



**LIFE
EXTENSION®**

The Science of a Healthier Life®

LifeExtension.com

July 2024

FEATURE ARTICLES

- 7 Tragic Error About Vitamin D
- 24 Hidden Power of Mushrooms
- 34 Aged Black Garlic and Heart Health
- 44 Internal Protection from Sun's Rays
- 55 What are Prebiotics?
- 67 Research Update: Selenium



**HOW AGED
BLACK GARLIC
PROTECTS THE
HEART**

PLUS
Higher Vitamin D Linked to
Lower Cancer Death Risk



Add AMPK

TO YOUR HEALTH ROUTINE

AMPK is an *enzyme* in the body that signals cells to burn **fat** for energy.

Over time, AMPK levels decline and can cause accumulation of **abdominal fat**.

AMPK Metabolic Activator provides gynostemma and hesperidin extracts to:

- Revitalize youthful AMPK activity
- Encourage use of abdominal fat for energy
- Promote healthy cellular metabolism



Item #02207 • 30 vegetarian tablets

1 bottle \$28.50 • 4 bottles \$24 each



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

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.

REPORTS



**PAGE 34
ON THE COVER**

**Novel Cardiovascular
Support**

Aged black garlic contains a compound with **cardiovascular benefits**. **Clinical data** show aged black garlic *improved* cardiovascular markers in just **12 weeks**.

24 HIDDEN POWER OF MUSHROOMS

Higher **mushroom** intake may reduce all-cause mortality by **35%**. A mushroom compound helps *protect* against **telomere shortening, DNA damage, and cognitive decline**.



44 MORE COMPLETE SUN PROTECTION

A **clinical study** found that an oral **fern extract** protected the skin from photo-aging and *decreased* UV-radiation-induced DNA mutations by **84%**.



55 WHAT ARE PREBIOTICS?

A **prebiotic** helps restore healthy *Bifidobacteria*, while reducing cholesterol, triglycerides, and blood sugar.



**67 SELENIUM PROMOTES NEW BRAIN
CELL GROWTH**

A recent animal study found **selenium promotes** the growth of **new brain cells**. Selenium may also protect against cognitive decline in humans.



DEPARTMENTS

7 AWSI: ANOTHER TRAGIC ERROR

About **43%** of Americans have low bone density, which can lead to fractures and shortened longevity.

In another tragic error, the **U.S. Preventive Services Task Force** now recommends *against* routine **blood testing for vitamin D**.

17 IN THE NEWS

Higher vitamin D levels tied to lower risk of cancer deaths;

Greater magnesium intake may reduce post-stroke mortality; NAC could decrease need for pain drugs after spinal surgery; More fish, fish oil, linked to lower risk of frailty.



65 SUPERFOODS: SAUERKRAUT

Sauerkraut contains live probiotic cultures that support digestion, immunity, reduced inflammation, and cancer protection.



Stay connected—and save!

Don't miss out on a single sale. Sign up for exclusive savings opportunities and the latest health news.



**Get \$15 Off
+ FREE Shipping**

on your order of \$75+
when you sign up for
emails & texts.

Text "HEALTH" to 543339 to
sign up for emails & texts.

By signing up via text, you agree to receive recurring automated text messages with account related notices and information, and promotional offers from Life Extension at the mobile number provided when signing up. Consent is not a condition of any purchase. Reply HELP for help and STOP to cancel. Msg frequency varies. Mag & data rates may apply. See Offer for details. View Terms <https://www.lifeextension.com/legal/legal-notices-01#text> and Privacy <https://www.lifeextension.com/legal/privacy-notice>.



**#1 Rated
Catalog/Internet Merchant
8 Time Winner!***

* Ratings based on results of the 2023
ConsumerLab.com survey of supplement users.
More information at www.ConsumerLab.com/survey.

Editorial

Editor-in-Chief • Philip Smith
Executive Managing Editor • Renee Smith
Medical Editor • Mahwish Aurangzeb, MD, MPH
Senior Editor • Dan Jewel
Senior Staff Writer • Michael Downey
Department Editor • Laurie Mathena
Associate Editor • Rivka Rosenberger, EdD
Creative Director • Robert Vergara, MS
Art Director • Alexandra Maldonado

Chief Medical Officer

Steven Joyal, MD

Chief Scientific Officer

Andrew Swick, MS, PhD

Scientific Advisory Board

Richard Black, DO • John Boik, PhD • Aubrey de Grey, PhD
Deborah F. Harding, MD • Sandra C. Kaufmann, MD
Peter H. Langsjoen, MD, FACC • Dipnarine Maharaj, MD
L. Ray Matthews, MD, FACS • Ralph W. Moss, PhD
Michael D. Ozner, MD, FACC • Xiaoxi Wei, PhD • Jonathan V. Wright, MD

