet, researchers sought to identify the constituents of the well-studied **Mediterranean** and **DASH** diets that possessed the greatest neuro-protective properties.

The **MIND** diet consists of **15** dietary components shown to powerfully impact neurological function for the good or bad.

The ten brain-**healthy** food groups are:

1. Green leafy vegetables
2. Other vegetables
3. Nuts
4. Berries
5. Beans
6. Whole grains
7. Fish
8. Poultry
9. Olive oil
10. Wine (moderate drinking)

Consuming lots of the 10 healthy food groups above conferred significant protection against Alzheimer’s and mild cognitive impairment.⁶

The five **dangerous** food groups are:

1. Red meats
2. Butter and stick margarine
3. Cheese
4. Pastries and sweets
5. Fried/fast food

By reducing one’s intake of the five brain-damaging foods listed above, significant protection against Alzheimer’s and mild cognitive impairment was conferred.⁶

This does not mean one can never consume any of the five bad food groups. Individuals can still follow a MIND diet if they reduce consumption of these **brain-damaging** foods listed on the next column:

Brain-Damaging Foods

Here are the five **brain-damaging** foods to reduce or avoid:

1. Pastries and sweets to under five servings per week
2. Red meat to under four servings per week
3. Cheese to under one serving per week
4. Butter or margarine to under one tablespoon per day
5. Fried/fast foods to under one serving per week

On a personal note, I don’t find the above restrictions confining, and I don’t think many readers of this magazine will either.

Components of the MIND Diet

The name of the **MIND** diet study is:

*“**MIND** diet associated with reduced incidence of Alzheimer’s disease.”*

It investigated the role of **diet** in the development of **Alzheimer’s disease** in 923 people ages **58** to **98** years for an average period of 4.5 years.

Similar to the **Mediterranean** and **DASH** diets, the **MIND** diet emphasizes natural plant-based foods and limited intake of animal and high-saturated-fat foods. Some of the unique aspects of the MIND diet are that it specifies the consumption of **berries** and **green leafy vegetables**, but does not suggest high fruit consumption.

Researchers found that greater adherence to the **MIND** diet resulted in a markedly slower rate of cognitive decline. The incredible finding from this Rush University study was that strict adherence to the **MIND** diet reduced Alzheimer’s incidence by **52%**.⁶

These findings reveal the robust impact that **dietary choices** have in maintaining brain health.

Overcoming Compliance Difficulties

Strict adherence to either a **MIND** or **Mediterranean** diet produced enormous benefits, such as a **50%** or more reduction in **Alzheimer’s** incidence.⁶

Since most Americans ingest a wide range of foods, some good and some bad, the researchers were concerned that their findings would have little real-world value to the





general population because of compliance difficulties.

Researchers then scrutinized the components of various “healthy” diets to identify which foods provided meaningful protection against age-related cognitive deficits and Alzheimer’s disease.

They then sought to identify if ingesting only isolated constituents from Mediterranean or MIND diets would be effective. They were not able to identify specific components of the **Mediterranean diet** that were effective in isolation.

The researchers did discover that by ingesting just modest amounts of the **MIND** diet constituents, such as **berries**, a significant (**35%**) reduction in Alzheimer’s disease risk was observed.⁶

The brain health benefits of **berries** (like strawberries and blueberries) have been demonstrated in other large human observational studies such as the famous **Nurses’ Health Study**.²⁹

These findings are also corroborated by a number of rodent studies showing better memory performance and brain protection in response to eating **berries**.^{11,30-33}

Memory Loss Associated with Alzheimer’s Reversed for First Time

In the introduction of this editorial, I briefly described a study of 10 elderly people that showed **memory loss** associated with Alzheimer’s disease could be reversed.¹

This is of particular significance to those already suffering from early- to mid-stage Alzheimer’s dementia.

The approach used in this **UCLA/Buck Institute** study was personalized to each patient, based on extensive testing to determine what is affecting the brain’s plasticity signaling network. Here is a sample of some of the strategies used on the therapeutic program to reverse **memory loss** in nine out of 10 of the patients:

- Eliminating all simple carbohydrates, gluten, and processed food from the diet, and eating more vegetables, fruits, and non-farmed fish
- Meditating twice a day and beginning yoga to reduce stress
- Sleeping seven to eight hours per night, up from four to five
- Taking melatonin, methylcobalamin, vitamin D3, fish oil, and coenzyme Q10 each day
- Optimizing oral hygiene by using an electric flosser and electric toothbrush
- Reinstating hormone replacement therapy, which had previously been discontinued
- Fasting a minimum of 12 hours between dinner and breakfast, and a minimum of three hours between dinner and bedtime
- Exercising a minimum of 30 minutes, four to six days per week

The one patient that failed to show improvement was unable to comply with all of the components of **UCLA/Buck Institute** protocol. Nine out of 10 people in this study who did comply showed **reversals** in measurements of memory loss.

The lead researcher of this study admits that the program’s downsides are its complexity and that the burden falls on patients and caregivers to follow it.

It’s interesting to note that three of the **dietary supplements** used in this study (CoQ10, methylcobalamin, and melatonin) were first introduced to Americans by **Life Extension**.²⁸

The more encouraging news comes from the study done at **Rush University** on a much larger group of elderly people that shows even modest improvements in dietary patterns dramatically reduce Alzheimer’s risk.

Not Everyone Can Afford Blueberries

Buying blueberries in stores can be quite expensive. A prime factor keeping prices high is the shipping of the heavy blueberries and the high rate of spoilage if they are not sold and eaten quickly.

A more cost-effective way of obtaining the active components in blueberries is to take a standardized **blueberry extract** supplement each day. These are remarkably inexpensive because spoilage and high shipping costs are not an issue.

This magazine has published numerous articles extolling the neuroprotective effects of blueberries and their extracts.³⁸⁻⁴³ This information has also garnered popular media reports based on scientific studies that found **blueberries** improve cognitive performance and protect against senile structural changes in the brain.⁴⁴⁻⁴⁶

We urge our customers to include **berries** as part of their regular diet, and if this is not possible, take advantage of the convenience and low cost of standardized **blueberry extract** capsules.

After I wrote this article, several more studies were published showing markedly lower **dementia risk** in those who adhered more to a **Mediterranean** diet.⁴⁷⁻⁴⁹

The incredible message is that senility of the brain is largely optional. If people follow even modestly healthy dietary patterns, the risk of losing their mind can be greatly reduced.

For longer life,



William Faloon

References

1. Bredesen DE. Reversal of cognitive decline: a novel therapeutic program. *Aging (Albany NY)*. 2014;6(9):707-17.
2. Available at: https://www.alz.org/downloads/facts_figures_2012.pdf. Accessed January 13, 2016.
3. Conner TS, Brookie KL, Richardson AC, et al. On carrots and curiosity: eating fruit and vegetables is associated with greater flourishing in daily life. *Br J Health Psychol*. 2015;20(2):413-27.
4. Shukitt-Hale B, Bielinski DF, Lau FC, et al. The beneficial effects of berries on cognition, motor behaviour and neuronal function in ageing. *Br J Nutr*. 2015;114(10):1542-9.
5. Ngandu T, Lehtisalo J, Solomon A, et al. A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring versus control to prevent cognitive decline in at-risk elderly people (FINGER): a randomised controlled trial. *Lancet*. 2015;385(9984):2255-63.
6. Morris MC, Tangney CC, Wang Y, et al. MIND diet associated with reduced incidence of Alzheimer's disease. *Alzheimers Dement*. 2015;11(9):1007-14.
7. Joseph JA, Denisova NA, Arendash G, et al. Blueberry supplementation enhances signaling and prevents behavioral deficits in an Alzheimer disease model. *Nutr Neurosci*. 2003;6(3):153-62.
8. Shukitt-Hale B. Blueberries and neuronal aging. *Gerontology*. 2012;58(6):518-23.
9. Joseph JA, Shukitt-Hale B, Denisova NA, et al. Reversals of age-related declines in neuronal signal transduction, cognitive, and motor behavioral deficits with blueberry, spinach, or strawberry dietary supplementation. *J Neurosci*. 1999;19(18):8114-21.
10. Duffy KB, Spangler EL, Devan BD, et al. A blueberry-enriched diet provides cellular protection against oxidative stress and reduces a kainate-induced learning impairment in rats. *Neurobiol Aging*. 2008;29(11):1680-9.

Immediate Deleterious Brain Impact of Consuming Unhealthy Foods

We usually think it takes a lifetime of **poor dietary** choices to impair our neurological function and brain structure. A recent study found significant indicators of brain damage occur just **four weeks** after eating the wrong kinds of food.

This study evaluated 78 older adults and first fed them a diet high in **simple sugars** and **saturated fats** (a high-glycemic index/high-fat diet). After only **four weeks**, study subjects experienced impaired measures of cognitive function and higher spinal fluid markers indicating brain damage and development of Alzheimer's pathologies (such as tau protein).³⁴

When these same individuals were put on a diet low in **simple sugars** and **saturated fats** (a low-glycemic index/low-saturated-fat diet), measures of cognitive function and spinal fluid indicators of brain damage/Alzheimer's improved.

These findings corroborate observational studies showing that high consumption of **simple carbohydrates** and **saturated fats** are risk factors for pathological brain aging and symptomatic mild cognitive impairment.³⁵⁻³⁷

These findings also help substantiate the remarkable data obtained from the **MIND diet** study (2015), the **UCLA/Buck Institute for Research on Aging** study (2014), the 2014 presentation made by the three women from the **Sharp Again Naturally** (sharpagain.org) charity, and what has long been espoused in this and other health publications.

The take-home lesson from these studies is to follow a dietary pattern consisting of a high intake of berries, monounsaturated and unsaturated fatty acids, and fish, combined with a low intake of simple sugars and saturated fats (especially those derived from beef and dairy).

11. Casadesus G, Shukitt-Hale B, Stellwagen HM, et al. Modulation of hippocampal plasticity and cognitive behavior by short-term blueberry supplementation in aged rats. *Nutr Neurosci*. 2004;7(5-6):309-16.
12. Shukitt-Hale B, Carey AN, Jenkins D, et al. Beneficial effects of fruit extracts on neuronal function and behavior in a rodent model of accelerated aging. *Neurobiol Aging*. 2007;28(8):1187-94.
13. Galli RL, Bielinski DF, Szprengiel A, et al. Blueberry supplemented diet reverses age-related decline in hippocampal HSP70 neuroprotection. *Neurobiol Aging*. 2006;27(2):344-50.
14. Joseph JA, Carey A, Brewer GJ, et al. Dopamine and Abeta-induced stress signaling and decrements in Ca²⁺ buffering in primary neonatal hippocampal cells are antagonized by blueberry extract. *J Alzheimers Dis*. 2007;11(4):433-46.
15. Zafra-Stone S, Yasmin T, Bagchi M, et al. Berry anthocyanins as novel antioxidants in human health and disease prevention. *Mol Nutr Food Res*. 2007;51(6):675-83.
16. Oboh G, Akinyemi AJ, Ademiluyi AO, et al. Inhibitory effect of some tropical green leafy vegetables on key enzymes linked to Alzheimer's disease and some pro-oxidant induced lipid peroxidation in rats' brain. *J Food Sci Technol*. 2014;51(5):884-91.
17. Kang JH, Ascherio A, Grodstein F. Fruit and vegetable consumption and cognitive decline in aging women. *Ann Neurol*. 2005;57(5):713-20.
18. Cordain L, Eaton SB, Sebastian A, et al. Origins and evolution of the Western diet: health implications for the 21st century. *Am J Clin Nutr*. 2005;81(2):341-54.
19. Heidemann C, Schulze MB, Franco OH, et al. Dietary patterns and risk of mortality from cardiovascular disease, cancer, and all causes in a prospective cohort of women. *Circulation*. 2008;118(3):230-7.
20. Yang M, Kenfield SA, Van Blarigan EL, et al. Dietary patterns after prostate cancer diagnosis in relation to disease-specific and total mortality. *Cancer Prev Res (Phila)*. 2015;8(6):545-51.
21. Kesse E, Clavel-Chapelon F, Boutron-Ruault MC. Dietary patterns and risk of colorectal tumors: a cohort of French women of the National Education System (E3N). *Am J Epidemiol*. 2006;164(11):1085-93.
22. Erdelyi I, Levenkova N, Lin EY, et al. Western-style diets induce oxidative stress and dysregulate immune responses in the colon in a mouse model of sporadic colon cancer. *J Nutr*. 2009;139(11):2072-8.
23. Newmark HL, Yang K, Lipkin M, et al. A Western-style diet induces benign and malignant neoplasms in the colon of normal C57Bl/6 mice. *Carcinogenesis*. 2001;22(11):1871-5.
24. Odermatt A. The Western-style diet: a major risk factor for impaired kidney function and chronic kidney disease. *Am J Physiol Renal Physiol*. 2011;301(5):F919-31.
25. Van Kampen E, Jaminon A, van Berkel TJ, et al. Diet-induced (epigenetic) changes in bone marrow augment atherosclerosis. *J Leukoc Biol*. 2014;96(5):833-41.
26. Available at: <http://www.wsj.com/articles/a-diet-might-cut-the-risk-of-developing-alzheimers-1429569168>. Accessed January 13, 2016.
27. Available at: <http://experimentalbiology.org/PDFS/2015/ASN-Morris-Greens-FINAL.aspx>. Accessed January 13, 2016.
28. Available at: http://www.lifeextension.com/about/lef-scientific-achievements-in-health-and-longevity_01. Accessed January 13, 2016.
29. Devore EE, Kang JH, Breteler MM, et al. Dietary intakes of berries and flavonoids in relation to cognitive decline. *Ann Neurol*. 2012;72(1):135-43.
30. Carey AN, Gomes SM, Shukitt-Hale B. Blueberry supplementation improves memory in middle-aged mice fed a high-fat diet. *J Agric Food Chem*. 2014;62(18):3972-8.
31. Malin DH, Lee DR, Goyarzu P, et al. Short-term blueberry-enriched diet prevents and reverses object recognition memory loss in aging rats. *Nutrition*. 2011;27(3):338-42.
32. Andres-Lacueva C, Shukitt-Hale B, Galli RL, et al. Anthocyanins in aged blueberry-fed rats are found centrally and may enhance memory. *Nutr Neurosci*. 2005;8(2):111-20.
33. Papandreou MA, Dimakopoulou A, Linares ZI, et al. Effect of a polyphenol-rich wild blueberry extract on cognitive performance of mice, brain antioxidant markers and acetylcholinesterase activity. *Behav Brain Res*. 2009;198(2):352-8.
34. Bayer-Carter JL, Green PS, Montine TJ, et al. Diet intervention and cerebrospinal fluid biomarkers in amnesic mild cognitive impairment. *Arch Neurol*. 2011;68(6):743-52.
35. Winocur G, Greenwood CE. Studies of the effects of high fat diets on cognitive function in a rat model. *Neurobiol Aging*. 2005;26 Suppl 1:46-9.
36. Craft S, Cholerton B, Baker LD. Insulin and Alzheimer's disease: untangling the web. *J Alzheimers Dis*. 2013;33 Suppl 1:S263-75.
37. Cholerton B, Baker LD, Craft S. Insulin resistance and pathological brain ageing. *Diabet Med*. 2011;28(12):1463-75.
38. Available at: <http://www.lifeextension.com/magazine/1999/9/report2/page-03>. Accessed January 18, 2016.
39. Available at: <http://www.lifeextension.com/magazine/2005/ss/blueberry/page-01>. Accessed January 18, 2016.
40. Available at: http://www.lifeextension.com/magazine/2006/2/report_blueberries/page-01. Accessed January 18, 2016.
41. Available at: <http://www.lifeextension.com/magazine/2006/9/aas/page-01>. Accessed January 18, 2016.
42. Available at: http://www.lifeextension.com/magazine/2007/7/sf_blueberries/page-01. Accessed January 18, 2016.
43. Available at: <http://www.lifeextension.com/magazine/2008/2/maintaining-youthful-cognitive-function-with-blueberries/page-01>. Accessed January 18, 2016.
44. Available at: <http://abcnews.go.com/blogs/health/2012/04/26/are-berries-the-new-brain-food/>. Accessed January 18, 2016.
45. Available at: <http://www.scientificamerican.com/article/your-brain-on-blueberries/>. Accessed January 18, 2016.
46. Available at: <http://www.cnn.com/2015/02/18/health/five-ways-to-eat-yourself-healthier/>. Accessed January 18, 2016.
47. Gu Y, Brickman AM, Stern Y, et al. Mediterranean diet and brain structure in a multiethnic elderly cohort. *Neurology*. 2015;85(20):1744-51.
48. Smyth A, Dehghan M, O'Donnell M, et al. Healthy eating and reduced risk of cognitive decline: A cohort from 40 countries. *Neurology*. 2015;84(22):2258-65.
49. Valls-Pedret C, Sala-Vila A, Serra-Mir M, et al. Mediterranean diet and age-related cognitive decline: a randomized clinical trial. *JAMA Intern Med*. 2015;175(7):1094-103.



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References

1. *Int Angiol.* 2014 Feb;33(1):20-6.
2. *Int J Clin Pharmacol Ther.* 2002 Apr;40(4):158-68.
3. *Int Angiol.* 2015 Feb;34(1):43-52.
4. *Angiology.* 2001 Oct;52 Suppl 2:S69-73.
5. *Angiology.* 2001 Oct;52 Suppl 2:S19-25.

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

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Item #01496 • 60 vegetarian capsules

	Retail Price	Your Price
1 bottle	\$29	\$21.75
4 bottles		\$19.50 each

To order **Blueberry Extract** or **Enhanced Berry Complete with Acai**, call **1-800-544-4440** or visit **www.LifeExtension.com**

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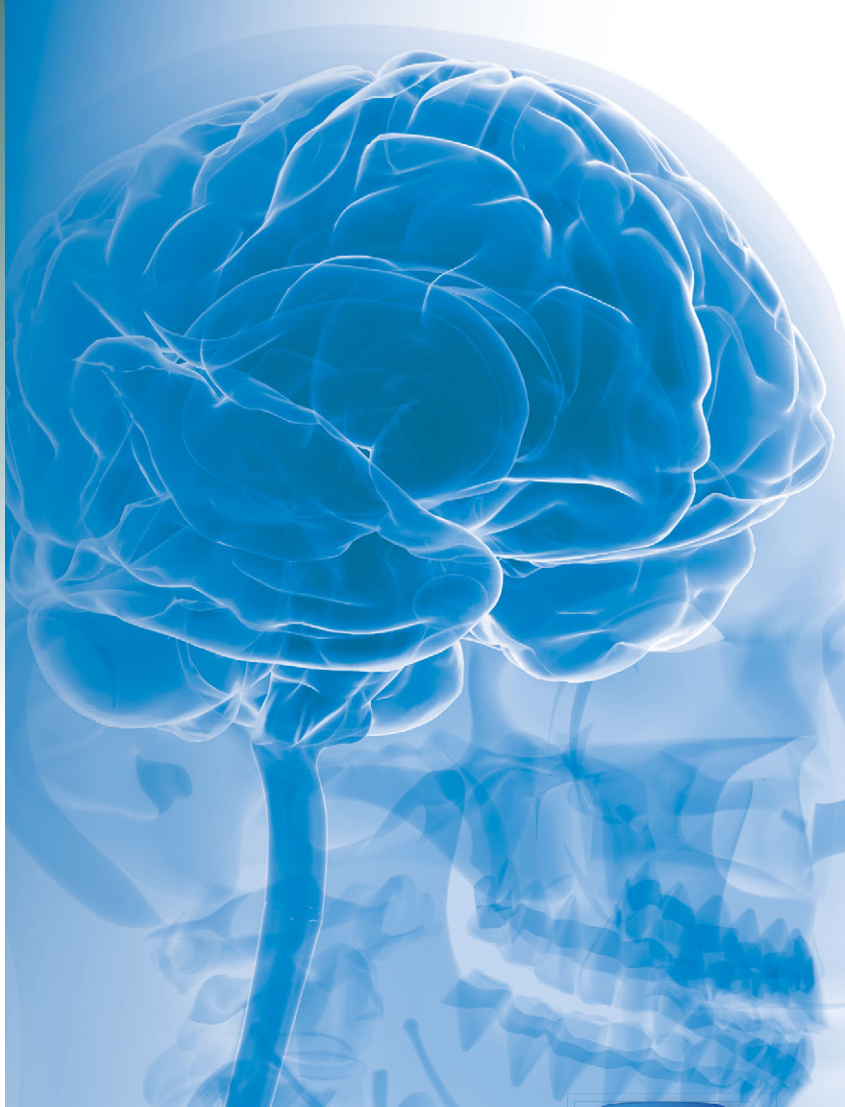
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References

1. *J Neurosci*. 2013 May 8;33(19):8423-41.
2. *Neuron*. 2010 Jan 28;65(2):165-77.
3. *Yale J Biol Med*. 1933 Jul;5(6):545-53.
4. *J Neurosci*. 2011 Oct 19;31(42):14871-81.



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Aspirin Lowers Risk of Advanced Prostate Cancer

According to a new study presented at the American Society of Clinical Oncology Genitourinary Cancers Symposium in San Francisco, men who took greater than three aspirin a week reduced their risk of dying from prostate cancer. In the beginning of the study, the patients were taking a **325 mg** dose three times a week; however, later on some patients switched to the **81 mg** dose.*

Among patients in the early stages of the disease, aspirin helped decrease the risk of developing advanced prostate cancer by **24%**. It also lowered the risk of dying from prostate cancer by **39%**. In the study, the researchers examined over 22,000 men enrolled in the Physicians' Health Study, which began in 1982.

A total of 3,193 men were diagnosed with prostate cancer over the almost 30-year study. Just over 400 men developed lethal prostate cancer. Lethal prostate cancer was defined as either death from prostate cancer or the spread of prostate cancer to other organs.

In addition to alleviating pain and inflammation, aspirin prevents platelets from binding together during the blood clotting process. Because of this, the researchers believe that the common pain reliever may help fight prostate cancer progression by preventing tumor cells from metastasizing to bone.

Editor's Note: "It was after diagnosis of prostate cancer that there appeared to be a benefit," said study author Christopher Allard, adding that aspirin "doesn't affect the incidence, but it affects the progression."

*American Society of Clinical Oncology Genitourinary Cancers Symposium in San Francisco, Jan 7-9, 2016.



Breast Cancer Risk Linked to High-Sugar Diet

A new study published in *Cancer Research* claims that a diet high in sugar may increase the likelihood of breast cancer as well as hasten the spread of the disease to the lungs.*

Study co-author Lorenzo Cohen and colleagues set out to assess how sugar intake influenced breast cancer development in mice that were randomized to various diets, including a sucrose-enriched diet, a fructose-enriched diet, and a starch-control diet.

According to the researchers, the amount of sucrose and fructose the mice consumed was comparable to that found in a typical Western diet, characterized by a high intake of refined sugars, saturated fat and red meat, and a low intake of fresh fruits, vegetables, and whole grains.

Compared with mice fed the starch-control diet, those fed the sucrose- and fructose-enriched diets were more likely to develop breast cancer. The team found **30%** of the mice fed the starch-control diet had breast cancer tumors at 6 months of age, compared with **50%** to **58%** of mice fed the sucrose-enriched diet.

The researchers found that the mice fed a sucrose- or fructose-enriched diet had significantly more tumors on the lungs than those fed the starch-control diet, suggesting high sugar intake speeds up breast cancer metastasis.

The team found that dietary fructose and sucrose increased 12-lipoxygenase (12-LOX) signaling, which increased production of 12-hydroxy-5Z,8Z,10E,14Z-eicosatetraenoic acid (12-HETE) to raise the risk of breast cancer development and metastasis.

Editor's Note: "We determined that it was specifically fructose, in table sugar and high-fructose corn syrup, ubiquitous within our food system, which was responsible for facilitating lung metastasis and 12-HETE production in breast tumors," said Professor Cohen, of the University of Texas MD Anderson Cancer Center.

**Canc Res.* 2016 Jan 4.



Low Vitamin D Levels Linked to Increased Leukemia Rates

On December 4, 2015, *PLOS One* reported the findings of an increased risk of leukemia in environments with a lower level of ultraviolet B (UVB) irradiance, which reduces the amount of vitamin D manufactured by the body.*

The researchers utilized leukemia incidence rates from the International Agency for Cancer Research and cloud cover data from the NASA International Satellite Cloud Climatology Project for 172 countries. They found a correspondence between higher leukemia rates and residence in countries closer to the poles, including Australia, the United States, Ireland, Canada, and New Zealand, while equatorial countries, including Bolivia, Nigeria, and Samoa had lower rates.

"These results suggest that much of the burden of leukemia worldwide is due to the epidemic of vitamin D deficiency we are experiencing in winter in populations distant from the equator," commented co-author Cedric Garland, DrPH.

Editor's Note: "People who live in areas with low solar ultraviolet B exposure tend to have low levels of vitamin D metabolites in their blood," Dr. Garland explained. "These low levels place them at high risk of certain cancers, including leukemia."

**PLOS One*. 2015 Dec 4.

Walnuts Have 21% Fewer Calories than Previously Believed

A new study published in the *Journal of Nutrition* found that a 1-ounce (or 28.35 grams) serving of walnuts has 146 calories, or **21%** fewer than the 185 calories listed in the USDA Nutrient Database.*

The calorie value for walnuts was traditionally determined using the 19th century Atwater factors system, which calculates metabolizable energy (ME), or energy available to the body, for many foods. The study, led by Dr. David J. Baer at the US Department of Agriculture, used the bomb calorimetry method to calculate calories of walnuts metabolized by the study participants.

In the study, the research team looked at 18 healthy adults. Each was randomly assigned a sequence of two diets: a controlled American diet without walnuts for a three-week period and a controlled diet with 1.5 servings of walnuts (**42 grams**) for another three-week period. Total calorie levels were consistent for individual participants across both treatment periods. Administered diets, walnuts, and fecal and urine samples were collected and subject to bomb calorimetry to measure calories, and the resulting data were used to calculate the metabolizable energy of the walnuts.

Editor's Note: "Given the potential health benefits of consuming walnuts, including the reduced risk for cardiovascular disease, it is worthwhile to understand the calorie content of walnuts in the human diet and potentially reduce the barriers to their consumption," said Dr. Baer.

**J Nutr*. 2015 Nov. 18.



Low Testosterone Linked with Alzheimer's Disease Risk

The December 7, 2015, issue of the *Journal of Clinical Oncology* published the results of a case-control study that found the risk of Alzheimer's disease was significantly higher among men who were prescribed androgen deprivation therapy for prostate cancer compared to those who did not receive it.*

Kevin T. Neale and colleagues evaluated medical records from the Stanford health system and New York's Mount Sinai Hospital for 16,888 nonmetastatic prostate cancer patients, of whom 2,397 received androgen deprivation therapy. Men treated with androgen deprivation therapy for various lengths of time were matched with control patients who did not receive the therapy. Researchers discovered that men who received the therapy were **88%** more likely to develop Alzheimer's over follow-up. Longer androgen deprivation therapy duration (equal to or greater than 12 months) was associated with more than double the risk of developing Alzheimer's.

Editor's Note: "Based on the results of our study, an increased risk of Alzheimer's disease is a potential adverse effect of androgen deprivation therapy, but further research is needed before considering changes to clinical practice," Dr. Neale noted. It is regrettable that this therapy must be employed to save the lives of certain prostate cancer patients.

These findings help reinforce a strategy that men with advancing prostate cancer who need to block testosterone production should consider intermittent androgen deprivation therapy, in which therapy is stopped after the PSA falls to a low level, usually after 3-9 months. Androgen deprivation therapy is resumed only if the PSA increases significantly. By carefully monitoring PSA blood levels, androgen deprivation can often be used sparingly to control PSA levels while maintaining quality of life.

**J Clin Oncol*. 2015 Dec 1.



Vitamin D Tied to Surgical Outcome

An article published online December 14, 2015, in the journal *Obesity Science & Practice* reports the findings of researchers at Johns Hopkins University of an association between increased vitamin D status and improved outcome following bariatric surgery for obesity.*

Leigh Peterson, PhD, MHS, and colleagues analyzed data from 932,091 bariatric surgery patients, among whom **64.8%** had surgeries that occurred in northern US latitudes of at least 37 degrees. They found that patients who underwent the surgery in the south and in the summer had fewer complications than those whose procedure took place in the north or winter, which suggests a protective role for vitamin D. Just over **70%** of the cases involving an extended length of stay, defined as over three days in the hospital, occurred in northern latitudes, and extended stays were more common in winter than in the spring, fall, or summer. Wound infection and dehiscence (rupture of a sutured wound) were also more common during winter months.

Editor's Note: "Vitamin D supplementation, an easy and inexpensive treatment, may mitigate these risks and prevent adverse outcomes following bariatric surgery," the authors conclude. "A prospective study measuring preoperative 25(OH)D concentration would strengthen the case for causality in adverse surgical outcomes."

**Obes Sci Prac.* 2015 Dec 14.



Vitamins C and E Associated with Decreased Inflammation in Diabetics

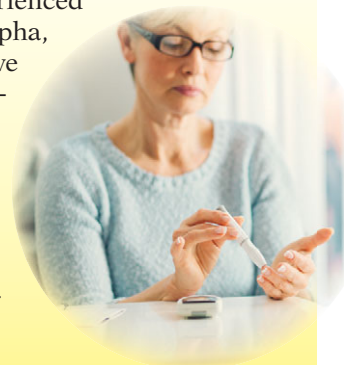
The November-December 2015 issue of *Avicenna Journal of Phytomedicine* published the findings of a trial conducted by Iranian researchers regarding the anti-inflammatory effects of **vitamin C** and **vitamin E** in male diabetics. Elevated blood sugar in overweight diabetics results in higher levels of inflammation, which contributes to insulin resistance.*

In the study, 80 men with type II diabetes were randomized to receive **1,000 mg** ascorbic acid or **300 mg** alpha-tocopherol daily for four weeks. Tumor necrosis factor-alpha (TNF- α), high-sensitivity C-reactive protein (hs-CRP), leptin, serum amyloid A (SAA, expressed in the liver in response to inflammatory stimuli), insulin resistance, and other factors were assessed before and after treatment.

At the end of four weeks, both groups experienced a similar decrease in tumor necrosis factor-alpha, serum amyloid A, and high-sensitivity C-reactive protein, indicating a reduction in inflammation. Leptin levels were also lowered in both groups. Vitamin C supplementation was associated with reduced insulin resistance and fasting insulin.

Editor's Note: The authors observe that it is the first time that oral administration of vitamin C or E was shown to decrease serum leptin levels in diabetic subjects. (Diabetics become leptin resistant, thereby developing higher-than-normal leptin levels.)

