Boost Your Feel Good Brain Signal

Surprising Cardiovascular Benefits of Glucosamine p.26
MORE

Two-Per-Day Offers You More Benefits Than Centrum®

Why settle for subpar supplements?

Two-Per-Day Capsules

Item #02314 • 120 capsules (two-month supply)
1 bottle $18
4 bottles $16 each

Two-Per-Day Tablets

Item #02315 • 120 tablets (two-month supply)
1 bottle $17.25
4 bottles $15.50 each

Each bottle provides a two-month supply.

For full product description and to order Two-Per-Day, call 1-800-544-4440 or visit www.LifeExtension.com

Lycored LycoBeads® is a registered trademark of Lycored; Orange, New Jersey. SelenoExcell® is a registered trademark of Cypress Systems Inc. L-OptiZinc® and logo are trademarks of Lonza or its affiliates. Crominex® 3+, Capros® and PrimaVie® are registered trademarks of Natreon, Inc.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
7 DON’T DIE TRYING TO BOOST BRAIN DOPAMINE
People engage in deadly habits like abusing alcohol and smoking to boost dopamine. Safer approaches to restore dopamine brain levels are discussed.

39 IN THE NEWS
Epigenetic reprogramming may reverse vision loss; L-carnitine improves metabolic syndrome; lower vitamin D linked to more severe hair loss in young men; flavonols associated with lower Alzheimer’s risk.

72 ZINC’S ROLE IN BONE HEALTH
Studies show that zinc stimulates new bone formation.

26 A 22% LOWER RISK OF CARDIOVASCULAR DEATH!
A 2019 analysis found that regular glucosamine use was associated with a 22% lower risk of cardiovascular death.

36 CISTANCHE ACTIVATES IMMUNE FUNCTION
Research suggests the herb Cistanche promotes youthful immune function and decreases inflammatory cytokines.

56 MILK THISTLE REDUCES ELEVATED GLUCOSE
Milk thistle, often taken for liver support, has been shown to reduce fasting blood glucose by 11% and insulin by 14%.

65 PEA’S PROMISE AS A GLAUCOMA TREATMENT
A clinical study shows the fatty acid PEA lowered eye pressure in glaucoma patients and improved retinal function. A human study found a 43% improvement in eye health.

89 SUPER FOODS
Protein-packed pistachios boast higher levels of potassium, tocopherol, vitamin K, phytosterols, and xanthophyll carotenoids than any other nut. They protect the heart and control blood sugar.
PROSTATE HEALTH

The best way to keep You in the picture.

Ultra Prostate Formula was created to help maintain prostate health. It contains a dozen standardized ingredients to:

• Support healthy urination
• Promote healthy prostate function
• Support healthy prostate cell division

Ultra Prostate Formula is the most comprehensive standardized-ingredient prostate-health supplement.

For full product description and to order Ultra Prostate Formula, call 1-800-544-4440 or visit www.LifeExtension.com

Item #02029 • 60 softgels
1 bottle $28.50 • 4 bottles $26.25 each

AprèsFlex is a registered trademark of Laila Nutraceuticals exclusively licensed to PL Thomas-Laila Nutra LLC. HMRlignan™ is a trademark used under sublicense from Linnea S.A. Lyc-O-Mato® is a registered trademark of Lycored Corp. Albion® is a registered trademark of Albion Laboratories, Inc. Graminex® is a registered trademark of Graminex LLC.

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Title and Affiliations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gustavo Tovar Baez, MD</td>
<td>operates the Life Extension Clinic in Caracas, Venezuela. He is the first physician in Caracas to specialize in anti-aging medicine.</td>
</tr>
<tr>
<td>Ricardo Bernales, MD</td>
<td>is a board-certified pediatrician and general practitioner in Chicago, IL, focusing on allergies, bronchial asthma, and immunodeficiency.</td>
</tr>
<tr>
<td>Mark S. Bezzek, MD, FACP, FAARM, FAAEM</td>
<td>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 U.S. patents for a multivitamin/mineral supplement, an Alzheimer’s/dementia compilation, and a diabetic regimen.</td>
</tr>
<tr>
<td>Thomas F. Crais, MD, FACS, FACPM</td>
<td>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.</td>
</tr>
<tr>
<td>William Davis, MD</td>
<td>is a preventive cardiologist and author of <em>Wheat Belly: Lose the Wheat, Lose the Weight and Find Your Path Back to Health</em>. He is also medical director of the online heart disease prevention and reversal program, <em>Track Your Plaque</em> (<a href="http://www.trackyourplaque.com">www.trackyourplaque.com</a>).</td>
</tr>
<tr>
<td>Martin Dayton, MD, DO</td>
<td>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.</td>
</tr>
<tr>
<td>John DeLuca, MD, DC</td>
<td>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.</td>
</tr>
<tr>
<td>Sergey A. Dzugan, MD, PhD</td>
<td>was formerly chief of cardiovascular surgery at the Donetsk Regional Medical Center in Donetsk, Ukraine. Dr. Dzugan’s current primary interests are anti-aging and biological therapy for cancer, cholesterol, and hormonal disorders.</td>
</tr>
<tr>
<td>Patrick M. Fratellone, MD, RH</td>
<td>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.</td>
</tr>
<tr>
<td>Norman R. Gay, MD</td>
<td>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.</td>
</tr>
<tr>
<td>Mitchell J. Ghen, DO, PhD</td>
<td>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 hematopoietic studies.</td>
</tr>
<tr>
<td>Gary Goldfaden, MD</td>
<td>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.</td>
</tr>
<tr>
<td>Miguelangelo Gonzalez, MD</td>
<td>is a certified plastic and reconstructive surgeon at the Miguelangelo Plastic Surgery Clinic, Cabo San Lucas.</td>
</tr>
<tr>
<td>Garry F. Gordon, MD, DO</td>
<td>is a Payson, Arizona-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.</td>
</tr>
<tr>
<td>Richard Heifetz, MD</td>
<td>is a board-certified anesthesiologist in Santa Rosa, CA, specializing in the delivery of anesthesia for office-based, plastic/surgical, cosmetic surgery, chelation therapy, and pain management.</td>
</tr>
<tr>
<td>Roberto Marasi, MD</td>
<td>is a psychiatrist in Brescia and in Piacenza, Italy. He is involved in anti-aging strategies and weight management.</td>
</tr>
<tr>
<td>Maurice D. Marholin, DC, DO</td>
<td>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.</td>
</tr>
<tr>
<td>Professor Francesco Marotta, MD, PhD</td>
<td>of Montenapoleone Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech &amp; Traditional Medicine, University of Milano, Italy and honorary resident professor, Nutrition, Texas Women’s University. He is the author of more than 130 papers and 400 lectures.</td>
</tr>
<tr>
<td>Philip Lee Miller, MD</td>
<td>is a Payson, Arizona-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.</td>
</tr>
<tr>
<td>Michael D. Seidman, MD, FACS</td>
<td>is the director of skull base surgery and wellness for the Adventist Health System in Celebration, FL.</td>
</tr>
<tr>
<td>Michael R. Rose, MD</td>
<td>is a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staff of the University of Southern California and UCLA.</td>
</tr>
<tr>
<td>Ron Rothenberg, MD</td>
<td>is a full clinical professor at the University of California San Diego School of Medicine and founder of California HealthSpan Institute in San Diego.</td>
</tr>
<tr>
<td>Roman Rozencwaig, MD</td>
<td>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.</td>
</tr>
<tr>
<td>Ronald L. Shuler, BS, DDS, CCN, LN</td>
<td>is involved in immunoncology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis. He is board-certified in anti-aging medicine.</td>
</tr>
<tr>
<td>Filippo Ongaro, MD</td>
<td>is board-certified in anti-aging medicine and has worked for many years as flight surgeon at the European Space Agency. He is a pioneer in functional and anti-aging medicine in Italy where he also works as a journalist and a writer.</td>
</tr>
<tr>
<td>Lambert Titus K. Parker, MD</td>
<td>is an internist and a board-certified anti-aging physician, practices integrative medicine from a human ecology perspective with emphasis on personalized brain health, biomarkers, genomics and total health optimization. He serves as the Medical Director of Integrative Longevity Institute of Virginia, a 501(c)3 Non-Profit Medical Research Institute. He also collaborates on education and research for Hampton Roads Hyperbaric Therapy.</td>
</tr>
<tr>
<td>Ross Pelton, RPh, PhD, CCN</td>
<td>is scientific director for Essential Formulas, Inc.</td>
</tr>
<tr>
<td>Patrick Quillin, PhD, RD, CNS</td>
<td>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.</td>
</tr>
<tr>
<td>Allan Rashford, MD</td>
<td>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.</td>
</tr>
<tr>
<td>Marc R. Rose, MD</td>
<td>practices ophthalmology in Los Angeles, CA, and is president of the Rose Eye Medical Group. He is on the staff of Pacific Alliance Medical Center, Los Angeles, and other area hospitals.</td>
</tr>
<tr>
<td>Michael R. Rose, MD</td>
<td>is a board-certified ophthalmologist with the Rose Eye Medical Group in Los Angeles, CA, is on the staff of the University of Southern California and UCLA.</td>
</tr>
<tr>
<td>Ron Rothenberg, MD</td>
<td>is a full clinical professor at the University of California San Diego School of Medicine and founder of California HealthSpan Institute in San Diego.</td>
</tr>
<tr>
<td>Roman Rozencwaig, MD</td>
<td>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.</td>
</tr>
<tr>
<td>Michael D. Seidman, MD, FACS</td>
<td>is the director of skull base surgery and wellness for the Adventist Health System in Celebration, FL.</td>
</tr>
<tr>
<td>Ronald L. Shuler, BS, DDS, CCN, LN</td>
<td>is involved in immunoncology for the prevention and treatment of cancer, human growth hormone secretagogues, and osteoporosis. He is board-certified in anti-aging medicine.</td>
</tr>
</tbody>
</table>
Sandra C. Kaufmann, MD, is a fellowship-trained and board-certified pediatric anesthesiologist as well as the Chief of Anesthesia at the Joe DiMaggio Children’s Hospital in Hollywood, Florida. She is the founder of The Kaufmann Anti-Aging Institute and the author of the book The Kaufmann Protocol: Why we Age and How to Stop it (2018). Her expertise is in the practical application of anti-aging research.

Richard Black, DO, is a dedicated nuclear medicine physician practicing as an independent contractor out of Cleveland, Ohio. Dr. Black is board certified in internal medicine and nuclear medicine, and is licensed to practice medicine in multiple states throughout the United States.

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 earned his doctorate at the University of Texas Graduate School of Biomedical Sciences with research at the MD Anderson Cancer Center, focusing on screening models to identify promising new anti-cancer drugs. He conducted his postdoctoral training at Stanford University’s Department of Statistics.

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

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 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, FRC Path., FACP (Edinburgh), FRCP (Glasgow), FRCP 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.

L. Ray Matthews, MD, FAC, is a professor of surgery and director of Surgical Critical Care at Morehouse School of Medicine in Atlanta, GA, and a trauma and critical care surgeon at Grady Memorial Hospital. He has published widely and is known as one of the top vitamin D experts. Dr. Matthews has spoken before the U.S. Food and Drug Administration several times, presenting a recent update about clinical research on vitamin D.

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 more than 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-Thera 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.
NEURO-THREE: MAGNESIUM L-THREONATE

Restore Connections Between Your Neurons

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

Neuro-Mag® Magnesium L-Threonate was specifically formulated by MIT scientists to be uniquely absorbable by brain and nerve cells. The numbers of synapses that connect brain cells decline with aging. Magnesium L-Threonate has been shown to improve synaptic density and other structural components of the brain.*

Item #01603 • 90 vegetarian capsules
1 bottle $30 • 4 bottles $27 each

Item #02032 • 93.35 grams of powder
1 jar $28.50 • 4 jars $26 each

For full product description and to order Neuro-Mag® Magnesium L-Threonate or Neuro-Mag® Magnesium L-Threonate Powder, call 1-800-544-4440 or visit www.LifeExtension.com

Magtein® is a registered trademark of Magceutics, Inc. and is distributed exclusively by AIDP, Inc. Magtein® is protected under U.S. patents 8,178,118; 8,142,803; 8,163,301 and other patents pending.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Cocaine, nicotine, alcohol, sugar, opioids (and pleasurable emotional experiences) increase dopamine levels in the brain.

America’s deadly addictions are often related to the desire for a dopamine rush.

When people binge on sweets, alcohol, or many narcotics, they are often seeking to fulfil their “cravings” for a dopamine “high.”

Once largely confined to the young, older people are now abusing alcohol and drugs, as aging reduces their dopamine levels.

Dopamine deficits contribute to a diminished sense of wellbeing. This causes people to turn to dopamine-boosting agents, be it sugar, narcotics, or alcohol.

This is particularly hard for smokers, who are addicted to the mild dopamine release they get when lighting a cigarette.

The brain uses dopamine for more than mood elevation. It also enables youthful cognitive performance and body coordination.¹

Dopamine depletion is linked with neuro-degenerative diseases (beyond Parkinson’s) along with shortened lifespans.²,³

This article describes a low-cost method to safely restore more dopamine, without unpleasant up-and-down spikes.
As people age past 45 years, dopamine brain levels decline by 13% each decade thereafter. Dopamine is produced by specialized cells that die off with aging.

When only 30% of dopamine-producing cells remain, symptoms of Parkinson’s disease manifest. If dopamine-producing cells decline to 10% of normal, the outcome is death.

Long before this happens, people feel their youth shrivel as they are unable to enjoy the same feelings of pleasure and wellbeing as when their dopamine levels were higher.

There are proven ways to block the enzyme that breaks down dopamine in the brain and help protect dopamine-producing cells against neurotoxicity.

Inhibiting the Dopamine-Depleting Enzyme

Dopamine is abundantly produced in young brains and then precisely controlled by enzymes called MAOs (monoamine oxidases). As people age, levels of the MAO-B enzyme increase and deplete too much dopamine. This is partially why people start to feel their age as youthful dopamine levels wane.

A solution is to ingest compounds that inhibit the MAO-B enzyme. MAO-B-inhibiting compounds enable more feel-good dopamine to be available to brain cells. Prescription drugs like deprenyl function as MAO-B inhibitors and are used as adjunctive treatment for Parkinson’s disease. Parkinson’s is characterized by severe dopamine depletion and accelerated death of dopamine-producing brain cells.

MAO-B Inhibitor Increases Lifespan

Since the 1980s, Life Extension® has encouraged readers to ask their doctor to consider prescribing a drug called deprenyl, which is an MAO-B inhibitor.

We made this recommendation based on published studies emanating from Europe showing lifespan increases in animals given deprenyl. When elderly rats were treated with deprenyl, remaining lifespan doubled. Aged dogs given deprenyl had twice the survival rate compared with placebo-treated dogs.

Mice that were immune suppressed lived up to about 200% longer on deprenyl. Most elderly humans suffer immune senescence.
In addition to longer lifespans, some deprenyl-supplemented animals displayed more youthful energy levels and dramatically heightened sexual activity.³

This outpouring of scientific data from Europe had Americans clamoring to get their hands on deprenyl. While deprenyl had been used in Europe to treat Parkinson’s disease beginning in the 1970s, the FDA did not approve it for Americans until 1989.²¹

Life Extension® and Parkinson’s support groups fought a multi-year battle to force the FDA to approve deprenyl.

Plant-Derived MAO-B inhibitors

Despite losing patent status decades ago, deprenyl still costs more than it should in the United States. And most physicians are unwilling to prescribe deprenyl for anti-aging purposes (i.e., “off-label”).

In 2016, Life Extension® introduced a green oat extract that has demonstrated MAO-B-inhibiting properties. This green oat extract was unaffordable for some.

Even with its cost, green oat extract remains popular because of its dopamine-boosting properties.

The good news is that another plant-derived MAO-B inhibitor has been discovered that costs far less.

Medicinal Plant Inhibits MAO-B

One of the top 50 medicinal plants used in Korea and China is the bark of the Amur cork tree. It has a difficult-to-pronounce name:

Phellodendron amurense

It’s been used for centuries in Asia to treat infections of the urinary and digestive tracts, as well as other sources of acute inflammation.

When studied in vitro against other plants, an extract of the Amur cork tree ranked as one of the most potent and selective inhibitors of MAO-B.²²,²³ It showed more than 80% inhibition of the activity of the MAO-B enzyme, which is comparable to deprenyl.²³

Based on these properties, we are suggesting people start off with 500 mg daily of low-cost Amur cork tree bark.