Contributors

Steve Clark • Michael Downey • Heather L. Makar • Laurie Mathena

Advertising

Chief Marketing Officer • Rey Searles • rsearles@lifeextension.com
National Advertising Manager • JT Hroncich • 404-347-4170

Senior Director of Sales and Business Development

Carolyn Bouchard • cbouchard@lifeextension.com • 954-202-7685

Circulation & Distribution

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

Customer Service: 800-678-8989 • Email: customerservice@LifeExtension.com

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

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

LIFE EXTENSION (ISSN 1524-198X) Vol. 30, No. 7 ©2024 is published monthly except bi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. LE Publications, Inc. All rights reserved. Published 13 times a year. Subscription rate: \$40 per year in the United States. US \$47 in Canada. US \$60 in other countries. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Printed in USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional. LEGAL NOTICE: Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA-approved, qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. *Life Extension Magazine*® does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in it, except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.



Top Rated Multivitamin by Consumer Labs

More Nutrients than the Leading Brand*



- 50 times the VITAMIN B1
- 25 times the VITAMIN B6
- 12 times the VITAMIN B12
- 10 times the BIOTIN
- 10 times the SELENIUM
- 7 times the VITAMIN C
- 2.5 times the VITAMIN B3
- 2 times the VITAMIN D
- 2 times the VITAMIN E
- 2 times the ZINC



Two-Per-Day Multivitamin Tablets

Item #02315 • 120 tablets (two-month supply)
1 bottle \$18.38 • 4 bottles \$16.25 each

Two-Per-Day Multivitamin Capsules

Item #02314 • 120 capsules (two-month supply)
1 bottle \$19.13 • 4 bottles \$17 each

Each bottle provides a two-month supply.

“Covers all
the bases.”

Brian
VERIFIED
CUSTOMER
REVIEW

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

* 2023 Consumer Satisfaction, Rated #1 Catalog/Internet Merchant. Ratings based on results of the
2023 ConsumerLab.com Survey of Supplement Users. More information at www.consumerlab.com/survey.

* Compared to CENTRUM Silver Adults 50+

Crominex® 3+, Capros® and PrimaVie® are patent protected and registered trademarks of Natreon, Inc.
Lycored LycoBeads® is a registered trademark of Lycored; Orange, New Jersey. SelenoExcell® is a registered trademark of Cypress Systems Inc.
L-OptiZinc® is a Lonza trademark, registered in the USA.

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. 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. These products are not intended to diagnose, treat, cure, or prevent any disease.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Professor Francesco Marotta, MD, PhD, of Montepapaleone Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech & Traditional Medicine, University of Milano, Italy and honorary resident professor, Nutrition, Texas Women's University. He is the author of more than 130 papers and 400 lectures.

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

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

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

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

Ross Pelton, RPh, PhD, CCN, is scientific director for Essential Formulas, Inc.

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

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

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

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

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

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

Michael D. Seidman, MD, FACS, is the director of skull base surgery and wellness for the Adventist Health System in Celebration, FL.

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



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.



Joel Kahn, MD, FACC of Detroit, Michigan, is a practicing cardiologist, and a Clinical Professor of Medicine at Wayne State University School of Medicine. He graduated Summa Cum Laude from the University of Michigan Medical School. Known as "America's Healthy Heart Doc", Dr. Kahn has triple board certification in Internal Medicine, Cardiovascular Medicine and Interventional Cardiology. He was the first physician in the world to certify in Metabolic Cardiology with A4M/MMI and the University of South Florida. He founded the Kahn Center for Cardiac Longevity in Bingham Farms, MI.

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



Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP, is the Medical Director of the Maharaj Institute of Immune Regenerative Medicine, 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, FACS, 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 *Heart Attacks Are Not Worth Dying For*, *The Great American Heart Hoax*, and *The Complete Mediterranean Diet*. 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-Therma Inc., a company developing a radical new highway towards non-toxic, hyper-effective antifreeze agents to fight unwanted ice formation in regenerative medicine and reduce mechanical icing.



"Good stuff!"
Steven
VERIFIED CUSTOMER
REVIEW

A Bodyguard for Your Brain

People tend to live longer in areas where lithium is abundant in the drinking water.*

Lithium is a low-cost mineral that functions in several ways to support cognition and overall brain health.

Protect healthy cognition with lithium—it's like a bodyguard for your brain!

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



*European Journal of Nutrition. 2011;50(5):387-389.

(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.



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.

Another Tragic Error



WILLIAM FALOON



The **U.S. Preventive Services Task Force (USPSTF)** garners lots of attention when it makes new recommendations.

The **USPSTF** track record, however, is littered with *errors* that may collectively claim millions of lost life years.