**Avicenna J Phytomed.* 2015 Nov-Dec;5(6):531-9.



Osteoporosis Drug Protects Stem Cell DNA

An article published in *Stem Cells* reveals that the bone-loss prevention drug zoledronate protects DNA and extends the life span of mesenchymal stem cells: multipotent connective tissue cells that can differentiate into a number of cell types, including bone, fat, and cartilage cells.*

Mesenchymal stem cells undergo a decline in function following expansion or exposure to radiation. Acting on the finding that zoledronate treatment was associated with improved survival in patients with low-trauma hip fracture versus untreated patients, Ilaria Bellantuono and colleagues at England's University of Sheffield sought to determine whether the drug could extend the life span of human stem cells in culture and, if so, if the mechanism involved protection against DNA damage.

The team found that, not only did zoledronate-treated cells survive longer following expansion and exposure to radiation, but the cells' DNA was better protected.

Editor's Note: "The drug enhances the repair of the damage in DNA occurring with age in stem cells in the bone," reported Dr. Bellantuono. "It is also likely to work in other stem cells. Now we want to understand whether the drug can be used to delay or revert the aging in stem cells in older people and improve the maintenance of tissues such as the heart, muscle, and immune cells, keeping them healthier for longer. We want to understand whether it improves the ability of stem cells to repair those tissues after injury, such as when older patients with cancer undergo radiotherapy."

**Stem Cells.* 2015 Dec 17.

Omega-3 Linked with Improved Survival Following Breast Cancer

The results of an investigation of breast cancer patients found a lower risk of mortality from all causes over a median period of 14.7 years among women with a higher intake of **omega-3 fatty acids** and fish.*

Nikhil K. Khankari, PhD, MPH, and colleagues analyzed data from 1,463 women with breast cancer enrolled in the Long Island Breast Cancer Study Project. Dietary questionnaires completed within three months after diagnosis were analyzed for the intake of fish, omega-3, and omega-6 polyunsaturated fatty acids.

Over a median follow-up period of 14.7 years, there were 485 deaths, of which 210 were attributed to breast cancer. Compared to those who never consumed baked or broiled fish, women whose intake was among the highest one-fourth of subjects had a **25%** lower adjusted risk of dying from any cause over follow-up, and for tuna, the risk was **29%** lower.

Editor's Note: Women among the top **25%** of DHA intake had a **29%** lower risk of death, and for EPA (another fatty acid found in fish), the risk was **34%** and **16%** lower for those among the third and fourth highest groups.

**Cancer*. 2015 Jul 1;121(13)2244-52.



Vitamin K2 Shows Promise as Rheumatoid Arthritis Treatment

The August 2015 issue of the *European Journal of Pharmacology* reports a positive outcome for treatment with **menaquinone-7**, a form of **vitamin K2**, among rheumatoid arthritis (RA) patients.*

The trial included 24 male and 60 female rheumatoid arthritis patients. For the three-month study, 42 subjects received **100 micrograms MK-7** per day in addition to their rheumatoid arthritis medications, while the remainder received only their normal therapeutic regimens. Clinical and biochemical markers—including disease activity score, erythrocyte sedimentation rate, serum undercarboxylated osteocalcin (a bone metabolism marker that is elevated with low vitamin K status), C-reactive protein, and matrix metalloproteinase, an enzyme that degrades collagens and other tissue components correlated with systemic inflammation of rheumatoid arthritis—were assessed before and after the treatment period.

Among those who received MK-7, disease activity score, erythrocyte sedimentation rate, serum undercarboxylated osteocalcin, C-reactive protein, and matrix metalloproteinase decreased significantly from baseline levels.

Editor's Note: The authors remark that MK-7 is significantly less toxic than antirheumatic drugs and it has the additional benefit of protecting against osteoporosis. The longer half-life of MK-7 compared to MK-4 enables the vitamin to be administered in a once-daily low dose.

**Eur J Pharmacol*. 2015 Aug 15;761:273-8.



DHEA Eases Common Postmenopausal Complaint

An article in the March 2016 issue of *Menopause* reports a role for dehydroepiandrosterone (**DHEA**) in relieving vaginal symptoms such as dryness and painful sex in postmenopausal women.*

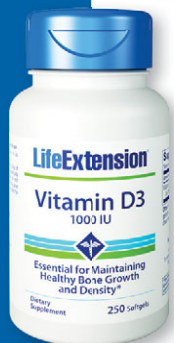
The phase III trial included 482 postmenopausal women, among whom **84%** had moderate to severe vaginal dryness. For 12 weeks, researchers gave 325 women a daily intravaginal DHEA suppository and 157 women were given a placebo. Vaginal symptoms were scored before and after treatment.

Among those who received DHEA, there was an **8.44%** average increase in cells lining the vagina and a **27.7%** decrease in immature precursors to these cells, indicating a reduction in thinning that occurs in the vaginal lining during menopause. Moderate to severe dryness also improved in the DHEA group. Vaginal secretions, tissue color, and vaginal lining integrity and thickness improved on average from **86%** to **121%** among women who received DHEA.

Editor's Note: The group also experienced a reduction in vaginal pH, indicating greater acidity. (A healthy vagina has an acidic pH.)

**Menopause*. 2015 Mar;23(3).





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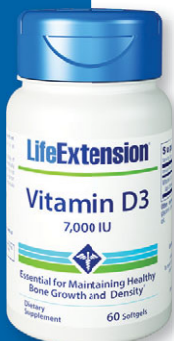


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HOW PQQ *Protects the BRAIN*

PQQ is the acronym for **pyrroloquinoline quinone**.

PQQ remains a little-known essential component of all living things.^{1,2}

It has not become a popular supplement because there currently is a limitation on the amount of PQQ that can be produced. Only a tiny fraction of the American population is able to access it now. That has not stopped scientific exploration into its biological effects.

● Researchers are uncovering how **PQQ** functions as a **neuroprotective** agent that can help protect memory and cognition.

While only discovered about 50 years ago, scientists have been actively exploring the benefits of PQQ in healing the brain.^{3,4}

In an exciting new discovery, PQQ has been found to increase the formation of new nerve cells.⁵

In addition, researchers have found that PQQ can promote growth of new mitochondria!^{6,7} This is an important longevity strategy that can help prevent the diseases of aging.

During the life span, the brain suffers from multiple sources of damage. As these effects accumulate, the result is often the development of neurodegenerative disorders, as well as the risk of stroke from progressive injury to brain blood vessels. Brain trauma is yet another way that the delicate microstructure of brain cells is disrupted, leading to loss of cognition and function.

PQQ has been found to help guard the **brain** against these major brain-threatening processes by a variety of mechanisms related to improving brain energy metabolism.

Threats to the Brain

While **dementia**, **stroke**, and **brain injury** may appear to be unrelated events, they all share fundamental processes that contribute to the eventual **loss of brain cells** and the decline in cognitive abilities.

Mainstream medicine tends to focus on managing each condition *after* it has emerged. By that time, much of the damage has already occurred. A more effective approach is to attack the underlying degenerative processes all at once, *before* irreversible damage is done.

That's what PQQ does.

By launching an all-out attack on underlying pathologic processes, PQQ has been shown to help protect the brain from neurodegenerative diseases, stroke damage, and even the effects of traumatic brain injury.

Let's examine the most common factors that contribute to aging brains and the impact that PQQ supplementation has against each of those factors. This provides an understanding as to how this molecule functions.

PQQ Promotes New Mitochondrial Formation

Recent studies corroborate the unique ability of PQQ to stimulate the *formation* of new mitochondria and improve the function of existing mitochondria.^{6,7}

It would be difficult to overstate the dramatic impact this has on the entire body, especially the brain. Mitochondria are responsible for converting the food we

eat into the energy that powers cells to perform at peak function. Unfortunately, mitochondrial function declines with age. This decline has been linked to virtually all killer diseases of aging, including Parkinson's and Alzheimer's.^{8,9}

Creating new mitochondria is an important longevity strategy that can help ward off the diseases of aging.^{10,11}

Numerous preclinical studies show that PQQ rejuvenates mitochondrial function and restores mitochondria numbers.^{12,13} Importantly, this has led to the prevention of cognitive impairments, and was also shown to improve the **gait** disturbances seen in Parkinson's disease.^{7,14,15}

An exciting human study has further demonstrated that PQQ supplementation improves mitochondrial function.¹⁶ A single dose of PQQ (equaling **13 mg** for an average-sized adult) led to improved measurements of urinary oxidant levels (indicators of mitochondrial efficiency).

This team of scientists also evaluated the impact of a higher daily dose of PQQ supplementation after three days (equaling about **20 mg** per day for an average-sized adult) and found that measurements of **inflammation** (such as **C-reactive protein** and **interleukin-6**) were decreased.

PQQ Promotes Nerve Cell Growth

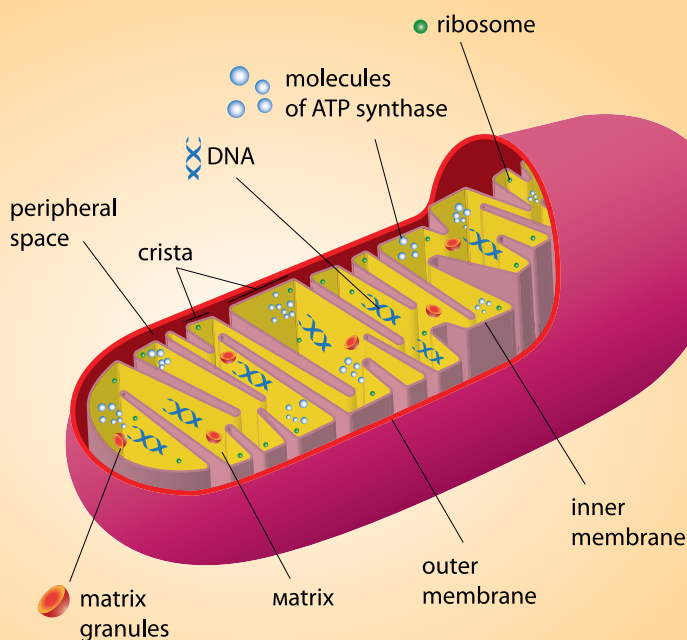
In a stunning development, PQQ was found to stimulate previously unknown healing processes in the brain, leading to the formation of **brand-new nerve cells**. Nerve cells transmit messages throughout the body in order to regulate everything from the nervous system to organ function.

Laboratory experiments have determined that one of the ways PQQ promotes the development of new nerve cells is through stimulation of *nerve growth factor* (NGF) in brain cells.^{17,18} In fact, PQQ proved to be far superior to other molecules aimed at stimulating nerve growth factor in cultures of brain cells.¹⁸

Nerve growth factor is a small protein molecule that is required for the development and maintenance of nerve cells, including many of the cells that are critical for **memory**, **cognition**, and **learning**.¹⁹

Nerve growth factor is particularly important for maintaining nerve *plasticity*, the process by which nerve cells form connections in order to communicate with each other. Essentially, this is what allows us to engage in the process of learning and memory.

By stimulating the production and release of nerve growth factor in cells that support neurons,¹⁷ PQQ has been found to protect memory and cognition in aging animals and humans.^{20,21}



Mitochondrion



What You Need to Know

PQQ Provides Potent Neuroprotection

- The current global epidemic of cognitive decline and dementia threatens everyone's hopes for healthy aging. There is also an increase in strokes and traumatic brain injury.
- The unique chemical compound called PQQ shows the ability to slow or reverse cognitive decline and dementia by targeting a variety of mechanisms.
- Lab studies and animal experiments demonstrate that PQQ promotes brain cell survival and improves cognitive function by protecting cellular metabolic processes and enhancing nature's own healing and protective mechanisms.
- PQQ should form an important part of a supplementation regimen for those concerned about supporting and preserving brain health.

Lab experiments have shown PQQ's ability to promote the healing of injured nerves.^{22,23} In one study, scientists inserted tubes containing PQQ into areas where nerves had been severed.²³ **New nerve tissue** eagerly filled the gaps, increasing the number and diameter of individual fibers, effects not seen in control animals.

Another means by which PQQ impacts new nerve cell development is by protecting nerve **stem** and **progenitor** cells from oxidative damage. This allowed these cells to survive and potentially form **new brain cells**.⁵

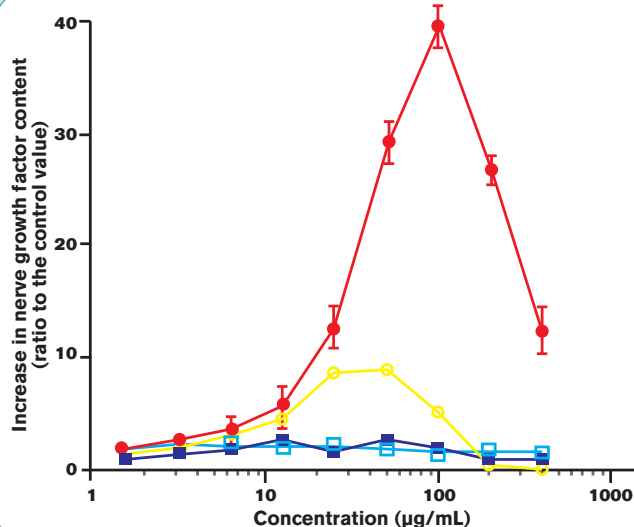
PQQ Protects against Oxidative Damage

Numerous studies demonstrate that PQQ improves **brain function**.

Improvements in learning ability and memory were seen in rats supplemented with PQQ. Researchers attribute this to PQQ's ability to reduce oxidative damage.²⁴

These results were confirmed in a later study of healthy older rats. In this study, PQQ was found to boost the ability of older rats to learn new information and help the animals use that memory after a prolonged period. The researchers attributed this increase both to relief of oxidative damage and also to enhanced production of *nerve growth factor*.²¹

Effect of PQQ on Nerve Growth Factor Production in Cultured Cells



Graph showing increase in nerve growth factor content of cultured cells following exposure to several candidate nerve growth factor-stimulating compounds. Red circles represent PQQ, additional symbols represent other related but less effective compounds.¹⁸

Neurodegenerative Diseases

Oxidative damage is one of the key factors leading to **neurodegenerative diseases**. Studies have demonstrated that PQQ's ability to fight oxidative damage makes it of special interest in treating Parkinson's disease.

Lab studies show that in the presence of PQQ, cells exposed to a toxin that induces oxidative damage are protected against death and fragmentation of their DNA.²⁵ This demonstrates its potential use against Parkinson's.

Ischemic Stroke

PQQ could also play an important role in protecting the brain from the devastation of a stroke.

An ischemic stroke occurs when the loss of blood supply to a specific area of the brain deprives the brain of the essential nutrients/oxygen it needs. The result is **brain cell death** and loss of function reflected in the region of the brain where the damage occurred. Depending on the area affected, this can result in paralysis, memory impairment, and even death.

In lab studies, PQQ reduced ischemic damage, potentially improving the quality of life following a stroke.

This was clearly demonstrated in an animal model of ischemic stroke. When PQQ supplementation was given *before* ischemia was induced, it significantly reduced the size of the damaged brain tissue region. Surprisingly, PQQ had a similar protective effect even when it was administered *after* the ischemia was induced.²⁶

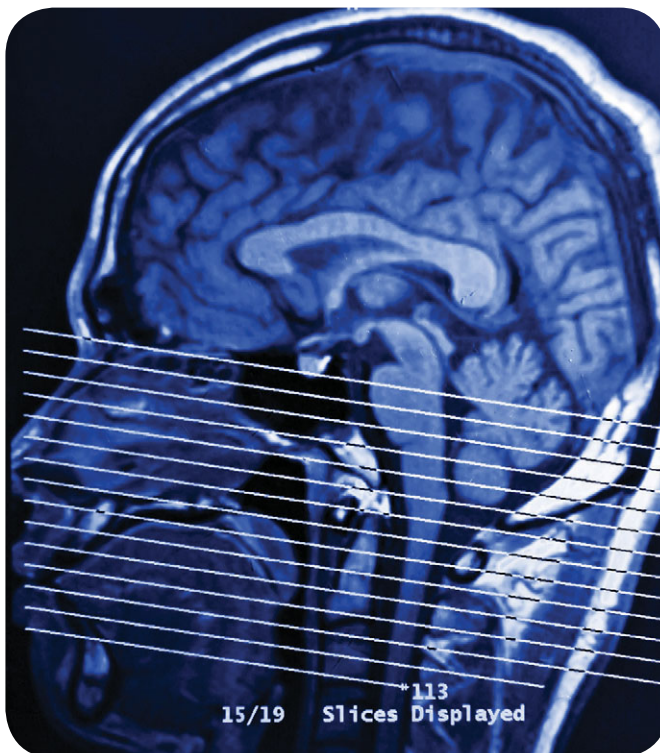
Another study showed similar neuroprotective effects. It also showed that PQQ led to significantly improved neurobehavioral scores after the stroke.²⁷ These findings are tremendously exciting for those working in the area of human stroke prevention and treatment. The implication is that stroke patients could be given PQQ in the emergency room and reduce paralyzing brain damage.

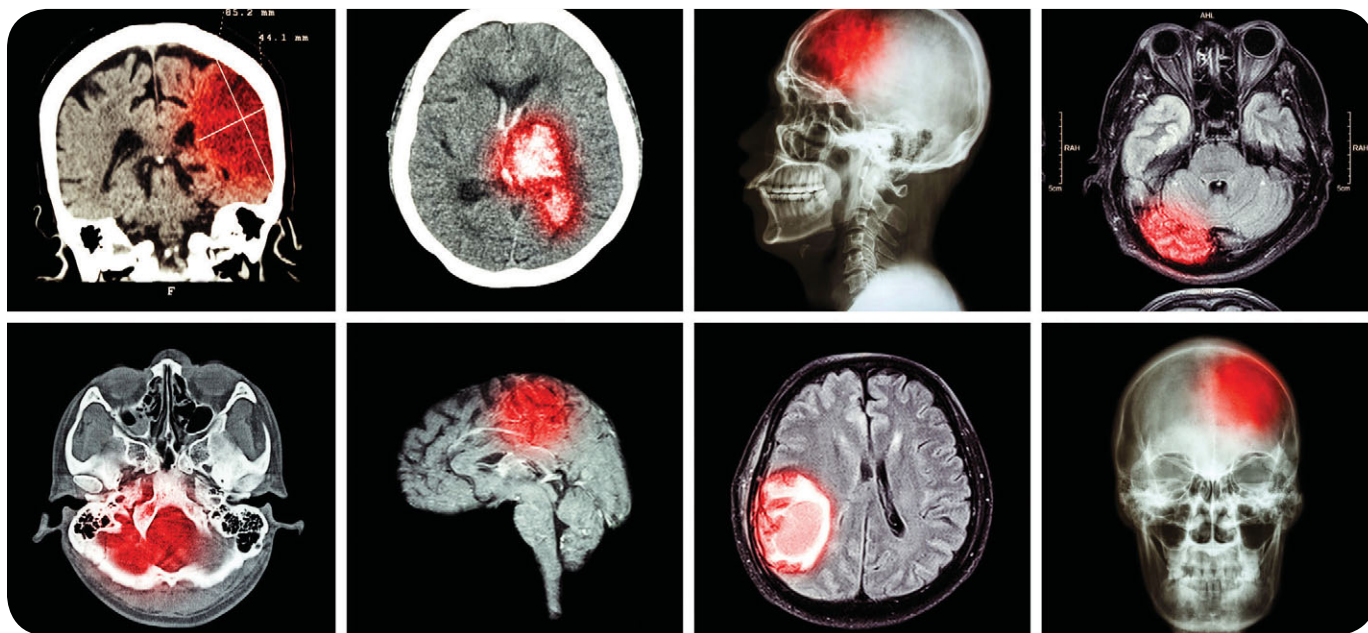
PQQ Reduces Harmful Neuroinflammation

Neuroinflammation directly damages brain cells and accelerates the aging process.^{28,29}

Chronic, low-grade inflammation of the brain is common to many neurodegenerative diseases. It also occurs following a stroke and traumatic brain injury. Other causes of neuroinflammation include infection, oxidative damage, and the effects of high glucose levels.

Studies show that PQQ supplementation markedly reduces harmful neuroinflammation. One of the ways it does this is by inhibiting the production of two pro-inflammatory signaling molecules.³⁰





Neuroinflammation is especially damaging following a traumatic brain injury. In a recent study conducted at the University of Maryland School of Medicine, the researchers argued that inflammation is to blame for many of the symptoms of traumatic brain injury, including brain atrophy and cognitive decline.³¹

Fortunately, an animal study published in the *Journal of Neurotrauma* shows that by protecting against neuroinflammation, PQQ can help to protect against some of the effects of traumatic brain injury.³²

PQQ Protects against Excitotoxicity

Excessive glutamate stimulation of brain cells, or excitotoxicity, is a major factor in the development of long-term neurodegenerative disorders, stroke, and schizophrenia.^{33,34} Glutamate-induced excitotoxicity triggers undesired programmed cell death (apoptosis).³⁵

Fortunately, not only can PQQ help protect against the damaging effects of excitotoxicity, it can also help prevent it from occurring to begin with.

Studies of cultured cells from the hippocampus (the brain's major memory-processing center) reveal that PQQ *reverses* oxidative damage caused by excitotoxicity. PQQ accomplishes this by turning on protective genes and signaling molecules that protect brain cells.^{35,36} PQQ also modulates the cellular receptor that triggers an excitatory response. This helps to prevent these dangerous responses from occurring in the first place.³⁷

In a powerful study demonstrating PQQ's protective effects against excitotoxicity, researchers directly injected rat brains with glutamate.³⁸ As expected, oxidative damage rose abruptly and brain cells began to die off because of the glutamate surge.

However, when rats were given glutamate and PQQ at the same time, it produced an entirely different picture. The presence of PQQ significantly reduced cell death and decreased oxidative damage. As an added benefit, PQQ increased the expression of a host of intracellular protective systems and growth factor regulators, resulting in both protection from damage and a head start on recovery.³⁸

PQQ Prevents Glucose-Induced Brain Damage

One of the least-known consequences of the diabetes epidemic is damage to brain cells from chronic exposure to elevated blood sugar levels. It is alarming that people with diabetes are **60%** more likely to develop dementia.³⁹ In addition, the elevated insulin levels associated with diabetes may also contribute to neurological damage. This has led many scientists to refer to Alzheimer's disease as "type III diabetes."^{40,41}

PQQ can help protect the brain against the damage caused by high blood sugar. When researchers exposed cells from brain blood vessels in the lab to high blood sugar concentrations, it resulted in high rates of cell death.⁴² However, when PQQ was added to the cells' growth medium, it *reversed* the high-glucose damage, *suppressed* cell death, and *reduced* the production of dangerous reactive oxygen species.

These protective effects were also seen in animal studies.^{43,44} In fact, PQQ, at a dose equivalent to about **100 mg** in a human, significantly *reversed* brain cell damage in diabetic mice.⁴⁴ The recommended dose of **PQQ** supplementation for aging humans is **20 mg** each day.

PQQ Inhibits Malformed Brain Proteins

One of the main contributing factors in the development of Alzheimer's and Parkinson's diseases is the accumulation of *malformed proteins*. In Alzheimer's, these are collectively referred to as **beta amyloid**. Beta amyloid proteins cause a tremendous amount of damage and ultimately kill brain cells.⁴⁵

When PQQ was applied to brain cells in culture, it showed impressive abilities to save and revive dying cells. PQQ *reversed* the toxicity of beta amyloid proteins, *prevented* the death of brain cells, *reduced* oxidative damage caused by this malformed protein, and *revived* those cells that had begun to die.⁴⁵

In Parkinson's disease, the abnormal protein deposits in the brain contain tangled fibrils of a protein called **alpha-synuclein** that is toxic to brain tissue. PQQ prevents the formation of these cell-killing fibrils, which helps protect cells against oxidative damage.⁴⁶

Excitement is growing in the scientific community about PQQ's ability to inhibit the formation of toxic protein fibrils in both Alzheimer's and Parkinson's diseases.⁴⁷

Summary

Loss of brain function leads to cognitive decline, memory loss, and a gradual diminution of the self.

While neurodegenerative diseases, strokes, and brain injury appear to be different processes, a look at the cellular events involved show remarkable similarities.

Mainstream medical practice believes these degenerative processes are inevitable. The result is most physicians focus only on clinical endpoints, which is rarely successful in restoring lost cognitive function.

A more rational approach is to address the fundamental problems of neurodegeneration together, with the aim of preventing further damage and restoring what can still be repaired.

PQQ has demonstrated robust effects against major brain-aging pathological processes. ●

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



References

1. Krueger FR, Werther W, Kissel J, et al. Assignment of quinone derivatives as the main compound class composing 'interstellar' grains based on both polarity ions detected by the 'Cometary and Interstellar Dust Analyser' (CIDA) onboard the spacecraft STARDUST. *Rapid Commun Mass Spectrom*. 2004;18(1):103-11.
2. Rucker R, Chowanadisai W, Nakano M. Potential physiological importance of pyrroloquinoline quinone. *Altern Med Rev*. 2009;14(3):268-77.
3. Klinman JP, Bonnot F. Intrigues and intricacies of the biosynthetic pathways for the enzymatic quinocofactors: PQQ, TTQ, CTQ, TPQ, and LTQ. *Chem Rev*. 2014;114(8):4343-65.
4. Available at: <http://www.bioclinicnaturals.com/ca/en/articles/4/conditions-and-diseases/21/neurological-support/show/92/pyrroloquinoline-quinone-a-newly-discovered-vitamin-like-compound>. Accessed January 26, 2016.
5. Guan S, Xu J, Guo Y, et al. Pyrroloquinoline quinone against glutamate-induced neurotoxicity in cultured neural stem and progenitor cells. *Int J Dev Neurosci*. 2015;42:37-45.
6. Kuo YT, Shih PH, Kao SH, et al. Pyrroloquinoline quinone resists denervation-induced skeletal muscle atrophy by activating PGC-1alpha and integrating mitochondrial electron transport chain complexes. *PLoS One*. 2015;10(12):e0143600.
7. Martino Adami PV, Quijano C, Magnani N, et al. Synaptosomal bioenergetic defects are associated with cognitive impairment in a transgenic rat model of early Alzheimer's disease. *J Cereb Blood Flow Metab*. 2015.
8. Devi L, Ohno M. Mitochondrial dysfunction and accumulation of the beta-secretase-cleaved C-terminal fragment of APP in Alzheimer's disease transgenic mice. *Neurobiol Dis*. 2012;45(1):417-24.
9. Das NR, Sharma SS. Cognitive impairment associated with Parkinson's disease: role of mitochondria. *Curr Neuropharmacol*. 2016.
10. Palikaras K, Lionaki E, Tavernarakis N. Interfacing mitochondrial biogenesis and elimination to enhance host pathogen defense and longevity. *Worm*. 2015;4(3):e1071763.
11. Rogers RP, Rogina B. Increased mitochondrial biogenesis preserves intestinal stem cell homeostasis and contributes to longevity in Indy mutant flies. *Aging (Albany NY)*. 2014;6(4):335-50.
12. 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.
13. Stites T, Storms D, Bauerly K, et al. Pyrroloquinoline quinone modulates mitochondrial quantity and function in mice. *J Nutr*. 2006;136(2):390-6.