We base this on our direct interactions with the Hungarian inventor of deprenyl (Dr. Joseph Knoll). He insisted that deprenyl was being overdosed in Parkinson’s patients at 10 mg a day.

Dr. Knoll recommended that Parkinson’s patients take 5 mg a day (or less) of deprenyl to achieve optimal MAO-B inhibition.

He also told us that for anti-aging purposes, a dose of 5 mg of deprenyl twice a week would likely yield benefits. Amur cork tree, in the dose of 500 mg, can be taken daily.
Protect Dopamine-Producing Brain Cells

Inhibiting dopamine-degrading MAO-B can yield immediate and long-term health benefits.

To guard against eventual loss of dopamine, it is critical to also protect dopamine-producing cells in the brain.

Excess activity of MAO-B causes toxic byproducts to form, including hydrogen peroxide, free radicals, and aldehydes.\textsuperscript{11,24,25}

These compounds can wreak havoc in brain cells, contributing to neurotoxicity.\textsuperscript{24}

Amur cork tree has been shown to be neuroprotective in cell and animal models of neurodegeneration.\textsuperscript{26-28}

Guard Your Brain Against Excess MAO-B

Loss of dopamine function plays a primary role in the development of certain neurodegenerative disorders.\textsuperscript{2,3}

Normal aging results in elevated MAO-B, causing our brains to be dopamine depleted.\textsuperscript{29}

People over age 45 should intervene by taking 5 mg of the drug deprenyl two to three times a week, 500 mg of Amur cork tree bark powder daily, or 800 mg of green oat extract daily.

An advantage to Amur cork tree bark is its low price and centuries of documented medicinal use in Asia.

In this Month’s Issue...

Glucosamine has been used for decades to rebuild cartilage and relieve joint discomfort. Recent findings reveal that people supplementing with glucosamine have a 22\% lower risk of cardiovascular death.

The article on page 26 of this issue describes beneficial mechanisms of glucosamine to support cartilage regeneration, and cleanse cells of toxic debris via autophagy.

Milk thistle has long been known for its liver-protecting properties. Research described on page 56 reveals it also helps lower blood glucose levels.

Zinc is taken to boost immune function, but it also plays a critical role in maintaining strong bones, as the article on page 72 describes.
A detailed article about the dopamine-enhancing properties of Amur cork tree bark powder can be found on page 46 of this month’s issue.

Thank You for Your Support of Research on Aging!

We use proceeds from supplement sales to fund research projects aimed at slowing and reversing biological aging.

As results from these clinical trials are reported, I look forward to enlightening Life Extension® readers about novel methods for living longer and healthier.

For longer life,

William Falloon, Co-Founder
Life Extension Buyers Club

References

7. Knoll J. Antiaging compounds: (-)deprenyl (selegeline) and (-1-(benzofuran-2-yl)-2-propylaminopentane, [(-)BPAP], a selective highly potent enhancer of the impulse propagation mediated release of catecholamine and serotonin in the brain. CNS Drug Rev. 2001 Fall;7(3):317-45.


45 Times Greater Bioavailability
Curcumin

Patented turmeric extract (500 mg) results in 45 times greater bioavailability of free curcuminoids.

Item #02407
500 mg, 60 vegetarian capsules
1 bottle $24 • 4 bottles $22 each

Same 500 mg potency patented turmeric extract with added benefits of ginger and other turmeric actives.

Item #02324
500 mg curcumin + gingerol, 30 softgels
1 bottle $20 • 4 bottles $18 each

For full product description and to order Curcumin Elite™ or Advanced Curcumin Elite™, call 1-800-544-4440 or visit www.LifeExtension.com

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

The secret to Kyolic® garlic’s health benefits lies in its proprietary aging process.

Kyolic organic garlic is aged for 20 months to enhance its bioavailability and eliminate odor.

Over 870 peer-reviewed studies show Kyolic® aged garlic:

- Supports healthy blood pressure
- Promotes healthy cholesterol levels
- Enhances circulation

Each capsule supplies 600 mg of standardized aged organic garlic.

NOT ALL GARLIC IS THE SAME

Item #00789 • 120 capsules
1 bottle $23.69

For full product description and to order Kyolic® Reserve, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
DOPAMINE
The “FEEL GOOD” Neurotransmitter

Dopamine, the “feel good” neurotransmitter, regulates motivation, mood, movement, and cognitive function.

With age, dopamine levels decline due to the increase of the MAO-B enzyme.

Amur Cork Tree (Phellodendron bark) can help preserve dopamine by inhibiting MAO-B activity.

Dopamine Advantage provides 500 mg of Amur Cork Tree in each capsule.

For full product description and to order Dopamine Advantage, call 1-800-544-4440 or visit www.LifeExtension.com

Note: Those who take MAO-B-inhibiting drugs like deprenyl do not need to take phellodendron.

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

BioActive Complete B-Complex provides enzymatically active forms of meaningful potencies of each B vitamin.

This includes the pyridoxal 5’-phosphate form of vitamin B6 shown to protect lipids and proteins against glycation and the most biologically active form of folate called 5-methyltetrahydrofolate (5-MTHF), which is up to 7 times more bioavailable than folic acid.*

Item #01945 • 60 vegetarian capsules
1 bottle $9 • 4 bottles $8 each

For full product description and to order BioActive Complete B-Complex, call 1-800-544-4440 or visit www.LifeExtension.com

Caution: Temporary flushing, itching, rash, or gastric disturbances may occur.

People who struggle with weight loss often point to several issues that sabotage their efforts:
- Eating between meals,
- Grazing at night, and
- Constant desire to snack.

A proprietary extract of saffron, is **clinically proven** to deal with these issues in women as shown by the following results:\(^1,^2\)
- 100% reduction in the desire to snack
- 55% less eating between meals
- Less hunger
- Moderate weight loss
- More energy
- Better mood

Say goodbye to “kitchen raids” and say hello to Optimized Saffron.

**Item #01432** • 60 vegetarian capsules

1 bottle **$27**
4 bottles **$24 each**

**References**

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

For full product description and to order Optimized Saffron, call 1-800-544-4440 or visit www.LifeExtension.com

Satiereal® is a registered trademark of INORÉAL International patents pending.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
THE LARGEST CONFERENCE FOR PROSTATE CANCER PATIENTS + CAREGIVERS

The annual PCRI Conference is a comprehensive educational experience for prostate cancer patients and caregivers. The conference moderated by Mark Moyad, MD, consists of keynote presentations from leading doctors followed by Q&A sessions. We will be livestreaming this online event for free! Attend the conference from the comfort of your own home. You can expect to learn information that will help you become empowered to make the best decisions. Learn more about this unique educational event at www.pcri.org/2021-conference.

RSVP TODAY AT: www.pcri.org/2021-conference

FREE ONLINE EVENT! Visit www.pcRI.org to learn more!

[KEYNOTE TOPICS]
- All Prostate Cancer Treatments
- Newly Diagnosed
- Diet & Exercise
- Sexual Dysfunction
- Active Surveillance
- Treatment Side Effects
- Prostate Imaging
- Benign Prostate Hyperplasia (BPH)
- Advanced Treatment Strategies
Vision Loss in Mice Reversed with Epigenetic Reprogramming

Vision loss due to glaucoma and aging in mice was reversed with the use of epigenetic reprogramming, according to the results of a study published in Nature.*

This approach proposes that changes to the body’s system that activates and deactivates genes (the epigenome) cause cells to read the wrong genes, leading to degenerative diseases.

Co-author, geneticist Dr. David Sinclair and colleagues at Harvard Medical School, utilized a virus to deliver three of four youth-restoring genes known as Yamanaka Factors into the retinas of mice. The genes were previously found to eliminate epigenetic markers on cells and return cells to the embryonic state from which they can develop into other types of cells.

After receiving the genes, mice with damaged optic nerves experienced nerve regeneration, and vision loss was restored in a mouse model of glaucoma. Vision was also restored in 12-month-old mice that had aging-related visual impairment.

Editor’s Note: “These data indicate that mammalian tissues retain a record of youthful epigenetic information—encoded in part by DNA methylation—that can be accessed to improve tissue function and promote regeneration in vivo,” the authors stated.

**Metabolic Syndrome Factors Improve with L-Carnitine Supplementation**

A review and meta-analysis of randomized, placebo-controlled trials found improvement in factors that characterize metabolic syndrome among people given L-carnitine, according to an article in *Nutrients.*

Metabolic syndrome is determined by the presence of three or more factors that include high blood pressure, elevated fasting triglycerides, low levels of HDL cholesterol, increased abdominal circumference and high fasting blood glucose. The presence of metabolic syndrome is associated with an increased risk of developing type II diabetes and cardiovascular disease.

The researchers selected nine articles that reported the findings of trials that evaluated the effects of L-carnitine supplementation among 508 participants and reported data concerning fasting blood glucose, triglycerides, waist circumference, blood pressure, or HDL cholesterol. L-carnitine doses ranged from 750 mg to 3,000 mg per day.

Supplementing with L-carnitine was associated with significant reductions in waist circumference and systolic blood pressure in comparison with the placebo groups.

*Editor’s Note:* When studies that tested doses of one to three grams were analyzed, L-carnitine was additionally associated with a significant decrease in fasting blood glucose and triglycerides, and an increase in beneficial HDL cholesterol. “Ultimately, two to three grams a day of supplemented L-carnitine is recommended,” the authors stated.

* Nutrients. 2020 Sep 12;12(9):2795.
Severity of Male-Pattern Hair Loss Linked to Decreased Levels of Vitamin D

An association was found between deficient vitamin D levels and greater severity and premature onset of androgenetic alopecia (otherwise known as male-pattern hair loss) in young men, an article in the International Journal of Dermatology reported.*

Researchers conducted a case-control study that age-matched 50 men with premature androgenetic alopecia with 50 healthy, control subjects who did not have the condition. Participants were limited to those who were 30 years of age or younger.

Eighty-six percent of the men with hair loss were deficient (<12 ng/mL) in the vitamin and 14% of them had insufficient (12-20 ng/mL) levels.

The mean levels of serum vitamin D were significantly lower in men with the condition, compared to the controls (20.10 ng/mL vs. 29.34 ng/mL).

Vitamin D levels were not found to be related to how much sun exposure the men received.

Editor’s Note: “Our study showed a significant correlation between vitamin D deficiency and the severity of androgenetic alopecia,” the authors concluded. “This suggests that vitamin D may play a role in the premature onset of androgenetic alopecia.”

Lower Alzheimer's Risk Linked to Greater Flavonol Intake

An article in the journal *Neurology* reported an association between consuming more compounds known as flavonols, and a lower risk of developing Alzheimer’s disease.*

Flavonols are found in many fruits and vegetables, as well as in tea.

The study included 921 participants with an average age of 81. The subjects did not have Alzheimer’s disease at the beginning of the study.

Questionnaires completed at enrollment and then annually during a six-year average follow-up period, provided data on dietary intake that was analyzed for flavonol content. Participants were also evaluated yearly for the presence of Alzheimer’s disease.

Over the course of follow-up, 220 individuals developed the disease.

Participants were divided into five groups, according to their level of flavonol intake. Among those whose intake was highest, at an average of 15.3 mg per day, 15% developed Alzheimer’s disease, compared to 30% whose intake was lowest, at approximately 5.3 mg per day—a 48% lower, adjusted risk.

*Editor’s Note:* The authors stated that, “Eating more fruits and vegetables and drinking more tea could be a fairly inexpensive and easy way for people to help stave off Alzheimer’s dementia.”

GEROPROTECT® Autophagy Renew stimulates the body’s natural “cellular cleanup” process essential to youthful cellular function and overall health.

Artificial Intelligence was one of the tools utilized by researchers to help identify the best nutrients in this advanced formulation.

This new longevity formula contains luteolin and piperlongumine to:

• Promote ongoing cellular housekeeping
• Encourage healthy cell debris removal
• Inhibit mTOR signaling

Activating autophagy supports healthy cellular function and longevity.

For full product description and to order GEROPROTECT® Autophagy Renew, call 1-800-544-4440 or visit www.LifeExtension.com

†Developed in collaboration with Insilico Medicine, Inc.
Support Healthy Immune Function with WHEY Protein

Whey protein, packed with vital amino acids, promotes glutathione synthesis.

Glutathione plays an important role in supporting immune balance in the body.¹⁻³

Whey fractions help modulate a full range of healthy bodily functions.

Choose the Best Whey for You!

→ **WHEY CONCENTRATE** (chocolate or vanilla flavor)
Pure whey with the water removed. Contains 80% easy-to-digest protein.
- Item #02260 Vanilla • Item #02261 Chocolate
  - 1 container $22.50 • 2 containers $19.95 each

→ **WHEY ISOLATE** (chocolate or vanilla flavor)
Filtered to reduce carbohydrates, lactose and fat. Contains 98% protein with some lactose.
- Item #02242 Vanilla⁺ • Item #02243 Chocolate⁺
  - 1 container $22.50 • 2 containers $19.50 each

→ **ADVANCED WHEY ISOLATE with GLUTAMINE and CREATINE**
A premium isolate for greater strength and exercise performance.
- Item #02246 Vanilla⁺
  - 1 container $22.50 • 2 containers $19.50 each

References

For full product description and to order Wellness Code®, Whey Protein Concentrate, Whey Isolate, or Advanced Whey Isolate with Glutamine and Creatine, call 1-800-544-4440 or visit www.LifeExtension.com

* Provon® is a registered trademark of Glanbia plc.

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
Are you experiencing general fatigue? Do you lack motivation? Well, it’s time to get up off the mat and fight back!

What you’re feeling may be the result of declining NAD⁺ levels, a coenzyme found in every cell in your body. NAD⁺ facilitates ATP production, which your body uses for fuel.

Life Extension’s best-selling NAD⁺ Cell Regenerator™ can help maintain the youthful levels of NAD⁺ you need to thrive.

**NAD⁺ Cell Regenerator™ and Resveratrol**
Item #02348 • 30 veg. caps.
1 bottle *

**NAD⁺ Cell Regenerator™**
Item #02344 • 30 veg. caps.
1 bottle *

* For pricing available to readers of this magazine, call 1-800-544-4440 or visit LifeExtension.com/NAD

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

For full product description and to order NAD⁺ Cell Regenerator™ or NAD⁺ Cell Regenerator™ and Resveratrol, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
A 22% Lower Risk of Cardiovascular Death!

BY MICHAEL DOWNEY
Glucosamine has been used for decades to rebuild cartilage in aging joints.

An analysis published in May 2019 found that regular glucosamine use was associated with a 22% lower risk of cardiovascular death.¹

In seeking to ascertain the anti-death mechanisms, the autophagy-boosting property of glucosamine is a candidate, along with its inflammation-reducing effects.

Aging cells accumulate metabolic waste products that shorten healthy lifespans. In youth, cells are cleansed of this toxic debris via a natural process called autophagy.

The ability of glucosamine to “turn back on” beneficial autophagy may explain its life-extending properties.

Another beneficial mechanism is glucosamine’s ability to turn down inflammatory reactions that underlie cardiovascular disorders.

Many readers of Life Extension® magazine have supplemented with the 1,500 mg/day dose of glucosamine shown to confer these death-defying benefits.

This article describes the scientific evidence supporting the use of glucosamine to maintain healthy joint structure and function.

It also reviews new data showing reduced death rates in those who use glucosamine.
Osteoarthritis becomes more common as we age. One reason is that the structural cartilage in joints degrades, resulting in pain, swelling, and loss of motion.

To cope, people often turn to pain relievers that do nothing to repair or restore damaged joint cartilage.

Glucosamine has been shown to relieve joint pain as effectively as drugs like ibuprofen — without harmful side effects.2

Reduced Risk for Heart Disease

Although glucosamine is traditionally used to treat osteoarthritis, studies have shown that it has a wide range of benefits.

One of the most significant findings is that regular glucosamine use is associated with a reduction in cardiovascular disease.

A 2019 study used data from 466,039 individuals without a history of cardiovascular disease.1 These subjects were followed for an average of seven years.

Compared to non-users, people who used glucosamine supplements had a 15% lower risk of total cardiovascular disease events, defined as cardiovascular death, coronary heart disease, and stroke.

When these outcomes were examined individually, glucosamine use was associated with a 22% lower risk of cardiovascular death, an 18% lower risk of coronary heart disease and a 9% lower risk of stroke.

Activating Autophagy

Studies of glucosamine in the last several years explain how it may improve health and extend lifespan.

One of the most prominent discoveries is that glucosamine induces autophagy, or “cellular housekeeping.”

Autophagy is the natural process by which cells rid themselves of toxic internal metabolic waste.