14. Qin J, Wu M, Yu S, et al. Pyrroloquinoline quinone-conferred neuroprotection in rotenone models of Parkinson's disease. *Toxicol Lett.* 2015;238(3):70-82.
15. Zhang Q, Zhang J, Jiang C, et al. Involvement of ERK1/2 pathway in neuroprotective effects of pyrroloquinoline quinone against rotenone-induced SH-SY5Y cell injury. *Neuroscience.* 2014;270:183-91.
16. Harris CB, Chohanadisai W, Mishchuk DO, et al. Dietary pyrroloquinoline quinone (PQQ) alters indicators of inflammation and mitochondrial-related metabolism in human subjects. *J Nutr Biochem.* 2013;24(12):2076-84.
17. Murase K, Hattori A, Kohno M, et al. Stimulation of nerve growth factor synthesis/secretion in mouse astroglial cells by coenzymes. *Biochem Mol Biol Int.* 1993;30(4):615-21.
18. Yamaguchi K, Sasano A, Urakami T, et al. Stimulation of nerve growth factor production by pyrroloquinoline quinone and its derivatives in vitro and in vivo. *Biosci Biotechnol Biochem.* 1993;57(7):1231-3.
19. Terry AV, Jr., Kutiyawalla A, Pillai A. Age-dependent alterations in nerve growth factor (NGF)-related proteins, sortilin, and learning and memory in rats. *Physiol Behav.* 2011;102(2):149-57.
20. Nakano M, Yamamoto T, Okamura H, et al. Effects of oral supplementation with pyrroloquinoline quinone on stress, fatigue, and sleep. *Funct Foods Health Dis.* 2012;2(8):307-24.
21. Takatsu H, Owada K, Abe K, et al. Effect of vitamin E on learning and memory deficit in aged rats. *J Nutr Sci Vitaminol (Tokyo).* 2009;55(5):389-93.
22. Luo L, Gan L, Liu Y, et al. Construction of nerve guide conduits from cellulose/soy protein composite membranes combined with Schwann cells and pyrroloquinoline quinone for the repair of peripheral nerve defect. *Biochem Biophys Res Commun.* 2015;457(4):507-13.
23. Azizi A, Azizi S, Heshmatian B, et al. Improvement of functional recovery of transected peripheral nerve by means of chitosan grafts filled with vitamin E, pyrroloquinoline quinone and their combination. *Int J Surg.* 2014;12(5):76-82.
24. Ohwada K, Takeda H, Yamazaki M, et al. Pyrroloquinoline quinone (PQQ) prevents cognitive deficit caused by oxidative stress in rats. *J Clin Biochem Nutr.* 2008;42:29-34.
25. Hara H, Hiramatsu H, Adachi T. Pyrroloquinoline quinone is a potent neuroprotective nutrient against 6-hydroxydopamine-induced neurotoxicity. *Neurochem Res.* 2007;32(3):489-95.
26. Jensen FE, Gardner GJ, Williams AP, et al. The putative essential nutrient pyrroloquinoline quinone is neuroprotective in a rodent model of hypoxic/ischemic brain injury. *Neuroscience.* 1994;62(2):399-406.
27. Zhang Y, Feustel PJ, Kimelberg HK. Neuroprotection by pyrroloquinoline quinone (PQQ) in reversible middle cerebral artery occlusion in the adult rat. *Brain Res.* 2006;1094(1):200-6.
28. Covacu R, Brundin L. Effects of neuroinflammation on neural stem cells. *Neuroscientist.* 2015.
29. Verdile G, Keane KN, Cruzat VF, et al. Inflammation and oxidative stress: the molecular connectivity between insulin resistance, obesity, and Alzheimer's disease. *Mediators Inflamm.* 2015;2015:105828.
30. Yang C, Yu L, Kong L, et al. Pyrroloquinoline quinone (PQQ) inhibits lipopolysaccharide induced inflammation in part via downregulated NF-kappaB and p38/JNK activation in microglial and attenuates microglia activation in lipopolysaccharide treatment mice. *PLoS One.* 2014;9(10):e109502.
31. Aungst SL, Kabadi SV, Thompson SM, et al. Repeated mild traumatic brain injury causes chronic neuroinflammation, changes in hippocampal synaptic plasticity, and associated cognitive deficits. *J Cereb Blood Flow Metab.* 2014;34(7):1223-32.
32. Zhang L, Liu J, Cheng C, et al. The neuroprotective effect of pyrroloquinoline quinone on traumatic brain injury. *J Neurotrauma.* 2012;29(5):851-64.
33. Cassano T, Pace L, Bedse G, et al. Glutamate and mitochondria: two prominent players in the oxidative stress-induced neurodegeneration. *Curr Alzheimer Res.* 2016;13(2):185-97.
34. Dawe GB, Auroousseau MR, Daniels BA, et al. Retour aux sources: defining the structural basis of glutamate receptor activation. *J Physiol.* 2015;593(1):97-110.
35. Zhang Q, Shen M, Ding M, et al. The neuroprotective action of pyrroloquinoline quinone against glutamate-induced apoptosis in hippocampal neurons is mediated through the activation of PI3K/Akt pathway. *Toxicol Appl Pharmacol.* 2011;252(1):62-72.
36. Zhang Q, Ding M, Gao XR, et al. Pyrroloquinoline quinone rescues hippocampal neurons from glutamate-induced cell death through activation of Nrf2 and up-regulation of antioxidant genes. *Genet Mol Res.* 2012;11(3):2652-64.
37. Aizenman E, Jensen FE, Gallop PM, et al. Further evidence that pyrroloquinoline quinone interacts with the N-methyl-D-aspartate receptor redox site in rat cortical neurons in vitro. *Neurosci Lett.* 1994;168(1-2):189-92.
38. Zhang Q, Ding M, Cao Z, et al. Pyrroloquinoline quinone protects rat brain cortex against acute glutamate-induced neurotoxicity. *Neurochem Res.* 2013;38(8):1661-71.
39. Chatterjee S, Peters SA, Woodward M, et al. Type 2 diabetes as a risk factor for dementia in women compared with men: a pooled analysis of 2.3 million people comprising more than 100,000 cases of dementia. *Diabetes Care.* 2015.
40. Blazquez E, Velazquez E, Hurtado-Carneiro V, et al. Insulin in the brain: its pathophysiological implications for States related with central insulin resistance, type 2 diabetes and Alzheimer's disease. *Front Endocrinol (Lausanne).* 2014;5:161.
41. Li X, Song D, Leng SX. Link between type 2 diabetes and Alzheimer's disease: from epidemiology to mechanism and treatment. *Clin Interv Aging.* 2015;10:549-60.
42. Wang Z, Chen GQ, Yu GP, et al. Pyrroloquinoline quinone protects mouse brain endothelial cells from high glucose-induced damage in vitro. *Acta Pharmacol Sin.* 2014;35(11):1402-10.
43. Kumar N, Kar A. Pyrroloquinoline quinone (PQQ) has potential to ameliorate streptozotocin-induced diabetes mellitus and oxidative stress in mice: A histopathological and biochemical study. *Chem Biol Interact.* 2015;240:278-90.
44. Kumar N, Kar A. Pyrroloquinoline quinone ameliorates oxidative stress and lipid peroxidation in the brain of streptozotocin-induced diabetic mice. *Can J Physiol Pharmacol.* 2015;93(1):71-9.
45. Zhang JJ, Zhang RF, Meng XK. Protective effect of pyrroloquinoline quinone against Abeta-induced neurotoxicity in human neuroblastoma SH-SY5Y cells. *Neurosci Lett.* 2009;464(3):165-9.
46. Kim J, Harada R, Kobayashi M, et al. The inhibitory effect of pyrroloquinoline quinone on the amyloid formation and cytotoxicity of truncated alpha-synuclein. *Mol Neurodegener.* 2010;5:20.
47. Kim J, Kobayashi M, Fukuda M, et al. Pyrroloquinoline quinone inhibits the fibrillation of amyloid proteins. *Prion.* 2010;4(1):26-31.





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4 bottles		\$12 each

Non-GMO

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References

1. *Food Chem.* 2013;139(1-4):129-37.

2. *Panminerva Med.* 2014;56(3 Suppl 1):1-6.

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PQQ (pyrroloquinoline quinone) activates genes involved in the production of cellular energy.¹⁻⁵

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Also available are **10 mg PQQ caps with BioPQQ®** (Item #1500) and **100 mg Super Ubiquinol CoQ10 with BioPQQ®** (Item #01733).

References

1. *Alt Med Rev.* 2009; 14(3):268-77.
2. *J Nutr.* 2006 Feb;136(2):390-6.

3. *Exp Biol Med (Maywood).* 2003 Feb;228(2):160-6.
4. *Biochim Biophys Acta.* 2006 Nov;1760(11):1741-8.

5. *J Biol Chem.* 2010 Jan 1;285:142-52.
6. *Cardiovasc Drugs Ther.* 2004 Nov;18(6):421-31.

7. *J Cardiovasc Pharmacol Ther.* 2006 Jun;11 (2):119-28.
8. *FOOD Style.* 2009;21:13(7)50-3.



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References

1. Indian J Pharm Sci. 2008 Jul-Aug;70(4):445-9.
2. AAPS J. 2014 Jul;16(4):649-57.
3. Ceska Slov Farm. 2014 Feb;63(1):26-31.

4. AAPS J. 2009 Sep;11(3):495-510.
5. Anesth Analg. 2014 Jun;118(6):1336-44.
6. Zhongguo Zhong Yao Za Zhi. 2014 Oct;39(19):3846-9.
7. Platelets. 2011;22(4):270-6.

8. Phytother Res. 2014 Oct;28(10):1553-60.
9. Pharmacol Res. 2015 May-Jun;95-96C:71-81.
10. Int J Pharmacol. 2009;5(6):333-45.
11. Food Nutr Res. 2009;48(3):148-52.

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MEGA BENFOTIAMINE

PROTECT AGAINST SYSTEMIC GLYCATION

Scientists have known that when blood sugar combines with fats and proteins, the result is known as *glycation* and it produces *accelerated aging*.¹ Even those with blood sugar levels within normal range experience the impact of systemic *glycation* on a daily basis.²

Fortunately, researchers in Japan developed **benfotiamine**, a unique form of vitamin B1 (thiamine) that supports healthy blood sugar metabolism and protects against *glycation*.³⁻⁵ What makes **benfotiamine** especially effective is that unlike ordinary vitamin B1, it is fat soluble and can easily penetrate the inside of cells.⁶ Regular vitamin B1 is water soluble and has a short life span in the body.⁷

Mega Benfotiamine helps inhibit the formation of *advanced glycation end products* (AGEs) to maintain healthy endothelial, retinal, kidney, and nerve cell function.⁸⁻¹²

Each capsule provides **250 mg** of **benfotiamine** and **10 mg** of vitamin B1 (as thiamine HCl). The suggested dose is 1-2 capsules a day for most individuals. Each bottle therefore lasts **2-4 months**.

Non-GMO

References

1. *Drugs & Aging*. 1996 Aug;9(2):69-77.
2. *J Biol Chem*. 2011 Dec 30; 286(52): 44350-6.
3. *J Biochem*. 1954;41:219-44.
4. *Genes Nutr*. 2012 Jul;7(3):459-69.
5. *Diabetes Metab Res Rev*. 2004 Jul-Aug;20(4):330-6.
6. *Acta Diabetol*. 2001;38(3):135-8.
7. *Nutr Res*. 2010 Mar;30(3):171-8.
8. *Nat Med*. 2003 Mar;9(3):294-9.
9. *Diabetes Care*. 2006 Sep;29(9):2064-71.
10. *Ann N Y Acad Sci*. 2005 Jun;1043:777-83.
11. *Pharmacol Res*. 2010 Jun;61(6):482-8.
12. *Ann N Y Acad Sci*. 2005 Jun;1043:784-92.



Mega Benfotiamine

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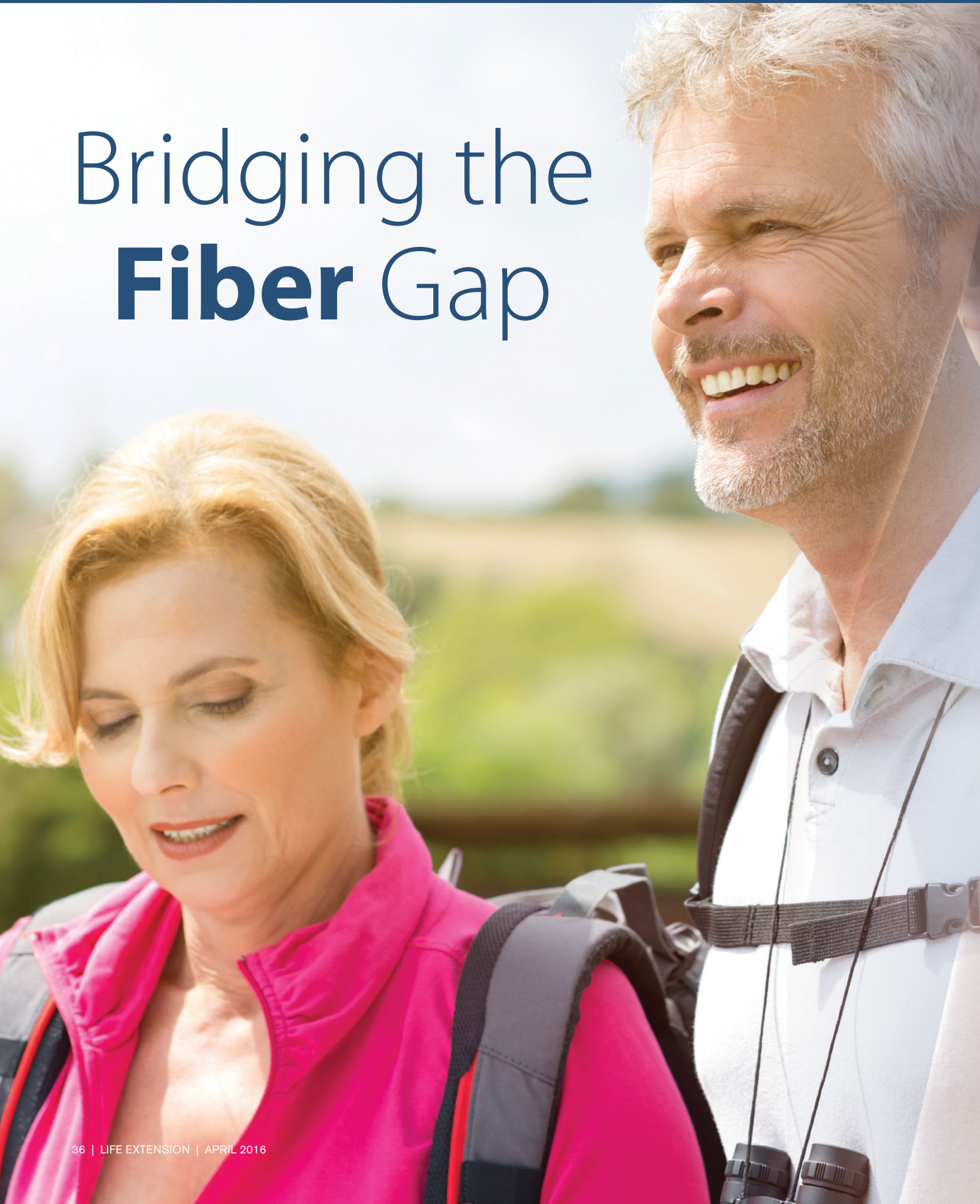
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The **Mitochondrial Energy Optimizer** formula provides **150 mg** of benfotiamine, which when combined with other antiglycation agents like carnosine and pyridoxal-5-phosphate, provides substantial protection at different checkpoint opportunities in the glycation process. Item #01868

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Bridging the **Fiber** Gap



Over 2,000 years ago, Hippocrates said that all disease begins in the gut.

Modern science is proving how right he was.

Scientists are discovering that **fiber** not only boosts digestive health but also contributes to our **immune** function.¹ This makes sense, considering **70% to 80%** of the cells of the immune system are located in the gastrointestinal tract.²

Studies show that dietary **fiber** has multiple properties that improve cardiovascular and metabolic biomarkers—and even extend life span.

Despite its importance, few Americans get the recommended intake of fiber per day through diet alone, making what is called the “**fiber gap**” a public health concern.

To help fill this dietary “gap,” researchers have created a broad-spectrum formula by combining three different fibers that offer immune support and improved intestinal health.

The primary component is a unique fiber called **beta-glucan**. Derived from **baker’s yeast**, beta-glucans are essential for boosting the intestine’s immune system function. Beta-glucans have a unique molecular structure that captures the attention of cells in the **immune system** of the intestine.³⁻⁵

When beta-glucans are blended with two other fiber sources, **psyllium** and fruit from the **African Baobab tree**, the combination offers powerful immune metabolic, and intestinal support.

Beta-Glucans Revive Exhausted Immune Systems

Beta-glucans are crucial weapons in the fight for health and longevity. These molecules naturally boost the immune system by optimizing its response to diseases and infection.⁶

While beta-glucans can be obtained from sources such as shiitake mushrooms and cereal grains, beta-glucans that come specifically from **baker's yeast** have a unique molecular structure that grabs the attention of cells in the **immune system** of the intestine.³⁻⁵

Beta-glucans “prime” the immune system to be ready to respond to threats throughout the entire body. Such priming helps increase the immune system’s responsiveness to foreign molecules, such as those found on bacteria and viruses. In addition, it can assist in the fight against cancer by enhancing the immune system’s ability to detect and destroy malignant cells.⁶

Beta-glucans have numerous actions that help supercharge the immune system:

- Beta-glucans promote the emergence of **T cells**,⁷ which are white blood cells that help the body fight diseases or harmful substances.
- Beta-glucans have been shown to *increase* the body’s **antitumor** immune response, while *decreasing* immune-suppressive cells that cancer cells use as protection against immune detection and destruction.³
- Beta-glucans promote the production of **interferon-gamma**, a powerful antiviral and immune-modulating signaling protein with specific actions against many viruses that cause human disease.⁸
- Finally, beta-glucans from baker’s yeast have been found to increase the salivary levels of immunoglobulin A (IgA) antibodies. **Immunoglobulin A antibodies** are the first line of defense against cold and flu viruses and may help prevent worsening of symptoms.⁹

All of these immune-boosting benefits seen at the cellular level have been shown to have real-world effects. Human studies demonstrate how beta-glucan supplementation can rejuvenate the immune systems of those who need it most.

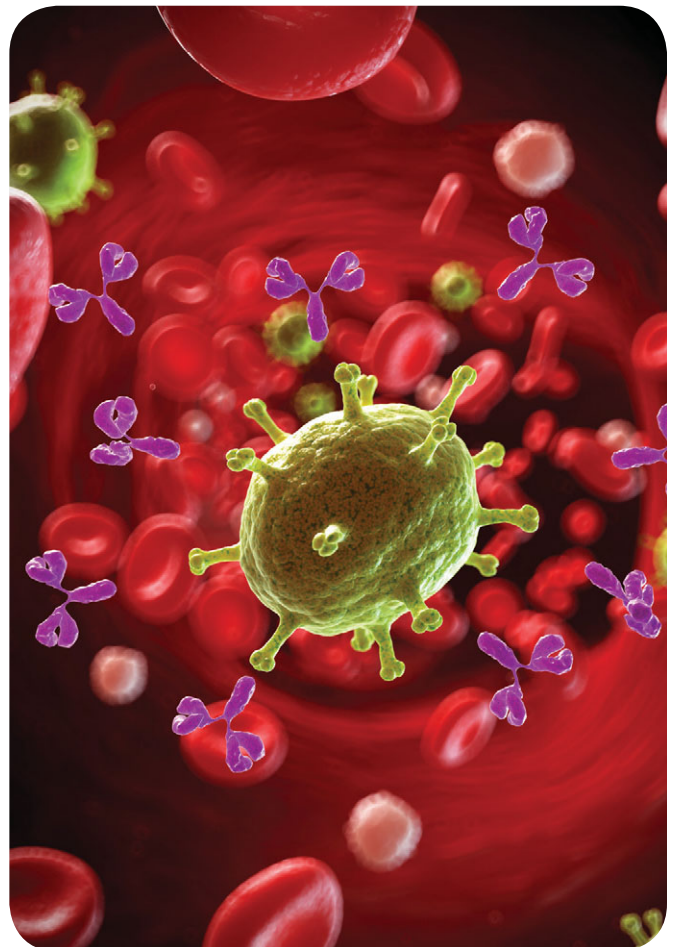
Human Studies

Marathon runners are especially good subjects for the study of immune-boosting supplements because they are particularly susceptible to developing upper respiratory tract infections (colds) after a run.^{9,10}

Beta-glucans have been found to reduce the severity and duration of cold symptoms in marathon runners, demonstrating their ability to *activate* immune cells.

In one study, a daily dose of **250** or **500 mg** of beta-glucans was found to reduce reports of upper respiratory tract infections in the four weeks following a marathon.¹¹ That improvement was also associated with better overall health and decreased confusion, fatigue, tension, and anger, as well as increased vigor, based on a standard **profile of mood state** survey.

A subsequent study showed that marathon athletes who supplemented with beta-glucans demonstrated a significant **37% reduction** in the number of days they presented with cold or flu symptoms in the 28-day period following a marathon, compared with placebo recipients. Levels of salivary antibodies (immunoglobulin A) were also increased by **32%** at two hours following exercise, compared with placebo recipients.⁹





Any form of strenuous exercise temporarily weakens the immune system.¹² For the next study, recreationally active men and women supplemented with **250 mg** per day of beta-glucans. After 10 days, the subjects experienced significant increases in microbe-destroying white blood cells and signaling molecules that promote immune system detection and destruction of viruses and bacteria.¹²

The likely explanation for the reduction in cold or flu symptoms seen in such subjects is that immunoglobulin A is vital in preventing viruses from attaching to the mucous membranes of the mouth, nose, and throat.¹³

Beta-Glucans Battle the Impacts of Stress

Stress also lowers the immune system's resistance to cold symptoms. Beta-glucans from baker's yeast, dosed at **250** or **500 mg** per day for four weeks, reduced such symptoms. Again, these benefits were accompanied by an improvement in overall health and vigor and a reduction in tension, fatigue, and confusion, based on the profile of mood states standard survey.¹⁴

In a group of healthy women with moderate psychological stress, just 12 weeks of supplementation with **250 mg** of beta-glucans per day significantly reduced upper respiratory symptoms by **66%** compared to placebo. Additionally, the women taking beta-glucans experienced a boost in overall well-being scores by more than **8%** and mental/physical energy levels by **21%**.¹⁵

Fiber Trio Provides Critical Immune Support

- Americans suffer from a “fiber gap,” consuming only one-half to two-thirds of the recommended daily amount of dietary fiber.
- This fiber gap contributes not only to suboptimal intestinal health but also to a growing vulnerability to systemic disorders such as cardiovascular and metabolic diseases, as well as inadequate immune function.
- Researchers have identified three forms of fiber that support both immune and intestinal health.
- Beta-glucans from baker's yeast powerfully boost immune function in the intestine, causing effects throughout the whole body.
- Beta-glucans reduce the severity and duration of cold symptoms in stressed humans by activating immune cells through specific molecular mechanisms.
- Psyllium fiber and Baobab fruit powder have proven abilities to release the vital short-chain fatty acids the body needs for optimum immune, cardiovascular, and metabolic function.
- Using these three sources of fiber together can help close the fiber gap in order to ensure total body health.

Another group of people known to be under a tremendous amount of stress are university students. A study published in *Nutrition* analyzed healthy university students at the peak of the cold season for 90 days. In students who developed symptoms during this time, the ones taking **250 mg** per day of beta-glucans showed a clinically relevant reduction in the total number of days with symptoms compared with placebo recipients. The supplemented students also had a statistically significant increase in the ability to “breathe easily.”¹⁶

Protection against an Overactive Immune Response

Allergies are at the other end of the spectrum of immune system disturbances. They are characterized by an **overactive** immune response to foreign matter. Evidence of the *comprehensive immune modulating effect* of beta-glucans comes from a study of ragweed allergy sufferers who are otherwise healthy.¹⁷

At the beginning of the fall ragweed season, subjects began supplementation with either beta-glucan or a placebo for four weeks. Supplementation resulted in significant reductions of **28%** in total allergy symptoms, **52%** in symptom severity, and **37%** in symptom rating on a visual scale.¹⁷

On the profile of mood states scale, supplemented subjects reported significant increases in vigor of **10%**, as well as reductions in tension (**34%**), depression (**45%**), anger (**41%**), fatigue (**38%**), and confusion (**34%**). And on a health survey used in a variety of studies, beta-glucan recipients scored a significant **11%** higher on physical health, **19%** higher on energy, and **7%** higher on emotional well-being, compared with placebo recipients.¹⁷

Finally, the beta-glucan group reported significant reductions in allergy-related sleep problems (**53%**), nasal symptoms (**59%**), eye symptoms (**57%**), and non-nasal symptoms (**50%**), as well as improvements in activities (**53%**), emotions (**57%**), quality of life (**56%**), and improved global mood state (**13%**).¹⁷

Soluble/Insoluble Fiber Types

Dietary fiber comes in two main categories, **soluble** and **insoluble** fiber. Soluble fiber, as the name implies, can dissolve in water. It is the chief source of fermentable fiber that is digested in the colon to produce vital short-chain fatty acids.

Insoluble fiber cannot dissolve in water, and its chief function is to provide bulk to fecal matter. The combination of **beta-glucans**, **psyllium**, and fruit from the **Baobab tree** provide fiber in a ratio of approximately **75%** or more soluble fiber to about **25%** insoluble fiber.



BAKER'S YEAST

An array of research has shown the beneficial effects on the immune system in those that supplement with beta-glucans derived from baker's yeast. Fiber supplementation with **psyllium** and **Baobab fruit** offers an added layer of immune and health-boosting properties as we are about to learn.

Why Is Fiber So Important?

The secret to fiber's dramatic impact on the immune system isn't the fiber itself but what happens to it once it enters the body. Since fiber cannot be broken down by human digestive enzymes, it passes unchanged through the upper parts of our digestive tract. That undigested fiber is then *fermented* by beneficial bacteria living in part of the large bowel known as the colon.¹⁸

Fermentation itself has many benefits, including supporting beneficial gut bacteria. However, it is the breakdown products of the fermentation process that are now recognized as holding the key to improved digestive and total body health.^{18,19}

Those byproducts are primarily **short-chain fatty acids**, specifically *acetate*, *propionate*, and *butyrate*, which nourish and protect the cells lining the colon wall.¹⁸⁻²¹

In addition to serving as beneficial nutrients for cells that line the intestines, recent studies demonstrate that the short-chain fatty acids produced from **soluble fiber** are crucial for **normal immune function**.^{19,20} These are a few of their most potent immune-boosting mechanisms of action:

- They regulate the activity of intestinal white blood cells, modulating their inflammatory responses to potential invaders such as disease-causing bacteria and viruses.²⁰
- They help those white cells produce the chemical signals (cytokines, prostaglandins, and interferons) that direct other immune system cells to sites of infection where they destroy dangerous microbes.²⁰
- They promote the development of regulatory T cells that either increase or decrease the immune response, depending on the nature of the microbe.^{22,23}

It has recently been shown that the effects of these fiber-derived short-chain fatty acids go even further, powerfully modifying the expression of genes involved in immune function and **longevity**.²⁰



Fiber and Metabolic Syndrome

In addition to boosting the immune system through the creation of short-chain fatty acids, fiber also promotes good health by fighting against **metabolic syndrome** (the combination of abdominal obesity, high blood pressure, blood lipid disturbances, and loss of blood sugar control). Metabolic syndrome underlies multiple age-related disorders, promoting diabetes, cardiovascular disease, cancer, major depression, and even osteoporosis, among other preventable conditions.²⁴⁻²⁶ Sufficient fiber in the diet is turning out to be essential in the fight against all of these conditions.

As early as 1981, there was evidence that improving fiber intake could help manage blood sugar levels in type II diabetics.²⁷

Numerous studies have since confirmed that soluble fibers can lead to reductions in fasting and after-meal blood sugar, as well as beneficial reductions in insulin levels (high insulin is associated with cancer promotion). A reduction in blood cholesterol, triglycerides, and blood pressure was also found.²⁸⁻³⁸ Other research demonstrates fiber-induced reductions in the response of appetite-promoting hormones, which may help to produce a sense of fullness and prevent over-eating.³⁹

Two fibers, **psyllium** and **Baobab fruit**, have been found to have specific benefits against **metabolic syndrome**. In addition, psyllium is rich in soluble fiber, which ferments the short-chain fatty acids that are so critical to maintaining a strong **immune** system. Let's look at each one of these fibers.

Psyllium Fiber

Psyllium is the fiber obtained from the seed husks of a plantain (unrelated to the edible plantains found in many markets). When compared to the fiber in wheat bran, **psyllium** leads to greater production of beneficial **short-chain fatty acids** (specifically *butyrate*, *propionate*, and *acetate*) throughout the colon, perhaps because it is more rapidly fermented by colonic bacteria.⁴⁰

Butyrate has vital **anti-inflammatory** properties.^{41,42} In an experimental rat model of ulcerative colitis (an inflammatory bowel disease), psyllium fiber supplementation reduced colonic inflammation, while decreasing the concentrations of important pro-inflammatory signaling molecules, such as *leukotriene B4* and *tumor necrosis factor alpha*.⁴²

While perhaps most known for its ability to combat constipation, recent human studies have revealed that psyllium is a proven weapon in the fight against metabolic syndrome and its devastating consequences.³⁷ When used regularly, psyllium has been shown to beneficially impact cholesterol, blood sugar, and digestive health.

Cholesterol

Studies have shown that increased psyllium fiber intake translated into reductions in plasma triglycerides and low-density ("bad") cholesterol.^{37,43,44} In a study involving type II diabetics, 12-week supplementation with **15 grams** of psyllium daily significantly reduced plasma triglycerides by **25.5%**, total cholesterol by **9.3%**, and LDL cholesterol by **15.71%**, while significantly raising levels of high-density ("good") cholesterol in comparison to the placebo group.³⁷

Smaller doses show benefits as well, with a **6-gram** per day dose of psyllium leading to a **6%** reduction in LDL cholesterol.³²

Blood Sugar

On the blood sugar front, a daily dose of **15 grams** (three **5-gram** doses) produced a reduction in fasting blood glucose levels in patients with type II diabetes.³⁷ Another study found reductions in all-day glucose levels (**11%**) and after-lunch glucose levels (**19%**) among psyllium recipients, compared with placebo.⁴⁵

A similar dose of psyllium, **14 grams** per day, reduced glucose absorption from a meal by more than **12%**, contributing to a reduction in blood sugar.⁴⁴

In type II diabetics specifically, two months of psyllium treatment effectively optimized metabolic control, significantly reducing body mass index, waist circumference, hemoglobin A1c (a measure of long-term glucose control), and fasting blood sugar levels.⁴³

Digestive Health

Psyllium is best known for its ability to combat constipation. The seed husks swell greatly in water, which aids patients with constipation by providing bulk and retaining water in stools. Animal studies show that psyllium fiber increases fecal weight and water content more effectively than twice the dose of wheat bran fiber, while also increasing the water content of feces.⁴⁰

And human studies have demonstrated psyllium fiber's ability to reduce fecal incontinence by more than **50%** compared with placebo, while increasing fecal water-holding capacity.⁴⁶⁻⁴⁸ In addition, it has

been shown to effectively lower symptom severity in patients with irritable bowel syndrome (IBS) significantly better than placebo or bran.⁴⁹

Baobab Fruit Powder: Unique and Novel Source of Fiber

The powdered, dried fruit of the **Baobab tree** completes this protective fiber trio. Like psyllium, it has the ability to promote gut health while also defending against metabolic syndrome.

Baobab fruit has a long history of health-promoting effects on the gastrointestinal tract, particularly in the treatment of infantile diarrhea.⁵⁰ But Baobab fruit pulp may also have unique prebiotic properties. This was demonstrated by a study showing that a **4%** solution of the fruit pulp promoted growth of the probiotic *Lactobacillus rhamnosus*, an organism important in human intestinal health.⁵¹

Baobab fruit can also help defend against **metabolic syndrome** and diabetes by slowing the rate of

Fiber: A Matter of Life and Death

Fiber has long been viewed simply as a way to support regular, normal bowel movements (i.e., to overcome constipation).⁵⁵ However, recent studies show a strong association between insufficient dietary fiber intake and the risk of dying from any cause. A large meta-analysis with nearly a million subjects showed that, compared with people with the lowest one-third of fiber intake, those in the highest third had a **16% reduction** in the risk of death. Each **10-gram** per day increase in fiber led to an additional **10% reduction** in the risk of death.⁵⁶

And a study conducted by the National Institutes of Health (NIH) and the American Association of Retired Persons (AARP) revealed that, compared with the lowest one-fifth, those with the highest one-fifth of fiber intake had a **22% reduction** in the risk of dying from any cause.⁵⁷ This study also showed reductions in the risk of dying from cardiovascular disease, infections, and respiratory diseases of **34%** to **59%** in women and **24%** to **56%** in men.

The United States Department of Agriculture (USDA) recommends daily fiber intakes of **28 grams** per day for men over 50 and **22 grams** per day for women in that age group.⁵⁸ However, the average American's fiber intake is a meager **16 grams** per day, a shortfall of **43%** for men and **27%** for women.⁵⁹

The problem is that it is difficult to get the recommended amounts of fiber purely from food. And, while many people believe that whole-grain foods and nuts are a good fiber source, few such foods in fact supply the recommended **3 grams** or more per serving of fiber.⁵⁵

Because of the health benefits that dietary fiber has on human health, this "fiber gap" has been identified as a major public health concern.⁵⁵

In response to the fiber gap that is so pervasive in the American diet, scientists have formulated a fiber combination aimed at closing that gap, a combination that includes **beta-glucans**, **psyllium**, and **Baobab fruit**.

This unique combination of fibers provides **6 grams** of fiber per serving. The recommended daily fiber intake for men and women are **28** and **22 grams** per day, respectively.⁵⁸ Given the average American's daily fiber intake of **16 grams**, one serving for women and two servings for men would bring total fiber consumption up to the daily recommendation by the USDA for men and women over 50.

Increasing fiber intake to and above recommended values can provide many health benefits, including reductions in risks for metabolic syndrome, cardiovascular disease, diabetes, cancer, and more.



digestion of carbohydrates. In a human study, dried Baobab fruit powder reduced the amount of rapidly digestible starch from white bread samples, an effect that lowered the resulting blood sugar response when people consumed the bread.⁵² This reduction in **glycemic response** is an important approach to lowering the damaging effects of blood sugar elevations, particularly following meals.^{53,54}

Summary

While many people continue to think of dietary fiber as an aid to intestinal function only (e.g., preventing constipation), in reality fiber has taken on tremendous importance for supporting a healthy immune system and the health of the entire body.

Fiber molecules are fermented in the colon to produce valuable short-chain fatty acids that affect health in numerous ways—from preventing colon cancer and boosting immune function to modifying the metabolism to better cope when fats and sugars consumed.

A combination of **three forms** of fiber offers both immune and intestinal health support.

Beta-glucans “prime” the **immune system**, increasing its responsiveness to foreign molecules such as those found on bacteria and viruses, while enhancing its ability to detect and destroy malignant cells.

Psyllium fiber is a rich source of soluble fiber that produces beneficial short-chain fatty acids. It is a proven weapon in the fight against **metabolic syndrome** and its devastating consequences.

The powdered, dried fruit of the **Baobab tree** completes this protective trio, offering a boost to beneficial gut bacteria and slowing the surge of glucose into the bloodstream that occurs after a carbohydrate meal, helping to further defend against metabolic syndrome and diabetes.

Without ample fiber intake, people risk more than constipation. Rather, they place themselves in unnecessary peril of serious but preventable immune, cardiovascular, and metabolic disorders. Using these three sources of fiber together can help close the fiber gap in order to ensure total body health. ●

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

References

1. Sherry CL, Kim SS, Dilger RN, et al. Sickness behavior induced by endotoxin can be mitigated by the dietary soluble fiber, pectin, through up-regulation of IL-4 and Th2 polarization. *Brain Behav Immun.* 2010;24(4):631-40.
2. Furness JB, Kunze WA, Clerc N. Nutrient tasting and signaling mechanisms in the gut. II. The intestine as a sensory organ: neural, endocrine, and immune responses. *Am J Physiol.* 1999;277(5 Pt 1):G922-8.
3. Tian J, Ma J, Ma K, et al. beta-Glucan enhances antitumor immune responses by regulating differentiation and function of monocytic myeloid-derived suppressor cells. *Eur J Immunol.* 2013;43(5):1220-30.
4. Qi C, Cai Y, Gunn L, et al. Differential pathways regulating innate and adaptive antitumor immune responses by particulate and soluble yeast-derived beta-glucans. *Blood.* 2011;117(25):6825-36.
5. Goodridge HS, Reyes CN, Becker CA, et al. Activation of the innate immune receptor Dectin-1 upon formation of a ‘phagocytic synapse’. *Nature.* 2011;472(7344):471-5.
6. Akramiene D, Kondrotas A, Didziapetriene J, et al. Effects of beta-glucans on the immune system. *Medicina (Kaunas).* 2007;43(8):597-606.
7. Kim HS, Hong JT, Kim Y, et al. Stimulatory effect of β -glucans on immune cells. *Immune Netw.* 2011;11(4):191-5.
8. Javmen A, Nemeikaite-Ceniene A, Bratchikov M, et al. Beta-glucan from *Saccharomyces cerevisiae* induces IFN-gamma production in vivo in BALB/c mice. *In Vivo.* 2015;29(3):359-63.
9. McFarlin BK, Carpenter KC, Davidson T, et al. Baker’s yeast beta glucan supplementation increases salivary IgA and decreases cold/flu symptomatic days after intense exercise. *J Diet Suppl.* 2013;10(3):171-83.
10. Gill SK, Teixeira AM, Rosado F, et al. The impact of a 24-h ultra-marathon on salivary antimicrobial protein responses. *Int J Sports Med.* 2014;35(11):966-71.
11. Talbott S, Talbott J. Effect of BETA 1, 3/1, 6 GLUCAN on upper respiratory tract infection symptoms and mood state in marathon athletes. *J Sports Sci Med.* 2009;8(4):509-15.
12. Carpenter KC, Breslin WL, Davidson T, et al. Baker’s yeast beta-glucan supplementation increases monocytes and cytokines post-exercise: implications for infection risk? *Br J Nutr.* 2013;109(3):478-86.
13. Available at: <http://www.ncbi.nlm.nih.gov/books/NBK27162/>. Accessed January 14, 2016.

14. Available at: <http://www.doveclinic.co.uk/downloads/contributed-ocs/Lifestylestresspaper.pdf>. Accessed January 14, 2016.
15. Talbott SM, Talbott JA. Baker's yeast beta-glucan supplement reduces upper respiratory symptoms and improves mood state in stressed women. *J Am Coll Nutr*. 2012;31(4):295-300.
16. Fuller R, Butt H, Noakes PS, et al. Influence of yeast-derived 1,3/1,6 glucopolysaccharide on circulating cytokines and chemokines with respect to upper respiratory tract infections. *Nutrition*. 2012;28(6):665-9.
17. Talbott SM, Talbott JA, Talbott TL, et al. beta-glucan supplementation, allergy symptoms, and quality of life in self-described ragweed allergy sufferers. *Food Sci Nutr*. 2013;1(1):90-101.
18. May T, Mackie RI, Fahey GC, Jr., et al. Effect of fiber source on short-chain fatty acid production and on the growth and toxin production by *Clostridium difficile*. *Scand J Gastroenterol*. 1994;29(10):916-22.
19. Slavin J. Fiber and prebiotics: mechanisms and health benefits. *Nutrients*. 2013;5(4):1417-35.
20. Vinolo MA, Rodrigues HG, Nachbar RT, et al. Regulation of inflammation by short chain fatty acids. *Nutrients*. 2011;3(10):858-76.
21. Le Poul E, Loison C, Struyf S, et al. Functional characterization of human receptors for short chain fatty acids and their role in polymorphonuclear cell activation. *J Biol Chem*. 2003;278(28):25481-9.
22. Furusawa Y, Obata Y, Fukuda S, et al. Commensal microbe-derived butyrate induces the differentiation of colonic regulatory T cells. *Nature*. 2013;504(7480):446-50.
23. Kim CH, Park J, Kim M. Gut microbiota-derived short-chain fatty acids, T cells, and inflammation. *Immune Netw*. 2014;14(6):277-88.
24. Okada-Iwabu M, Iwabu M, Ueki K, et al. Perspective of small-molecule adipoR agonist for type 2 diabetes and short life in obesity. *Diabetes Metab J*. 2015;39(5):363-72.
25. Phillips CM, Perry IJ. Depressive symptoms, anxiety and well-being among metabolic health obese subtypes. *Psychoneuroendocrinology*. 2015;62:47-53.
26. Yilmaz Y. Review article: non-alcoholic fatty liver disease and osteoporosis--clinical and molecular crosstalk. *Aliment Pharmacol Ther*. 2012;36(4):345-52.
27. Aro A, Uusitupa M, Voutilainen E, et al. Improved diabetic control and hypocholesterolaemic effect induced by long-term dietary supplementation with guar gum in type 2 (insulin-independent) diabetes. *Diabetologia*. 1981;21(1):29-33.
28. Smith U, Holm G. Effect of a modified guar gum preparation on glucose and lipid levels in diabetics and healthy volunteers. *Atherosclerosis*. 1982;45(1):1-10.
29. Todd PA, Benfield P, Goa KL. Guar gum. A review of its pharmacological properties, and use as a dietary adjunct in hypercholesterolaemia. *Drugs*. 1990;39(6):917-28.
30. Landin K, Holm G, Tengborn L, et al. Guar gum improves insulin sensitivity, blood lipids, blood pressure, and fibrinolysis in healthy men. *Am J Clin Nutr*. 1992;56(6):1061-5.
31. Fairchild RM, Ellis PR, Byrne AJ, et al. A new breakfast cereal containing guar gum reduces postprandial plasma glucose and insulin concentrations in normal-weight human subjects. *Br J Nutr*. 1996;76(1):63-73.
32. De Bock M, Derraik JG, Brennan CM, et al. Psyllium supplementation in adolescents improves fat distribution & lipid profile: a randomized, participant-blinded, placebo-controlled, crossover trial. *PLoS One*. 2012;7(7):e41735.
33. Hunninghake DB, Miller VT, LaRosa JC, et al. Long-term treatment of hypercholesterolemia with dietary fiber. *Am J Med*. 1994;97(6):504-8.
34. Gatenby SJ, Ellis PR, Morgan LM, et al. Effect of partially depolymerized guar gum on acute metabolic variables in patients with non-insulin-dependent diabetes. *Diabet Med*. 1996;13(4):358-64.
35. Blake DE, Hamblett CJ, Frost PG, et al. Wheat bread supplemented with depolymerized guar gum reduces the plasma cholesterol concentration in hypercholesterolemic human subjects. *Am J Clin Nutr*. 1997;65(1):107-13.
36. Jensen CD, Haskell W, Whittam JH. Long-term effects of water-soluble dietary fiber in the management of hypercholesterolemia in healthy men and women. *Am J Cardiol*. 1997;79(1):34-7.
37. Rodriguez-Moran M, Guerrero-Romero F, Lazcano-Burciaga G. Lipid- and glucose-lowering efficacy of plantago psyllium in type II diabetes. *J Diabetes Complications*. 1998;12(5):273-8.
38. Anderson JW, Baird P, Davis RH, Jr., et al. Health benefits of dietary fiber. *Nutr Rev*. 2009;67(4):188-205.
39. Karhunen LJ, Juvonen KR, Flander SM, et al. A psyllium fiber-enriched meal strongly attenuates postprandial gastrointestinal peptide release in healthy young adults. *J Nutr*. 2010;140(4):737-44.
40. Edwards CA, Eastwood MA. Comparison of the effects of ispaghula and wheat bran on rat caecal and colonic fermentation. *Gut*. 1992;33(9):1229-33.
41. Meijer K, de Vos P, Priebe MG. Butyrate and other short-chain fatty acids as modulators of immunity: what relevance for health? *Curr Opin Clin Nutr Metab Care*. 2010;13(6):715-21.
42. Rodriguez-Cabezas ME, Galvez J, Camuesco D, et al. Intestinal anti-inflammatory activity of dietary fiber (*Plantago ovata* seeds) in HLA-B27 transgenic rats. *Clin Nutr*. 2003;22(5):463-71.
43. Sartore G, Reitano R, Barison A, et al. The effects of psyllium on lipoproteins in type II diabetic patients. *Eur J Clin Nutr*. 2009;63(10):1269-71.
44. Sierra M, Garcia JJ, Fernandez N, et al. Therapeutic effects of psyllium in type 2 diabetic patients. *Eur J Clin Nutr*. 2002;56(9):830-42.
45. Anderson JW, Allgood LD, Turner J, et al. Effects of psyllium on glucose and serum lipid responses in men with type 2 diabetes and hypercholesterolemia. *Am J Clin Nutr*. 1999;70(4):466-73.
46. Bliss DZ, Jung HJ, Savik K, et al. Supplementation with dietary fiber improves fecal incontinence. *Nurs Res*. 2001;50(4):203-13.
47. Campbell S. Dietary fibre supplementation with psyllium or gum arabic reduced incontinent stools and improved stool consistency in community living adults. *Evid Based Nurs*. 2002;5(2):56.
48. Korula J. Dietary fiber supplementation with psyllium or gum arabic reduced fecal incontinence in community-living adults. *ACP J Club*. 2002;136(1):23.
49. Bijkerk CJ, de Wit NJ, Muris JW, et al. Soluble or insoluble fibre in irritable bowel syndrome in primary care? Randomised placebo controlled trial. *BMJ*. 2009;339:b3154.
50. Tal-Dia A, Toure K, Sarr O, et al. A baobab solution for the prevention and treatment of acute dehydration in infantile diarrhea. *Dakar Med*. 1997;42(1):68-73.
51. Mpofu A, Linnemann AR, Sybesma W, et al. Development of a locally sustainable functional food based on mutandabota, a traditional food in southern Africa. *J Dairy Sci*. 2014;97(5):2591-9.
52. Coe SA, Clegg M, Armengol M, et al. The polyphenol-rich baobab fruit (*Adansonia digitata* L.) reduces starch digestion and glycemic response in humans. *Nutr Res*. 2013;33(11):888-96.
53. Gunness P, Gidley MJ. Mechanisms underlying the cholesterol-lowering properties of soluble dietary fibre polysaccharides. *Food Funct*. 2010;1(2):149-55.
54. Livesey G, Taylor R, Hulshof T, et al. Glycemic response and health--a systematic review and meta-analysis: relations between dietary glycemic properties and health outcomes. *Am J Clin Nutr*. 2008;87(1):258s-68s.
55. Mobley AR, Jones JM, Rodriguez J, et al. Identifying practical solutions to meet America's fiber needs: proceedings from the Food & Fiber Summit. *Nutrients*. 2014;6(7):2540-51.
56. Yang Y, Zhao LG, Wu QJ, et al. Association between dietary fiber and lower risk of all-cause mortality: a meta-analysis of cohort studies. *Am J Epidemiol*. 2015;181(2):83-91.
57. Park Y, Subar AF, Hollenbeck A, et al. Dietary fiber intake and mortality in the NIH-AARP diet and health study. *Arch Intern Med*. 2011;171(12):1061-8.
58. Available at: <http://health.gov/dietaryguidelines/dga2010/dietaryguidelines2010.pdf>. Accessed January 15, 2016.
59. King DE, Mainous AG, 3rd, Lambourne CA. Trends in dietary fiber intake in the United States, 1999-2008. *J Acad Nutr Diet*. 2012;112(5):642-8.



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References

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

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References

1. *Age (Dordr)*. 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.

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References

1. *Evid Based Nurs.* 2002;5(2):56.
2. *J Dairy Sci.* 2014;97(5):2591-9.
3. *Food Sci Nutr.* 2013;1(1):90-101.
4. *Br J Nutr.* 2013;109(3):478-86.
5. *Am J Clin Nutr.* 1999;70(4):466-73.
6. *J Diabetes Complications.* 1998;12(5):273-8.

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UNEXPECTED *NEUROLOGICAL* *BENEFITS* from ALGAE

Researchers long ago verified the important **eye** benefits of the carotenoid **astaxanthin** found in algae and other natural sources. Given the direct connection between the eye and the brain, it is not surprising that scientists are discovering that astaxanthin also has important **brain health** benefits.

Continued exploration into the biological properties of this carotenoid has resulted in the discovery of an array of unexpected brain benefits, including protecting neuronal memory centers against **glucose** damage.

What separates astaxanthin from most other oxidant scavengers is that it can easily cross the blood-brain barrier. This allows the nutrient greater access to difficult-to-reach parts of the brain.¹

A multitude of data shows that astaxanthin can circumvent many diseases through a broad range of functions. In fact, almost every cell of the body, including those in the eyes, heart, and kidney can benefit.^{2,3}

There is now substantial research showing that **astaxanthin** may provide even greater protection against **neurodegeneration**.^{4,5}

Protection in the Hippocampus

Glucose-induced cognitive deficits occur in both nondiabetics and diabetics.^{6,7}

The overload of excess glucose passing through the bloodstream causes **inflammation** and **oxidative stress** throughout the body. The brain, however, is particularly sensitive to this glut of glucose. Excess glucose damages precious brain cells and leads to neurological diseases such as Alzheimer's and Parkinson's.^{7,8}

Scientists have noted that the **hippocampus**, the part of the brain that stores memory, is highly vulnerable to damage from glucose.^{9,9}

Astaxanthin plays a variety of beneficial roles in the hippocampus. Animal studies show that this unique carotenoid can mitigate **diabetes-induced** neuronal damage in the hippocampus.^{9,10}

In one study, diabetic mice given astaxanthin had significantly lower amounts of neuronal loss in the hippocampus than mice who didn't receive astaxanthin. The group that received astaxanthin also recorded *inhibition* of the master inflammatory molecule **NF-kappaB** and reduction of pro-inflammatory **TNF-alpha**.⁹

Several studies have shown that astaxanthin supplementation decreases oxidative stress and the overexpression of a deadly protein called **caspase-3**.¹¹⁻¹³

The caspase protein is nicknamed the "**executioner**" protein because of the role it plays in apoptosis (cellular death), necrosis, and inflammation. Caspase-3 has a specific role in executing apoptosis. This protein benefits the body when it is expressed in the correct amount. Overexpression of caspase-3 caused by poor health factors, such as high glucose levels, is harmful because it causes neuronal cell death.^{14,15}

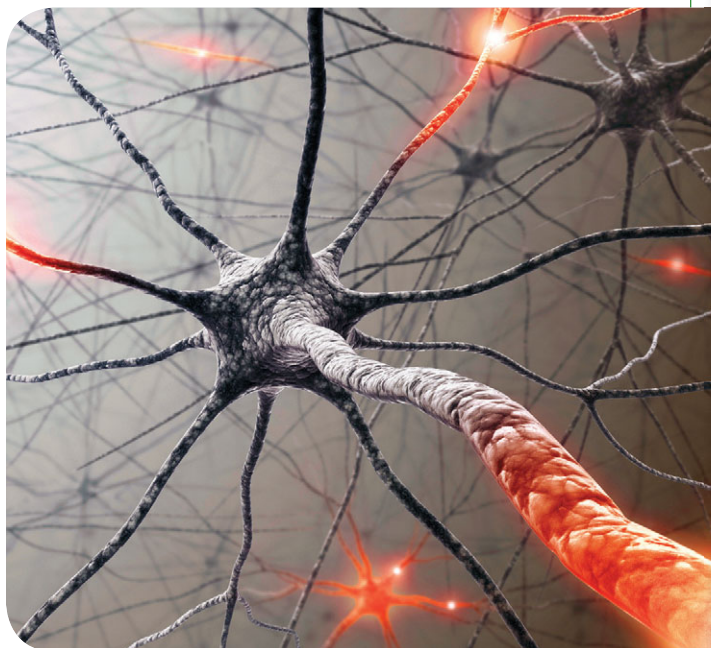
An underappreciated aspect of excess **glucose** is the acceleration of brain aging it inflicts. **Life Extension®** has long argued that ideal **fasting glucose** levels should be below 86 mg/dL. This is a challenging target to achieve as people age and develop metabolic disturbances that cause glucose levels to remain too high. The ability of **astaxanthin** to protect against glucose-induced neural toxicity is especially important for those unable to achieve optimal glucose control.

Human Cognitive Enhancement Studies

Two separate, yet similar, studies on astaxanthin were released in the *Journal of Clinical Biochemistry and Nutrition*. Researchers demonstrated that supplementation with astaxanthin provided a cognitive boost in the elderly. These human studies further vindicate the role of astaxanthin to increase overall brain health.^{21,22}

The first study was implemented on 10 older males who complained of having age-related forgetfulness. After six weeks of taking oral astaxanthin, there was significant reduction in response time for **divided attention** tasks (the ability to execute more than one action at a time). After 12 weeks, there was improvement in all cognitive areas with significant improvement in the subjects' **working memory**.²¹

The later study was more comprehensive. The researchers conducted a double-blind placebo-controlled study on **96** subjects, men and women between the ages of 52 and 59. The subjects were tested by card games on a computer.²²



Astaxanthin Promotes Cell-Regulating Pathway

The **PI3K/AKT** pathway is a regulator of various cellular functions throughout the body. The survival of cells is dependent on the expression of this **PI3K/AKT** pathway.

When the **PI3K/AKT** pathway becomes dysfunctional, it allows for greater amounts of unwanted cell death. It is now associated with a multitude of human diseases.¹⁶⁻¹⁹ Researchers have been aiming their efforts towards finding ways to increase the regulation and expression of the PI3K/AKT pathway to fight many diseases.²⁰

A number of studies have revealed that **astaxanthin** can promote the PI3K/AKT pathway.^{10,13} In many of these studies, the researchers proposed that the positive results seen on astaxanthin were largely attributed to its ability to increase the expressions of AKT protein and PI3K.

What You Need to Know

Astaxanthin's Brain Benefits

- Astaxanthin is a carotenoid that not only provides eye health benefits but also a wide variety of brain benefits, including protecting the brain's memory centers against glucose damage. Astaxanthin can easily cross the blood-brain barrier, which allows it greater access to difficult-to-reach parts of the brain.
- The hippocampus, the part of the brain that stores memory, is highly vulnerable to glucose damage and astaxanthin plays a variety of beneficial roles in maintaining hippocampus health.
- In one study, subjects who received oral astaxanthin showed significant improvements in both working memory and delayed recall compared to a group that received a placebo.
- Astaxanthin also shows potential to reduce brain damage inflicted by ischemic stroke. In a recent study, astaxanthin reduced brain injury and brain cell death while a control group that did not receive astaxanthin had almost double the mortality rate within 24 hours.
- Researchers note astaxanthin's direct benefit for epilepsy by protecting the brain by lessening oxidative damage and lipid peroxidation, as well as preventing mitochondrial death. The effects are especially notable when astaxanthin is combined with omega-3.
- Both omega-3 and astaxanthin are found together in crustaceans, algae, and small fish, and it makes sense that the two compounds should be taken together.

They tested the subjects' **working memory** by asking whether a card was the same as the previous card. Subjects were also tested on their **delayed recall** by seeing if they could remember if overturned cards had appeared previously.

After a period of 12 weeks, those who received oral **astaxanthin** showed significant improvements in both working memory and delayed recall compared to the group that received a **placebo**.

Preventing Brain Cell Death in Stroke

Astaxanthin is also exhibiting potential to reduce brain damage inflicted by ischemic stroke.

In a compelling study on astaxanthin, *thrombosis* (the formation of a blood clot inside a blood vessel) was measured in hypertensive rats. The results showed that astaxanthin was able to inhibit thrombosis from occurring in cerebral vessels.²³

The researchers also observed that the usual increase of systolic blood pressure in these stroke-prone rats was suppressed by the astaxanthin treatment. The antihypertensive benefits of astaxanthin were explained by its ability to preserve **nitric oxide** levels by lowering oxidative stress in the arterial lining.²³

In the US, ischemic strokes account for approximately **87%** of all strokes.²⁴ When **ischemic stroke** is left untreated, the patient typically loses **1.9 million** neurons per minute. Poor post-stroke functional outcome is attributed to the amount of brain cell death that occurred.²⁵



Striking results on astaxanthin were also observed in another study. Astaxanthin was able to reduce ischemic brain injury in adult rats by preventing neuronal damage and death.²⁶

Intracerebroventricular injection, a direct injection into the brain, of astaxanthin was administered to an experimental group prior to ischemia-induced injury. The rats given astaxanthin exhibited improved post-stroke locomotor activity and reduced cerebral infarctions compared to the placebo. Upon analysis of brain tissue, there was less free radical damage, excitotoxicity, and neuronal brain cell death.²⁶

A **subarachnoid hemorrhage** is a type of stroke that is usually caused when an aneurysm ruptures in the area between the membranes that cover the brain. An aneurysm is a balloon-like dilation in a weak area of an artery wall that can rupture and cause hemorrhaging. Blood spills out on the circumference of the brain causing massive damage, painful headaches, and cell death (apoptosis) in the brain.

Anti-apoptotic therapies, or treatments to stop cell death in the body, are gaining recognition from researchers as a way to lower the death rate in the event of a subarachnoid hemorrhage.¹³ Since astaxanthin has been shown to greatly weaken expression of **caspase-3** (apoptosis-inducing protein), it would make sense that it would provide such a benefit. In the past few years, studies on astaxanthin have been published showing that it lowered oxidative stress, inflammation, blood brain barrier disruption, brain edema, and neuronal apoptosis from subarachnoid hemorrhage.²⁷⁻³⁰ These studies pave the way for the therapeutic use of astaxanthin in the treatment of subarachnoid hemorrhage.



The mortality rate six months after a subarachnoid hemorrhage is **50%**. A startling **10%** to **15%** die before ever making it to the hospital.³¹ In a recent animal study, astaxanthin was shown to reduce brain injury and brain cell death. In addition, the group that did not receive astaxanthin had almost double the mortality rate of **21.1%** compared to **11.8%** in the group that did receive astaxanthin within 24 hours.¹³

Astaxanthin's Eye Health Advantages

Some of the most admired information on astaxanthin has been on its wide variety of benefits to the eyes. Along with the carotenoids **zeaxanthin** and **lutein**, astaxanthin has the ability to cross not only the blood-brain barrier but also the **blood-eye barrier**.³²

New research on astaxanthin now provides evidence against cataract formation. An interesting human study was conducted on 35 human patients who had a cataract formation in both eyes. The patients first underwent surgery for one eye without astaxanthin. Later the same surgery was performed on the other eye after the patients supplemented with astaxanthin for two weeks.³³

The researchers measured oxidative stress in the **aqueous humor**, which is the transparent fluid between the lens and cornea. After the initial surgery, patients showed elevated oxidative stress. However, oxidative stress was significantly lower with supplementation of astaxanthin prior to the second surgery.³³

In a more recent study, astaxanthin was tested against steroid-induced cataract formation in chick embryos. The researchers tested the **opacity** (lack of transparency) of the lenses 48 hours after astaxanthin was administered.

Lens opacity was seen in **63%** of the group that received no treatment compared to only **26%** in the astaxanthin group. Clearly, astaxanthin slashed the chances of eye cloudiness from the steroid.³⁴

Ultraviolet rays, smoking, and a deficiency of vitamins C and E are the greatest risk factors for cataracts.³⁵⁻³⁷ Since these risk factors can cause an increase in oxidative stress, it is proposed that astaxanthin would be of great value in preserving eye health.³⁴ The results of these studies add greater evidence to support astaxanthin's role in benefiting those affected by cataracts.^{33,34}



Potential Usage for Epilepsy

Research has shown that oxidative stress contributes to epilepsy and causes severe neuronal damage induced by epilepsy.^{38,39} There is a wealth of data showing that nutrients such as omega-3s are effective in the prevention and treatment of epilepsy.⁴⁰⁻⁴² However, astaxanthin provides an additional unique benefit to epilepsy patients by crossing the **blood-brain barrier** to target oxidative stress directly. Astaxanthin's oxidant-scavenging benefits have intrigued many researchers for its use in the fight against epilepsy.

The **amygdala** is the part of the brain that controls emotions. Overexcitement, or *kindling*, of this brain region may directly cause a seizure if there is sufficient neurological damage. **Amygdala kindling** is the most commonly used form of testing in epilepsy research. It involves the use of a machine that releases an electrical stimulation in the center of the brain.⁴³

In an amygdala-kindling test on rats, astaxanthin was shown to significantly weaken the neuronal damage from the electrical stimulation. The results suggest that astaxanthin was able to guard the brain against this damage by lessening oxidative damage and lipid peroxidation, as well as preventing mitochondrial death.¹¹

It is important to note that this is a recent study and the first to show astaxanthin's direct benefit for epilepsy. However, there has been significantly more research that shows the ability of **omega-3s** to prevent epilepsy.⁴⁰⁻⁴² In fact, a recent study involving 70 medically resistant epileptic children demonstrated the benefits of omega-3 on reducing epilepsy. Before the study, all the children averaged four seizures per

month. Half of the children received **1,200 mg of fish oil** daily and the other half received a placebo. Results showed that **57%** of the supplemented group experienced no seizures after three months. Those children receiving a placebo had no appreciable difference in the number of seizures.⁴¹

Summary

Astaxanthin has many lifesaving qualities. One is to protect against cognitive decline. The brain consumes **20%** of the body's oxygen, which makes it more vulnerable to oxidative damage.

Interestingly, astaxanthin can also protect the brain from **hypoxia** (lack of oxygen). This demonstrates astaxanthin's ability to help the brain maintain oxygen balance.⁵²

Cognitive decline is experienced by some degree in all aging individuals. Some of the risk factors include oxidative stress,⁵³⁻⁵⁵ inflammation,⁵⁶ decline in hormones,⁵⁷ endothelial dysfunction,⁵⁸ insulin resistance,⁵⁹ and suboptimal nutrition.⁶⁰ Astaxanthin and omega-3s have been shown to circumvent many of these risk factors.^{4,9,23,61-63}

Supplementing with astaxanthin benefits almost every cell in the body and the research about its value to **neurological function** is rapidly expanding.³⁻⁵ ●

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



References

- Liu X, Osawa T. Astaxanthin protects neuronal cells against oxidative damage and is a potent candidate for brain food. *Forum Nutr.* 2009;61:129-35.
- Higuera-Ciapara I, Felix-Valenzuela L, Goycoolea FM. Astaxanthin: a review of its chemistry and applications. *Crit Rev Food Sci Nutr.* 2006;46(2):185-96.
- Yuan JP, Peng J, Yin K, et al. Potential health-promoting effects of astaxanthin: a high-value carotenoid mostly from microalgae. *Mol Nutr Food Res.* 2011;55(1):150-65.
- Wu H, Niu H, Shao A, et al. Astaxanthin as a potential neuroprotective agent for neurological diseases. *Mar Drugs.* 2015;13(9):5750-66.
- Hussein G, Sankawa U, Goto H, et al. Astaxanthin, a carotenoid with potential in human health and nutrition. *J Nat Prod.* 2006;69(3):443-9.
- Ravona-Springer R, Moshier E, Schmeidler J, et al. Changes in glycemic control are associated with changes in cognition in non-diabetic elderly. *J Alzheimers Dis.* 2012;30(2):299-309.
- Wright SA, Piroli GG, Grillo CA, et al. A look inside the diabetic brain: Contributors to diabetes-induced brain aging. *Biochimica et biophysica acta.* 2009;1792(5):444-53.
- Zhang P, Tian B. Metabolic syndrome: an important risk factor for Parkinson's disease. *Oxid Med Cell Longev.* 2014;2014:729194.
- Zhou X, Zhang F, Hu X, et al. Inhibition of inflammation by astaxanthin alleviates cognition deficits in diabetic mice. *Physiol Behav.* 2015;151:412-20.
- Xu L, Zhu J, Yin W, et al. Astaxanthin improves cognitive deficits from oxidative stress, nitric oxide synthase and inflammation through upregulation of PI3K/Akt in diabetes rat. *Int J Clin Exp Pathol.* 2015;8(6):6083-94.
- Lu Y, Xie T, He XX, et al. Astaxanthin rescues neuron loss and attenuates oxidative stress induced by amygdala kindling in adult rat hippocampus. *Neurosci Lett.* 2015;597:49-53.
- Wen X, Huang A, Hu J, et al. Neuroprotective effect of astaxanthin against glutamate-induced cytotoxicity in HT22 cells: Involvement of the Akt/GSK-3 β pathway. *Neuroscience.* 2015;303:558-68.
- Zhang XS, Zhang X, Wu Q, et al. Astaxanthin alleviates early brain injury following subarachnoid hemorrhage in rats: possible involvement of Akt/bad signaling. *Mar Drugs.* 2014;12(8):4291-310.
- Li P, He QP, Ouyang YB, et al. Early release of cytochrome C and activation of caspase-3 in hyperglycemic rats subjected to transient forebrain ischemia. *Brain Res.* 2001;896(1-2):69-76.
- Sharifi AM, Eslami H, Larijani B, et al. Involvement of caspase-8, -9, and -3 in high glucose-induced apoptosis in PC12 cells. *Neurosci Lett.* 2009;459(2):47-51.
- Costa C, Pereira S, Lima L, et al. Abnormal protein glycosylation and activated PI3K/Akt-mTOR pathway: role in bladder cancer prognosis and targeted therapeutics. *PLoS One.* 2015;10(11):e0141253.
- Hauge M, Bruserud O, Hatfield KJ. Targeting of cell metabolism in human acute myeloid leukemia - more than targeting of IDH mutations and PI3K-AKT-mTOR signaling? *Eur J Haematol.* 2015.
- Petrulea MS, Plantinga TS, Smit JW, et al. PI3K/Akt/mTOR: A promising therapeutic target for non-medullary thyroid carcinoma. *Cancer Treat Rev.* 2015;41(8):707-13.