With advancing age, autophagy doesn’t always work as intended. Deficits in autophagy have been implicated in loss of function and risk for chronic disease.3

Studies in various cell types have found that glucosamine is a potent activator of autophagy.4-9 Several of these studies demonstrate that it accomplishes this by inhibiting mTOR signaling in cells. At least one study has found that it induces autophagy through an mTOR-independent pathway.9 This means that glucosamine activates autophagy by more than one mechanism!

The implications for this finding are profound. We can already see evidence that glucosamine use leads to lower rates of cardiovascular disease, cardiovascular-related death, and death by all causes in humans. The augmentation of healthy autophagy is one explanation for this remarkable finding.
Joint Deterioration

Two of the most vital components of our joints are cartilage and synovial fluid.

Cartilage covers the surface of the bone, reducing friction at the joint during movement. Synovial fluid lubricates the joint.

Over 32 million Americans are affected by osteoarthritis and it is one of the most common causes of disability.10

Osteoarthritis is more than just a wear-and-tear process; it is an inflammatory process.

Several factors play a role in the development of osteoarthritis, including:10

- Altered biomechanical properties of joint tissue,
- Increased proinflammatory mediators (i.e. cytokines), and
- Destruction of joint tissue via protein-digesting enzymes (i.e. matrix metalloproteinases).

WHAT YOU NEED TO KNOW

Glucosamine

- In osteoarthritis many structural changes occur, including deterioration of cartilage, leading to joint pain, swelling, and loss of mobility.
- Glucosamine supports healthy cartilage and joint function.
- Clinical studies show that taking glucosamine eases joint pain about as well as pain medications.
- In addition, regular use of glucosamine has been associated with a 22% lower risk of cardiovascular death.

How Glucosamine Helps

The body uses glucosamine to synthesize cartilage and synovial fluid.11-13

It plays a crucial role in maintaining joint lubrication and has shown anti-inflammatory effects in laboratory studies.14-16

Orally administered glucosamine, in doses of 1,500 mg a day, is easily absorbed into the bloodstream and leads to direct increases of glucosamine levels at the joints.17

Decades of clinical trials have demonstrated just how well oral glucosamine works.
In one randomized, double-blind study of patients with knee osteoarthritis, scientists compared 1,500 mg a day of glucosamine to 1,200 mg a day of ibuprofen for two weeks. The study concluded that glucosamine is as effective as ibuprofen in treating symptoms, but without harsh side effects.2

Another recent analysis found that glucosamine was clearly superior to a placebo in relieving symptoms of knee osteoarthritis.18

Summary

Osteoarthritis becomes more common with age. Its destructive effects on joints result in painful movement, swelling, loss of motion, and stiffness in knees, hips, hands, and other body parts.

Medications can relieve pain but come with potential side effects and don’t address the underlying damage.

Clinical trials show that oral intake of glucosamine sulfate supports healthy cartilage and joint function. An analysis published in 2019 revealed that regular use of glucosamine was associated with a 22% reduced risk of cardiovascular death.

Glucosamine standalone capsules and multi-nutrient joint health formulas containing high-potency glucosamine are affordable and widely available.

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

References

Glucosamine and Longevity

Although glucosamine supplementation is most widely appreciated for its impact on joint and cartilage health, recent research suggests that it also has a remarkable impact on whole-body health.

It has long been recognized that a diet that restricts calories activates several pro-longevity pathways in cells and extends life. Some nutrients modulate these same pathways.

In animal models, glucosamine has been found to be just such a compound. In a study of both roundworms and aged mice, glucosamine supplementation was found to prolong the lifespan of these experimental animals. Furthermore, a study of various pro-longevity nutrients and drugs found that glucosamine was one of the few that had ample evidence of life extension in multiple animal models while having one of the lowest potentials for side effects with regular use.

**Caloric restriction** is one of the best documented means to extend lifespan. In cell and animal models ranging from yeast to mammals, either restricting total calorie intake or introducing periods of intermittent fasting is the best-known method to slow the aging process and increase longevity.

However, caloric restriction in humans can be very difficult to implement and maintain.

In an attempt to find life extending alternatives that are easier to adhere to, scientists have investigated the mechanisms by which caloric restriction protects health. They have revealed several key pathways within cells that are modified by a reduced caloric intake.

There is an ongoing search to identify so-called **caloric restriction mimetics**—nutrients that can impact the same pathways as caloric restriction. Recent research has revealed that **glucosamine** is such a compound.

Several of the cellular pathways affected by calorie restriction have been shown to be similarly affected by glucosamine supplementation:

- **AMPK** activation with induction of fat metabolism and mitochondrial activation
- **Activation of sirtuins**
- **Induction of autophagy**—cellular “housekeeping” and repair

All of this has been shown to translate into life extension in animal models. In a study coming out of Switzerland, glucosamine supplementation extended the life of both worms and aged mice.

Given this newfound property of glucosamine, scientists recently published the results of a study to further investigate glucosamine’s anti-aging abilities. In a rat model of accelerated aging, the researchers supplemented some rats with glucosamine and compared them to rats without supplementation.

They looked at several well-established markers of aging, including markers of antioxidant capacity and glycation. In typical aging, antioxidant capacity declines and tissue damage due to glycation is increased.

In the aged animals given glucosamine, antioxidant capacity was increased, cellular antioxidant enzyme activity was increased, and glycation was reduced.


RE-ENERGIZE

Heart AND Brain Cells

Three Choices of Superior Ubiquinol CoQ10 Mitochondrial Delivery Systems

100 mg CoQ10

Item #01426 • 100 mg, 60 softgels
1 bottle $46.50
4 bottles $39 each

200 mg CoQ10

Item #01431 • 200 mg, 30 softgels
1 bottle $44.25
4 bottles $37.50 each

100 mg CoQ10 + 10 mg PQQ

Item #01733 • 100 mg, 30 softgels
1 bottle $37.50
4 bottles $30 each

For full product description and to order Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support, or Super Ubiquinol CoQ10 with PQQ, call 1-800-544-4440 or visit www.LifeExtension.com

PrimaVie® is a registered trademark of Natreon, Inc. Q+, Kaneka Ubiquinol™, and the quality seal™ are registered or pending trademarks of Kaneka Corp.

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

**PREMIER REWARDS**
- **FREE** Unlimited Shipping
- **4%** Back On Purchases
- $50 Instant Credit
  Use now or save for later.
- **Worry-Free**
  No auto-enrollment. Cancel anytime.

**JOIN PREMIER TODAY!**
ONLY $49.95 PER YEAR.

LifeExtension.com/YourPremier

**AUTOSHIP & SAVE**
- **FREE Shipping**
  We ship to any address in the United States (including Alaska and Hawaii) regardless of order size.
- **LOWEST Prices**
  Always pay the lowest price for your favorite Life Extension® products.
- **NEAREST Formulations**
  Always receive the latest version of our innovative formulas.

Complimentary program! Cancel any time

LifeExtension.com/AutoShip

Call 1-855-867-9361 | Please use code REWARDS

---

*Average savings based on the average AutoShip discount across all products. Premier service expires 12 months after date of purchase or renewal and can only be renewed 6 months after Premier purchase or renewal. Includes FREE standard delivery (3 to 5 business days) to any mailing address within the United States, excluding U.S. territories. Discounts on non-standard and international shipping also available. International customers pay $59.95 for Premier. During checkout, redeem LE Dollars (one is equal to $1 U.S. Dollar) to purchase products, blood tests, sale items, and shipping fees.
Glucosamine has been used for decades to support joint function and protect cartilage.

New studies reveal it may also promote heart health and beneficial autophagy.

Large cohort studies showed that people who took glucosamine were more likely to live longer, healthier lives.1-4

Each capsule of this new formula provides 750 mg of glucosamine.

References

For full product description and to order Glucosamine Sulfate, call 1-800-544-4440 or visit www.LifeExtension.com
CISTANCHE
Activates Immune Function

BY MARSHA MCCULLOCH, RD
Traditional Chinese-medicine practitioners have long used the herb Cistanche to support immunity, brain function, and more.\textsuperscript{1,2}

The demand is now growing as scientists identify Cistanche’s multiple \textbf{anti-aging} effects.\textsuperscript{3,4}

Cistanche has been shown, in preclinical research, to activate \textbf{immune} functions and help reverse certain aspects of \textbf{immune senescence}.\textsuperscript{3,5,6}

This research provides insight on how this plant may protect against age-related health concerns, including increased vulnerability to infections, malignancies, and neuroinflammation.\textsuperscript{3,4}
Aging and Immune Function

As we age, our organs and tissues are prone to dysfunction. So is our immune system. This immune senescence puts us at greater risk of infections and cancer. It also reduces the effectiveness of vaccines.7

Some of the deleterious immune changes that accompany aging include:7

- A decrease in available naïve (not yet activated) T cells, including CD8+ T cells needed to kill viral-infected cells and tumor cells,
- A decrease in B cells, which make antibodies to fight specific pathogens,
- A decrease in the effectiveness of memory T cells that help keep latent (dormant) viruses in check, such as the virus that causes shingles,
- An increase in pro-inflammatory proteins, including interleukin-6 (IL-6), which is linked to impaired immune function, and
- An increase in persistent, low-grade inflammation or inflammaging.

Scientists have found that many natural plant compounds, including those in Cistanche, may help slow the rate of immune senescence and optimize our immune function.

Bolstering Immune Defenses

Researchers have performed several cell culture and animal studies to identify how Cistanche extract can support the aging immune system.

These studies suggest Cistanche could help:

- Increase amounts of natural killer cells, which help defend against tumors and a number of pathogens,3
- Promote the production of naïve T cells and B cells, also needed to help fight pathogens,3,5,6
- Support proper immune system function through its anti-inflammatory activities,5
- Increase the activity of dendritic cells, which help activate naïve T cells,8 and
- Decrease harmful proinflammatory cytokine interleukin-6 (IL-6).3

Among the most beneficial compounds in Cistanche are polysaccharides and a class of polyphenols called phenylethanoid glycosides, which include echinacoside.5

Echinacoside is also a key component of Echinacea, an herb known for supporting the immune system. Cistanche tubulosa has a high content of echinacoside.9
A Cistanche extract was shown in an animal model to increase the potency of an influenza vaccine. Substances that enhance the body’s reaction to an immune response are commonly added to vaccines to improve their effectiveness.

When Cistanche extract was added to an influenza vaccine, it elicited more rapid antibody production against the flu antigens.10

Taming Neuroinflammation

Cistanche’s anti-inflammatory activity makes it a good candidate for protecting against the damaging effects of neuroinflammation.11

In a placebo-controlled pilot study, men and women with moderate Alzheimer’s disease took 300 mg of Cistanche three times daily for nearly a year.12

Taking Cistanche resulted in significantly lower levels of certain inflammatory factors in the fluid surrounding the subjects’ brain and spinal cord, compared to the untreated group.

Untreated subjects also had hippocampus shrinkage of 4.2%, while the Cistanche group had no change in the volume of their hippocampus. The hippocampus plays a key role in cognition, memory, and learning.

Consistent with these findings, the Cistanche group performed significantly better on cognitive tests at the end of the study.12

In addition, a rat model of Alzheimer’s showed that echinacoside and other bioactive components of Cistanche can pass through the blood-brain barrier to protect brain cells.2

WHAT YOU NEED TO KNOW

Live Well, Live Long with Cistanche

- **Cistanche** is an herb with a long history of use in traditional Chinese medicine to treat common concerns of aging, including weakened immunity and heightened inflammation.

- Research supports the anti-aging and longevity benefits of Cistanche, which are linked with the herb’s ability to promote more youthful immune function.

- Preclinical studies suggest Cistanche increases immune cells needed to fight harmful viruses, bacteria, and cancers. The herb also decreases inflammatory cytokines.

- Cistanche may help lower neuroinflammation and support cognitive function.
**Anticancer Activity**

Preclinical research suggests *Cistanche* may help fight cancer in cells of the esophagus, breast, colon, and liver.\(^{13-16}\)

For example, *Cistanche* has been found to trigger the death of colorectal cancer cells.\(^{5}\)

One laboratory study found that *Cistanche* inhibited the growth of colon cancer cells by 60% within just 72 hours of treatment. This included cancerous cells that had metastasized.\(^{15}\)

In mouse studies, *Cistanche* stimulated the immune system, increasing levels of cancer-fighting CD8+ T cells.

*Cistanche* inhibited the growth of liver cancer cells and greatly improved the rodents’ survival rate.\(^{16,17}\)

**Longevity Promotion**

Scientists use species with short lifespans, including fruit flies and roundworms, to quickly test the lifespan effects of compounds.

Though these creatures are tiny, their organ systems and cellular processes have many similarities to our own.\(^{18}\)

When adult fruit flies were given *Cistanche* for 20 days, it extended their average lifespan by as much as 18.9%.\(^{19}\)

Another study used small roundworms to test the longevity effects of the echinacoside found in *Cistanche*. This compound increased the average lifespan of roundworms by 13.64%, compared to an untreated group.\(^{20}\)

These findings are not surprising considering immune senescence is a major cause of death in aging people.

**Stimulating Growth Hormone**

Once we hit puberty, our growth hormone levels drop about 14% per decade. Declining health and longevity tend to accompany this hormonal downturn.\(^{21}\)

*Cistanche* may provide a natural way to promote youthful growth hormone levels.

When rat pituitary cells were exposed to compounds from *Cistanche*, they stimulated the secretion of growth hormone. Echinacoside was especially effective.\(^{22}\)

**Other Benefits of Cistanche**

Research suggests that *Cistanche* has health benefits beyond promoting longevity mechanisms and improved measures of immune function.

Cell culture studies show that echinacoside stimulates bone-building osteoblast cells to regenerate
bone. Postmenopausal rat models of osteoporosis have found that Cistanche reverses bone loss and improves bone density.⁵,⁶,2³ Preclinical research suggests Cistanche could help improve insulin resistance, promote healthy blood sugar levels, prevent depression, and lower cholesterol.⁵,²⁴

Cistanche may also help combat physical fatigue, support reproductive health, alleviate constipation, and reduce the severity of cataracts.⁵,⁶,2⁵,2⁶

This research adds to the growing body of evidence that oral intake of Cistanche promotes healthier aging.

Summary

To live a long, healthy life requires healthy immunity. Immune function and lifespan are closely linked. Immune system dysfunction, or immune senescence, brings increased risks of infection, cancer, and chronic inflammatory conditions.

Extracts of the herb Cistanche contain bioactive compounds that support immune function.

Preclinical studies suggest Cistanche could help bolster immune defenses, reduce cancer risk, and increase lifespan.

Human research shows that Cistanche can also help reduce neuroinflammation and protect brain function.

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

References

DEFEND YOUR HEALTH

VITAMIN D3
Systemic support for immune function, bone health, and normal blood-sugar levels.

Item #01713 • 5,000 IU • 60 softgels
1 bottle $7.50 • 4 bottles $6.50 each

For full product description and to order Vitamin D3, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: Individuals consuming more than 50 mcg (2000 IU)/day of vitamin D (from diet and supplements) should periodically obtain a serum 25-hydroxy vitamin D measurement. Do not exceed 10000 IU per day unless recommended by your doctor. Vitamin D supplementation is not recommended for individuals with high blood calcium levels.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Humans don't manufacture vitamin C internally, so it must be obtained through dietary sources or supplements.

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

A highly absorbable form of quercetin complements vitamin C’s activity in the body.

Each tablet provides **1,000 mg of vitamin C** and **15 mg of Bio-Quercetin Phytosome**.

For full product description and to order **Vitamin C and Bio-Quercetin Phytosome**, call 1-800-544-4440 or visit **www.LifeExtension.com**


These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Scientists have identified *Cistanche* as rich in echinacosides which promote increased development of T cells and natural killer cells.\(^1,2\)

A 12-week human study using *Cistanche* extract found impressive results in immune function.\(^2\)

*Cistanche* helps support an already healthy inflammatory response and inhibit immune senescence.\(^3\)

For full product description and to order Standardized Cistanche, call 1-800-544-4440 or visit www.LifeExtension.com

Note: The same dose of standardized Cistanche can also be found in the Immune Senescence Protection Formula that also provides Reishi mushroom and Pu-erh tea extracts.

References
PHELLODENDRON
Supports Healthy Dopamine Levels

BY STUART NADEL
Dopamine is one of the most important neurotransmitters in the brain.