The Synergistic Combination of Astaxanthin and Omega-3s

Lipid peroxidation is the oxidation of fats (lipids), rendering them useless by the body. Omega-3s can be vulnerable to lipid peroxidation unless certain nutrients are taken alongside it.⁴⁴ Several studies have demonstrated sesame lignans and vitamin E prevent lipid peroxidation, especially for omega-3s.⁴⁴⁻⁴⁶ Astaxanthin is also showing strong evidence in preventing oxidation of omega-3s in this same way. In addition, studies are showing more beneficial effects when these nutrients are taken together.⁴⁷⁻⁴⁹

One of the many markers produced to reduce oxidative stress is **glutathione**. A study tested the amount of glutathione released in response to supplementation with **astaxanthin** and **omega-3**, both separately and in combination. The results of the study showed that the combination of astaxanthin and omega-3 not only worked better to increase the amount of glutathione, but it also increased the ratio of *active* glutathione to oxidized (inactive) glutathione **6-fold**.⁵⁰

Additional studies show that astaxanthin and omega-3s complement each other and create greater reductions in oxidative stress.^{48,49} Since these two compounds are found naturally together in crustaceans, algae, and small fish, it would make sense that they should be taken together.⁵¹

19. Su H, Gu Y, Li F, et al. The PI3K/AKT/mTOR signaling pathway is overactivated in primary aldosteronism. *PLoS One*. 2013;8(4):e62399.
20. Available at: <http://www.cellsignal.com/common/content/content.jsp?id=pathways-akt-signaling>. Accessed January 6, 2016.
21. Satoh A, Tsuji S, Okada Y, et al. Preliminary clinical evaluation of toxicity and efficacy of a new astaxanthin-rich *Haematococcus pluvialis* extract. *J Clin Biochem Nutr*. 2009;44(3):280-4.
22. Katagiri M, Satoh A, Tsuji S, et al. Effects of astaxanthin-rich *Haematococcus pluvialis* extract on cognitive function: a randomised, double-blind, placebo-controlled study. *J Clin Biochem Nutr*. 2012;51(2):102-7.
23. Sasaki Y, Kobara N, Higashino S, et al. Astaxanthin inhibits thrombosis in cerebral vessels of stroke-prone spontaneously hypertensive rats. *Nutr Res*. 2011;31(10):784-9.
24. Mozaffarian D, Benjamin EJ, Go AS, et al. Heart disease and stroke statistics—2015 update: a report from the American Heart Association. *Circulation*. 2015;131(4):e29-322.
25. Saver JL. Time is brain-quantified. *Stroke*. 2006;37(1):263-6.
26. Shen H, Kuo CC, Chou J, et al. Astaxanthin reduces ischemic brain injury in adult rats. *Faseb j*. 2009;23(6):1958-68.
27. Wu Q, Zhang XS, Wang HD, et al. Astaxanthin activates nuclear factor erythroid-related factor 2 and the antioxidant responsive element (Nrf2-ARE) pathway in the brain after subarachnoid hemorrhage in rats and attenuates early brain injury. *Mar Drugs*. 2014;12(12):6125-41.
28. Zhang XS, Zhang X, Wu Q, et al. Astaxanthin offers neuroprotection and reduces neuroinflammation in experimental subarachnoid hemorrhage. *J Surg Res*. 2014;192(1):206-13.
29. Zhang XS, Zhang X, Zhang QR, et al. Astaxanthin reduces matrix metalloproteinase-9 expression and activity in the brain after experimental subarachnoid hemorrhage in rats. *Brain Res*. 2015;1624:113-24.
30. Zhang XS, Zhang X, Zhou ML, et al. Amelioration of oxidative stress and protection against early brain injury by astaxanthin after experimental subarachnoid hemorrhage. *J Neurosurg*. 2014;121(1):42-54.
31. Available at: <http://emedicine.medscape.com/article/794076-overview>. Accessed January 8, 2016.
32. Available at: <http://www.google.com/patents/US5527533>. Accessed January 8, 2016.
33. Hashimoto H, Arai K, Hayashi S, et al. Effects of astaxanthin on antioxidation in human aqueous humor. *J Clin Biochem Nutr*. 2013;53(1):1-7.
34. Ishikawa S, Hashizume K, Nishigori H, et al. Effect of astaxanthin on cataract formation induced by glucocorticoids in the chick embryo. *Curr Eye Res*. 2015;40(5):535-40.
35. Hiller R, Sperduto RD, Podgor MJ, et al. Cigarette smoking and the risk of development of lens opacities. The Framingham studies. *Arch Ophthalmol*. 1997;115(9):1113-8.
36. Jacques PF, Chylack LT, Jr. Epidemiologic evidence of a role for the antioxidant vitamins and carotenoids in cataract prevention. *Am J Clin Nutr*. 1991;53(1 Suppl):352s-5s.
37. Taylor HR, West SK, Rosenthal FS, et al. Effect of ultraviolet radiation on cataract formation. *N Engl J Med*. 1988;319(22):1429-33.
38. Sashindranath M, McLean KJ, Trounce IA, et al. Early hippocampal oxidative stress is a direct consequence of seizures in the rapid electrical amygdala kindling model. *Epilepsy Res*. 2010;90(3):285-94.
39. Waldbaum S, Patel M. Mitochondria, oxidative stress, and temporal lobe epilepsy. *Epilepsy Res*. 2010;88(1):23-45.
40. DeGiorgio CM, Miller PR, Harper R, et al. Fish oil (n-3 fatty acids) in drug resistant epilepsy: a randomised placebo-controlled cross-over study. *J Neurol Neurosurg Psychiatry*. 2015;86(1):65-70.
41. Reda DM, Abd-El-Fatah NK, Omar Tel S, et al. Fisho intake and seizure control in children with medically resistant epilepsy. *N Am J Med Sci*. 2015;7(7):317-21.
42. Yuen AW, Flugel D, Poepel A, et al. Non-randomized open trial of eicosapentaenoic acid (EPA), an omega-3 fatty acid, in ten people with chronic epilepsy. *Epilepsy Behav*. 2012;23(3):370-2.
43. Bertram E. The relevance of kindling for human epilepsy. *Epilepsia*. 2007;48 Suppl 2:65-74.
44. Yamashita K, Kagaya M, Higuti N, et al. Sesamin and alpha-tocopherol synergistically suppress lipid-peroxide in rats fed a high docosahexaenoic acid diet. *Biofactors*. 2000;11(1-2):11-3.
45. Ide T, Hong DD, Ranasinghe P, et al. Interaction of dietary fat types and sesamin on hepatic fatty acid oxidation in rats. *Biochim Biophys Acta*. 2004;1682(1-3):80-91.
46. Ikeda S, Kagaya M, Kobayashi K, et al. Dietary sesame lignans decrease lipid peroxidation in rats fed docosahexaenoic acid. *J Nutr Sci Vitaminol (Tokyo)*. 2003;49(4):270-6.
47. Barros MP, Poppe SC, Bondan EF. Neuroprotective properties of the marine carotenoid astaxanthin and omega-3 fatty acids, and perspectives for the natural combination of both in krill oil. *Nutrients*. 2014;6(3):1293-317.
48. Saw CL, Yang AY, Guo Y, et al. Astaxanthin and omega-3 fatty acids individually and in combination protect against oxidative stress via the Nrf2-ARE pathway. *Food Chem Toxicol*. 2013;62:869-75.
49. Otton R, Marin DP, Bolin AP, et al. Combined fish oil and astaxanthin supplementation modulates rat lymphocyte function. *Eur J Nutr*. 2012;51(6):707-18.
50. Mattei R, Polotow TG, Vardaris CV, et al. Astaxanthin limits fish oil-related oxidative insult in the anterior forebrain of Wistar rats: putative anxiolytic effects? *Pharmacol Biochem Behav*. 2011;99(3):349-55.
51. Ambati RR, Phang SM, Ravi S, et al. Astaxanthin: sources, extraction, stability, biological activities and its commercial applications—a review. *Mar Drugs*. 2014;12(1):128-52.
52. Yamagishi R, Aihara M. Neuroprotective effect of astaxanthin against rat retinal ganglion cell death under various stresses that induce apoptosis and necrosis. *Mol Vis*. 2014;20:1796-805.
53. Butterfield DA, Sultana R. Redox proteomics identification of oxidatively modified brain proteins in Alzheimer's disease and mild cognitive impairment: insights into the progression of this dementing disorder. *J Alzheimers Dis*. 2007;12(1):61-72.
54. Lovell MA, Markesbery WR. Oxidative DNA damage in mild cognitive impairment and late-stage Alzheimer's disease. *Nucleic Acids Res*. 2007;35(22):7497-504.
55. Mecocci P, MacGarvey U, Beal MF. Oxidative damage to mitochondrial DNA is increased in Alzheimer's disease. *Ann Neurol*. 1994;36(5):747-51.
56. Schram MT, Euser SM, de Craen AJ, et al. Systemic markers of inflammation and cognitive decline in old age. *J Am Geriatr Soc*. 2007;55(5):708-16.
57. Yaffe K, Barnes D, Lindquist K, et al. Endogenous sex hormone levels and risk of cognitive decline in an older biracial cohort. *Neurobiol Aging*. 2007;28(2):171-8.
58. Rizzo MT, Leaver HA. Brain endothelial cell death: modes, signaling pathways, and relevance to neural development, homeostasis, and disease. *Mol Neurobiol*. 2010;42(1):52-63.
59. Okereke OI, Kurth T, Pollak MN, et al. Fasting plasma insulin, C-peptide and cognitive change in older men without diabetes: results from the Physicians' Health Study II. *Neuroepidemiology*. 2010;34(4):200-7.
60. Scarmeas N, Stern Y, Mayeux R, et al. Mediterranean diet and mild cognitive impairment. *Arch Neurol*. 2009;66(2):216-25.
61. Gammone MA, Riccioni G, D'Orazio N. Marine Carotenoids against oxidative stress: effects on human health. *Mar Drugs*. 2015;13(10):6226-46.
62. Gammone MA, Riccioni G, D'Orazio N. Carotenoids: potential allies of cardiovascular health? *Food Nutr Res*. 2015;59:26762.
63. Ni Y, Nagashimada M, Zhuge F, et al. Astaxanthin prevents and reverses diet-induced insulin resistance and steatohepatitis in mice: A comparison with vitamin E. *Sci Rep*. 2015;5:17192.

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References

1. *Ayurveda Integr Med.* 2014 Oct-Dec;5(4):241-5.
2. *Phytother Res.* 2005 Jan;19(1):78-80.
3. *Zhongguo Zhong Xi Yi Jie He Za Zhi.* 1999 Apr;19(4):209-11.

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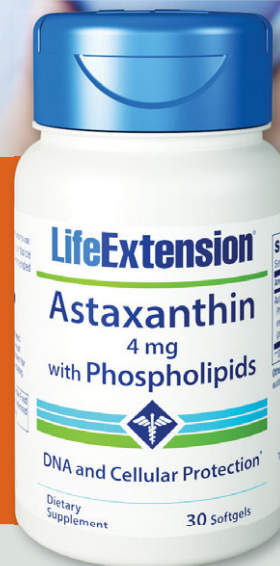
Reference

1. *Int J Pharm.* 2011 Jun 30; 412(1-2):99-105.

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Better GLUCOSE for a Better LIFE

When we were in our mid-40s, our lifestyle became the center of media attention.

It happened as word got out that a husband and wife, **calorie restriction** practitioners, were successful in slowing, and possibly even reversing aging.

Before long, we were featured on every major television network including NBC, CBS, ABC, and FOX, as well as on many special programs about life extension, including *60 Minutes*, *Oprah*, *Barbara Walters Special: Live to 150*, *Can You Do It? Today*, *Good Morning America*, and *CBS This Morning*.

Soon, the international media found their way to our door. We were featured on numerous BBC specials, *60 Minutes* Australia, Germany's *Der Spiegel*, and more.

Moreover, the news reports weren't anecdotal: Our lab results showed that we were on track. Following guidance from years of testing with scientists and doctors, we were able to set personal standards for health that may seem like science fiction to some.

- **Heart function:**
Age-related loss of heart cells slows.
Blood pressure averages 90/60.
- **Arterial plaque:** Accumulation remains static or reverses.
- **Muscle strength:** Maintains or increases with no lasting soreness or pain from exertion. Age-related loss of muscle cells slows.
- **Cellular energy production increases:** More energy to do what you want, when you want.
- **Improved immune function:**
Quick reaction to immune challenges.
Inflammation markers at low end of reference ranges.
- **Youthful hormones:**
Secretion levels are preserved.
- **Stronger skeletal system:**
Bone density increases gradually, likely with stronger matrix.
- **Improved feeling of well being:**
The less we ate, the better we felt.

In this article, you will learn what inspired the creation of *The CR Way® to Great Glucose Control* and why glucose control should be fundamental to your approach to optimal health and life extension.

Reversing Cognitive Decline

When we got into our 50s, one thing was still missing—reversing age-related cognitive decline. We both noticed that we were not quite as sharp as when we were in our 40s and we asked ourselves: Is this all we can get from calorie restriction? Must we accept a slow, age-related decline in cognition and grow into nice old people who repeat the same stories over and over?

To our good fortune, science came to the rescue. Dr. Mark Mattson, chief of the Laboratory of Neurosciences at the National Institute on Aging, released with his colleagues an impressive study: Mice that achieved very **low glucose** levels by fasting scored better on maze tests than controls and better even than mice whose calorie intake was restricted.¹

Blood tests helped explain why: Certain molecules, such as **brain derived neurotrophic factor** that promote formation of new neurons, were higher in the mice that fasted.¹

This was big news in the longevity world. It gave people who were slim a way to get the benefits of calorie restriction without losing too much weight. While calorie restriction improves cognitive functions,² the Mattson study indicated that fasting worked even better **without limiting calories**. Would the same thing work in humans?

We wanted to try it. However, we were already slim and did not want to lose weight so we were hesitant about fasting. We decided to take a different approach and marry two concepts: calorie restriction and intermittent fasting.

After months of study and work, Paul tried the low-glucose approach and we almost couldn't believe the results. His brain-training scores rocketed upward and mental capabilities from a younger age began to come back. We had discovered a new way to increase calorie restriction's brain benefits.

This new low-glucose approach to calorie restriction was clearly worth writing about and so *The CR Way® to Great Glucose Control* was born. We included glucose-control secrets we had learned—about meal timing, foods that work best, and cooking methods.

One by one, we created the recipes in our own kitchen. Each recipe's effect on blood glucose was personally tested by the two of us. We excluded difficult gourmet recipes that took lots of time to prepare. Every recipe is quick and easy. The point was to make learning the principals of glucose control and applying them to your own food preparation fun. And if you are working and on the go, healthful eating is easier this way.

Then we put it all together in lifestyle plans. We say *lifestyle plans* rather than *meal plans* because for glucose control to be truly “great,” it needs to be a round-the-clock program, starting from the time you wake up until the time you go to sleep. These lifestyle plans suggest glucose ranges for every part of the day so you have goals to aim for.

Taking advantage of internet technology, we designed *The CR Way® to Great Glucose Control* as an online adult education course that provides live, caring instruction to participants wherever they live.





What You Need to Know

Recognizing that the classes could benefit health conscious people, Life Extension® partnered with *The CR Way® to Great Glucose Control* and helped get the word out.

Thus, *The CR Way® to Great Glucose Control* became established as the resource for people who want to keep their blood glucose at optimal levels and increase their chances for living longer and better.

The CR Way® to Great Glucose Control— Makeover

After teaching glucose control to hundreds of people, we have learned a lot about the variety of challenges people face as they learn to control their blood sugar.

For example, some of our participants have very busy schedules and cannot attend long classes. So the class schedule has been reworked into separate sessions that are taught over a number of weeks. Each session is about 30 minutes long, which is enough time to share key points without requiring too big a commitment from already busy days.

Instructional videos, describing key elements of glucose control, are integrated with five beautifully illustrated e-books that have been updated with new recipes, food suggestions, and even ideas for improving the gut microbiome.

The CR Way® to Great Glucose Control— The Curriculum

- Introduction: Risks, Benefits, and Science
- Steps to Great Glucose Control
- Foods and Recipes
- Low-Glucose Lifestyle Plans for Optimal Health and Reversing Diabetes
- What If My Glucose Is Still Too High?

This core curriculum is provided to each participant along with summaries of the main points covered in each class and action items to facilitate glucose control as a routine part of life.

Improve Your Glucose and Your Life

- Calorie restriction slows, and possibly reverses, aging.
- But to regain the cognitive effects of youth, **glucose control** is key. Studies found that mice with very low glucose levels from fasting scored better on tests than controls and better even than mice whose calorie intake was restricted.
- After merging two concepts, calorie restriction and intermittent fasting, *The CR Way® to Great Glucose Control* was born.
- The program consists of instructional videos that describe key elements of glucose control, which are integrated with five e-books that include recipes, food suggestions, and ideas for improving the gut microbiome.

Prediabetes Reversal!

A few years ago, Mary, a LivingTheCRWay® member, got a diagnosis of prediabetes from her doctor. At 5.6, her HbA1c (which evaluates long-term blood sugar control) was a bit high. Other than that, she was in great health with a perfect weight and good all-around numbers on blood tests, including cardiovascular assessments.

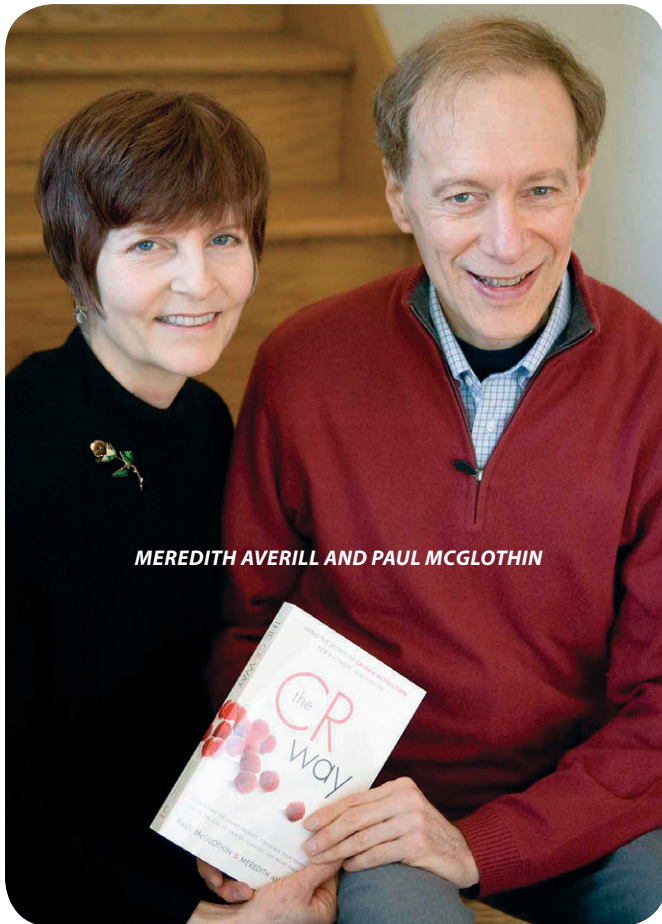
Her higher-than-normal fasting glucose was understandable. A busy schedule had kept her from following some of the all-natural things she had been doing to keep glucose low, like eating complex low-glycemic index (GI) carbs slowly and finishing her last meal of the day as early as possible. When she asked for help, we suggested she try to reset the memory of her pancreatic beta cells. The function of these cells is to secrete insulin, which guides glucose out of the blood into the cells, thus returning the blood glucose to fasting levels.

She had participated in *The CR Way® to Great Glucose Control* sessions and was aware that the fifth part of the *Great Glucose Control* e-book focuses on resetting beta cell memory. But she was having a hard time, so we worked with her: helping reorganize her eating schedule and adding exercise at strategic glucose-lowering times like after meals. At first, it was slow going. Her fasting glucose stubbornly remained above 100, which is a risk factor for many diseases.³

It took months to reset her levels into the 90s. And she stayed with it, finally getting her glucose into the 80s and eventually the 70s, which is perfect for activating longevity signaling in her cells. Her success showed up in other ways too. She had better blood pressure, improved eyesight, and better memory. All this was evidence that her glucose control was activating beneficial brain biochemistry.

At this point, her persistence allowed her to achieve fasting glucose levels that anyone would be happy with.

Graduates of *The CR Way® to Great Glucose Control* often let us know that it has made a difference in their lives. In August 2014, Dianne, a professional physiotherapist in Australia wrote that the difference to her is “life changing.”



MEREDITH AVERILL AND PAUL MCGLOTHLIN

“This practical advice for glucose control is easy to read and, more importantly, to apply. We do need to measure our glucose levels so we can make informed decisions.”

—Posted by Dianne in
Store.LivingTheCRWay.com on August 3, 2014

We were also very pleased when we heard from Thomas, who wrote that he experienced “less post-meal glucose surging.”

“With Paul and Meredith’s advice, I have already begun to see benefits in my post-meal glucose levels. I used to get really tired after my lunch at the office and it seemed to be due to a prediabetic condition that had my glucose surging in some cases. With healthier meal choices, understanding what affects my sugar levels, and a quick 15-minute walk after lunch, my glucose levels have never been better. And I feel both the positive physical and mental effects.”

—Posted by Thomas in
Store.LivingtheCRWay.com on April 24, 2014

Postprandial glucose or post-meal glucose surges, as Thomas appropriately describes them, can be extremely dangerous.⁴ We help participants plan meals that avoid this.

In October 2013, Cliff wrote, “In a word: *superb*.”

“*The CR Way® to Great Glucose Control* eBook has been invaluable to me. More than just basic meal planning or a simple diet designer, this book has given me a framework and foundation for how to live healthier. When you really understand how the biology works and what you are doing to your body with your food choices, then you can begin to truly control your blood glucose (and your underlying health).”

—Posted by Cliff in
Store.LivingtheCRWay.com on October 10, 2013

Improving Gut Health

The 2016 edition of *The CR Way® to Great Glucose Control* goes beyond glucose control and integrates new ideas for whole-body health. For example, we frequently write blog posts about practical ways to improve gut health and other health topics.⁵ This cutting-edge information is integrated into the new diet and lifestyle plans, so participants can improve many aspects of their health.



Live Classes Inspire Making Glucose Control a Reality

“We like talking with people and teaching the live sessions,” explains Meredith. “Learning to control glucose ultimately helps people live longer and better, and interacting with participants is part of that. It helps build positive social networks that have been shown over and over to lead to longer, healthier lives.”⁶

“If we help participants feel good, they are inspired to put healthy ideas into practice. That’s a prescription for longer life that anyone can follow.”

Summary

The CR Way® to Great Glucose Control features live online classes for people who want to keep their blood glucose at optimal levels. Since it was introduced in 2009, hundreds of people have benefited from the caring, personalized instruction.

The CR Way® to Great Glucose Control program has now been expanded:

- Four live 30-minute classes that are easy to work into busy schedules.
- Instructional videos that describe key elements of glucose control.
- Five beautifully illustrated and updated e-books with new easy-to-follow recipes, food suggestions, and ideas for improving the gut microbiome. ●

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

Paul McGlothlin and Meredith Averill are co-authors of *The CR Way®* (HarperCollins, 2008) and they lead The CR Way® Longevity Center. To learn more about the CR Way® or the CR Society International, visit www.LivingTheCRWay.com or www.CRSociety.org.

References

1. Mattson MP, Duan W, Guo Z. Meal size and frequency affect neuronal plasticity and vulnerability to disease: cellular and molecular mechanisms. *J Neurochem*. 2003;84(3):417-31.
2. Witte AV, Fobker M, Gellner R, et al. Caloric restriction improves memory in elderly humans. *Proc Natl Acad Sci U S A*. 2009;106(4):1255-60.
3. Available at: <http://www.niddk.nih.gov/health-information/health-topics/Diabetes/insulin-resistance-prediabetes/Pages/index.aspx>. Accessed January 12, 2016.
4. Available at: http://www.idf.org/webdata/docs/Guideline_PMG_final.pdf. Accessed January 12, 2016.
5. Available at: <http://calorierestrictiondietplan.com/science-and-health-news-views/fermented-foods-and-calorie-restriction-for-better-or-for-worse/>. Accessed January 12, 2016.
6. Dello Buono M, Urciuoli O, De Leo D. Quality of life and longevity: a study of centenarians. *Age Ageing*. 1998;27(2):207-16.

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References

1. *Nutr Metab (Lond)*. 2012;9(1):106.
2. *Nutr Res Pract*. 2012 Aug;6(4):322-7.
3. Available at: <http://www.medscape.com/viewarticle/461349>. Accessed September 24, 2013.
4. *J Med Food*. 2011 Jul-Aug;14(7-8):799-807.
5. *Am J Chin Med*. 2012;40(1):163-75.
6. *Nutr Res*. 2011 Nov;31(11):848-54.
7. *Diabetes*. 2012 Jan;61(1):187-96.
8. *Mol Biol Rep*. 2012 May;39(5):5299-306.

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Caution: If you are taking blood glucose-lowering medication, consult your health care provider before taking this product.



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Since it was introduced in 2009, hundreds of *The CR Way to Great Glucose Control* participants have benefited:

"...my glucose levels have never been better. And I feel both the positive physical and mental effects."

– Thomas, April 24, 2014

"...easy to read and, more important, easy to apply."

– Dianne, August 3, 2014

"...a framework and foundation for how to live healthier."

– Cliff, October 10, 2013

Take advantage of the new, expanded *The CR Way to Great Glucose Control*:

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Personal guidance by experts can cost thousands of dollars. To make it possible for Life Extension® supporters to participate, *The CR Way to Great Glucose Control* program is offered for an introductory price of just **\$159**. Act now to join Paul McGlothlin and Meredith Averill for the live classes, the five beautifully illustrated e-books, and the instructional videos—before the price increases next month.

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Meredith Averill and Paul McGlothlin
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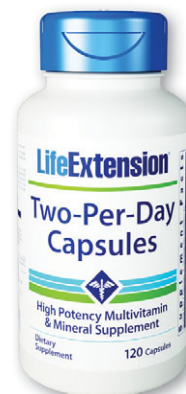
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1. *Pharmacol Biochem Behav.* 2012;103(2):245-52.
2. *J Physiol Anthropol.* 2012;31:28.
3. *J Herb Pharmacother.* 2006;6(2):21-30.
4. *ScientificWorldJournal.* 2014;2014:419032.

Newly Discovered Benefits of **BLUEBERRIES**



RESEARCH UPDATE

BY CHANCELLOR FALOON

Frailty is the medical term used to describe weakness, immobility, and loss of coordination that afflicts the elderly. **Frailty** and **osteoporosis** are major causes of the **falls** and **bone fractures** that can terminate independent living for senior citizens.

Blueberries have been found to improve mobility in the **elderly**, which can play a significant role in reducing the risk of life-threatening falls.⁹

Published research reveals that **blueberries** favorably impact cells throughout our bodies. Ingestion of blueberry **polyphenols** facilitates critical **DNA repair** needed to maintain *youthful* cell integrity.¹⁻⁸

This **Research Update** describes recent studies that confirm broad-spectrum benefits associated with blueberry polyphenols.

Enhanced Mobility in Frail Elderly

As we age, we tend to lose mobility due to factors such as obesity, lack of physical activity, and neuronal impairment, along with chronic diseases like arthritis or diabetes.⁹ This lack of mobility in the elderly is often accompanied by other disorders including incontinence, which can lead to a greater risk of a urinary or skin infection.¹⁰

A study published in *Applied Physiology, Nutrition, and Metabolism* found that when elderly subjects with poor mobility consumed two cups of blueberries a day for six weeks, they showed significant improvement in their movement.¹¹

The researchers observed the most improvement in their **gait**, or manner (steadiness) of walking. As one ages, the gait test is especially important because it measures the **risk of falling**.¹² Over 700,000 Americans a year are hospitalized due to injuries caused by a fall.¹³

In the study, those who consumed the blueberries for six weeks had **increased speed, fewer step errors, better foot placement, and improved balance** on the gait test compared to the control group.⁹

This human study clearly demonstrated how blueberry ingestion can protect against age-related loss of psychomotor function.

Reduction in Arterial Plaque

Some of the major risk factors for atherosclerosis include elevated LDL, low HDL, and high triglycerides, homocysteine, and glucose.¹⁴⁻¹⁷

A study published in the *International Journal of Food Sciences and Nutrition* evaluated the effects of blueberry supplementation on mice with hypercholesterolemia to determine if blueberries could reverse these risk factors for cardiovascular disease.¹⁸

Study researchers observed a significant difference in the outcome between a control group and mice given the highest dose of blueberry extract. Both groups were fed a high-fat diet containing pig grease and corn oil for six weeks. The experimental group was fed a **blueberry extract** for the last two weeks.

At the end of six weeks, total cholesterol in the mice that received the blueberry extract was approximately **29%** lower. **LDL** (bad cholesterol) was approximately **34%** lower in the mice given blueberry extract while **HDL** (good cholesterol) was close to **40%** higher.¹⁸

Triglycerides are a type of fat that accumulates inside normal cells turning them into fat cells (adipocytes). **Homocysteine** is a deleterious amino acid that causes inflammation on artery walls. Remarkably, the study revealed that both **triglycerides** and **homocysteine** were reduced by almost **50%** in the **blueberry extract**-supplemented group compared to controls.¹⁸

These findings have implications for aging humans who have risk factors for atherosclerosis.