It’s sometimes called the “feel good” or “pleasure” neurotransmitter.\(^1\)

But it’s also central to many different aspects of cognitive functioning including an essential role in motivation.\(^2\)

As we age, the activity of an enzyme called monoamine oxidase B (MAO-B) increases. MAO-B breaks down dopamine, reducing vital dopamine levels.\(^3\)

Increased MAO-B activity also has neurotoxic effects, contributing to age-related loss of brain function and risk for neurodegenerative diseases.\(^4-6\)

In animal studies, drugs that inhibit MAO-B also reduce age-related cognitive decline\(^7\) and even increase longevity.\(^8-13\)

Now scientists have found that components of phellodendron tree bark inhibit the MAO-B enzyme in vitro.\(^14,15\)

Animal studies have already shown that this extract has neuroprotective effects.\(^16-18\)

By preserving healthy dopamine levels, phellodendron tree bark may help maintain clear thinking, cognitive function, and motivation as well as reduced potential risk for neurodegenerative illnesses.
Dopamine and Brain Aging

Many accept brain fog, slower brain speed, and lack of interest and motivation as a normal part of aging. Part of the problem may be that brain levels of this feel-good neurotransmitter decline by about 13% each decade after age 45.19

This decline coincides with an increase in monoamine oxidase B (MAO-B), an enzyme that degrades neurotransmitters like dopamine.3,5,20,21

To overcome this age-related brain deficit, scientists screened hundreds of plants with MAO-B-inhibiting properties. Phellodendron tree bark stood out as one of the most potent and selective plant-derived MAO-B inhibitors.14,15

Inhibiting MAO-B overactivity prevents the breakdown of dopamine, protecting the brain.

Currently, the medical profession uses pharmaceuticals called MAO-B inhibitors such as deprenyl (also sometimes called selegiline) to stop MAO-B destruction of dopamine, especially in Parkinson’s patients.

What is Dopamine?

Dopamine is a crucial neurotransmitter that carries “messages” between brain cells.

There are four neural pathways in the brain through which dopamine acts to elicit behavioral, cognitive, and neurological responses.

It is through these pathways that dopamine exerts its effects on movement and learning, emotion and pleasure, cognition and memory, as well as on a hormonal pathway.22

Interestingly, it is believed that the role of dopamine in addiction extends to our troubled relationship with our smart phones and social media. You see people always checking their phone as if they can’t live without it for a minute or two.

Researchers claim that this behavior is dopamine driven. We get a “reward” when our phones (and social media) show us laughing faces, positive recognition from our peers, and messages from loved ones. We then become addicted to checking our phones to get a little dopamine reward every time we do.

These social media platforms are designed to activate and elicit a dopamine response and therefore get us hooked on them – even when in many cases we don’t get the positive pleasure reinforcement.23

Dopamine is known for the many roles it plays in our bodies and in our minds, but has received attention for its role as a “feel-good hormone” and in regulating mood.24

The brain releases dopamine during pleasurable activities such as eating or having sex (or using certain drugs).
But beyond pleasure and mood, dopamine levels can affect a person’s attention, motivation, and movement. Obviously, these are essential brain functions. We need motivation to make breakfast, to plan out the day, to accomplish tasks. With an adequate supply of dopamine in specific brain regions, we can tackle difficult tasks.2

The flip side is that low dopamine levels in brain reward regions are associated with depression, lack of motivation and pleasure (the latter is known as anhedonia), and the symptoms of drug withdrawal.25 These are also symptoms of normal aging in some people.

What is more, loss of dopamine function has been shown to play a major role in the development of some neurodegenerative diseases.26

Dangers of MAO-B Overactivity

Studies in rodents and humans have shown that MAO-B activity increases in the brain in older age.5,27-29 One study that mapped MAO-B activity in humans found an increase in most brain structures starting at age 50 to 60.29

Another study also documented increased MAO-B activity in older humans.28 This study found that its activity was higher in people with dementia than in non-impaired individuals of the same age.

That suggests that MAO-B overactivity plays a possible role in neurodegeneration through its dopamine-degrading activity.

But MAO-B’s effects on the brain go far beyond its impact on dopamine.

As MAO-B increases, highly toxic byproducts are formed, including hydrogen peroxide, free radicals, and toxic aldehydes.4-6 These compounds can wreak havoc in cells, leading to disease and dysfunction.

In the brain, these toxic byproducts contribute to neurotoxicity—damage to brain cells.4 This damage has been linked to brain deterioration and the development of age-related neurodegenerative diseases, such as Parkinson’s disease, Alzheimer’s disease, and others.

When levels of MAO-B activity are normal, these toxic substances are largely neutralized by cellular antioxidant defenses. But as MAO-B activity increases with older age, antioxidant defenses also tend to decline.4-6

This leaves an excess of these toxic compounds, which can do significant harm.

What You Need to Know

A Bark Extract That Protects the Brain

- Monoamine oxidase B (MAO-B) is an enzyme found in the brain and other tissues that degrades the neurotransmitter dopamine.
- MAO-B activity tends to increase after middle age. This leads to lower levels of dopamine, as well as the production of toxic compounds that can damage brain cells.
- This MAO-B overactivity has been implicated in age-related loss of brain function and risk for neurodegenerative disease.
- Drugs that inhibit MAO-B are used to treat Parkinson’s disease and other neurotransmitter-related conditions. In animal models, they help maintain cognitive function into older age and can increase longevity.
- Scientists screened hundreds of plants and identified an extract of phellodendron bark as one of the most powerful inhibitors of MAO-B.
Inhibiting MAO-B May Improve Lifespan

Drugs such as deprenyl that inhibit MAO-B activity have been used for many years. **Deprenyl** is most commonly prescribed for Parkinson's patients in order to correct their low levels of dopamine, though it is sometimes used in major depression and in attention deficit hyperactivity disorder (ADHD).

By inhibiting or blocking the activity of MAO-B, these medications leave more dopamine in our neural circuits.

Studies have found that MAO-B inhibition also has other benefits for the brain.

In various animal models, treatment with deprenyl consistently helps preserve cognitive function into older age.7-9

Even more remarkably, these drugs significantly boost longevity as well.

Animal studies have found that MAO-B inhibition extends lifespan.7-13 In two studies, for example, rats given deprenyl lived an average of over 37% longer than untreated rats.10,12

In both rat studies, healthy sexual activity was also maintained significantly further into old age in the deprenyl-treated animals, evidence of health benefits beyond cognitive function.

Those who take MAO-B-inhibiting drugs like deprenyl do not need to take phellodendron.

Phellodendron is not a substitute for physician-prescribed medications.

The typical dose of deprenyl people take for anti-aging purposes is 5 mg two to three times a week. Deprenyl does not need to be taken daily to suppress excess MAO-B in otherwise healthy people over age 45.
In rodent models, phellodendron also protects against neuroinflammation, amyloid production, and other changes associated with Alzheimer’s. These mechanisms help to maintain cognitive function in the animals into older age.

Various studies suggest that phellodendron has additional, body-wide benefits. It displays anti-inflammatory, antibacterial, antiviral, and antitumor properties, among others.

Along with its ability to protect cognitive function, these effects make this compound a safe way to help protect body and brain.

Summary

Overactivity of the enzyme MAO-B occurs in the aging brain after middle age.

This may result in reduced levels of the critical neurotransmitter dopamine. It also produces toxic compounds that damage brain cells and contribute to loss of function and risk for neurodegenerative diseases.

Drugs that inhibit MAO-B slow or prevent the breakdown of dopamine.

They are used in Parkinson’s disease and other neurotransmitter-related conditions and have been shown in animal models to protect the brain and to maintain cognitive function into older age.

Animal models have also shown they have an impact on overall longevity, significantly prolonging life.

Scientific research has identified phellodendron bark extract as an inhibitor of MAO-B.

It may help maintain dopamine levels and prevent the neurotoxicity associated with MAO-B overactivity. In addition, studies show that phellodendron has other neuroprotective and health-promoting properties.

Those who take MAO-B-inhibiting drugs like deprenyl do not need to take phellodendron. Phellodendron is not a substitute for physician-prescribed medications.

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

References

6. Naoi M, Maruyama W, Inaba-Hasegawa K. Type A and B mono-


MEGA VITAMIN K2

ENHANCE BONE DENSITY!

Physicians in Japan have long used a high dose of vitamin K2 to maintain and improve bone density.

Vitamin K2 has been shown to:
• Shuttle calcium into bones
• Inhibit soft-tissue calcification
• Improve bone density

New high-potency Mega Vitamin K2 provides 45,000 mcg of MK-4 in a one capsule daily serving.

**Mega Vitamin K2** is a perfect complement for those taking supplements like *Bone Restore*. A new formula called *Bone Restore Elite* provides 45,000 mcg of MK-4 plus highly absorbable calcium and other skeletal support nutrients. Those choosing *Bone Restore Elite* do not need to take *Mega Vitamin K2* as each product provides a high potency (45,000 mcg) of vitamin K2.

**Item #02417** • 30 capsules

1 bottle $28.50 • 4 bottles $26 each

CAUTION: If you are taking Warfarin (Coumadin®) or related medications, consult your healthcare practitioner before taking this product.

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

PYCNOGENOL®

Pycnogenol® is a plant extract derived from French maritime pine bark. Its benefits are available in these three formulations:

**ARTERIAL PROTECT**
- Provides Pycnogenol® and standardized gotu kola leaf extract to help stabilize endothelial plaque and promote healthy blood flow throughout the body.

**VENOFLOW™**
- For those who sit for long periods while traveling or in the office, this proprietary blend of Pycnogenol® and nattokinase promotes healthy venous blood flow.

**PYCNOGENOL®**
- Numerous published studies describe how concentrated extracts in Pycnogenol® help protect against multiple factors related to normal aging.

For full product descriptions and to order Pycnogenol®, Arterial Protect, or VenoFlow™, call 1-800-544-4440 or visit www.LifeExtension.com

*Pycnogenol® and Centellicum® are registered trademarks of Horphag Research.
Use of this product may be protected by one or more U.S. patents and other international patents.

*Pycnogenol® is a registered trademark of Horphag Research, Ltd.

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

These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.
DOPAMINE
THE “FEEL GOOD” NEUROTRANSMITTER

Feel Better, THINK More Clearly

Dopamine, the “feel good” neurotransmitter, regulates motivation, mood, movement, and cognitive function.

With age, dopamine levels decline due to the increase of the MAO-B enzyme.

Amur Cork Tree (Phellodendron bark) can help preserve dopamine by inhibiting MAO-B activity.

Dopamine Advantage provides 500 mg of Amur Cork Tree in each capsule.

For full product description and to order Dopamine Advantage, call 1-800-544-4440 or visit www.LifeExtension.com

Note: Those who take MAO-B-inhibiting drugs like deprenyl do not need to take phellodendron.
MILK THISTLE Reduces Elevated Glucose

BY CINDY RAWSON
Sometimes, no matter how healthy we try to be, we lose our ability to control blood sugar.

This is reflected in the fact that estimates of diabetes prevalence in people over age 64 in the U.S. are:

- 50% higher than for those aged 45-64,
- and
- 6.3 times higher than those aged 18-44.¹

Millions supplement with milk thistle today to support healthy liver function.

Recent studies show it also helps support healthy glucose balance and insulin sensitivity.

In one human study, milk thistle reduced fasting blood glucose by 11% and reduced insulin levels by 14%.² (Excess insulin creates metabolic health issues.)

For years, Life Extension® has stressed the importance of keeping fasting blood glucose between 70-85 mg/dL to protect against the many complications of normal aging.

Milk thistle provides another tool to help manage high glucose levels.
Milk Thistle Lowers Blood Sugar

A randomized controlled trial tested milk thistle on people with type II diabetes.

The study involved 40 diabetic adults, aged 25-50, who were on anti-diabetic medications. They were given either a pill containing 140 mg of silymarin (an extract of milk thistle), or a placebo, three times daily for 45 days.2

Compared with the placebo, milk thistle extract:2

• Reduced fasting blood sugar by 11%,
• Reduced blood insulin levels by 14%,
• Reduced insulin resistance, when cells ignore insulin’s signal to remove sugar from the blood, by 26%,
• Reduced triglyceride levels by 24%,
• Raised HDL (“good”) cholesterol by 7%,
• Reduced the triglyceride-to-HDL ratio by 28%, and
• Increased insulin sensitivity, how well cells respond to insulin, by over 5.5%.

Two other randomized, placebo-controlled clinical trials have shown similar results, indicating that milk thistle extracts—including as part of a multi-herb combination—successfully lowered both fasting blood sugar and hemoglobin A1c, a test that measures average blood sugar levels over the previous three months.3,4

Increasing Milk Thistle Absorption

Silybin, the star component of milk thistle, does not dissolve well in water5,6 That makes it difficult for it to reach tissues and cells in the body.7-10

Scientists have developed a simple but effective technology to overcome silybin’s poor bioavailability. The solution is to mix the silybin with a nutrient called phosphatidylcholine.

Phosphatidylcholine is a major component of cell membranes; it can facilitate transport across the cells lining the intestines, making it an ideal “carrier molecule” for silybin.7,11

The silybin-phosphatidylcholine complex is absorbed nearly five times better than silymarin alone, and its ultimate concentration in the liver, its target organ, is 10-fold greater than silymarin alone.8-10

In a study of rats exposed to various liver toxins (including dry-cleaning fluid, acetaminophen, and alcohol), silybin plus phosphatidylcholine protected against the telltale rise in plasma levels of liver enzymes (a marker of liver damage), while the same doses of either nutrient alone had no detectable effect.12

A series of human trials has found that this complex also has better results than silymarin or silybin alone, lowering serum levels of liver enzymes and producing clinical improvement in studies of liver cirrhosis and hepatitis caused by alcohol, drugs, and viruses.5
Summary

For decades, readers of this magazine have been warned about the dangers of elevated glucose levels. Diet, exercise, supplements, and medical intervention are all important means to achieve this.

Now scientists have revealed that an herb usually thought of for liver complaints is a valuable tool against diabetes and metabolic problems.

Studies in diabetics have shown that milk thistle drives glucose levels down, corrects lipid disturbances, and reduces hemoglobin A1C levels, a marker of blood sugar exposure over the medium term.

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

WHAT YOU NEED TO KNOW

Support Healthy Glucose with Milk Thistle

- Age is a major risk factor for diabetes, even when we take steps to control our diet and get ample exercise.

- Science reveals that milk thistle, an herb usually used for liver complaints, offers support in metabolic problems.

- Studies on diabetics show improved blood glucose and insulin levels with daily milk thistle use.

- Preclinical and clinical evidence showed that a silybin-phosphatidylcholine complex resulted in almost five-fold greater concentrations of silybin in the bloodstream than silymarin alone.

- Along with diet, exercise, supplements, and medications, milk thistle is another tool to keep blood sugar and insulin resistance under control.
References


BROAD-SPECTRUM IMMUNE SUPPORT

Lactoferrin is a component of whey protein best known for its immune benefits.

An array of published studies describes how lactoferrin up-regulates innate and adaptive immune responses to a variety of antigens.

Lactoferrin Caps (Apolactoferrin)

Item #01681 • 300 mg, 60 vegetarian capsules

1 bottle $45 • 2 bottles $40 each
(Two-Month Supply)

Contains milk.
Bioferrin® is a registered trademark of Glanbia.

For full product description and to order Lactoferrin Caps, call 1-800-544-4440 or visit www.LifeExtension.com

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
With age, our bifidobacteria levels decline to as little as 5%, creating gut imbalance.¹

Increasing bifidobacteria levels enhances digestion and carbohydrate metabolism.

Strawberry flavored FLORASSIST® Prebiotic Chewable helps restore healthy bifidobacteria levels in as little as 14 days using XOS prebiotic.²

1,000 mg of XOS (xylooligosaccharides) per prebiotic chewable.

References

PreticX™ is a trademark of AIDP, Inc.
Advanced Milk Thistle contains standardized, top-grade potencies of silymarin, silybin, isosilybin A, and isosilybin B, providing a full spectrum of liver-supportive compounds.

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

For full product description and to order Advanced Milk Thistle, call 1-800-544-4440 or visit www.LifeExtension.com

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

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Studies show that increasing AMPK activity encourages cells to stop storing fat.

AMPK Metabolic Activator helps trigger cellular AMPK, enabling your body to burn unwanted fat—particularly around your abdomen.

For full product description and to order AMPK Metabolic Activator, call 1-800-544-4440 or visit LifeExtension.com

Item #02207 • 30 vegetarian tablets
1 bottle $28.50 • 4 bottles $24 each

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

Actiponin® is a trademark of TG Biotech Co., Ltd.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
Glaucoma affects 80 million people around the world.