Retina Protection

Light-induced damage can lead to debilitating ocular conditions such as age-related macular degeneration,¹⁹ a major cause of blindness in the elderly population.²⁰ Part of what happens when there is excessive light damage is the oxidation of fatty acids that compromise health and threaten retinal cells.

Researchers evaluated the impact that daily visible light exposure had on retinal fatty acids and then assessed the benefits of supplementation with blueberries and their impact on lipid peroxidation. In this study, blueberries were shown to reduce lipid peroxidation, confirming their protection to the retina.²¹

Blueberries and Nutrients for the Brain

Over the years, numerous studies have shown blueberries support overall brain health.^{1-3,22-25} Significant results reveal that blueberries can reduce many of the risk factors for **Alzheimer's**, such as the aggregation of **beta amyloid** and oxidative stress.^{25,26}

When beta amyloid plaques accumulate in the brain, they interfere with the cell-to-cell signaling of neurons, which is believed to be a main cause of Alzheimer's. This build up begins growing in the hippocampus (part of the brain that stores memory), and if left untreated, spreads to other areas of the brain.²⁷

A recent mouse model for Alzheimer's disease evaluated the brain support provided by **blueberries** in combination with **omega-3** and **phosphatidylserine**.





Two-month-old animals were divided into three groups—a control group, a group given a low-dose supplement, and a group given a high-dose supplement.²⁸

After seven months, the control group developed an increase in the number and volume of **amyloid** plaques as expected. Conversely, mice in the low and high-dose supplement (blueberry, phosphatidylserine and omega-3) groups showed fewer plaques, suggesting that the nutrient combination can provide protection against the development of amyloid plaques. Markers of oxidative stress were also decreased in the supplemented mice.²⁸

A noteworthy result was that the mice who received the nutrient combination (blueberry, phosphatidylserine, and omega-3) showed an increased amount of **acetylcholine**,²⁸ which is a neurotransmitter that facilitates the transmission of impulses between neurons.

Acetylcholine deficiency has been linked in the development of Alzheimer's.^{29,30} The drug **memantine** (Namenda®), for example, is a widely used drug to treat Alzheimer's that works by inhibiting the enzyme that breaks down acetylcholine. This type of medication may reduce the symptoms of Alzheimer's, but is accompanied by unfavorable side effects.^{31,32}

Summary

Blueberries have even more health benefits than previously believed, including the ability to improve mobility and reduce the risk of life-threatening falls in the elderly.

New evidence shows that blueberries can help protect the **retina**, reduce risk factors involved in **atherosclerosis**, and protect against structural changes in the **brain** that lead to **Alzheimer's** dementia. ●

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

References

1. Andres-Lacueva C, Shukitt-Hale B, Galli RL, et al. Anthocyanins in aged blueberry-fed rats are found centrally and may enhance memory. *Nutr Neurosci*. 2005;8(2):111-20.
2. Joseph JA, Denisova NA, Arendash G, et al. Blueberry supplementation enhances signaling and prevents behavioral deficits in an Alzheimer disease model. *Nutr Neurosci*. 2003;6(3):153-62.
3. Joseph JA, Shukitt-Hale B, Casadesus G. Reversing the deleterious effects of aging on neuronal communication and behavior: beneficial properties of fruit polyphenolic compounds. *Am J Clin Nutr*. 2005;81(1 Suppl):313s-6s.
4. Ahmet I, Spangler E, Shukitt-Hale B, et al. Blueberry-enriched diet protects rat heart from ischemic damage. *PLoS ONE*. 2009;4(6):e5954.
5. Basu A, Du M, Leyva MJ, et al. Blueberries decrease cardiovascular risk factors in obese men and women with metabolic syndrome. *J Nutr*. 2010;140(9):1582-7.

6. Kalea AZ, Clark K, Schuschke DA, et al. Vascular reactivity is affected by dietary consumption of wild blueberries in the Sprague-Dawley rat. *J Med Food*. 2009;12(1):21-8.
7. Basu A, Rhone M, Lyons TJ. Berries: emerging impact on cardiovascular health. *Nutr Rev*. 2010;68(3):168-77.
8. Liu W, Lu X, He G, et al. Protective roles of Gadd45 and MDM2 in blueberry anthocyanins mediated DNA repair of fragmented and non-fragmented DNA damage in UV-irradiated HepG2 cells. *Int J Mol Sci*. 2013;14(11):21447-62.
9. Brown CJ, Flood KL. Mobility limitation in the older patient: A clinical review. *JAMA*. 2013;310(11):1168-77.
10. Rogers MAM, Fries BE, Kaufman SR, et al. Mobility and other predictors of hospitalization for urinary tract infection: a retrospective cohort study. *BMC Geriatrics*. 2008;8:31.
11. Schrager MA, Hilton J, Gould R, et al. Effects of blueberry supplementation on measures of functional mobility in older adults. *Appl Physiol Nutr Metab*. 2015;40(6):543-9.
12. Vaught SL. Gait, balance, and fall prevention. *Ochsner J*. 2001;3(2):94-7.
13. Available at: <http://www.cdc.gov/homeandrecreationalsafety/falls/fallcost.html>. Accessed February 2, 2016.
14. Wall RT, Rubenstein MD, Cooper SL. Studies on the cellular basis of atherosclerosis: the effects of atherosclerosis risk factors on platelets and the vascular endothelium. *Diabetes*. 1981;30(Suppl 2):39-43.
15. Marcus J, Sarnak MJ, Menon V. Homocysteine lowering and cardiovascular disease risk: lost in translation. *Can J Cardiol*. 2007;23(9):707-10.
16. Available at: <http://www.nhlbi.nih.gov/health/health-topics/topics/hd/atrisk>. Accessed February 2, 2016.
17. Cromwell WC, Otvos JD. Low-density lipoprotein particle number and risk for cardiovascular disease. *Curr Atheroscler Rep*. 2004;6(5):381-7.
18. Stroher DJ, Escobar Piccoli Jda C, Gullich AA, et al. 14 Days of supplementation with blueberry extract shows anti-atherogenic properties and improves oxidative parameters in hypercholesterolemic rats model. *Int J Food Sci Nutr*. 2015;66(5):559-68.
19. Zrenner E. Light-induced damage to the eye. *Fortschr Ophthalmol*. 1990;87 Suppl:S41-51.
20. Plestina-Borjan I, Klinger-Lasic M. Long-term exposure to solar ultraviolet radiation as a risk factor for age-related macular degeneration. *Coll Antropol*. 2007;31 Suppl 1:33-8.
21. Liu Y, Zhang D, Hu J, et al. Visible light-induced lipid peroxidation of unsaturated fatty acids in the retina and the inhibitory effects of blueberry polyphenols. *J Agric Food Chem*. 2015;63(42):9295-305.
22. Lau FC, Bielinski DF, Joseph JA. Inhibitory effects of blueberry extract on the production of inflammatory mediators in lipopolysaccharide-activated BV2 microglia. *J Neurosci Res*. 2007;85(5):1010-7.
23. McGuire SO, Sortwell CE, Shukitt-Hale B, et al. Dietary supplementation with blueberry extract improves survival of transplanted dopamine neurons. *Nutr Neurosci*. 2006;9(5-6):251-8.
24. Casadesus G, Shukitt-Hale B, Stellwagen HM, et al. Modulation of hippocampal plasticity and cognitive behavior by short-term blueberry supplementation in aged rats. *Nutr Neurosci*. 2004;7(5-6):309-16.
25. Fuentealba J, Dibarrart AJ, Fuentes-Fuentes MC, et al. Synaptic failure and adenosine triphosphate imbalance induced by amyloid-beta aggregates are prevented by blueberry-enriched polyphenols extract. *J Neurosci Res*. 2011;89(9):1499-508.
26. Jeong HR, Jo YN, Jeong JH, et al. Blueberry (*Vaccinium virgatum*) leaf extracts protect against Abeta-induced cytotoxicity and cognitive impairment. *J Med Food*. 2013;16(11):968-76.
27. Serrano-Pozo A, Frosch MP, Masliah E, et al. Neuropathological alterations in Alzheimer disease. *Cold Spring Harb Perspect Med*. 2011;1(1):a006189.
28. Wang S, Cu Y, Wang C, et al. Protective effects of dietary supplementation with a combination of nutrients in a transgenic mouse model of Alzheimer's disease. *PLoS One*. 2015;10(11):e0143135.
29. Tabet N. Acetylcholinesterase inhibitors for Alzheimer's disease: anti-inflammatories in acetylcholine clothing! *Age Ageing*. 2006;35(4):336-8.
30. Available at: <https://www.nlm.nih.gov/medlineplus/magazine/issues/fall07/articles/fall07pg8-10.html>. Accessed February 3, 2016.
31. Thompson S, Lancot KL, Herrmann N. The benefits and risks associated with cholinesterase inhibitor therapy in Alzheimer's disease. *Expert Opin Drug Saf*. 2004;3(5):425-40.
32. Parsons CG, Danysz W, Dekundy A, et al. Memantine and cholinesterase inhibitors: complementary mechanisms in the treatment of Alzheimer's disease. *Neurotox Res*. 2013;24(3):358-69.



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References

1. *Aging Cell*. 2015 Aug; 14(4): 644–58.
2. *Exp Geronto*. 2010 Oct; 45(10):763-71.
3. *Rejuvenation Res*. 2011 Oct;14(5):525-34.

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References

1. *Int J Impot Res*. 2008 Dec; Suppl 2:S9-14.
2. *Int J Impot Res*. 2008 Mar;20(2):173-80.
3. *Phytother Res*. 2009 Mar;23(3):297-302.
4. *J Sex Marital Ther*. 2003 May;29(3):207-13.
5. *European Bulletin of Drug Research*. 2005;13(1): 7-13.
6. *Akush Ginekol (Sofia)*. 2007;46(5):7-12.
7. Rohdewald P. Pycnogenol, French maritime pine bark extract. In: Coates P, ed. *Encyclopedia of Dietary Supplements*. New York; Marcel Dekker; 2004.
8. *Urology*. 2006 Dec;68(6):1350-4.

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References

1. *Curr Pharm Des.* 2013;19(34):6094-111.
2. *Int J Mol Sci.* 2013;14(11):21447-62.
3. *PLoS One.* 2009;4(6):e5954.
4. *Nutr Neurosci.* 2005 Apr;8(2):111-20.
5. Available at: <http://www.scientificamerican.com/article.cfm?id=your-brain-on-blueberries>. Accessed January 28, 2015.
6. *Georgian Med News.* 2006 Dec;(141):66-72.
7. *J Cosmet Dermatol.* 2009 Jun;8(2):147-51.
8. *Applied Physiol Nutr Met.* 2015;40(6):543-9.
9. *J Agric Food Chem.* 2010 Apr 14;58(7):3970-6.

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ENHANCE EYELASHES NATURALLY

Enhance Eyelashes Naturally





Aging can take a heavy toll on the eyelashes, making them noticeably thinner, shorter, and more brittle. Many people resort to commercial products to create an *illusion* of improvement, but they fail to address the underlying causes.

Current treatments include drugs originally developed to treat glaucoma.¹ The hefty price tag and side effects associated with these drugs prompted scientists to search for safer alternatives.^{2,3}

In this article, you'll learn how scientists uncovered natural compounds that work in complementary ways to protect and strengthen the structural foundation of eyelashes—*naturally* making them healthier, longer, and thicker.

Getting to the Root of Eyelash Growth

Stem cells are responsible for the constant self-renewal and repair of the skin. They have the unique ability to either remain a stem cell or transform into a specialized cell type through cell division.⁴ Research shows that stem cells reside at the base of each hair follicle where they facilitate hair regeneration.⁵ These are referred to as hair follicle stem cells.

Each eyelash follicle rotates through the same three stages of growth as other body hair follicles. The first stage (*anagen*) is the growth phase that lasts roughly one to two months.⁶ It is characterized by stem cells giving rise to specialized cells called keratinocytes with two main functions: 1) producing the hair shaft visible above the skin, and 2) synthesizing the tough and fibrous protein keratin that adds fullness, length, and strength to the hair shaft.⁷⁻⁹

As the eyelash follicle enters the second or transitional stage (*catagen*), which lasts approximately two weeks, it begins to shrink and hair growth ceases. In the third and final stage (*telogen*), the eyelash follicle becomes active once again, producing new hair that emerges from the skin's surface by pushing out old hair to shed naturally. **Telogen** is the longest phase for eyelashes, lasting around four to nine months.⁶

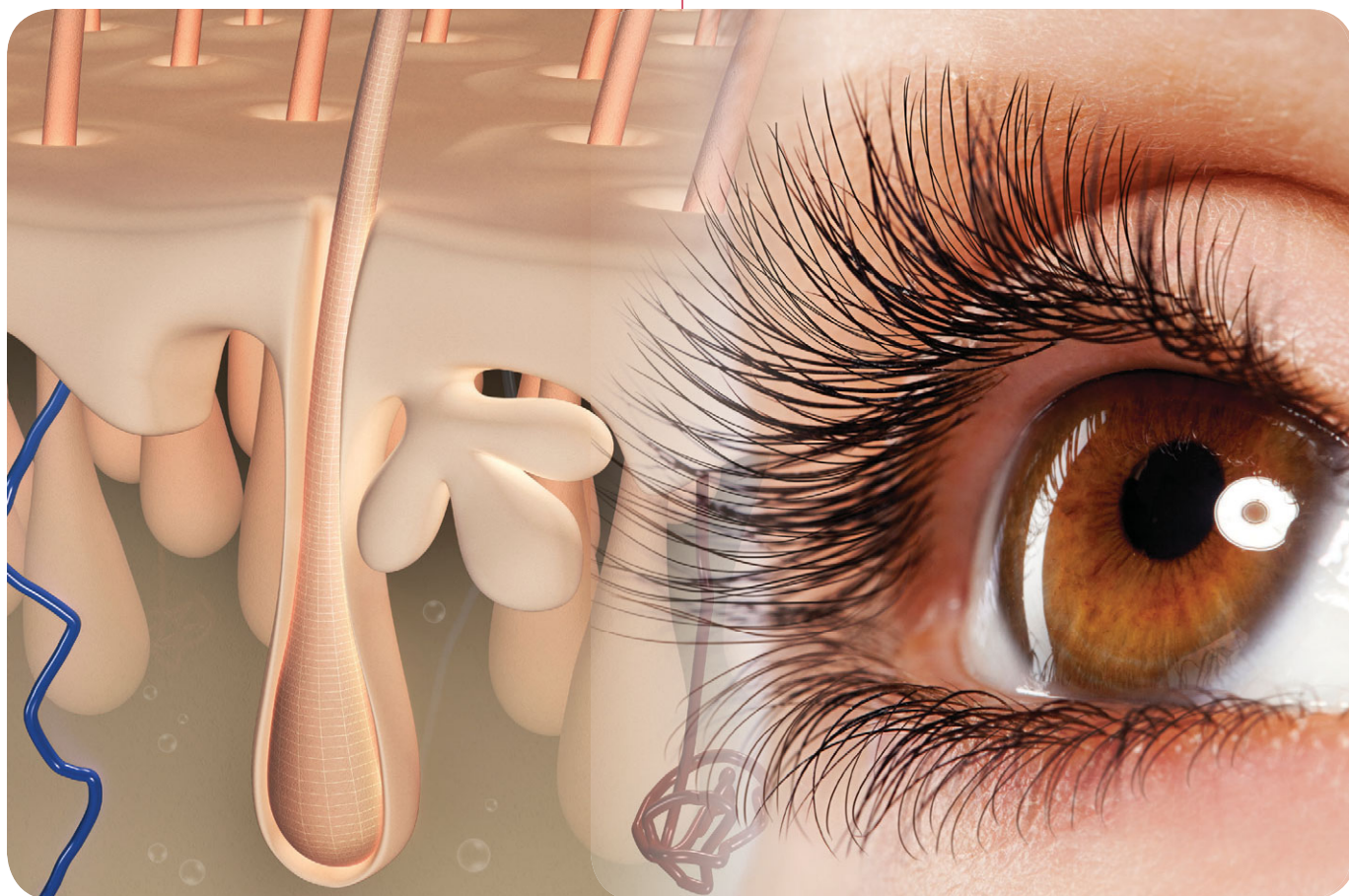
As a person ages, exposure to ultraviolet (UV) radiation compromises the regenerative capacity of hair follicle stem cells.¹⁰ Keratin production also diminishes in hair follicles.¹¹ Together, these age-associated changes lead to the outward appearance of weak, thin, and short eyelashes.

Fortunately, scientists have uncovered compounds that effectively target these changes to improve the appearance of eyelashes.

Novel Plant Extract Safeguards against Ultraviolet Radiation

Ultraviolet radiation induces oxidative stress in hair follicle stem cells that reduces their vitality and activity, in turn diminishing the health and longevity of the eyelashes.^{12,13} Scientists began investigating safe and effective compounds that protect hair follicle stem cells against the consequences of sun exposure. Plant stem cells derived from a rare grape variety quickly stood out.

Gamay Teinturier Fréaux grapes grow in an east-central region of France. They have red flesh and juice that signifies a high content of **anthocyanins**, flavonoids that combat oxidative stress through





potent free radical scavenging activity.^{14,15} The unique synergy between anthocyanins and other metabolites present in the grape provides frontline defense against ultraviolet damage.¹⁶

The capacity of stem cells to form colonies, known as **colony-forming efficiency**, is a key measure of their vitality and activity. Ultraviolet radiation has been shown to decrease colony-forming efficiency. Researchers conducted a laboratory experiment in which skin stem cells were treated with or without grape stem cell extract before exposure to ultraviolet radiation. While untreated cells experienced a **58% decrease** in colony-forming efficiency, **no** changes were seen in treated cells. This demonstrated that treated cells were safeguarded against harmful ultraviolet radiation.¹⁶

Let's now take a look at how a recently developed peptide significantly enhances eyelash growth.

Myristoyl Pentapeptide-17 Stimulates Eyelash Growth

The formation of keratin in the anagen phase is essential for eyelash growth and density. With advancing age, this process fails to run smoothly.¹¹ To combat age-related decline in keratin synthesis, scientists developed a peptide called **myristoyl pentapeptide-17**. It has been shown in laboratory experiments to **increase** the expression of keratin genes by up to **160%**, thereby boosting keratin production.¹⁷ This has translated into striking results in human clinical studies.

In a recent trial, 15 human volunteers ranging in age from 24 to 82 applied an eyeliner serum containing **myristoyl pentapeptide-17** to the roots of their lashes. The researchers used computer-assisted image

Boost Eyelash Growth Naturally

- Hair regeneration depends on the activity of stem cells at the base of each hair follicle and adequate keratin—the tough and fibrous protein that adds length, strength, and fullness to hair.
- With advancing age, ultraviolet radiation compromises the regenerative capacity of hair follicle stem cells and keratin production declines.
- The result is noticeably thinner, shorter, and more brittle eyelashes.
- Current treatments are unattractive to many people due to high cost and significant side effects.
- Scientists have identified a number of topical compounds, including a novel plant extract, myristoyl pentapeptide-17, glycoproteins, and panthenol, which protect and strengthen the structural foundation of eyelashes to leave them healthier, longer, and thicker.

analysis software to assess eyelash characteristics. They observed a **25% increase** in eyelash length and thickness in just 14 days!¹⁷

Even more impressive, another study revealed that participants applying an eyeliner serum with myristoyl pentapeptide-17 to the target area increased eyelash thickness and length by **72%** after six weeks. Both studies reported no adverse side effects.¹⁷

Glycoproteins Support Hair Follicle Formation

Glycoproteins are large molecules composed of carbohydrate and protein. They form a vital part of the **extracellular matrix** that provides a proper environment for the development of new hair follicles. In fact, research indicates that glycoproteins act as powerful chemical messengers between the layers of the skin to jumpstart eyelash growth.^{18,19}

Panthenol Exerts Powerful Moisturizing Effects

Panthenol has been a mainstay ingredient in hair products for the past two decades and for good reason. It is a derivative of pantothenic acid (vitamin B5), a vital component of coenzyme A that assists in metabolic functions such as protein and lipid synthesis. Panthenol is converted into pantothenic acid in the hair shaft where it effectively binds water molecules, thereby improving eyelash moisture.²⁰

Summary

Current treatments to improve aging eyelashes come with a steep price and substantial side effects, making them an unattractive option for many people. Fortunately, scientists have identified a network of complementary compounds, including a novel plant extract, myristoyl pentapeptide-17, glycoproteins, and panthenol, which protect and strengthen hair follicles to naturally deliver healthier, longer, and thicker eyelashes. ●



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

Gary Goldfaden, MD, is a clinical dermatologist and lifetime member of the American Academy of Dermatology. He is the founder of Academy Dermatology in Hollywood, FL, and Cosmesis Skin Care. Dr. Goldfaden is a member of Life Extension®'s Medical Advisory Board. All Cosmesis products are available online.

References

1. Law SK. Bimatoprost in the treatment of eyelash hypotrichosis. *Clin Ophthalmol*. 2010;4:349-58.
2. Alm A, Grierson I, Shields MB. Side effects associated with prostaglandin analog therapy. *Surv Ophthalmol*. 2008;53 Suppl1:S93-105.
3. Hollo G. The side effects of the prostaglandin analogues. *Expert Opin Drug Saf*. 2007;6(1):45-52.
4. Blanpain C, Fuchs E. Epidermal stem cells of the skin. *Annu Rev Cell Dev Biol*. 2006;22:339-73.
5. Ohshima M. Hair follicle bulge: a fascinating reservoir of epithelial stem cells. *J Dermatol Sci*. 2007;46(2):81-9.
6. Jones D. Enhanced eyelashes: prescription and over-the-counter options. *Aesthetic Plast Surg*. 2011;35(1):116-21.
7. Lavker RM, Sun TT, Oshima H, et al. Hair follicle stem cells. *J Invest Dermatol Symp Proc*. 2003;8(1):28-38.
8. Yano K, Brown LF, Detmar M. Control of hair growth and follicle size by VEGF-mediated angiogenesis. *J Clin Invest*. 2001;107(4):409-17.
9. Roh C, Tao Q, Lyle S. Dermal papilla-induced hair differentiation of adult epithelial stem cells from human skin. *Physiol Genomics*. 2004;19(2):207-17.
10. Ruetze M, Dunckelmann K, Schade A, et al. Damage at the root of cell renewal--UV sensitivity of human epidermal stem cells. *J Dermatol Sci*. 2011;64(1):16-22.
11. Giesen M, Gruedl S, Holtkoetter O, et al. Ageing processes influence keratin and KAP expression in human hair follicles. *Exp Dermatol*. 2011;20(9):759-61.
12. Tower J. Stress and stem cells. *Wiley Interdiscip Rev Dev Biol*. 2012;1(6):789-802.
13. Trueb RM. Oxidative stress in ageing of hair. *Int J Trichology*. 2009;1(1):6-14.
14. Georgiev V, Ananga A, Tsovala V. Recent advances and uses of grape flavonoids as nutraceuticals. *Nutrients*. 2014;6(1):391-415.
15. Lila MA. Anthocyanins and human health: an in vitro investigative approach. *J Biomed Biotechnol*. 2004;2004(5):306-13.
16. Available at: <http://biogreenscience.com/file/clinical/solarvitis.pdf>. Accessed February 18, 2016.
17. Available at: <http://beverlyhills-md.com/pdfs/SymPeptideforEyelash0909.pdf>. Accessed January 4, 2016.
18. Li J, Tzu J, Chen Y, et al. Laminin-10 is crucial for hair morphogenesis. *Embo J*. 2003;22(10):2400-10.
19. Couchman JR. Hair follicle proteoglycans. *J Invest Dermatol*. 1993;101(1 Suppl):60s-4s.
20. Trueb RM. Pharmacologic interventions in aging hair. *Clin Interv Aging*. 2006;1(2):121-9.



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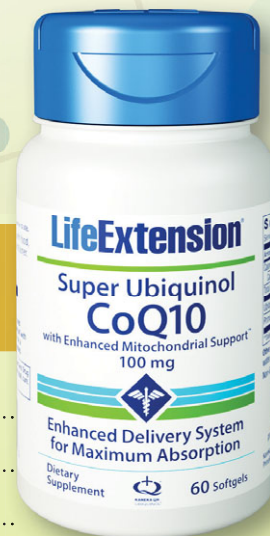
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References

1. Available at: <http://biogreenscience.com/file/clinical/solarvitis.pdf>. Accessed February 18, 2016.
2. Available at: <http://beverlyhills-md.com/pdfs/Sym-PeptideforEyelash0909.pdf>. Accessed January 5, 2016.
3. *J Invest Dermatol*. 1993;101(1 Suppl):60s-4s.
4. *Embo J*. 2003;22(10):2400-10.
5. *Clin Interv Aging*. 2006;1(2):121-9.

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References

1. *Mutagenesis*. 2015;30(1):129-37.
2. *Curr Opin Clin Nutr Metab Care*. 2013;16(6):688-97.
3. *Circ J*. 2010;74(3):578-88.
4. *Nutrition*. 2014;30(3):337-42.
5. *BMC Musculoskelet Disord*. 2009;10:110.
6. *J Transl Med*. 2015;13:79.

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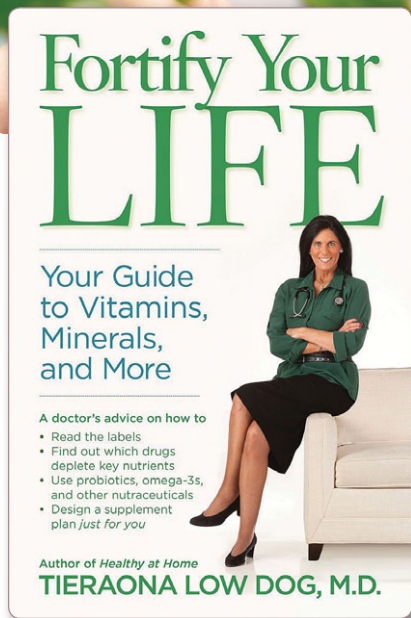
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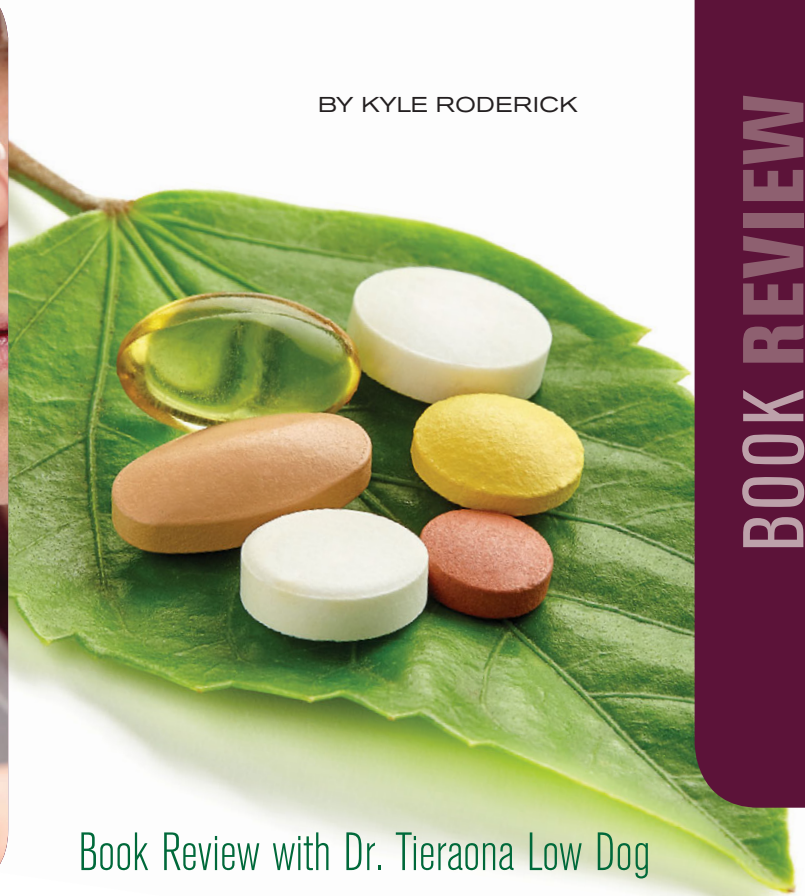
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Fortify Your Life

Your Guide to Vitamins, Minerals, and More



Book Review with Dr. Tieraona Low Dog

"Clearly," says Tieraona Low Dog, MD, "many Americans are not getting everything they need in their diet as seen by the deficiencies noted by the US Centers for Disease Control data."

Of Cherokee descent, Dr. Low Dog is an integrative medicine specialist practicing in Pecos, New Mexico. "Many of my patients," she notes, "benefit from a high-quality multivitamin that is specific for age, gender, and lifestyle." She also prescribes a wide array of minerals, herbal remedies, and other supplements, especially to older patients.

An internationally recognized authority on integrative medicine and dietary supplements, Dr. Low Dog has chaired two committees on dietary supplements for the US Pharmacopeia and served as adviser to both the White House and the National Institutes of Health. She's also the author of *Fortify Your Life* (National Geographic Books), a recently published guide to vitamins, minerals, and other key supplements. Dr. Low Dog says that a major reason that she wrote this book is that, "Very few health care professionals are routinely checking nutrient levels, and even fewer discuss the potential for deficiencies with their patients, with the exception of potassium and diuretic use."

Drug-Induced Nutrient Deficiencies

Dr. Low Dog and her physician colleagues are seeing various drug-related nutrient-deficiency problems on the rise. For instance, “We are seeing more people having difficulty with absorption of nutrients due to broad use of proton pump inhibitors, or PPIs, which are drugs that inhibit the proton, or acid-producing, pumps in the stomach,” she says. “Sold under such brand names as Prilosec®, Nexium®, and Protonix®, these are used to treat acid reflux and are, in my opinion, overprescribed.”

Dr. Low Dog relates that a person’s level of CoQ10, “which is very important for heart and neurological health, can be depleted by numerous prescription drugs.” These include such widely prescribed drugs as statins and beta-blockers.

“We are also seeing more people having difficulty with absorption of nutrients due to the prevalence of autoimmune disease and the aging population,” says Dr. Low Dog. “Digestive enzymes can be useful in this regard because they stimulate the body’s production and/or release of stomach acid, bile, and pancreatic enzymes.”