The cost incurred in the United States due to glaucoma is close to $3 billion yearly.¹

It can’t be cured, and is one of the most common causes of blindness.²

Treatment is usually focused on topical eye drops that help to slow vision loss by reducing the excessive pressure in the eyeball that is an underlying feature of glaucoma.

A recent clinical trial adds to evidence that oral intake of palmitoylthanolamide (PEA) improves glaucoma scores alongside prescription eye drops.³

In the trial, PEA lowered damaging eye pressure in glaucoma patients and led to improvements on tests of retinal function.
Glaucoma and Vision Loss

About three million Americans suffer from glaucoma, a group of related eye diseases. They often have no symptoms until loss of vision begins.

In glaucoma, there is an increased pressure within the eye, referred to as intraocular pressure. This pressure results from a buildup of fluid in the eyeball.

As glaucoma worsens over time, it damages cells in the retina of the eye called the retinal ganglion cells in the optic nerve. These cells are responsible for passing visual information from the eye to the brain, where it's formed into an image.

When these nerve cells and their fibers deteriorate, the result is gradual vision loss, eventually culminating in complete blindness if not successfully treated.

As these retinal cells die, input to the visual centers of the brain is lost.

Prescription eye drops can slow the progression of this vision loss. But nothing can reverse it yet in humans.

What is PEA?

Palmitoylethanolamide (PEA) is a fatty acid produced in the body in response to inflammation.

It is found in trace amounts in some food sources, including egg yolk and peanuts.

PEA has been used clinically for pain management and discomfort relief.

As they learn more about PEA, scientists have found that it has beneficial biological activity in other areas.

How PEA Fights Glaucoma

PEA can help control glaucoma in different ways.

One of the main causes of glaucoma is the buildup of fluid, known as the aqueous humor, in the eye. This buildup leads to an increase in intraocular pressure.

PEA improves the outflow or drainage of the aqueous humor, reducing fluid levels.

Human studies have shown that oral intake of 600 mg of PEA daily significantly lowers intraocular pressure.

In one randomized, placebo-controlled study, 300 mg of PEA twice per day for three months resulted in reduced intraocular pressure and improved endothelial function (measured by flow-mediated dilation).

In addition, animal studies show that PEA has neuroprotective effects, shielding nerve cells in the retina and the brain from damage due to various forms of injury.

Clinical Improvements

Researchers in Italy recently conducted a clinical trial of PEA in glaucoma patients.

People who were already taking eye-drop medications for glaucoma were randomized into two groups. One continued the current therapy. The second group also took 600 mg of PEA daily.

A non-invasive test called a pattern electroretinogram (PERG) was performed on all subjects. This measures eye health by testing the function of the retinal ganglion cells that are damaged by glaucoma.

At the end of the study, patients who took PEA had PERG test scores that were approximately 43% improved compared to their starting values and the values of subjects who did not receive PEA.

The intraocular pressure of all subjects was also recorded. Those taking PEA had significantly lower eye intraocular pressure, (an average reduction of about 1.58 points).

A prior trial of glaucoma patients established that for each 1 mmHg reduction in intraocular pressure, the risk of progression of loss is reduced by 10%. That means that this degree of improvement equates to a potential reduction in the risk of progression of glaucoma symptoms.
Quality-of-life scores were also calculated using a vision-specific questionnaire designed by the National Eye Institute. Subjects taking PEA scored an average 6.89 points higher on the quality-of-life exam compared to those not taking PEA.3

These results show significant benefits for patients suffering from any stage of glaucoma.

Summary

Glaucoma is a chronic and progressive eye disease. It is one of the most common causes of blindness in adults.

PEA is a compound produced in small amounts in the body. Oral intake of PEA is often used to control pain.

Studies have demonstrated that PEA can help control glaucoma as well, protecting the eyes and vision in several different ways.

In 2020, a study was published that evaluated the use of PEA as an add-on glaucoma therapy to prescription eye drops. It found that a 600 mg dosage of PEA daily lowered damaging eye pressure and improved retinal cell function and quality of life.

PEA holds promise as a glaucoma adjuvant alongside conventional medications.●

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

References

Maintain Optimal Hormone Levels

7-Keto® is a metabolite of DHEA ideal for weight management.

Maintaining youthful DHEA levels can help support immune function, circulatory health, mood, libido, and more.

DHEA Complete delivers 7-Keto® DHEA (100 mg) and regular DHEA (25 mg), plus extracts from curcumin, green tea, and whole red grapes.

Caution: Consult a physician or licensed qualified health care professional before using this product if you have, or have a family history of breast cancer, prostate cancer, or other hormone-sensitive diseases.

For full product description and to order DHEA Complete, call 1-800-544-4440 or visit www.LifeExtension.com

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

7-Keto® brand is a registered trademark of InterHealth N.I. U.S. Patent 7,199,116.
Fisetin, a flavonoid found in strawberries and apples, is currently being studied for its effectiveness as a senolytic in humans.1

In preclinical studies, fisetin:
- Mimics effects of calorie reduction2
- Targets longevity pathways3-6
- Extends lifespan of mice by about 10%7
- Removes senescent cells through senolytic action7
- Suppresses excess mTOR activation8

Fisetin is poorly absorbed due to its breakdown in the small intestines.

Bio-Fisetin solves this problem by enclosing fisetin with a compound from the fenugreek herb.

A human trial showed bioavailability of this new fisetin compound increased up to 25 times compared to fisetin by itself.9

Just one capsule daily of Bio-Fisetin helps manage senescent cells and may support overall longevity.

References

Item #02414 • 30 vegetarian capsules
1 bottle $11.25 • 4 bottles $10 each

For full product description and to order Bio-Fisetin, call 1-800-544-4440 or visit www.LifeExtension.com
LITHIUM

The Brain & Body Element

In areas where lithium is naturally abundant in the drinking water, people tend to live longer, healthier lives.¹⁻³

Lithium is a low-cost mineral that supports cognition, neural function, and healthy aging.⁴⁻⁵

LITHIUM

(1,000 mcg of lithium per tiny cap)

Item # 02403 • 100 vegetarian capsules

1 bottle $12 • 4 bottles $10.50 each

Each bottle lasts 100 days.

For full product description and to order Lithium, call 1-800-544-4440 or visit www.LifeExtension.com

References

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
PEA is a fatty acid found in the body that works at the site of discomfort.

Clinical studies show PEA can combat stubborn, minor pain and discomfort within 14-30 days of supplementation.¹³

Each chewable tablet delivers 600 mg of PEA (palmitoylethanolamide.)

For full product description and to order Discomfort Relief, call 1-800-544-4440 or visit www.LifeExtension.com
ZINC’S Role in BONE HEALTH

BY PAZ ETCHEVERRY, PhD
Experts commonly recommend several nutrients to help build strong, healthy bones, especially calcium, magnesium, and vitamin D.

But there’s another mineral that’s also essential for bone health.

**Zinc** is often overlooked by mainstream bone-building protocols. It is critical for growth and maintenance of healthy bone.

Zinc both prevents the breakdown of bone and helps form new bone. It’s a building block of bone itself. And it reduces the inflammation that can damage bone.

Daily oral intake of zinc in combination with other essential bone nutrients can help maintain strong bones well into older age.
Bone Remodeling

We have more than 200 bones in our body.\(^1\) About 90% of bone volume is made up of minerals and various proteins.\(^2\)

The remaining 10% is occupied by different kinds of cells, including osteoclasts and osteoblasts.\(^2\)

Bone is not a static organ. It is constantly going through a process known as remodeling\(^2,3\).

During this process, osteoclasts break down and remove old and damaged bone, transferring minerals from bone tissue to blood.

Osteoblasts use those minerals to form healthy new bone.\(^3\)

When this process works the way it’s supposed to, our bone mineral density or bone mass remains at an optimal level.

As we age, bone mineral density often begins to decline. This problem can be made worse by other factors, including low levels of calcium, vitamin D, vitamin K, and others, as well as a sedentary lifestyle, smoking, and more.\(^4\)

The Threat of Osteoporosis

Osteoporosis is a disease characterized by a severe reduction in bone mass. It causes bones to become fragile and prone to fracture. It may lead to reduced quality of life, disability, and sometimes death.\(^5\)

It is estimated that about 10 million Americans over age 50 have osteoporosis,\(^6\) which literally means “porous bone.” People often don’t know they have it until they suffer a fracture.

An additional 43 million Americans have osteopenia,\(^6\) a bone mineral density that is lower than normal but not low enough to qualify as osteoporosis.

Physicians routinely recommend increased calcium and vitamin D intake to maintain and preserve bone mass.\(^7,8\)

This approach is not sufficient. Bone remodeling is a complex process that requires sufficient intake of many other nutrients, including zinc, magnesium and vitamin K.

Zinc is often neglected in discussions of bone health. But without enough zinc, building strong bones is impossible.\(^9\)
Zinc and Healthy Bones

Zinc is an essential mineral that plays diverse roles in the human body. It is needed for proper immune function, cell replication, protein synthesis, and more.\(^1\)

Zinc is also required for the growth, development, and maintenance of healthy bones.\(^9\)

Low dietary intake and blood levels of zinc are associated with osteoporosis in adult men\(^1\) and postmenopausal women.\(^1\)

One study showed that average zinc levels were significantly lower in osteoporotic women than in either those with osteopenia or normal women.\(^1\)

In one randomized controlled trial, oral intake of zinc prevented decreases in bone density in postmenopausal women with low zinc consumption.\(^1\)

Zinc’s Role in Bone Formation

Zinc appears to increase bone formation in a few different ways.

It plays a role in the synthesis of insulin-like growth factor-1 (IGF-1), a protein that plays an important part in the maintenance of bone health.\(^15\)

WHAT YOU NEED TO KNOW

Zinc Helps Build Stronger Bones

- As we age, our bone mineral density tends to decline. This can eventually lead to osteoporosis and fractures.
- Many nutrients, like calcium and vitamin D, are known to be essential for bone health. But the mineral zinc is also essential for building strong bones, though it is often overlooked.
- In studies, adults with osteoporosis have lower levels of zinc than adults with healthy bones.
- Research shows that zinc inhibits the breakdown of bone, helps in the formation of new bone, and prevents chronic inflammation and oxidative damage that can harm bones.
- Life Extension suggests a total intake of 25 mg to 50 mg of zinc daily, along with other nutrients to support healthy bone mineral density and protect against fractures.
ZINC’S ROLE IN BONE HEALTH

Nutrients to Promote Bone Health

Bones are a dynamic, living tissue, with all the vulnerabilities to damage as any other tissue. Zinc is important for the maintenance of healthy bones. Other ingredients promoting bone health:

**Calcium** provides the bulk of the mineral content of bones and **vitamin D3** promotes calcium uptake from the gut.23

**Magnesium** regulates calcium movement into and between bone cells, increasing bone mineral density.24

**Vitamin K** is essential for bone strength.25,26 Low vitamin K status is associated with decreased bone mineral density and increased risk of fracture.27

**Manganese** functions as an essential cofactor (helper molecule) for enzymes that promote the growth of bone and prevent damaging oxidative stress.28

**Silicon** improves the quality of **bone matrix** (the non-mineral part of bone composed of collagen and other proteins) and facilitates the bone-building process known as **mineralization**.29

**Boron** is a trace mineral that has beneficial effects for bone and joint strength.30

This mineral has also been shown to stimulate the expression of a transcription factor related to the differentiation of stem cells to pre-osteoblast cells (precursor cells that become osteoblasts).16 Keep in mind that bone is constantly going through a process known as **remodeling**.2,3

Studies also indicate that zinc increases the activity of an enzyme called **alkaline phosphatase**, which spurs osteoblasts to begin forming new bone.16,17

In one study, patients with **traumatic bone fractures** received either 50 mg per day of zinc or a placebo.17 After 60 days, zinc intake had positive effects on the formation of **callus**, the bony and cartilaginous material that forms on a bone fracture during repair. Zinc also resulted in a significant elevation of alkaline phosphatase activity.17

At the same time that zinc helps in bone formation, it **inhibits** bone breakdown by osteoclasts.18 This helps support the proper balance between old bone and new bone, known as **bone remodeling**.
Many dietary supplement users receive zinc with their multivitamin formulas. Life Extension® suggests a total intake of 25 mg to 50 mg of zinc daily.

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

Stronger, Healthier Bones

Zinc doesn’t just help in the process of formation of bone. It plays a structural role in the skeleton as well. It is the most abundant trace mineral in the human skeleton. (Macrominerals like calcium, phosphorus, and magnesium are present in higher amounts.) Roughly 85% of zinc in the body is found in muscle and bone.18

Zinc is crucial for normal development and function of immune cells, which help protect against immune senescence and chronic inflammation.19 In bone, chronic inflammation may disrupt bone remodeling and result in bone loss.20,21

Zinc is also required for vitamin D to work properly inside cells. Several vitamin D-dependent genes are influenced by zinc concentrations.22

Summary

Bone health depends on a variety of nutrients, not just calcium and vitamin D.

The mineral zinc is often overlooked, but plays a vital role in building strong, healthy bone, and preventing osteoporosis.

It diminishes bone breakdown and stimulates bone formation, and is also required for the proper functioning of vitamin D.

It is essential to make sure you’re getting enough zinc on a daily basis, especially as you age.
ZINC’S ROLE IN BONE HEALTH

References

Mega Green Tea Extract provides powerful beneficial compounds called catechins including EGCG that support brain and whole-body health.

- EGCG supports new brain cell growth\(^1\)
- Promotes brain plasticity\(^2\)
- Improves cognitive performance\(^3\)
- Enhances brain wave activity\(^4\)

Each cost-effective bottle lasts over three months!

Each 725 mg capsule of Mega Green Tea Extract is standardized to 98% polyphenols that provide 326 mg of EGCG\(^*\).

An average cup of green tea contains about 150 mg to 300 mg of polyphenols.\(^5\) Each capsule of this supplement provides 725 mg of green tea extract, standardized to 98% polyphenols. That means you'd have to drink about 3 cups of green tea to get the same number of polyphenols as one capsule of Mega Green Tea Extract.

Mega Green Tea Extract

**Decaffeinated**

Item #00954 • 100 vegetarian capsules

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bottle</td>
<td>$22.50</td>
</tr>
<tr>
<td>4 bottles</td>
<td>$18 each</td>
</tr>
</tbody>
</table>

**Lightly Caffeinated**

Item #00953 • 100 vegetarian capsules

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 bottle</td>
<td>$22.50</td>
</tr>
<tr>
<td>4 bottles</td>
<td>$18 each</td>
</tr>
</tbody>
</table>

\(^*\) EGCG is the acronym for epigallocatechin gallate, which is the polyphenol in green tea that has demonstrated the most robust health benefits.

References

Ashwagandha supports the regeneration of axons and dendrites, nerve cell components that support brain and nervous system function.

For full product description and to order Optimized Ashwagandha, call 1-800-544-4440 or visit www.LifeExtension.com

Item #00888 • 60 vegetarian capsules
1 bottle $7.50
4 bottles $6.75 each

Sensoril® is protected under US Patent Nos 6,153,198 and 6,713,092 and is a registered trademark of Natreon, Inc.

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

You know zinc is good for you—but are you getting enough?

Zinc promotes critical immune functions and healthy bones.

This formula provides 50 mg of zinc in a convenient, vegetarian capsule.

For full product description and to order Zinc Caps call 1-800-544-4440 or visit www.LifeExtension.com

Item #01813
50 mg • 90 vegetarian capsules
1 bottle $6.75 • 4 bottles $6 each

OptiZinc® is a registered trademark of InterHealth Nutritionals, Inc.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
SUPER STRENGTH K2

BONE HEALTH

Bone Restore Elite is designed to help maintain optimal bone density.

The formula provides high potency vitamin K2 (MK-4) used in clinical trials along with proven skeletal-strengthening nutrients.

Each serving provides:

- 45,000 mcg of vitamin K2 (MK-4)
- 700 mg of three forms of easily absorbed calcium
- 25 mcg (1,000 IU) of vitamin D3
- Key minerals: magnesium, boron, zinc, silicon, and manganese

High potency for strong bones.

Bone Restore Elite

Super Potent K2

Item #02416 • 120 capsules
1 bottle $34.50 • 4 bottles $31.50 each

For full product description and to order Bone Restore Elite with Super Potent K2, call 1-800-544-4440 or visit www.LifeExtension.com

CAUTION: If you are taking Warfarin (Coumadin®) or related medications, consult your healthcare practitioner before taking this product.


These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.
The End of Mental Illness
How Neuroscience is Transforming Psychiatry and Helping Prevent or Reverse Mood and Anxiety Disorders, ADHD, Addictions, PTSD, Psychosis, Personality Disorders, and More

BY DANIEL G. AMEN, MD

Mental health conditions like anxiety, depression, bipolar disorders, and PTSD are increasing at an alarming rate.

Dr. Daniel Amen, neuroscientist, board-certified psychiatrist, and founder of Amen Clinics, has developed a radical new approach to diagnosing and treating mental illness. It’s based on one key idea: Get your brain right, and your mind will follow.

In his new book, The End of Mental Illness, Dr. Amen presents a radical new paradigm for understanding emotional health. He discusses the use of specific nutraceuticals to heal the brain and improve its function.

In this eye-opening book, Dr. Amen provides evidence that mental health is connected to brain health.

Utilizing a state-of-the-art, brain-imaging technique called SPECT, Dr. Amen is able to identify the underlying factors causing various mental health issues—which allows him to make use of targeted treatments for true healing.

Over the past 30 years, Amen Clinics has built the world’s largest database of SPECT scans for psychiatric issues, totaling nearly 160,000 scans on patients from 121 countries. Researchers there have also published 70 peer-reviewed scientific studies on SPECT.

This vast database of information has shown Dr. Amen that diagnosing and treating mental illness based on symptoms alone often misses the true cause of illness. It has also demonstrated to him that standard, drug-based treatment protocols rarely improve brain function, while more natural, lifestyle-based approaches can be far more effective.

In The End of Mental Illness, Dr. Amen details his BRIGHT MINDS approach to addressing the underlying factors revealed by the SPECT scans—and provides more than 100 simple ways to heal your brain.

In this interview with Life Extension®, Dr. Amen talks about the importance of brain imaging, discusses how factors like blood flow and aging impact the brain, and provides practical advice for making improvements in factors that can harm brain health.

—LAURIE MATHENA
LE: Can you talk more about the difference between mental health and brain health?

Dr. Amen: It has become crystal clear to us that, as psychiatrists, we are not dealing with mental health issues, but we are dealing with brain health issues; and this one idea has changed everything we do to help our patients.

Think of it this way. Your brain can have problems just as your heart can have problems. Most people who see cardiologists, however, have never had a heart attack. They are there because they have risk factors—a family history of heart disease, high blood pressure, or too much abdominal fat—and they want to prevent a heart attack.

To end mental illness, we must develop a similar way of thinking. Reframing the discussion from mental health to brain health changes everything. People begin to see their problems as medical, not moral.

Get your brain right, and your mind will follow. In study after study, improving the physical functioning of the brain improves the mind.

LE: How has using brain imaging transformed your treatment of patients with mental illness?

Dr. Amen: In 1991, I went to a lecture on brain SPECT imaging by Jack Paldi, MD, who was the chief of medicine at the hospital where I worked. Dr. Paldi told us that SPECT was a tool to give psychiatrists more information to help their patients.

SPECT looks at blood flow and activity. It looks at how the brain works. It is different from MRI and CT studies that look at brain structure. SPECT looks at brain function.

SPECT basically tells us three things about the activity in each area of the brain: if it is healthy, underactive, or overactive.

Our brain imaging work has completely disrupted how we help our patients get well, and this information can help you, even if no one ever looks at your brain.

LE: How does using brain imaging differ from the standard method of diagnosis?

Dr. Amen: Experienced clinicians can tell if someone is likely to have attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD), obsessive compulsive disorder (OCD), or bipolar disorder without the benefit of these tools.

But what clinicians cannot do, and will never be able to do, without functional brain imaging, is to know the underlying brain biology of the patients they treat.

Without imaging your brain, your doctor cannot tell if your inattention, depression, or aggression is from factors such as:

- Low blood flow from vascular disease
- An inflammatory process, related to low omega-3 fatty acids or gut problems
- A brain infection
- Nutrient or neurohormone abnormalities
- Blood sugar abnormalities

If we don’t look at the brain, we are unnecessarily flying blind. That can lead us to miss important diagnoses, give the wrong treatment plan, and hurt the people entrusted to us to help.

LE: Why isn’t the whole of psychiatry on board with brain imaging?

Dr. Amen: Because this new way of thinking completely changes the diagnostic and treatment paradigm that has been taught in medical schools and psychiatric residency training programs for more than 50 years.

Functional brain imaging takes psychiatry from a generalized symptom-cluster diagnostic and treatment specialty without any biological evidence to a more objective specialty, one that is solidly based on using state-of-the-art, brain-mapping tools to help optimize the patient’s brain function.

Besides completely changing the way we diagnose brain health/mental health, functional imaging leads to entirely different treatment protocols to improve brain function.
These include strategies that are often more natural and lifestyle-based and more directly accessible to patients. These types of protocols are not taught in medical schools and are not underwritten by the pharmaceutical industry that has dominated the financial support of the psychiatric establishment.

**LE:** Based on your extensive collection of data using SPECT, you developed an acronym called BRIGHT MINDS to explain the underlying factors involved in brain illness. Can you briefly review what those are?

**Dr. Amen:** In order for your biology to operate at peak efficiency, its machinery (cells, connections, chemicals, energy, blood flow, and waste processing) needs to work right. The brain is like a supercomputer, with both hardware and software.

Think of the biological circle as the hardware. Within it are the BRIGHT MINDS factors:

- Blood Flow
- Retirement/Aging
- Inflammation
- Genetics
- Head Trauma
- Toxins
- Mind Storms (abnormal brain electrical activity)
- Immunity/Infections
- Neurohormone Issues
- Diabesity
- Sleep

When the brain’s biology is healthy, all these factors work together in a positive way to maximize your success and sense of well-being. When any of the BRIGHT MINDS risk factors are troubled, you are more likely to suffer with a wide variety of symptoms.

**LE:** Let’s talk a bit more about the first factor: blood flow.

**Dr. Amen:** Blood flow is critical for life. It transports nutrients, including oxygen, to every cell in your body and flushes away toxins. Anything that damages your blood vessels or impairs blood flow hurts your brain.

Low blood flow on SPECT has been seen with depression, suicide, bipolar disorder, schizophrenia, attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD), traumatic brain injury (TBI), hoarding, murder, substance abuse, seizure activity, and more.

Low blood flow is the number one brain imaging predictor that a person will develop Alzheimer’s disease.

Our brain imaging research has taught us that the number one strategy to support your brain and mental health is to protect, nurture, and optimize your heart and blood vessels.

**LE:** Do you support the use of supplements to improve various factors involved in brain health?

**Dr. Amen:** At Amen Clinics we are not opposed to medications for your mind and prescribe them when necessary. However, we are opposed to medications being the first and only thing you do to help your brain and your mind.
I first became interested in using nutraceuticals for brain health/mental health issues once I started using SPECT scans. I could see that some of the medications I was taught to prescribe, especially benzodiazepines for anxiety and opiates for pain, were clearly associated with unhealthy looking scans.

I started looking for less toxic options for my patients and was surprised to find a growing body of scientific literature to support the use of supplements for many brain health/mental health issues.

After nearly 40 years as a psychiatrist, I recommend more and more treatments from nature, including foods and nutraceuticals. We want you to use all the tools available, especially if they are science based, effective, and cheaper, and have minimal side effects.

**LE:** What are a few supplements you recommend for improving blood flow?

**Dr. Amen:** Cocoa flavanols improve blood flow, support healthy blood pressure, and improve brain functions, even in those who haven’t had enough sleep.

Omega-3 fatty acids can improve blood flow, brain function, memory, and mood, as well as reduce inflammation and brain shrinkage from aging. There are two active compounds in omega-3s: EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid). You need both.

**LE:** What is the surprising connection between infections and brain health?

**Dr. Amen:** Back in 1991, when I first began using SPECT scans in my practice, I saw many patients who had been diagnosed with conditions like chronic fatigue syndrome and fibromyalgia. Many of these patients’ scans looked terrible, showing overall low blood flow caused by undiagnosed infections.

Clinical evidence now shows that chronic fatigue syndrome is an infectious disease, and I hope more physicians will start testing for infections.

**LE:** What have the SPECT scans revealed about the impact of aging on the human brain?

**Dr. Amen:** Brain imaging work at the Amen Clinics has also clearly shown the gravity of age. As your skin starts to sag and wrinkle and show other signs of aging, the same type of process occurs in the brain.

Yet your brain doesn’t have to deteriorate with age if you remain diligent about your health for as long as you want to have a clear and happy mind!

Too often, elderly (let’s say those over 70) people are dismissed with brain health/mental health issues—such as ADD/ADHD, depression, anxiety or memory issues—because they are older; but research has found that no matter what your age, your brain can be better if you put it in a healing environment.

**LE:** What are some practical ways to combat brain aging?

**Dr. Amen:** Fasting helps your brain stay healthy because it cleans out the buildup of toxic proteins that damage neurons, reducing inflammation and slowing down aging.

A simple way to do a nightly 12- to 16-hour fast is to eat dinner at 7 p.m., for example, and not eat again until 7 a.m. (or 11 a.m. for a longer fast). Even longer fasts of 24 hours can also be helpful.

**LE:** What nutraceuticals have you found to be most useful to slow aging’s impact on the brain?
**Dr. Amen:** N-acetylcysteine (NAC) has shown promising results in people with bipolar disorder, schizophrenia, OCD, and addictions. It can also decrease inflammation and may help delay brain atrophy in Alzheimer’s disease.

Recent clinical trials have found that saffron helps for depression, bipolar disorder, and anxiety. As a potent antioxidant and nerve protector, saffron enhances memory, protects the hippocampus, boosts blood flow and acetylcholine, and fights toxic buildup of the proteins thought to cause dementia.

**LE:** How would readers find a brain health practitioner who follows your BRIGHT MINDS approach to ending mental illness?

**Dr. Amen:** My mission has always been to teach other medical and mental health professionals the techniques we have learned at Amen Clinics. We have trained more than 3,000 brain health certified coaches (www.brainhealthcoaching.com).

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

To find professionals who will have a similar integrative mind-set to the one expressed in The End of Mental Illness, visit https://referraldirectory. amenuniversity.com/.

You can also go to the Institute for Functional Medicine (www.ifm.org) or American Academy of Anti-Aging Medicine (www.a4m.com) websites to see if there is a functional medicine doctor near you.

Daniel G. Amen, MD, is a physician, a double board-certified psychiatrist, the founder of Amen Clinics, and a 10-time New York Times bestselling author. Dr. Amen has written, produced, and hosted 14 popular public television shows about the brain that have aired more than 110,000 times across North America. His work has been featured in outlets including Newsweek, Time magazine, the New York Times, and Men’s Health.
ArthroMax® Advanced with NT2 Collagen™ & AprèsFlex® is a multinutrient formula that supports healthy joint function.

**Just Two Capsules a Day Provide:**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glucosamine sulfate 2KCI</td>
<td>1,500 mg</td>
</tr>
<tr>
<td>AprèsFlex® Indian frankincense</td>
<td>100 mg</td>
</tr>
<tr>
<td>(Boswellia serrata) extract (gum resin) [std. to 20% AKBA-]</td>
<td></td>
</tr>
<tr>
<td>NT2 Collagen™ standardized cartilage</td>
<td>40 mg</td>
</tr>
<tr>
<td>Total Collagen</td>
<td>10 mg</td>
</tr>
<tr>
<td>Boron (calcium fructoborate as patented)</td>
<td>1.5 mg</td>
</tr>
<tr>
<td>FruiteX-B® OsteoBoron®</td>
<td></td>
</tr>
</tbody>
</table>

NT2 Collagen™ is manufactured by Bioibérica. AprèsFlex® is a registered trademark of Laila Nutraceuticals exclusively licensed to PL Thomas - Laila NUTRA LLC. U.S. Patent No. 8,551,496 and other patents pending. FruiteX-B® and OsteoBoron® are registered trademarks of VDF FutureCeuticals, Inc. U.S. Patent No. 5,962,049.

³ 3-O-acetyl-5-keto-B-boswellic acid.

Item #02238 • 60 capsules

1 bottle $25.50

4 bottles $22 each

For full product description and to order ArthroMax® Advanced with NT2 Collagen™ & AprèsFlex®, call 1-800-544-4440 or visit www.LifeExtension.com

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

BY LAURIE MATHENA

Pistachios have a history as rich and varied as the nutrients they contain. Archaeological evidence indicates that they were consumed as far back as 7,000 B.C.

They were prized by royalty, like the Queen of Sheba, who decreed them to be an exclusively royal food, and Nebuchadnezzar, the king of Babylon, who had pistachio trees planted in his hanging gardens.

Ancient medicine men also reportedly used pistachios to treat ailments ranging from toothaches to liver problems.

But it wasn’t until the 1930s that pistachios made their way to America as a healthy snack food that we enjoy to this day.

Little Nut, Big Benefits

One ounce of pistachios contains more than 5.5 grams of protein, as well as magnesium, potassium, vitamin B6, and thiamin.

Pistachios are also lower in calories than many other nuts, containing just 159 calories per ounce, compared to 196 in pecans and 204 in macadamia nuts. However, they boast the highest levels of potassium, tocopherol, vitamin K, phytosterols, and xanthophyll carotenoids of any other nut.1

They also contain a higher ratio of amino acids (the building blocks of protein) and a higher percentage of branched chain amino acids than other nuts.

Heart Protection

Pistachios contribute to better heart health in numerous ways. Five randomized trials have shown that consuming pistachios helps promote heart-healthy lipid profiles.1

And a meta-analysis of 21 studies showed that eating nuts could reduce blood pressure in people without type II diabetes. Of all the nuts tested, pistachios had the strongest effects on reducing both systolic and diastolic blood pressure.2

Blood Sugar Control

Pistachios could be an ideal snack for type II diabetics or those looking to control their blood sugar.

One study showed that consuming 25 grams of pistachio nuts twice a day for 12 weeks had a beneficial effect on glycemic control, blood pressure, obesity, and inflammation markers in people with type II diabetes.3

And eating pistachios along with a carbohydrate-rich meal has been shown to reduce the body’s glycemic response.4

The most common way to enjoy pistachios is by cracking open their shells and eating them whole (just be sure to choose the unsalted variety). But there are many more creative ways to include them in your diet.

Their creamy flavor and crunchy texture make them an excellent nut-based crust (especially when looking for an alternative to flour, eggs, or milk).

Include them in a protein-packed energy ball with oats, dates, almond butter, and ground flax seed. Try a pistachio-crusted cod dish by making a paste of ground pistachios, parsley, garlic, and olive oil to coat the fish.

Or, simply chop up the pistachios and sprinkle them on salads for a tasty crunch.

References

Broccoli
THE TREE OF LIFE

Just one daily Optimized Broccoli and Cruciferous Blend tablet provides you with the same potent cell-protective and hormone health-promoting benefits as fresh vegetables.

For maximum benefits and absorption this enteric-coated tablet contains two layers:

- **Vegetable extracts** from broccoli, watercress, cabbage, and rosemary, and
- **Myrosinase** to release **sulforaphane** in the small intestine.

**Item #02368** • 30 enteric coated vegetarian tablets

1 bottle **$28.50** • 4 bottles **$26.50** each

For full product description and to order Optimized Broccoli and Cruciferous Blend, call **1-800-544-4440** or visit **LifeExtension.com**

TrueBroc® Produced under US patents 5,725,895; 5,968,505; 5,968,667; 6,177,122; and 6,242,018 licensed from Brassica Protection Products LLC; TrueBroc® is a trademark of Brassica Protection Products LLC. BroccoVital® Myrosinase is a registered trademark of Berg Imports, LLC.

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

WITH TOCOTRIENOLS!

• **Mixed tocotrienols** to support arterial health, cellular apoptosis, and normal lipid profiles.

• **Broad-spectrum Vitamin K** with four vitamin K2 subtypes (MK-4, MK-6, MK-7, MK-9) plus vitamin K1 to keep calcium in bones and out of arteries.

• **Macuguard** including zeaxanthin, lutein, and meso-zeaxanthin to support macular density.

• **Lycopene** to maintain healthy cell division.

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

• **Saffron** to support visual health.

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

For full product description and to order **Once-Daily Health Booster**, call 1-800-544-4440 or visit www.LifeExtension.com

Caution: If you are taking warfarin (Coumadin®) or related medications, consult with your healthcare provider before taking this product.