Dr. Low Dog points out that bitter foods (arugula, radicchio, endives) and bitter herbs (dandelion root, artichoke leaf, gentian root, angelica) can be added to the diet to enhance the stimulation of stomach acid, bile, and pancreatic enzymes.

“For some people, digestive enzymes may be necessary,” says Dr. Low Dog. “While you can take enzymes that are derived from plants or animal sources, I generally recommend the former. Look for products that provide Food Chemical Codex (FCC) units. In the

US, Food Chemical Codex is the national standard for evaluating activity and potency of enzymes.”

As a physician who views public health issues as major influences upon the fate of the nation, “I’m deeply concerned about the mixed messages in the media regarding the current state of nutrition in the US,” says Dr. Low Dog. She objects to the oft-repeated mantra, “If you just eat right, you’ll get everything you need.” As she notes in *Fortify Your Life*, this is contradicted by unassailable research findings that some of the most widely prescribed drugs in the US deplete the body of vital nutrients.

In Dr. Low Dog’s opinion, the science of drug-nutrient depletions and interactions “are totally off the radar” in US medical school curricula. “Drug companies should be required to list potential nutrient depletions in their commercials and advertisements,” she asserts. “While I am not in favor of direct-to-consumer advertising of drugs, until it is banned, I believe that this should be mandatory.

“We should increase the training for medical doctors, nurse practitioners, pharmacists, registered dietitians, psychologists, and many other health professionals so that we can all be advocates on our patient/client’s behalf,” Dr. Low Dog continues.

Fortify Your Life is filled with the kind of practical and actionable news that everyone can use. For instance, while it’s estimated that 30 million people take Prozac® and other anti-depressant SSRIs, these drugs have been proven to deplete the body of vital nutrients like iodine, selenium, and vitamin B9 (folate) and hormones like melatonin. “Around **60%** of Americans take at least one prescription drug,” Dr. Low Dog notes, “and **15%** take five or more every day.” Thus, the risk for drug-induced nutrient depletions in the majority of the population “further increases the risk of nutrient deficiencies.” Fortunately, *Fortify Your Life* contains a lengthy, detailed, and easy-to-understand Appendix of Drug-Nutrient Depletions and Interactions.



With more than 30 million Americans deficient in vitamin B6, which can cause depression and poor cognition, and roughly the same number of people taking antidepressant medications, “It concerns me that health care providers don’t ever think to check B6 levels,” says Dr. Low Dog. “If we never think about it,” she continues, “we may never look and thus we may remain unaware of the deficiency.”

“I do not always order blood tests,” explains Dr. Low Dog, “but I do if I suspect deficiency based upon a thorough history and physical exam.” If a nutrient deficiency is noted, “We make recommendations accordingly and then recheck generally in eight to 12 weeks.”

If the follow-up blood test shows that supplement levels have made little improvement, Dr. Low Dog carefully considers various factors related to the nutrient deficiency in question.

Best Way to Take Supplements

“Are we using the correct form of a nutrient (e.g. pyridoxal-5-phosphate instead of pyridoxine for vitamin B6)?” Dr. Low Dog asks. “Would a liquid or capsule be superior to a tablet? Do we have the partner nutrients that are necessary for activation, use, and transport by the body?”

For instance, she says, “Iron is needed to correct iron deficiency anemia, but you need vitamin A to move the iron into the hemoglobin and vitamin C is necessary to absorb non-heme forms of iron.” Then again, “You need vitamin A to see in dim light at night, but you must have zinc to transport it from the liver (where it is stored) to the retina.” Noting that vitamin D insufficiency is very common in

Dr. Low Dog’s Supplement Lowdown

Dr. Low Dog’s practice of correcting patients’ nutritional deficiencies with supplements carries through into her own life.

Dr. Low Dog takes melatonin every night about two hours before bedtime. She explains that “when taken several hours before sleep, it can shorten the time it takes to fall asleep as well as help you stay asleep. Besides playing a primary role in maintaining our 24-hour circadian rhythm,” she continues, “melatonin also acts as an antioxidant, anti-inflammatory, pain reliever, and antidepressant. Additionally, melatonin protects the GI tract and nervous system and assists in the regulation of blood sugar. It may even help protect us against certain cancers.”

Our natural production of melatonin may decline with age. “In Europe,” Dr. Low Dog notes, “sustained-release melatonin is approved for adults aged 55 and older who have primary insomnia.”

Dr. Low Dog also takes a multivitamin and vitamin D every day. “I take probiotics three to four times per week and eat culture-rich yogurts on the other days. I take a high quality cod liver oil two to three times per week. During cold and flu season, I take vitamin C, zinc, and elderberry.”

the US population, Dr. Low Dog offers this compelling advice about supplementing with vitamin D: “Taking vitamin D with the dinner meal can increase absorption by **50%** more than taking with breakfast (dinner meals generally contain more fat).”

More Health-Enhancing Facts

Noting that immunity begins in the gut, Dr. Low Dog says, “Probiotics and prebiotics, whether in supplement form or in foods, are vitally important in a society where one in three babies are born by C-section and the average 21-year-old [person] has typically taken 17 rounds of antibiotics. We are just in our infancy when it comes to fully realizing the vital importance of the human microbiome and health.”

Fortify Your Life brims with many other potentially health-

enhancing facts on often-overlooked benefits of basic nutrients such as magnesium. For instance: “When blood sugars rise, magnesium is excreted in the urine. Up to a third of people with diabetes are deficient in magnesium, further complicating their ability to maintain good blood sugar control: a vicious cycle. Magnesium may also protect us from stroke by making our platelets less likely to form blood clots.”

She goes on to add more intriguing facts: “Iodine deficiency is the most preventable cause of brain damage in the world,” and as more Americans eat sea salt, Himalayan salt, and other so-called “gourmet salts” (as opposed to table salt), they are becoming increasingly iodine-deficient.

When it comes to healthy-aging supplements, the medical evidence comes out strongly in favor of alpha-lipoic acid and acetyl-L-carnitine. “Dr. Bruce Ames,



an emeritus professor of biochemistry and molecular biology at the University of California, Berkeley, has done extensive research on mitochondria and aging,” Dr. Low Dog relates in *Fortify Your Life*. “Dr. Ames discovered that if you want to maintain a healthy heart, brain, and nervous system, there is probably no better combination than the antioxidant alpha-lipoic acid and acetyl-L-carnitine, a potent [amino acid].” These enhance the energy production of the mitochondria, the powerhouse of our cells. Dr. Low Dog believes that many people 50 and over “would benefit from taking a supplement that provides **500 to 1,500 mg** of acetyl-L-carnitine in addition to alpha-lipoic acid.”

Cognitive Protection

As Dr. Low Dog writes in *Fortify Your Life*, “Since alpha-lipoic acid easily crosses the blood-brain barrier, its antioxidant effects may be particularly important in pro-

tecting the central nervous system from illness, disease, and DNA damage. Thus, it may play a role in helping protect us against Alzheimer’s disease, dementia, and Parkinson’s disease. One small, double-blinded, placebo-controlled 12-month study published in 2014 in the *Journal of Alzheimer’s Disease* found that the combination of fish oil (**975 mg** of EPA and **675 mg** of DHA) and **600 mg** of alpha lipoic acid slowed both cognitive and functional decline in people with dementia.”

Although Dr. Low Dog emphasizes that we are only in the “very early stages of research, and neurodegenerative diseases are complex, based upon what we know so far, alpha-lipoic acid may play an important role in the healthy aging of our brain.” Anyone aged 65 or older, diabetics, and those with a family history of dementia or other neurodegenerative diseases may want to consider supplementing with alpha-lipoic acid. Dr. Low Dog recommends **200 to 400 mg** a day for most users and **600 mg** two

times per day in case of neuropathy or cognitive decline.

These and other highly nuanced insights into maximizing our nutrient intake for well-being and optimum aging makes *Fortify Your Life* such a worthwhile book to read and refer to as you manage your health. ●

Dr. Tieraona Low Dog is an internationally recognized expert in the fields of dietary supplements, herbal medicine, women’s health, and natural medicine. In 2000, she was appointed by President Bill Clinton to serve on the White House Commission of Complementary and Alternative Medicine and she recently completed a three-year term as a member of the Advisory Council for the National Institutes of Health National Center for Complementary and Alternative Medicine (NCCAM). She has published 45 peer-reviewed articles, written 22 chapters for medical textbooks, and authored three National Geographic books, including *Healthy at Home* and *Life Is Your Best Medicine*. She has also co-authored the *Guide to Medicinal Herbs*.

For more information, or to contact Dr. Low Dog, visit www.drlowdog.com.

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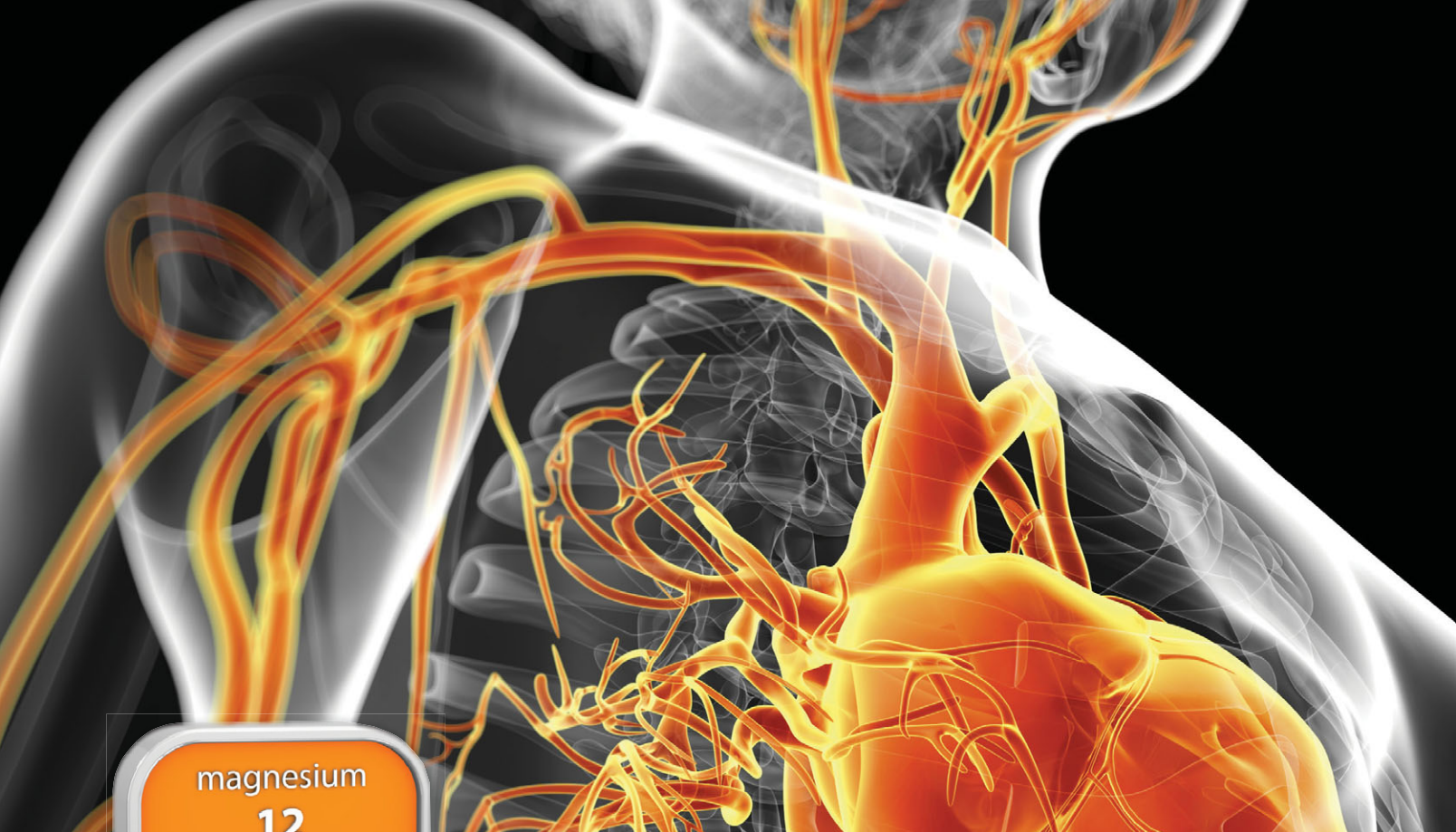


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Caution: If taken in high doses, magnesium may have a laxative effect. If this occurs, divide dosing, reduce intake, or discontinue use.

References

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

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A Multi-Targeted Approach to Reduce the Risk of Alzheimer's Disease

LE: I'm concerned about Alzheimer's disease, as it "runs" in my family. Am I at risk?

HL: Characterized by a decline in cognitive function, Alzheimer's disease is a neurodegenerative disorder that affects millions of individuals and families worldwide. Research finds this devastating disease to be the consequence of multiple factors including inflammation, mitochondrial dysfunction, accumulation of toxic proteins, and oxidative stress. Others stress the implications of chronic infection both in the development and progression of Alzheimer's disease. In addition, age-related changes in vascular function and declining hormone levels are thought to contribute to the disease.

It is clear that multiple factors influence the risk of Alzheimer's disease. Some of the factors associated with Alzheimer's disease like obesity and nutrient deficiencies are modifiable, but others, such as carrying the ApoE4 gene, are not. Family history, aging, and certain infections, as well as diseases like diabetes and hypertension, also increase the risk. This is just a small list of the most common factors associated with an increased risk of Alzheimer's disease.

More important is to look at the specific individual when it comes to the risk factors, such as if an aging adult has a parent with Alzheimer's disease and/or if this person has a history of high blood pressure. The appropriate approach would be to look at blood pressure first. What usually happens at this point when the causes of high blood pressure are explored, risk factors like elevated cholesterol or homocysteine arise.

Q: What are some suggestions to reduce the risks?



HL: As mentioned previously, the importance of identifying the root problem(s) is crucial and usually results in a better outcome. When it comes to risk factors, think of them like a loaded gun, meaning that we are all at risk and it's up to the individual to fire the gun or not. For example, if someone has a strong family history of diabetes but follows a strict diet, the likelihood of developing diabetes is greatly reduced. Contrary to this is the individual with family history of high blood pressure who smokes and follows a sedentary lifestyle and consumes a diet high in sodium.

When talking about Alzheimer's disease risk factors and a useful way to reduce them, the same applies. A detailed medical history (both family and personal), current medications (as many deplete the body of key nutrients), and information about social habits, exercise, and diet is a good start. Based on this, a recommendation of comprehensive blood testing

to identify additional risks (that will vary from person to person) is made. With all this information in hand, a specific regimen to correct root problem(s) is suggested.

We'll use the same example described previously about the individual with a family history of Alzheimer's disease and high blood pressure: Commonly prescribed medications for high blood pressure include diuretics like hydrochlorothiazide or furosemide that deplete the body of key nutrients such as coenzyme Q10 (CoQ10), magnesium, calcium, phosphorus, and vitamins B and C, all of which are important in brain function and cognition. With this in mind and with the goal of reducing risk factors and ensuring proper blood pressure control, it's suggested that an individual keep a blood pressure log and replace those nutrients depleted by the medication. This is also the time in which a conversation about diet (low sodium) and exercise (at least 30 minutes three or four times a week) takes place.

The next step is to identify additional risk factors by looking at blood work. Life Extension®'s **Male** and **Female Panels** do a great job as they are comprehensive tests that look at different areas including markers for diabetes (glucose and HbA1c) and inflammation (C-reactive protein and homocysteine) as well as male/female hormones, lipid panel, vitamin D, complete blood count (CBC), and blood chemistry.

Let's assume that the results from the blood test reveal elevated homocysteine and cholesterol levels, blood markers associated with an increased risk for both high blood pressure and Alzheimer's disease. The proper approach for this individual would be to correct nutrient deficiencies caused by a medication (as this might be related to the increase in homocysteine due to depletion of B vitamins) followed by strict blood pressure control, dietary modifications, an exercise program, and nutrients like red yeast rice and omega-3s to aid healthy cholesterol metabolism. Due to the individual's family history of Alzheimer's disease, preventive approaches with nutrients like acetyl-L-carnitine, vitamin D, CoQ10, N-acetyl cysteine (NAC), curcumin, and R-lipoic acid could be suggested.

LE: I have been told that my memory is good, so how can I preserve it?

HL: Nutritional approaches should be combined together with diet and exercise to successfully preserve memory in aging adults. Remember that cognitive decline if left unchecked can develop into more serious conditions like Alzheimer's disease.

If someone does an internet search for memory and supplements, they would be overwhelmed with the amount of information that is provided. For those concerned about memory, the top nutrients to incorporate into a regimen may include:

Fish oil: Helps ease inflammation and support the integrity of cell membranes that are crucial for brain function. Numerous studies indicate that supplementation optimizes cognitive health.

Phosphatidylserine (PS): Important for cell membrane integrity and facilitates cell communication between neurons in the brain.

Alpha-glyceryl phosphoryl choline (A-GPC): This form of choline supports healthy acetylcholine levels, an essential neurotransmitter that allows brain cells to communicate and is involved in memory and learning.

Vinpocetine: Derived from the periwinkle plant, it supports healthy cerebral blood flow.

Acetyl-L-carnitine: This form of carnitine crosses the blood-brain barrier and supports mitochondrial health.

Taurine: Promotes new brain cell formation.

Ashwagandha: Targets the enzyme that breaks down acetylcholine in the brain.

Be aware that these are not the only nutrients that may support brain function. The most important component of any supplement regimen is to identify the underlying factors that contribute to the problem and correct it. Other key nutrients that aging adults may consider and that are specific to Alzheimer's disease are summarized in the table below.

LE: Are there any dietary or lifestyle strategies to reduce the risk of Alzheimer's?

HL: Several studies have demonstrated a reduction in neurodegenerative diseases including

Alzheimer's disease in those that follow a Mediterranean or MIND (Mediterranean-DASH Intervention for Neurodegenerative Delay) diet. Incorporating "good fats," especially omega-3s and olive oil, multi-colored vegetables and fruits, nuts, legumes, and fish along with a lower intake of sweets, meats, and high-fat dairy may help reduce the risk of Alzheimer's disease and several other diseases. Other researchers have reported that a low-calorie diet is also beneficial to reduce the risks of cognitive decline and Alzheimer's disease.

Physical exercise is known to enhance cognitive function in humans. Research has identified a signaling protein called **brain-derived neurotrophic factor** that is key to brain health as it facilitates the growth of new neurons (brain cells). Regular exercise is associated with an increase in brain-derived neurotrophic factor.

For those concerned about cognitive decline and Alzheimer's disease, a combination of a low-calorie Mediterranean/MIND diet along with an exercise regimen that includes 30 minutes of physical activity at least three or four times a week may be useful.

Remember that addressing the underlying cause(s) of Alzheimer's disease is perhaps the most valuable and important approach to prevent such a devastating disease. Currently, there is no magic bullet to reduce the risk for this condition and it is crucial to build a multi-targeted regimen around diet, exercise, and nutrients to reduce the risks. ●

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

Hernando Latorre, MD, MSc, is the medical editor for **Life Extension®** magazine.

Nutrients to Combat Alzheimer's Disease

Nutrients with Strong Evidence from Human Studies

Acetyl-L-carnitine	Lipoic acid
<i>Panax ginseng</i>	N-acetyl cysteine (NAC)
Huperzine A	Omega-3 fatty acids
Vitamin D	<i>Ginkgo biloba</i>

Nutrients with Strong Evidence from Epidemiological Studies

Coffee	Vitamin E
Magnesium	

Nutrients with Strong Laboratory and Theoretical Evidence

B vitamins	Blueberry extracts
CoQ10	PQQ
Curcumin	Grape seed extract
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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.

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- Eye health, and
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References

1. *Mol Vis*. 2012;18;2673-86.
2. *Stem Cell Res*. 2015 May;14(3):369-79.
3. *Exp Clin Cardiol*. 2008 Summer;13(2):57-65.
4. *Exp Mol Med*. 2012 Nov 30;44(11):665-73.
5. *Curr Opin Clin Nutr Metab Care*. 2006 Nov;9(6):728-33.
6. *J Biomed Sci*. 2010 Aug 24;17 Suppl1:S1.
7. *Amino Acids*. 2008 Aug;35(2):469-73.
8. *Amino Acids*. 2012 Nov;43(5):1979-93.
9. *Neurosci Lett*. 2006 May 15;399(1-2):23-6.



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BY KYLE RODERICK



A Time-Travel Party with David Kekich



Have you ever imagined what it would be like to live 100 years from now? Life sciences entrepreneur David Kekich of Newport Beach, California, stretches imagination into reality by hosting parties around the time-traveling premise that the future *is now*.

Kekich's end-of-the-year 2015 bash drew an all-star cast of PhD evolutionary biologists, anti-aging researchers, wellness executives, gene therapy entrepreneurs, and other super-centenarian seekers. One wall of the room featured a huge television that silently screened the original *Star Wars* film. Partygoers clad as characters out of iconic science fiction series such as *Star Trek* (as well as those in chic Californian ensembles) debated such questions as:

- What anti-aging research breakthroughs will occur in 2016?
- Where in the world is gene therapy research progressing the fastest? What cures will be the first to become widely affordable?
- How should CRISPR-cas9, the bacterial system discovered in 2012 that allows for quick and easy changing of the DNA of nearly any organism, (including humans) be regulated?

According to Kekich, “The main point of the party was to enjoy catching up with each other, as well as to celebrate how the search for an enhanced human life span is picking up speed.”

Kekich, clad in a sleek silver jumpsuit reminiscent of Flash Gordon, has been confined to a wheelchair for decades due to a spinal cord injury. Due to the synergistic effects of disciplined workouts, careful eating, nutritional supplementation, and innate curiosity, Kekich is nevertheless a highly engaging avatar of anti-aging. Brimming with radiant health, compelling conversation, and high energy, Kekich is the author of ***Smart, Strong and Sexy at 100***, a how-to guide that summarizes evidence-based medical research into remedies for aging, along with action plans for cultivating optimum health and maximum life span.

Good News Ahead

There is plenty of marvelous medical health news to celebrate at this moment in history, Kekich said. “With each passing year,” he noted, “science comes closer to finding remedies for slowing the onset of aging.”

Kekich, who defines aging variously as “a disease” or as “an undesirable, but not necessarily inevitable, byproduct of the evolutionary process,” has devoted decades of energy to the anti-aging business and to studying anti-aging research. “I specialize in raising funding and providing management for life sciences-related technologies that aim to enhance quality of life and human life span,” he added. “Talking to research scientists and working with them is endlessly fascinating, which fills my life with ongoing exploration and surprises.”

Supplementation Tips

David Kekich suggests that an anti-aging specialist monitor your blood panels, as he has done, if you want to take a scientific approach to supplementation. Kekich looks forward to the day when everyone can customize a vitamin, mineral, and nutraceutical supplement regimen with scientific precision across a life span. “I am hoping that we will soon be able to affordably map personal genomes and learn what to do with all the data rather than rely on educated guesswork,” he said.

Given that everyone has unique body biochemistry and health issues, Kekich added, “I never suggest any particular dosages for specific supplements. One size does not fit all. For optimal health, and before starting any supplement protocol, I recommend that you see a qualified anti-aging physician.”

Kekich buys almost all of his supplements from Life Extension®. “I have been a customer of Life Extension for 25 years,” he says. “I agree with its list of the 12 essential steps for streamlining one’s longevity protocol.”

Life Extension®’s recommendations for achieving optimal health include the following:

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- Vitamin D3
- Mitochondrial Energy Optimizer with BioPQQ®
- DHEA (see an anti-aging physician or speak to a Life Extension® Health Advisor for more information)
- Cognitex® with Pregnenolone & Brain Shield®
- Bone Restore
- Ultra Natural Prostate
- Advanced Bio-Curcumin® with Ginger & Turnerones
- Low-Dose Aspirin (Enteric Coated)
- Once-Daily Health Booster

In addition, Kekich also takes probiotics for intestinal health, a full range of vitamins and other supplements including vitamin C, vitamin E (mixed tocopherols alpha/gamma), vitamin K, acetyl-L-carnitine, alpha lipoic acid, anthocyanins, astaxanthin, and melatonin. (Melatonin production declines with age in humans. As Kekich notes in his book, some anti-aging physicians and functional medicine specialists suggest that increased dosages may be helpful for those experiencing insomnia as time goes by.)

Kekich's Background and History

In 1999, Kekich founded the Maximum Life Foundation, a 501(c)(3) not-for-profit corporation dedicated to reversing human aging and aging-related diseases. Since then, the Foundation, in collaboration with leading researchers, has developed scientific action plans for helping slow the onset of aging while fostering optimal mental and physical health. The CEO of SciCog Systems, Inc. and Age Reversal, Inc., Kekich also serves as a board member of the American Aging Association and Alcor Foundation Patient Care Trust Fund.

"I first became intrigued with the concept of life extension in 1977 after founding the largest life insurance master general agency in the United States," Kekich said. "This raised \$3.1 billion of premium income for First Executive Corp. and the experience exposed me to many sobering facts and figures related to death from unhealthy lifestyles and death from aging." It also prompted him to seek out and work with expert researchers in the field. Paraphrasing evolutionary biologist, author, and party guest Michael Rose, PhD, Kekich explained, "It appears that the evolutionary process loses power with each year that we live past the onset of our reproductive age until 'the force' (as Dr. Rose calls it) finally fades to black."

On the upside, "I am encouraged by Dr. Rose's precedent-setting experiments that substantially postponed aging in fruit flies," Kekich said. "These were the *first* to demonstrate that longevity can be genetically modulated." Dr. Rose is a professor and director of the Network for Experimental

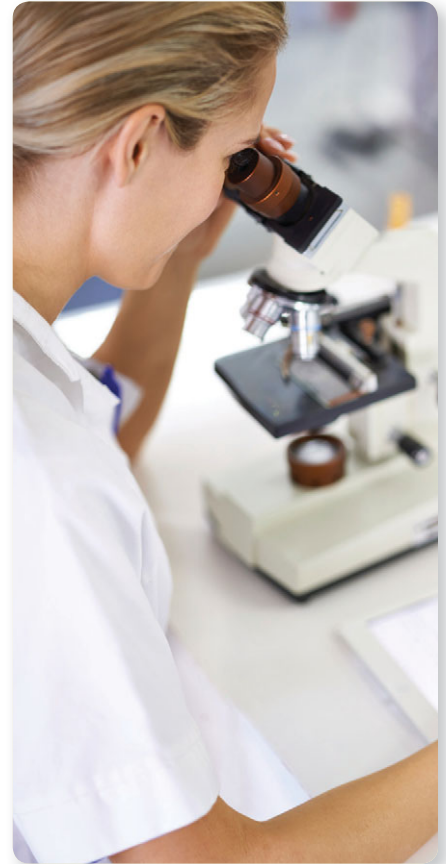
Research on Evolution (NERE), Ecology and Evolutionary Biology in the School of Biological Sciences at the University of California, Irvine. (Fulfilling Kekich's mandate to dress for anti-aging success, Dr. Rose came cloaked in the ageless vampire elegance of Count Dracula, costumed in formal eveningwear topped off by a billowing black silk cape.)

Telomerase and a Longer Life Span

Along with other life extension research that suggests it may be possible to extend human existence beyond the maximum life span of 120 years, telomerase research fills Kekich with hope. "Publication of peer-reviewed scientific research on telomerase gene therapy and other scientific projects indicates that we are getting closer to the goal of extending human life span," he said.

A 1998 article in the journal *Science* identified telomerase as a protein that is capable of extending cell life span. Telomerase is now recognized as capable of immortalizing human somatic cells. The idea of potentially extending life span using telomerase is derived from research done by the laboratory of Spanish scientist Maria Blasco, PhD.

In 2012, Dr. Blasco demonstrated that telomerase gene therapy could extend the life span of mice by as much as **20%**. "It is breakthroughs such as these that make [now] such an exciting time to be alive," Kekich noted. Expert researchers in the field share Kekich's enthusiasm for telomerase, including the venerable George Church, PhD, Professor of Genetics at Harvard Medical School and director of



personalgenomes.org, which provides the world's only open-access information on human Genomic, Environmental and Trait data. In October 2015, at a meeting of the National Academy of Sciences organized to discuss US policy on genetic interventions, Dr. Church proposed that telomerase deserves close consideration for its potential to enhance the human life span.

Yet another reason why telomerase looms large in the minds of research scientists and life sciences entrepreneurs like Kekich is because the molecule is present in those cells that can continue to divide indefinitely. As Kekich stated, "This includes stem cells, which are simple cells in the body that are able to develop into any one of various kinds of cells, such as blood cells, skin cells, etc."

More Anti-Aging Research

Actively participating in other anti-aging avenues, Kekich is an investor in BioViva, a US company founded in 2014. “The founders view aging as a disease and believe that aging lies at the root of pathology. Gene therapies are being tested around the world and some are available to treat such conditions as macular degeneration,” Kekich said. “These new therapies are relatively expensive. BioViva believes everyone should have access to cutting-edge medical treatments, not just those in the highest income brackets,” Kekich added. “BioViva aims to invent gene therapies that are affordable to the masses.”

One inexpensive therapy that will hopefully result from BioViva’s laboratories involves the use of telomerase as a possible remedy for skin aging. As the BioViva website (www.bioviva-science.com)



states, “It is likely the first telomerase therapy we will develop that will focus on rejuvenating aging skin and restoring youthful elasticity. The skin represents an easily accessible target for therapy. We now propose to move forward with this therapy to regenerate skin and dermal tissue using telomerase induction and in doing so return skin to a youthful state.”

Kekich is also the co-founder of SciCog Systems, Inc., “which is working on creating an automated artificial intelligence (AI) research assistant. The first application, Kekich explained, “will accelerate biomedical science progress by deploying advanced artificial intelligence technology, with initial focus on the biology of healthy longevity.” Artificial intelligence pioneers such as inventor and author Ray Kurzweil influence Kekich’s philosophy and business.

Kurzweil’s thinking and writings are important and inspiring “because he reminds us how fundamental measures of information technology follow predictable and exponential trajectories,” Kekich said. “I would imagine that most scientists, as well as everyone else in the realm of anti-aging product research and development, are encouraged because of Kurzweil’s law of accelerating returns.” As Kekich summarized, “Kurzweil’s law states that information technology progresses exponentially. Because of this assured exponential growth in the intelligence of information technology, it is just a matter of time before we have the computing power to find solutions to various scientific problems such as how to radically slow down or reverse aging, or remedy a specific disease.”

It is worth noting that Kurzweil’s law of accelerating returns springs from “Moore’s Law,” named for

Intel co-founder Gordon Moore. “Moore predicted in 1965 that the number of transistors incorporated in a chip will approximately double every 24 months,” Kekich said. “While computers have downsized from room-sized to pocket-sized, they have become massively more powerful. History validates the accuracy of Moore’s prediction, and I’m betting that the accuracy and action plan for radically extending human life span will be revealed in the near future.”