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

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

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01529</td>
<td>Creatine Capsules</td>
</tr>
<tr>
<td>02318</td>
<td>Keto Brain and Body Boost</td>
</tr>
<tr>
<td>02020</td>
<td>Super Carnosine</td>
</tr>
<tr>
<td>02023</td>
<td>Tart Cherry with CherryPURE®</td>
</tr>
<tr>
<td>02146</td>
<td>Wellness Bar–Chocolate Brownie</td>
</tr>
<tr>
<td>02147</td>
<td>Wellness Bar–Cookie Dough</td>
</tr>
<tr>
<td>02246</td>
<td>Wellness Code® Advanced Whey Protein Isolate Vanilla</td>
</tr>
<tr>
<td>02220</td>
<td>Wellness Code® Whey Protein Concentrate Chocolate</td>
</tr>
<tr>
<td>02246</td>
<td>Wellness Code® Whey Protein Concentrate Vanilla</td>
</tr>
<tr>
<td>02243</td>
<td>Wellness Code® Whey Protein Isolate Chocolate</td>
</tr>
<tr>
<td>02221</td>
<td>Wellness Code® Muscle Strength &amp; Restore Formula</td>
</tr>
<tr>
<td>02243</td>
<td>Wellness Code® Plant Protein Complete &amp; Amino Acid Complex</td>
</tr>
<tr>
<td>02261</td>
<td>Wellness Code® Whey Protein Concentrate Chocolate</td>
</tr>
<tr>
<td>02224</td>
<td>Wellness Code® Whey Protein Isolate Chocolate</td>
</tr>
</tbody>
</table>

### AMINO ACIDS

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01039</td>
<td>Arginine &amp; Ornithine Capsules</td>
</tr>
<tr>
<td>00038</td>
<td>Arginine Ornithine Powder</td>
</tr>
<tr>
<td>01253</td>
<td>Branched Chain Amino Acids</td>
</tr>
<tr>
<td>01829</td>
<td>Carnosine</td>
</tr>
<tr>
<td>01671</td>
<td>D,L-Phenylalanine Capsules</td>
</tr>
<tr>
<td>01624</td>
<td>L-Arginine Capsules</td>
</tr>
<tr>
<td>01532</td>
<td>L-Carnitine</td>
</tr>
<tr>
<td>00345</td>
<td>L-Glutamine</td>
</tr>
<tr>
<td>00141</td>
<td>L-Glutamine Powder</td>
</tr>
<tr>
<td>01678</td>
<td>L-Lysine</td>
</tr>
<tr>
<td>01827</td>
<td>Taurine</td>
</tr>
<tr>
<td>00133</td>
<td>Taurine Powder</td>
</tr>
<tr>
<td>00326</td>
<td>Tyrosine Tablets</td>
</tr>
</tbody>
</table>

### BLOOD PRESSURE & VASCULAR SUPPORT

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01824</td>
<td>Advanced Olive Leaf Vascular Support</td>
</tr>
<tr>
<td>02004</td>
<td>Arterial Protect</td>
</tr>
<tr>
<td>70000</td>
<td>Blood Pressure Monitor Arm Cuff</td>
</tr>
<tr>
<td>02497</td>
<td>Endothelial Defense™ Pomegranate Plus</td>
</tr>
<tr>
<td>02320</td>
<td>NitroVasc™ Boost</td>
</tr>
<tr>
<td>00984</td>
<td>Optimal BP Management</td>
</tr>
<tr>
<td>01953</td>
<td>Pomegranate Complete</td>
</tr>
<tr>
<td>00956</td>
<td>Pomegranate Fruit Extract</td>
</tr>
<tr>
<td>02024</td>
<td>Triple Action Blood Pressure AM/PM</td>
</tr>
<tr>
<td>02102</td>
<td>VenoFlow™</td>
</tr>
</tbody>
</table>

### BONE HEALTH

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01726</td>
<td>Bone Restore</td>
</tr>
<tr>
<td>02123</td>
<td>Bone Restore Chewable Tablet</td>
</tr>
<tr>
<td>02416</td>
<td>Bone Restore Elite with Super Potent K2</td>
</tr>
<tr>
<td>01727</td>
<td>Bone Restore with Vitamin K2</td>
</tr>
<tr>
<td>01725</td>
<td>Bone Strength Collagen Formula</td>
</tr>
<tr>
<td>00313</td>
<td>Bone-Up™</td>
</tr>
<tr>
<td>01963</td>
<td>Calcium Citrate with Vitamin D</td>
</tr>
<tr>
<td>01506</td>
<td>Dr. Strum’s Intensive Bone Formula</td>
</tr>
<tr>
<td>02417</td>
<td>Mega Vitamin K2</td>
</tr>
<tr>
<td>01476</td>
<td>Strontium Caps</td>
</tr>
</tbody>
</table>

### BRAIN HEALTH

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01524</td>
<td>Acetyl-L-Carnitine</td>
</tr>
<tr>
<td>01974</td>
<td>Acetyl-L-Carnitine Arginate</td>
</tr>
<tr>
<td>02321</td>
<td>Cognitex® Basics</td>
</tr>
<tr>
<td>02396</td>
<td>Cognitex® Elite</td>
</tr>
<tr>
<td>02397</td>
<td>Cognitex® Elite Pregnenolone</td>
</tr>
<tr>
<td>01540</td>
<td>DMAE Bitartrate (dimethylaminoethanol)</td>
</tr>
<tr>
<td>02006</td>
<td>Dopa-Mind™</td>
</tr>
<tr>
<td>02413</td>
<td>Dopamine Advantage</td>
</tr>
<tr>
<td>02212</td>
<td>Focus Tea™</td>
</tr>
<tr>
<td>01658</td>
<td>Ginkgo Biloba Certified Extract™</td>
</tr>
<tr>
<td>01527</td>
<td>Huperzine A</td>
</tr>
<tr>
<td>00020</td>
<td>Lecithin Granules</td>
</tr>
<tr>
<td>02101</td>
<td>Memory Protect</td>
</tr>
</tbody>
</table>

### ENERGY MANAGEMENT

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01628</td>
<td>Adrenal Energy Formula • 60 veg capsules</td>
</tr>
<tr>
<td>01630</td>
<td>Adrenal Energy Formula • 120 veg capsules</td>
</tr>
<tr>
<td>01805</td>
<td>Asian Energy Boost</td>
</tr>
<tr>
<td>00972</td>
<td>D-Ribose Powder</td>
</tr>
<tr>
<td>01473</td>
<td>D-Ribose Tablets</td>
</tr>
<tr>
<td>01900</td>
<td>Energy Renew</td>
</tr>
<tr>
<td>01544</td>
<td>Forskolin</td>
</tr>
<tr>
<td>00668</td>
<td>Metabolic Advantage Thyroid Formula™</td>
</tr>
<tr>
<td>01869</td>
<td>Mitochondrial Basics with PQQ</td>
</tr>
<tr>
<td>01868</td>
<td>Mitochondrial Energy Optimizer with PQQ</td>
</tr>
<tr>
<td>01904</td>
<td>NAD+ Cell Regenerator™ - 100 mg, 30 veg capsules</td>
</tr>
<tr>
<td>02344</td>
<td>NAD+ Cell Regenerator™ 300 mg, 30 veg capsules</td>
</tr>
<tr>
<td>02348</td>
<td>NAD+ Cell Regenerator™ and Resveratrol</td>
</tr>
<tr>
<td>01500</td>
<td>PQQ Caps • 10 mg</td>
</tr>
<tr>
<td>01647</td>
<td>PQQ Caps • 20 mg</td>
</tr>
<tr>
<td>00889</td>
<td>Rhodiola Extract</td>
</tr>
<tr>
<td>02003</td>
<td>Triple Action Thyroid</td>
</tr>
</tbody>
</table>

### FISH OIL & OMEGAS

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>02311</td>
<td>Clearly EPA/DHA Fish Oil</td>
</tr>
<tr>
<td>00463</td>
<td>Flaxseed Oil</td>
</tr>
<tr>
<td>01937</td>
<td>Mega EPA/DHA</td>
</tr>
<tr>
<td>02218</td>
<td>Mega GLA Sesame Lignans</td>
</tr>
<tr>
<td>01983</td>
<td>Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract</td>
</tr>
<tr>
<td>01988</td>
<td>Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill &amp; Astaxanthin</td>
</tr>
</tbody>
</table>

### CHOLESTEROL MANAGEMENT

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01529</td>
<td>Migra-Eeze™</td>
</tr>
<tr>
<td>01603</td>
<td>Neuro-Mag® Magnesium L-Threonate Caps</td>
</tr>
<tr>
<td>02032</td>
<td>Neuro-Mag® Magnesium L-Threonate Powder</td>
</tr>
<tr>
<td>00888</td>
<td>Optimized Ashwagandha</td>
</tr>
<tr>
<td>01676</td>
<td>PS (Phosphatidylserine) Caps</td>
</tr>
<tr>
<td>02406</td>
<td>Quick Brain Nootropic</td>
</tr>
<tr>
<td>01327</td>
<td>Vinpocetine</td>
</tr>
</tbody>
</table>

### DIGESTION SUPPORT

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>53348</td>
<td>Betaine HCl</td>
</tr>
<tr>
<td>54160</td>
<td>Black Vinegar</td>
</tr>
<tr>
<td>02412</td>
<td>Bloat Relief</td>
</tr>
<tr>
<td>30747</td>
<td>Digest RC®</td>
</tr>
<tr>
<td>07136</td>
<td>Effervescent Vitamin C - Magnesium Crystals</td>
</tr>
<tr>
<td>02021</td>
<td>Enhanced Super Digestive Enzymes</td>
</tr>
<tr>
<td>02022</td>
<td>Enhanced Super Digestive Enzymes and Probiotics</td>
</tr>
<tr>
<td>02033</td>
<td>Esophaco™</td>
</tr>
<tr>
<td>01737</td>
<td>Esophageal Guardian</td>
</tr>
<tr>
<td>01706</td>
<td>Extraordinary Enzymes</td>
</tr>
<tr>
<td>02100</td>
<td>Gastro-Ease™</td>
</tr>
<tr>
<td>01122</td>
<td>Ginger Force™</td>
</tr>
<tr>
<td>00605</td>
<td>Regimint</td>
</tr>
<tr>
<td>01386</td>
<td>TruFiber®</td>
</tr>
</tbody>
</table>

### EYE HEALTH

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>01923</td>
<td>Astaxanthin with Phospholipids</td>
</tr>
<tr>
<td>00893</td>
<td>Brite Eyes III</td>
</tr>
<tr>
<td>02323</td>
<td>Digital Eye Support</td>
</tr>
<tr>
<td>01514</td>
<td>Eye Pressure Support with Mirtogenol®</td>
</tr>
<tr>
<td>01992</td>
<td>MacuGuard® Ocular Support with Saffron</td>
</tr>
<tr>
<td>01993</td>
<td>MacuGuard® Ocular Support with Saffron &amp; Astaxanthin</td>
</tr>
<tr>
<td>01873</td>
<td>Standardized European Bilberry Extract</td>
</tr>
<tr>
<td>01918</td>
<td>Tear Support with MaquiBright®</td>
</tr>
</tbody>
</table>

### FISH OIL & OMEGAS

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>02311</td>
<td>Clearly EPA/DHA Fish Oil</td>
</tr>
<tr>
<td>00463</td>
<td>Flaxseed Oil</td>
</tr>
<tr>
<td>01937</td>
<td>Mega EPA/DHA</td>
</tr>
<tr>
<td>02218</td>
<td>Mega GLA Sesame Lignans</td>
</tr>
<tr>
<td>01983</td>
<td>Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract</td>
</tr>
<tr>
<td>01988</td>
<td>Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill &amp; Astaxanthin</td>
</tr>
<tr>
<td>Category</td>
<td>Product</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>PRODUCTS</strong></td>
<td>01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract</td>
</tr>
<tr>
<td></td>
<td>01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract</td>
</tr>
<tr>
<td></td>
<td>01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract</td>
</tr>
<tr>
<td></td>
<td>01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans &amp; Olive Extract</td>
</tr>
<tr>
<td></td>
<td>01812 Provinal® Purified Omega-7</td>
</tr>
<tr>
<td><strong>FOOD</strong></td>
<td>02008 California Estate Extra Virgin Olive Oil</td>
</tr>
<tr>
<td></td>
<td>02170 Rainforest Blend Decaf Ground Coffee</td>
</tr>
<tr>
<td></td>
<td>02169 Rainforest Blend Ground Coffee</td>
</tr>
<tr>
<td></td>
<td>02171 Rainforest Blend Whole Bean Coffee</td>
</tr>
<tr>
<td></td>
<td>00438 Stevia™ Organic Liquid Sweetener</td>
</tr>
<tr>
<td></td>
<td>00432 Stevia™ Sweetener</td>
</tr>
<tr>
<td><strong>GLUCOSE MANAGEMENT</strong></td>
<td>01503 CinSulin® with InSea® &amp; Crominex® 3+</td>
</tr>
<tr>
<td></td>
<td>01620 CoffeeGenic® Green Coffee Extract</td>
</tr>
<tr>
<td></td>
<td>02122 Glycemic Guard™</td>
</tr>
<tr>
<td></td>
<td>00925 Mega Benfotiamine</td>
</tr>
<tr>
<td><strong>HEART HEALTH</strong></td>
<td>01066 Aspirin (Enteric Coated)</td>
</tr>
<tr>
<td></td>
<td>01842 BioActive Folate &amp; Vitamin B12 Caps</td>
</tr>
<tr>
<td></td>
<td>01700 Cardio Peak™</td>
</tr>
<tr>
<td></td>
<td>02121 Homocysteine Resist</td>
</tr>
<tr>
<td></td>
<td>02018 Optimized Carnitine</td>
</tr>
<tr>
<td></td>
<td>01949 Super-Absorbable CoQ10 Ubiquinone with d-Limonene</td>
</tr>
<tr>
<td></td>
<td>01951 Super-Absorbable CoQ10 Ubiquinone with d-Limonene</td>
</tr>
<tr>
<td></td>
<td>01929 Super Ubiquinol CoQ10</td>
</tr>
<tr>
<td></td>
<td>01427 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™</td>
</tr>
<tr>
<td></td>
<td>01425 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™</td>
</tr>
<tr>
<td></td>
<td>01437 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™</td>
</tr>
<tr>
<td></td>
<td>01426 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™</td>
</tr>
<tr>
<td></td>
<td>01431 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™</td>
</tr>
<tr>
<td></td>
<td>01733 Super Ubiquinol CoQ10 with PQQ</td>
</tr>
<tr>
<td></td>
<td>01859 TMG Liquid Capsules</td>
</tr>
<tr>
<td></td>
<td>00349 TMG Powder</td>
</tr>
<tr>
<td><strong>HORMONE BALANCE</strong></td>
<td>00454 DHEA (Dehydroepiandrosterone)</td>
</tr>
<tr>
<td></td>
<td>00335 DHEA (Dehydroepiandrosterone)</td>
</tr>
<tr>
<td></td>
<td>00882 DHEA (Dehydroepiandrosterone)</td>
</tr>
<tr>
<td></td>
<td>00607 DHEA (Dehydroepiandrosterone)</td>
</tr>
<tr>
<td></td>
<td>01689 DHEA (Dehydroepiandrosterone)</td>
</tr>
<tr>
<td></td>
<td>02368 Optimized Broccoli and Cruciferous Blend</td>
</tr>
<tr>
<td></td>
<td>00302 Pregnenolone • 50 mg, 100 capsules</td>
</tr>
<tr>
<td></td>
<td>00700 Pregnenolone • 100 mg, 100 capsules</td>
</tr>
<tr>
<td></td>
<td>01468 Triple Action Cruciferous Vegetable Extract</td>
</tr>
<tr>
<td></td>
<td>01469 Triple Action Cruciferous Vegetable Extract with Resveratrol</td>
</tr>
<tr>
<td><strong>IMMUNE SUPPORT</strong></td>
<td>02411 5 Day Elderberry Immune</td>
</tr>
<tr>
<td></td>
<td>00681 AHCC*</td>
</tr>
<tr>
<td></td>
<td>02302 Bio-Quercetin</td>
</tr>
<tr>
<td></td>
<td>02410 Black Elderberry + Vitamin C</td>
</tr>
<tr>
<td></td>
<td>01961 Enhanced Zinc Lozenges</td>
</tr>
<tr>
<td></td>
<td>01704 Immune Modulator with Tinoef®</td>
</tr>
<tr>
<td></td>
<td>00955 Immune Protect with PARACTIN®</td>
</tr>
<tr>
<td></td>
<td>02005 Immune Senescence Protection Formula™</td>
</tr>
<tr>
<td></td>
<td>29727 Kinoko® Gold AHCC</td>
</tr>
<tr>
<td></td>
<td>24404 Kinoko® Platinum AHCC</td>
</tr>
<tr>
<td></td>
<td>00316 Kyolic® Garlic Formula 102</td>
</tr>
<tr>
<td></td>
<td>00789 Kyolic® Reserve</td>
</tr>
<tr>
<td></td>
<td>01681 Lactoferrin (Apolactoferrin) Caps</td>
</tr>
<tr>
<td></td>
<td>01903 NK Cell Activator™</td>
</tr>
<tr>
<td></td>
<td>01394 Optimized Garlic</td>
</tr>
<tr>
<td></td>
<td>01309 Optimized Quercetin</td>
</tr>
<tr>
<td></td>
<td>01811 Peony Immune</td>
</tr>
<tr>
<td></td>
<td>00525 ProBoost Thymic Protein A</td>
</tr>
<tr>
<td></td>
<td>01708 Reishi Extract Mushroom Complex</td>
</tr>
<tr>
<td></td>
<td>01906 Standardized Cistanche</td>
</tr>
<tr>
<td></td>
<td>13685 Ten Mushroom Formula*</td>
</tr>
<tr>
<td></td>
<td>01097 Ultra Soy Extract</td>
</tr>
<tr>
<td></td>
<td>01561 Zinc Lozenges</td>
</tr>
<tr>
<td><strong>INFLAMMATION MANAGEMENT</strong></td>
<td>01639 S-LOX Inhibitor with AprèsFlex®</td>
</tr>
<tr>
<td></td>
<td>02324 Advanced Curcumin Elite™ Turmeric Extract, Ginger &amp; Turmerones</td>
</tr>
<tr>
<td></td>
<td>01709 Black Cumin Seed Oil</td>
</tr>
<tr>
<td></td>
<td>02310 Black Cumin Seed Oil and Curcumin Elite™</td>
</tr>
<tr>
<td></td>
<td>00202 Boswellia</td>
</tr>
<tr>
<td></td>
<td>02467 Curcumin Elite™ Turmeric Extract • 30 veg capsules</td>
</tr>
<tr>
<td></td>
<td>02407 Curcumin Elite™ Turmeric Extract • 60 veg capsules</td>
</tr>
<tr>
<td></td>
<td>01804 Cytokine Suppress® with EGCG</td>
</tr>
<tr>
<td></td>
<td>02223 Pro-Resolving Mediators</td>
</tr>
<tr>
<td></td>
<td>00318 Serraflazyme</td>
</tr>
<tr>
<td></td>
<td>01203 Specially-Coated Bromelain</td>
</tr>
<tr>
<td></td>
<td>00407 Super Bio-Curcumin® Turmeric Extract</td>
</tr>
<tr>
<td></td>
<td>01254 Zyflamend™ Whole Body</td>
</tr>
<tr>
<td><strong>JOINT SUPPORT</strong></td>
<td>02404 Arthro-Immune Joint Support</td>
</tr>
<tr>
<td></td>
<td>02238 ArthroMax® Advanced NT2 Collagen™ &amp; AprèsFlex®</td>
</tr>
<tr>
<td></td>
<td>01617 ArthroMax® with Theaflavins &amp; AprèsFlex®</td>
</tr>
<tr>
<td></td>
<td>02138 ArthroMax® Elite</td>
</tr>
<tr>
<td></td>
<td>00965 Fast-Acting Joint Formula</td>
</tr>
<tr>
<td></td>
<td>00522 Glucosamine/Chondroitin Capsules</td>
</tr>
<tr>
<td></td>
<td>02420 Glucosamine Sulfate</td>
</tr>
<tr>
<td></td>
<td>01600 Krill Healthy Joint Formula</td>
</tr>
<tr>
<td></td>
<td>01050 Krill Oil</td>
</tr>
<tr>
<td></td>
<td>00451 MSM (Methylsulfonylmethane)</td>
</tr>
<tr>
<td></td>
<td>02231 NT2 Collagen™</td>
</tr>
<tr>
<td><strong>KIDNEY &amp; BLADDER SUPPORT</strong></td>
<td>00862 Cran-Max® Cranberry Whole Fruit Concentrate</td>
</tr>
<tr>
<td></td>
<td>01424 Optimized Cran-Max® with Ellirose™</td>
</tr>
<tr>
<td></td>
<td>01921 Uric Acid Control</td>
</tr>
<tr>
<td></td>
<td>01209 Water-Soluble Pumpkin Seed Extract</td>
</tr>
<tr>
<td><strong>LIVER HEALTH &amp; DETOXIFICATION</strong></td>
<td>01922 Advanced Milk Thistle • 60 softgels</td>
</tr>
<tr>
<td></td>
<td>01925 Advanced Milk Thistle • 120 softgels</td>
</tr>
<tr>
<td></td>
<td>02240 Anti-Alcohol Complex</td>
</tr>
<tr>
<td></td>
<td>01651 Calcium D-Glucarate</td>
</tr>
<tr>
<td></td>
<td>00550 Chlorella</td>
</tr>
<tr>
<td></td>
<td>01571 Chlorophyll</td>
</tr>
<tr>
<td></td>
<td>01522 Milk Thistle • 60 veg capsules</td>
</tr>
<tr>
<td></td>
<td>02402 FLORASSIST® Liver Restore™</td>
</tr>
<tr>
<td></td>
<td>01541 Glutathione, Cysteine &amp; C</td>
</tr>
</tbody>
</table>
01393  HepatoPro
01608  Liver Efficiency Formula
01534  N-Acetyl-L-Cysteine
00342  PectaSol-C® Modified Citrus Pectin Powder
01080  PectaSol-C® Modified Citrus Pectin Capsules
01884  Silymarin
02361  SOD Booster