Quoting Dr. Rose, Kekich concluded, “It is still reasonable to hope that eventually the great mass of people will be able to control their aging through pharmaceuticals and medicine.” ●

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

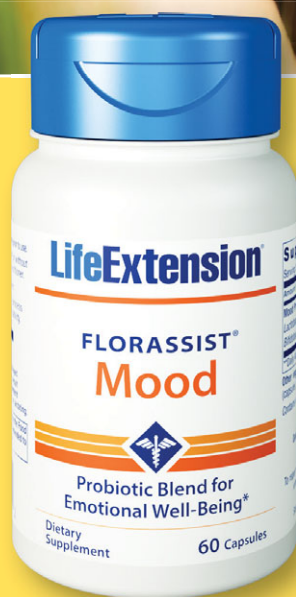
David Kekich, CEO of SciCog Systems, Inc., is a recognized authority on longevity science.

He founded Maximum Life Foundation, a not-for-profit corporation dedicated to reversing human aging. He also serves as a board member of the American Aging Association and Alcor Foundation Patient Care Trust Fund.

He authored *Smart, Strong and Sexy at 100: New Skin. New Hair. New You: 7 Simple Steps to Thrive at 100... and Beyond*, a how-to book for extreme life extension. He has appeared on numerous TV and radio shows and publishes a widely read newsletter.

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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.

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References

1. *Skin Pharmacol Physiol.* 2014;27(3):113-9.
2. *Vet Rec.* 1984 Dec 22-29;114(25-26):642-5.
3. *Nutr Today.* 1993;28(4):13-8.

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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.

Blood Testing The Ultimate Information

MOST POPULAR PANELS

COMPREHENSIVE PANELS	
MALE LIFE EXTENSION PANEL (LC322582) CBC/Chemistry Profile (See description) C-Reactive Protein Homocysteine DHEA-S Free Testosterone TSH for thyroid function Total Testosterone Estradiol PSA (prostate-specific antigen) Vitamin D 25-hydroxy Hemoglobin A1c	\$269
FEMALE LIFE EXTENSION PANEL (LC322535) CBC/Chemistry Profile (See description) C-Reactive Protein Homocysteine DHEA-S Free Testosterone TSH for thyroid function Total Testosterone Estradiol Vitamin D 25-hydroxy Progesterone Hemoglobin A1c	\$269
WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028) CBC/Chemistry profile (see description), 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), and Ferritin.	\$275
MALE ELITE PANEL* (LC100016) CBC/Chemistry Profile (See description), Free and Total Testosterone, Total Estrogens, Estradiol, DHEA-S, Progesterone, Pregnenolone, DHT, FSH, LH, TSH, Free T3, Free T4, Reverse T3, Free and Total PSA, IGF-1, SHBG, Vitamin D 25-OH, hs-CRP, Ferritin, Homocysteine	\$575
FEMALE ELITE PANEL* (LC100017) CBC/Chemistry Profile (See description), 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	\$575
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.	\$120
FEMALE HORMONE ADD-ON PANEL (LCADDF)* Pregnenolone and Total Estrogens 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.	\$125
COMPREHENSIVE THYROID PANEL (LC100018) TSH, T4, Free T4, Free T3, Reverse T3, TPO, ATA	\$199
LIFE EXTENSION THYROID PANEL (LC304131) TSH, T4, Free T3, Free T4.	\$75
THYROID PANEL WITH REVERSE T3 (LC100044) TSH, T4, Free T3, Free T4, Reverse T3	\$120
THE CBC/CHEMISTRY PROFILE (LC381822)	
Note: This CBC/Chemistry Profile is included in many Life Extension panels. Please check panel descriptions.	
CARDIOVASCULAR RISK PROFILE	
Total Cholesterol	Cholesterol/HDL Ratio
HDL Cholesterol	Estimated CHD Risk
LDL Cholesterol	Glucose
Triglycerides	Iron
LIVER FUNCTION PANEL	
AST (SGOT)	Total Bilirubin
ALT (SGPT)	Alkaline Phosphatase
LDH	
KIDNEY FUNCTION PANEL	
BUN	BUN/Creatinine Ratio
Creatinine	Uric Acid
BLOOD PROTEIN LEVELS	
Total Protein	Globulin
Albumin	Albumin/Globulin Ratio
BLOOD COUNT/RED AND WHITE BLOOD CELL PROFILE	
Red Blood Cell Count	Monocytes
White Blood Cell Count	Lymphocytes
Eosinophils	Platelet Count
Basophils	Hemoglobin
Polys (Absolute)	Hematocrit
Lymphs (Absolute)	MCV
Monocytes (Absolute)	MCH
Eos (Absolute)	MCHC
Baso (Absolute)	Polynucleated Cells
RDW	
BLOOD MINERAL PANEL	
Calcium	Sodium
Potassium	Chloride
Phosphorus	Iron
MALE COMPREHENSIVE HORMONE PANEL* (LC100010) CBC/Chemistry Profile, DHEA-S, Estradiol, DHT, PSA, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol.	\$299
FEMALE COMPREHENSIVE HORMONE PANEL* (LC100011) CBC/Chemistry Profile, DHEA-S, Estradiol, Total Estrogens, Progesterone, Pregnenolone, Total and Free Testosterone, SHBG, TSH, Free T3, Free T4, Cortisol.	\$299
FOOD SAFE ALLERGY TEST** (LCM73001) This test measures delayed (IgG) food allergies for 95 common foods.	\$198
STRESS MANAGEMENT PROFILE (LC100043) Cortisol AM/PM, DHEA-S, Glucose, Insulin, Progesterone, Free T3, Lipid Panel.	\$125
ADRENAL STRESS PROFILE-SALIVA** (LC100046) Cortisol X4, DHEA-S, Cortisol AM/DHEA-S ratio, Secretory IgA.	\$175
BASIC CORTISOL PROFILE-SALIVA** (LC100047) Cortisol X4 to measure cortisol rhythm over time.	\$129
SLEEP HORMONES PROFILE-SALIVA** (LC100048) Cortisol and Melatonin plus ratio.	\$175
MTHFR/COMT GENETIC METHYLATION PROFILE** (LC100045) Tests for genetic mutations in MTHFR and COMT.	\$149

NEW
SALIVA
TEST

NEW
SALIVA
TEST

NEW
SALIVA
TEST

NEW
GENETIC
TEST



Other Popular Tests and Panels

- | | |
|---|--|
| <p><input type="radio"/> HEALTHY AGING PANEL-COMPREHENSIVE* (LC100026) \$249</p> <p>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, and Insulin.</p> | <p><input type="radio"/> HORMONES</p> <p><input type="radio"/> DHEA-SULFATE (LC004020) \$61</p> <p>This test shows if you are taking the proper amount of DHEA.</p> |
| <p><input type="radio"/> HEALTHY AGING PANEL-BASIC* (LC100025) \$149</p> <p>CBC/Chemistry profile, C-Reactive Protein (high sensitivity), Vitamin B12, Folate, Vitamin D 25-hydroxy, Hemoglobin A1c, TSH, and Insulin.</p> | <p><input type="radio"/> MALE BASIC HORMONE PANEL (LC100012) \$75</p> <p>DHEA-S, Estradiol, Free and Total Testosterone, PSA</p> |
| <p><input type="radio"/> VAP™ TEST* (LC804500) \$90</p> <p>The VAP™ cholesterol test provides a more comprehensive coronary heart disease (CHD) risk assessment than the conventional lipid profile. Direct measurements, not estimations, are provided for total cholesterol, LDL, HDL, VLDL, and cholesterol subclasses.</p> | <p><input type="radio"/> FEMALE BASIC HORMONE PANEL (LC100013) \$75</p> <p>DHEA-S, Estradiol, Free and Total Testosterone, Progesterone</p> |
| <p><input type="radio"/> ANEMIA PANEL* (LC100006) \$79</p> <p>CBC/Chemistry Profile, Ferritin, Total Iron Binding Capacity (TIBC), Vitamin B12, Folate</p> | <p><input type="radio"/> DIHYDROTESTOSTERONE (DHT)* (LC500142) \$50</p> <p>Measures serum concentrations of DHT.</p> |
| <p><input type="radio"/> AUTOIMMUNE DISEASE SCREEN* (LC100041) \$199</p> <p>ANA screen, hs-CRP, TNF-alpha, Immunoglobulins, IgA, IgG, IgM</p> | <p><input type="radio"/> ESTRADIOL (LC004515) \$33</p> <p>For men and women. Determines the proper amount in the body.</p> |
| <p><input type="radio"/> DIABETES MANAGEMENT PROFILE – COMPREHENSIVE (LC100040) \$129</p> <p>Hemoglobin A1C, Glucose, Insulin, Lipid Panel, Glycomark</p> | <p><input type="radio"/> INSULIN FASTING (LC004333) \$29.90</p> <p>Can predict those at risk of diabetes, obesity, heart and other diseases.</p> |
| <p><input type="radio"/> DIABETES MANAGEMENT PROFILE – BASIC (LC100039) \$39</p> <p>Hemoglobin A1C, Glucose, Insulin</p> | <p><input type="radio"/> PREGNENOLONE* (LC140707) \$116</p> <p>Used to determine ovarian failure, hirsutism, adrenal carcinoma, and Cushing's syndrome.</p> |
| <p>ADVANCED CARDIAC BIOMARKERS</p> <p><input type="radio"/> ADVANCED OXIDIZED LDL PANEL* (LC100035) \$285</p> <p>This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic as well as cardiovascular disease and the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase, and Oxidized LDL.</p> | <p><input type="radio"/> PROGESTERONE (LC004317) \$55</p> <p>Primarily for women. Determines the proper amount in the body.</p> |
| <p><input type="radio"/> OXIDIZED LDL PANEL* (LC100034) \$175</p> <p>This panel looks at vascular inflammatory biomarkers, beginning with the development of metabolic as well as cardiovascular disease and the formation of vulnerable plaque. The panel contains the following tests: Myeloperoxidase and Oxidized LDL.</p> | <p><input type="radio"/> SEX HORMONE BINDING GLOBULIN (SHBG) (LC082016) \$33</p> <p>This test is used to monitor SHBG levels which are under the positive control of estrogens and thyroid hormones, and suppressed by androgens.</p> |
| <p><input type="radio"/> OXIDIZED LDL* (LC817472) \$75</p> <p>OxLDL is a powerful initiator of inflammatory changes in the artery wall, which eventually lead to the formation of plaque.</p> | <p>GENERAL HEALTH</p> <p><input type="radio"/> VITAMIN D (25OH) (LC081950) \$47</p> <p>This test is used to rule out vitamin D deficiency.</p> |
| | <p><input type="radio"/> FERRITIN (LC004598) \$28</p> <p>Ferritin levels reflect your body's iron stores and is also a biomarker for insulin resistance.</p> |
| | <p><input type="radio"/> PSA (PROSTATE SPECIFIC ANTIGEN) (LC010322) \$31</p> <p>Screening test for prostate disorders and possible cancer.</p> |

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.

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

ORDER LIFE SAVING BLOOD TESTS FROM VIRTUALLY ANYWHERE IN THE US!

TERMS AND CONDITIONS

This blood test service is for informational purposes only and no specific medical advice will be provided. National Diagnostics, Inc., and 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. I have read the above Terms and Conditions and understand and agree to them.

Signature _____

X _____

CUSTOMER NO.

☐ Male ☐ Female

Name _____

Date of Birth (required) / /

Address _____

City _____

State _____

Zip _____

Phone _____

Credit Card No. _____

Expiration Date /

Mail your order form to:

LifeExtension®
 National Diagnostics, Inc.

3600 West Commercial Boulevard
 Fort Lauderdale, FL 33309

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

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



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

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

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
Endothelial Defense™ with Full-Spectrum
Pomegranate™ and CORDIART™
Endothelial Defense™ with GliSODin®
Full-Spectrum Pomegranate™
Natural BP Management
NitroVasc with CORDIART™
Pomegranate Complete
Pomegranate Fruit Extract

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
Migra-Eeze™
Neuro-Mag® Magnesium L-Threonate
Neuro-Mag® Magnesium L-Threonate
with Calcium and Vitamin D3
Optimized Ashwagandha Extract
Prevagen™
PS (Phosphatidylserine) Caps
Vinpocetine

Cholesterol Management

Advanced Lipid Control
Cho-Less™
CHOL-Support™
Policosanol
Red Yeast Rice
Theaflavins Standardized Extract
Vitamin B3 Niacin Capsules

Digestion Support

Artichoke Leaf Extract
Carnosoothe with PicroProtect™
Digest RC®
Effervescent Vitamin C - Magnesium Crystals
Enhanced Super Digestive Enzymes
Enhanced Super Digestive Enzymes
w/Probiotics
Esophageal Guardian
Extraordinary Enzymes

Fem Dophilus
FiberImmune Support
Ginger Force®
Organic Golden Flax Seed
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

Mega EPA/DHA
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
Organic Golden Flax Seed
Provinal® Purified Omega-7
Vegetarian Sourced DHA

Food

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+
CoffeeGenic® Green Coffee Extract
Mega Benfotiamine
Natural Glucose Absorption Control
Tri Sugar Shield®

Heart Health

Aspirin (Enteric Coated)
Bio Active Folate & Vitamin B12 Caps
Cardio Peak™ with Standardized
Hawthorn and Arjuna
Fibrinogen Resist™ with Nattokinase
Optimized Carnitine with GlycoCam®
Super Ubiquinol CoQ10
Super Ubiquinol CoQ10 with BioPQQ®
Super Ubiquinol CoQ10 with Enhanced
Mitochondrial Support™
Super-Absorbable CoQ10 Ubiquinone
with α-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
i26 Hyperimmune Egg
Immune Modulator with Tinofend®
Immune Protect with PARACTIN®
Immune Senescence Protection Formula™
Kinoko® Gold AHCC
Kyolic® Garlic Formula 102
Kyolic® Garlic Formula 105
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 with Bio-Curcumin®
Black Cumin Seed Oil
Boswellia
Cytokine Suppress™ with EGCG
Nervia®
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®
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 Antioxidants with
HepatoProtection Complex
Calcium D-Glucarate
Chlorella
Chlorophyllin
European Milk Thistle
Glutathione, Cysteine & C
HepatoPro
Liver Efficiency Formula
Mega L-Glutathione Capsules
N-Acetyl-L-Cysteine
PectaSol-C®
Silymarin
SODzyme® with GliSODin® & Wolfberry

Longevity & Wellness

AMPK Activator
AppleWise Polyphenol Extract
Berry Complete
Blueberry Extract
Blueberry Extract with Pomegranate

CR Mimetic Longevity Formula
DNA Protection Formula
Enhanced Berry Complete with Acai
Essential Daily Nutrients
Grapeseed Extract with
Resveratrol & Pterostilbene
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 Alpha-Lipoic 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
Chromium Ultra
Iron Protein Plus
Magnesium (Citate)
Magnesium Caps
Only Trace Minerals
Optimized Chromium with Crominex® 3+
Sea-Iodine™
Se-Methyl L-Selenocysteine
Super Selenium Complex
Vanadyl Sulfate
Zinc Caps

Miscellaneous

Solarshield® Sunglasses

Mood & Stress Management

5 HTP
L-Theanine
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
BroccoMax®
FLORASSIST® Heart Health Probiotic
FLORASSIST® Oral Hygiene
FLORASSIST® Balance
FLORASSIST® Mood
FLORASSIST® Throat Health
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-Oxidant Rejuvenating Foot Scrub
Anti-Oxidant Rejuvenating Hand Cream
Anti-Redness & Adult Blemish Lotion
Bioflavonoid Cream
Broccoli Sprout Cream
Collagen Boosting Peptide Serum
Corrective Clearing Mask
DNA Repair Cream
Dual-Action MicroDermAbrasion
Enhanced FernBlock® with
Red Orange Complex
Essential Plant Lipids Reparative Serum
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
Skin Lightening Serum
Skin Restoring Phytoceramides with Lipowheat®
Skin Stem Cell Serum
Stem Cell Cream with Alpine Rose
Tightening & Firming Neck Cream
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)
Pure Plant Protein
Tart Cherry Extract
Whey Protein Isolate
(Chocolate and Vanilla Flavor)

Vitamins

Ascorbyl Palmitate
Benfotiamine with Thiamine
Beta-Carotene
BioActive Complete B-Complex
Biotin
Buffered Vitamin C Powder
Daily C+
Fast-C® with Dihydroquercetin
Gamma E Tocopherol with Sesame Lignans
Gamma E 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 Ascorbate C Capsules
Super Ascorbate C Powder
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 without Soy Isoflavones
Natural Estrogen
ProgestaCare® for Women
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			
01525	ACETYL-L-CARNITINE ARGINATE • 100 veg. caps	59.00	44.25	38.24			
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			
00681	AHCC® • 500 mg, 30 caps	59.98	44.99				
29727	AHCC® (KINOKO® GOLD) • 500 mg, 60 veg. caps	74.95	52.47				
00457	ALPHA-LIPOIC ACID W/Biotin (Super) • 250 mg, 60 caps	37.00	27.75	24.00			
01907	AMPK ACTIVATOR • 90 veg. caps	48.00	36.00	33.00			
01440	ANTI-ALCOHOL ANTIOXIDANTS W/HEPATOPRO • 100 caps	26.00	19.50	17.25			
01509	ANTI-ADIPOCYTE FORMULA W/MERATRIM® & INTEGRA LEAN® (Advanced) • 60 veg. caps	39.00	29.25	27.00			
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	48.00	36.00	33.00			
01617	ARTHRONAX® W/THEAFLAVINS & APRÈSFLEX® 120 veg. caps	44.00	33.00	30.00			
01618	ARTHRONAX® ADVANCED W/UC-II® & APRÈSFLEX® 60 caps	36.00	27.00	24.00			
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	11.25	8.44				
01622	BIFIDO GI BALANCE • 60 veg. caps	20.00	15.00	13.50			
01073	BILBERRY EXTRACT • 100 mg, 100 veg. caps	42.00	31.50	28.50			
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	18.95	15.16				
*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			
01008	BLAST™ • 600 grams of powder	26.95	20.21				
70000	BLOOD PRESSURE MONITOR (ACCUFIT™) • med/lg cuff	79.99	49.99				
70004	BLOOD PRESSURE MONITOR • Digital wrist cuff	69.95	52.46				
SUBTOTAL OF COLUMN 1							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
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			
01699	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			
26576	BROCCO MAX® • 60 veg. caps	26.95	20.21				
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			
01258	CARNOSOOTHE W/PICROPROTECT™ • 60 veg. caps	29.95	22.46	20.25			
01829	CARNOSINE • 500 mg, 60 veg. caps	36.00	27.00	24.00			
01687	CARNOSINE (Super) • 500 mg, 90 veg. caps	66.00	49.50	45.00			
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	23.50	17.63				
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			
01477	CHROMIUM ULTRA • 100 veg. caps	24.00	18.00	15.75			
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) 1,000 mg, 120 softgels	36.00	27.00	24.75	19.75		
00819	CLA BLEND W/GUARANA & SESAME (Super) 1,000 mg, 120 softgels	42.00	31.50	28.75			
01896	COGNITEX® W/BRAIN SHIELD® • 90 softgels	60.00	45.00	39.00	36.00		
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			
SUBTOTAL OF COLUMN 2							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
01945	COMPLETE B-COMPLEX (BioActive) • 60 veg. caps	12.00	9.00	8.00			
02098	COMPREHENSIVE NUTRIENT PACKS ADVANCED • 30 packs	90.00	67.50	61.50			
00949	COQ10 w/d-LIMONENE (Super-absorbable) 50 mg, 60 softgels	25.00	18.75	16.50	15.00		
00950	COQ10 w/d-LIMONENE (Super-absorbable) 100 mg, 100 softgels	46.00	34.50	28.00	26.25		
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	20.25			
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/BLEBERRY & 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			
80128	ANTIOXIDANT REJUVENATING FOOT SCRUB • 2 oz	59.00	44.25	38.94			
80117	ANTIOXIDANT REJUVENATING HAND CREAM • 2 oz	64.00	48.00	43.12			
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			
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			
SUBTOTAL OF COLUMN 3							

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		
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 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			
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			
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							
01912	DAILY C+ CITRUS FLAVOR • 30 stick packs	21.00	15.75	14.25			
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 sourced) • 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			
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			
SUBTOTAL OF COLUMN 4							

APRIL 2016

ITEM No.	PRODUCT	YOUR PRICE					QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	I		
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	48.00	36.00	32.00				
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				
00899	DUAL-ACTION MICRODERMABRASION ADV. EXFOLIATE • 2.4 oz	39.95	29.96	29.21				
E								
01528	ECHINACEA EXTRACT • 250 mg, 60 veg. caps	14.35	10.76	9.38				
01997	ENDOTHELIAL DEFENSE™ w/FULL-SPECTRUM POMEGRANATE™ AND CORDIART™ • 60 softgels	68.00	51.00	46.50				
00997	ENDOTHELIAL DEFENSE™ w/GLISODIN® • 60 veg. caps	54.00	40.50	36.00				
00625	EPA/DHA (Mega) • 120 softgels	19.95	14.96	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				
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	FEMMESENCE MACAPAUSE® • 120 veg. caps	34.99	26.24					
01728	FERNBLOCK® W/RED ORANGE COMPLEX (Enhanced) 30 veg. caps	42.00	31.50	28.50				
02007	FIBERIMMUNE SUPPORT (Apple Cinnamon) • 235 grams	34.00	25.50	23.50				
00718	FIBRINOGEN RESIST™ • 30 veg. caps	49.00	36.75	33.00				
01749	FLAX SEED (Organic golden) • 14 oz	11.67	8.75					
01821	FLORASSIST® HEART HEALTH PROBIOTIC • 60 veg. caps	32.00	24.00	21.00				
02011	FLORASSIST® ORAL HYGIENE • 30 lozenges	20.00	15.00	13.50				
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 (Bio Active) • 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								
00559	GAMMA E TOCOPHEROL/TOCOTRIENOLS • 60 softgels	42.00	31.50	27.75				
00759	GAMMA E TOCOPHEROL W/SESAME LIGNANS • 60 softgels	32.00	24.00	21.75				
01394	GARLIC (Optimized) • 200 veg. caps	24.95	18.71	15.75				
**01122	GINGER FORCE® • 60 liquid caps	34.95	26.21					
01658	GINKGO BILOBA CERTIFIED EXTRACT™ 120 mg, 365 veg. caps	46.00	34.50	31.50				
SUBTOTAL OF COLUMN 5								

ITEM No.	PRODUCT	YOUR PRICE					QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each	I		
00756	GLA WITH SESAME LIGNANS (Mega) • 60 softgels	19.50	14.63	13.50				
00345	(L-) GLUTAMINE CAPSULES • 500 mg, 100 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				
00314	L-GLUTATHIONE (Mega) • 250 mg, 60 caps	39.64	29.73					
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				
01604	GREEN COFFEE EXTRACT COFFEEGENIC® 200 mg, 90 veg. caps	22.00	16.50	15.00				
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/VERISON® 90 tabs	32.00	24.00	22.00				
01738	HCA (Garnicia) • 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								
*01060	I26 HYPERIMMUNE EGG • 140 grams powder	54.99	46.75					
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				
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								
00056	JARRO-DOPHILUS EPS® • 60 veg. caps	22.95	17.21					
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 • 60 softgels	33.95	25.46					
00316	KYOLIC® GARLIC FORMULA 102 • 200 veg. caps	26.45	19.84					
00214	KYOLIC® GARLIC FORMULA 105 • 200 caps	27.45	20.59					
00789	KYOLIC® RESERVE • 600 mg, 120 caps	27.95	20.96					
01681	LACTOFERRIN • 60 caps	52.00	39.00	36.00				
00020	LECITHIN • 16 oz granules	18.00	13.50	12.00				
02055	LIFE EXTENSION MIX™ • 315 tablets	80.00	60.00	52.00	43.75			
02057	LIFE EXTENSION MIX™ W/EXTRA NIACIN • 315 tablets	80.00	60.00	52.00	43.75			
02054	LIFE EXTENSION MIX™ • 490 caps	90.00	67.50	58.00	47.50			
SUBTOTAL OF COLUMN 6								

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
02056	LIFE EXTENSION MIX™ POWDER • 14.81 oz	80.00	60.00	52.00	43.75		
02065	LIFE EXTENSION MIX™ • 315 tablets w/o copper	80.00	60.00	52.00	43.75		
02064	LIFE EXTENSION MIX™ • 490 caps w/o copper	90.00	67.50	58.00	47.50		
02066	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							
01926	MACUGUARD® OCULAR SUPPORT • 60 softgels	22.00	16.50	14.85			
01927	MACUGUARD® OCULAR SUPPORT w/ASTAXANTHIN 60 softgels	42.00	31.50	28.50			
01459	MAGNESIUM CAPS • 500 mg, 100 veg. caps	12.00	9.00	7.50			
01682	MAGNESIUM (CITRATE) • 160 mg, 100 veg. caps	9.00	6.75	5.63			
01908	MEDITERRANEAN TRIM WITH SINETROL™-XPUR 60 veg. caps	18.00	13.50	12.00			
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 veg. 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 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			
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	29.50	22.13	19.75			
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			
01698	MIRAFORTE w/STANDARDIZED LIGNANS (Super) • 120 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	10.13			
01904	NAD+ CELL REGENERATOR™ • 100 mg, 30 veg. caps	34.00	25.50	19.50			
00066	NATTOKINASE • 60 softgels	25.50	19.13				
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			
01892	NATURAL ESTROGEN • 60 veg. tabs	38.00	28.50	25.50			
01893	NATURAL ESTROGEN W/O SOY ISOFLAVONES • 30 veg. caps	32.00	24.00	21.00			
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			
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		
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			
01121	NERVIA® • 60 softgels	49.95	37.46				
01603	NEURO-MAG® MAGNESIUM L-THREONATE • 90 veg. caps	40.00	30.00	27.00			
01602	NEURO-MAG® L-THREONATE W/CALCIUM & VITAMIN D3 225 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		
01989	ONCE-DAILY HEALTH BOOSTER • 60 softgels	52.00	39.00	36.00			
02001	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® SUPER 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	82.46				
01080	PECTA SOL-C® MODIFIED CITRUS PECTIN • 270 veg. caps	79.95	59.96				
01811	PEONY IMMUNE • 60 veg. caps	36.00	27.00	24.00			
00673	PGX® PLUS MULBERRY (WellBetX®) • 180 veg. caps	34.95	26.21				
01676	PHOSPHATIDYL SERINE CAPS • 100 mg, 100 veg. caps	54.00	40.50	36.00			
01436	POLICOSANOL • 10 mg, 60 veg. caps	20.00	15.00	11.25			
01953	POMEGRANATE COMPLETE • 30 softgels	24.00	18.00	15.75			
00956	POMEGRANATE FRUIT EXTRACT • 30 veg. caps	19.50	14.63	13.16			
01797	POMI-T® • 60 veg. caps	33.33	25.00	22.50			
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			
01576	PREVAGEN® • 30 caps	60.00	45.00				
*01577	PREVAGEN® ES • 30 caps	70.00	60.00				
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	PROGESTACARE® FOR WOMEN • 4 oz cream	35.50	26.63	24.38			
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 • 1 lb. powder	30.00	22.50	20.25			
01743	PROTEIN-ISOLATE (Whey) Chocolate • 1 lb. powder	30.00	22.50	20.25			
01770	PROTEIN CONCENTRATE (New Zealand Whey) Vanilla 520 grams	30.00	22.50	19.95			
01771	PROTEIN CONCENTRATE (New Zealand Whey) Chocolate 660 grams	30.00	22.50	19.95			
01812	PROVINAL® PURIFIED OMEGA-7 • 30 softgels	27.00	20.25	18.00			
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			
01587	PURE PLANT PROTEIN • Vanilla 540 grams powder	38.00	28.50	26.25			
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	16.95	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 FIRMING 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			
00046	SELENIUM • 2 fl. oz dropper	11.95	8.96				
01679	SE-METHYL L-SELENOCYSTEINE • 200 mcg, 100 veg. caps	12.00	9.00	8.25			
00318	SERRAFLAZYME • 100 tablets	18.00	13.50	12.00			
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			
01097	SOY EXTRACT (Ultra) • 150 veg. caps	87.00	65.25	58.50			
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			
01649	SUPER ABSORBABLE SOY ISOFLAVONES • 60 veg. caps	28.00	21.00	18.75			
01778	SUPER SELENIUM COMPLEX • 200 mcg, 100 veg. caps	14.00	10.50	9.00	8.25		
T							
01723	TART CHERRY EXTRACT W/STANDARDIZED CHERRYPURE® 60 veg. caps	22.00	16.50	15.00			
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	29.96				
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	TOOTH PASTE • 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	TRUFLORA® 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			
02016	TWO-PER-DAY • 60 tablets	10.50	7.88	7.13			
02015	TWO-PER-DAY • 120 tablets	20.00	15.00	13.50			
SUBTOTAL OF COLUMN 10							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
02014	TWO-PER-DAY • 120 caps	22.00	16.50	15.00			
00326	L-TYROSINE • 500 mg, 100 tablets	12.98	9.74				
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			
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			
00098	VITAMIN B5 • 500 mg, 100 caps (Pantothenic Acid)	10.50	7.88	7.04			
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	25.50	19.13	17.44			
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 EMULSION • 2,000 IU, 1 oz.	28.00	21.00	18.75			
01840	VITAMINS D AND K W/SEA-IODINE™ • 60 caps	24.00	18.00	16.50			
01763	VITAMIN E (Natural) • 400 IU, 100 softgels	30.00	22.50	21.00	19.50		
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							
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				
33880	OUTSTANDING HEALTH: THE 6 ESSENTIAL KEYS TO MAXIMIZE YOUR ENERGY AND WELL BEING by Michael Galitzer, MD & Larry Trivieri Jr. • 2015	24.95	18.71				
33878	TESTOSTERONE REPLACEMENT THERAPY by Dr. John Crisler • 2015	19.99	14.99				
SUBTOTAL OF COLUMN 11							

ITEM No.	PRODUCT	YOUR PRICE				QTY	Total
		Retail Each \$	1 Unit Each	4 Unit Each	10 Unit Each		
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			
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* J Diet Suppl. 2011 Jun; 8(2):158-68

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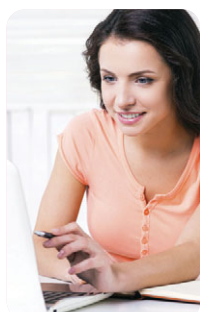
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