LONGEVITY & WELLNESS
00457  Alpha-Lipoic Acid
01625  AppleWise Polyphenol Extract
02414  Bio-Fisetin
01214  Blueberry Extract
01438  Blueberry Extract and Pomegranate
02270  DNA Protection Formula
02414  GEROPROTECT® Autophagy Renew
02119  GEROPROTECT® Ageless Cell™
02415  GEROPROTECT® Longevity A.I.™
02401  GEROPROTECT® Stem Cell
02211  Grapeseed Extract
00954  Mega Green Tea Extract (decaffeinated)
00953  Mega Green Tea Extract (lightly caffeinated)
01513  Optimized Fucoidan with Maritech® 926
02230  Optimized Resveratrol
00070  RNA (Ribonucleic Acid)
02301  Senolytic Activator
01208  Super R-Lipoic Acid
01940  Super MiraForte with Standardized Lignans
01909  Triple Strength ProstaPollen™
02029  Ultra Prostate Formula

MEN'S HEALTH
02209  Male Vascular Sexual Support
00455  Mega Lycopene Extract
02306  Men's Bladder Control
01789  PalmettoGuard® Saw Palmetto and Beta-Sitosterol
01790  PalmettoGuard® Saw Palmetto/Nettle Root Formula with Beta-Sitosterol
01837  Pomi-T®
01373  Prelox® Enhanced Sex for Men
01940  Super MiraForte with Standardized Lignans
01909  Triple Strength ProstaPollen™
02029  Ultra Prostate Formula

MINERALS
01661  Boron
02107  Extend-Release Magnesium
30731  Ionic Selenium
01677  Iron Protein Plus
02403  Lithium
01459  Magnesium Caps
01682  Magnesium (Citrate)
01328  Only Trace Minerals
01504  Optimized Chromium with Crominex® 3+
02309  Potassium with Extend-Release Magnesium
01740  Sea-Iodine™
01879  Se-Methyl L-Selenocysteine
01778  Super Selenium Complex
00213  Vanadyl Sulfate
01813  Zinc Caps

MISCELLANEOUS
00577  Potassium Iodide
00657  Solarshield® Sunglasses

MOOD & STRESS MANAGEMENT
02312  Cortisol-Stress Balance
00987  Enhanced Stress Relief
01074  5 HTP

MULTIVITAMINS
01683  L-Theanine
02175  SAME (S-Adenosyl-Methionine) 200 mg, 30 enteric coated vegetarian tablets
02176  SAME (S-Adenosyl-Methionine) 400 mg, 30 enteric coated vegetarian tablets
02174  SAME (S-Adenosyl-Methionine) 400 mg, 60 enteric coated vegetarian tablets

NERVE & COMFORT SUPPORT
02202  ComfortMAX™
02303  PEA Discomfort Relief

PERSONAL CARE
01006  Biosil™ 5 mg, 30 veg capsules
01007  Biosil™ 1 fl oz
00321  Dr. Proctor’s Advanced Hair Formula
00320  Dr. Proctor’s Shampoo
02322  Hair, Skin & Nails Collagen Plus Formula
01278  Life Extension Toothpaste
00408  Venotone
00409  Xyliwhite Mouthwash
02304  Youthful Collagen
02252  Youthful Legs

PET CARE
01932  Cat Mix
01931  Dog Mix

PROBIOTICS
01622  Bifido GI Balance
01825  FLORASSIST® Balance
02125  FLORASSIST® GI with Phage Technology
01821  FLORASSIST® Heart Health
02250  FLORASSIST® Mood Improve
02208  FLORASSIST® Immune & Nasal Defense
02120  FLORASSIST® Oral Hygiene
02203  FLORASSIST® Prebiotic
01920  FLORASSIST® Throat Health
02400  FLORASSIST® Winter Immune Support
52142  Jarro-Dophilus® for Women
00056  Jarro-Dophilus EPS® 60 veg capsules
21201  Jarro-Dophilus EPS® 120 veg capsules
01038  Theralac® Probiotics
01389  TruFlora® Probiotics

SKIN CARE
80157  Advanced Anti-Glycation Peptide Serum
80165  Advanced Growth Factor Serum
80170  Advanced Hyaluronic Acid Serum
80154  Advanced Lightening Cream
80155  Advanced Peptide Hand Therapy
80175  Advanced Probiotic-Fermented Eye Serum
80177  Advanced Retinol Serum
80152  Advanced Triple Peptide Serum
80140  Advanced Under Eye Serum with Stem Cells
80137  All-Purpose Soothing Relief Cream
80139  Amber Self MicroDermAbrasion
80119  Anti-Aging Mask
80151  Anti-Aging Rejuvenating Face Cream
80152  Anti-Aging Rejuvenating Scalp Serum
80176  Collagen Boosting Peptide Cream
80155  Collagen Boosting Peptide Serum
80240  Collagen Peptides for Skin & Joints
80169  Cucumber Hydra Peptide Eye Cream
80141  DNA Support Cream
80163  Eye Lift Cream
80123  Face Rejuvenating Anti-Oxidant Cream
80109  Hyaluronic Facial Moisturizer
80110  Hyaluronic Oil-Free Facial Moisturizer
80138  Hydrating Anti-Oxidant Facial Mist
00661  Hydroderm
55495  Intensive Moisturizing Cream
80103  Lifting & Tightening Complex
80159  Multi Stem Cell Skin Tightening Complex
80147  Neck Rejuvenating Anti-Oxidant Cream
80174  Purifying Facial Mask
80142  Resveratrol Anti-Oxidant Serum
01938  Shade Factor™
02129  Skin Care Collection Anti-Aging Serum
02130  Skin Care Collection Day Cream
02131  Skin Care Collection Night Cream
80166  Skin Firming Complex
02096  Skin Restoring Ceramides
80130  Skin Stem Cell Serum
80164  Skin Tone Equalizer
80143  Stem Cell Cream with Alpine Rose
80148  Tightening & Firming Neck Cream
80161  Triple-Action Vitamin C Cream
80162  Ultimate MicroDermabrasion
80173  Ultimate Peptide Serum
80178  Ultimate Telomere Cream
80160  Ultra Eyelash Booster
80101  Ultra Wrinkle Relaxer
80113  Under Eye Refining Serum
80104  Under Eye Rescue Cream
80171  Vitamin C Lip Rejuvenator
80129  Vitamin C Serum
80136  Vitamin D Lotion
80102  Vitamin K Cream
80178  Melatonin 6 Hour Timed Release
01786  Melatonin 6 Hour Timed Release
3 mg, 60 veg tablets
01721  Optimized Tryptophan Plus
01444  Quiet Sleep
01445  Quiet Sleep Melatonin

VITAMINS
01533  Ascorbyl Palmitate
00920  Benfotiamine with Thiamine
00664  Beta-Carotene
01945  BioActive Complete B-Complex
00102  Biotin
00084  Buffered Vitamin C Powder
02229  Fast-C® and Bio-Quercetin Phytosome
02075  Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
02070  Gamma E Mixed Tocopherol/Tocotrienols
01913  High Potency Optimized Folate
01674  Inositol Caps Liquid Emulsified
02244  Liquid Vitamin D3 • 2,000 IU, 1 fl oz
02232  Liquid Vitamin D3 • 2,000 IU, 1 fl oz, mint
01936  Low-Dose Vitamin K2
00065  MK-7
00373  No Flush Niacin
01939  Optimized Folate (L-Methylfolate)
01217  Pyridoxal 5'-Phosphate Caps
01400  Super Absorbable Tocotrienols
02334  Super K
02335  Super K Elite
01863  Super Vitamin E
02028  Vitamin B5 (Pantothenic Acid)
01535  Vitamin B6
00361  Vitamin B12 Methylcobalamin
01536  Vitamin B12 Methylcobalamin • 1 mg, 60 veg lozenges
01537  Vitamin B12 Methylcobalamin • 5 mg, 60 veg lozenges
02228  Vitamin C and Bio-Quercetin Phytosome
1,000 mg, 60 veg tablets
02227  Vitamin C and Bio-Quercetin Phytosome
1,000 mg, 250 veg tablets
01753  Vitamin D3 • 25 mcg (1,000 IU), 90 softgels
01751  Vitamin D3 • 25 mcg (1,000 IU), 250 softgels
01713  Vitamin D3 • 125 mcg (5,000 IU), 60 softgels
01718  Vitamin D3 • 175 mcg (7,000 IU), 60 softgels
01758  Vitamin D3 with Sea-lodine™
02040  Vitamins D and K with Sea-lodine™

WEIGHT MANAGEMENT & BODY COMPOSITION
00658  7-Keto® DHEA Metabolite • 25 mg, 100 capsules
02479  7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
01509  Advanced Anti-Adipocyte Formula
01807  Advanced Appetite Suppress
02207  AMPK Metabolic Activator
02478  DHEA Complete
01738  Garcinia HCA
01292  Integra-Lean®
01908  Mediterranean Trim with Sinetrol™-XPur
01492  Optimized Irvingia with Phase 3™ Calorie Control Complex
01432  Optimized Saffron
00818  Super CLA Blend with Sesame Lignans
01902  Waist-Line Control™
02151  Wellness Code® Appetite Control

WOMEN’S HEALTH
01942  Breast Health Formula
01626  Enhanced Sex for Women 50+
01894  Estrogen for Women
01064  Femmenessence MacaPause®
02204  Menopause 731™
02319  Prenatal Advantage
01441  Progesta-Care®
01649  Super-Absorbable Soy Isoflavones
A tannin-rich extract derived from the edible fruit of the *Terminalia bellerica* tree helps keep uric acid levels within healthy range.

This patent-pending, standardized extract from *Terminalia bellerica* supports healthy expression of two critical enzymes involved in uric acid metabolism:

- **Xanthine oxidase**

The name of this standardized *Terminalia bellerica* extract is **Ayuric®**. The suggested dose is one capsule twice a day.

For full product description and to order **Uric Acid Control**, call 1-800-544-4440 or visit www.LifeExtension.com

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

For full product description and to order Super Omega-3, or Super Omega-3 Plus, call 1-800-544-4440 or visit www.LifeExtension.com

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

* Highest Independent 5-star rating, International Fish Oil Society For Over Nine Years.

IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc.
26 A 22% LOWER RISK OF CARDIOVASCULAR DEATH!
Beyond benefiting joint health, glucosamine has been shown to reduce the risk of cardiovascular death.

46 BOOST YOUR ‘FEEL GOOD’ NEUROTRANSMITTER
Preserving brain dopamine improves mood and cognitive functions.

36 CISTANCHE ACTIVATES IMMUNE FUNCTION
The herb Cistanche promotes youthful immune function and decreases inflammatory cytokines.

56 MILK THISTLE REDUCES ELEVATED GLUCOSE
Milk thistle fights metabolic disorders by reducing fasting blood sugar 11% and high insulin levels 14%.

65 GLAUCOMA AND PEA
The fatty acid PEA lowered eye pressure and improved retinal health in glaucoma patients.

72 ZINC’S ROLE IN BONE HEALTH
Studies show that zinc stimulates new bone formation.