We've exposed some of these tragedies in previous columns, such as the USPSTF recommending *against PSA screening*. The result has been an upsurge of **metastatic prostate cancers** that would have been curable if they had been caught in *early* stages using **PSA** blood tests.

The latest **USPSTF** proclamation advises *against* routine testing of **vitamin D** blood levels.¹ They base this largely on a study where supplemental **vitamin D** by itself did not reduce **fracture risk**.²

Readers of this magazine know that it requires more than **vitamin D** alone to maintain **bone density**. The USPSTF seems oblivious to this.

Even more disturbing is the USPSTF's reliance on a study to discredit **vitamin D** that is loaded with so many defects that its findings are rendered virtually worthless.

One of the study's failings is that many in the **placebo** group were taking **vitamin D supplements** on their own, which diminished the difference between study subjects given **vitamin D** or **placebo**.

In this editorial I succinctly describe flaws in this widely publicized vitamin D study and how to best reduce fracture risks.

The importance cannot be overstated. A striking **43%** of Americans over **age 50** have low bone density that predisposes them to **osteoporosis**, shattered bones, and shortened longevity.³



Huge numbers of older Americans have less-than-optimal **bone mass**. Most don't know until they have a **bone density** test or suffer a crippling **fracture**.

Conventional medicine remains fixated on *single* agent therapies to protect bone mass. Yet it was well known decades ago that numerous factors contribute to **osteoporosis** and subsequent fractures.^{4,5}

A study published in the *New England Journal of Medicine* evaluated people given **2,000 IU/day** of supplemental **vitamin D** or **placebo**. When there was no difference in **fracture rates** between the two groups, the USPSTF, mainstream media, and some in conventional medicine advised *against* routine vitamin D **blood testing**.²

Overlooked were data sets showing that **vitamin D** requires **magnesium** to transform into its active form in the body. Most Americans are magnesium deficient.⁶

Also overlooked is the need for **vitamin K** to enable calcium and vitamin D to protect bone mass.^{7,8} Most Americans don't ingest optimal vitamin K.

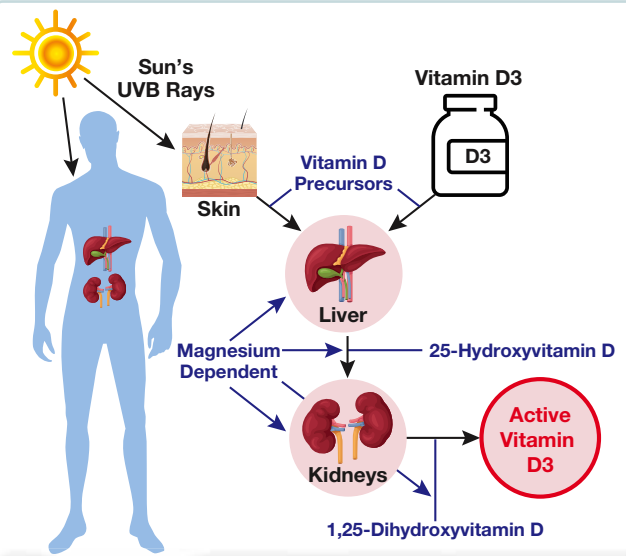
Readers of *Life Extension Magazine*® already know it requires more than a *single* nutrient (like vitamin D) to maintain skeletal structure.

What pleasantly surprised me were harsh criticisms about this anti-vitamin D study that were later published in the *New England Journal of Medicine* (NEJM).

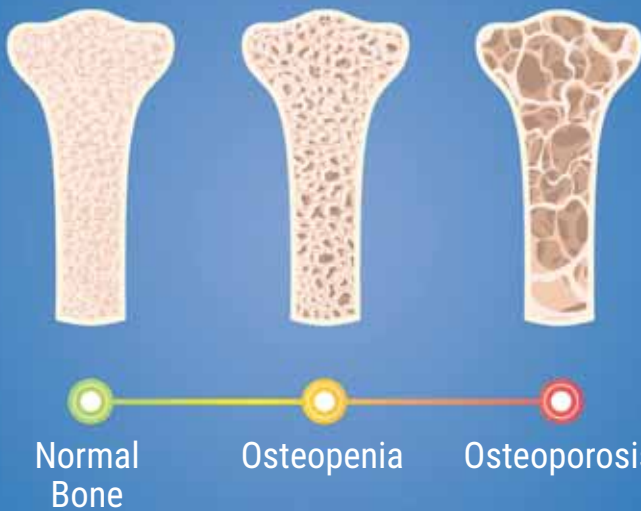
Conventional Doctors Condemn NEJM Study

Three months *after* the study attacking the value of vitamin D **blood tests** was published, the *New England Journal of Medicine* published a “correspondence” section of rebuttals.

The correspondence consisted of letters written by doctors critical of how the vitamin D study was designed and the conclusion to halt routine vitamin D blood testing.



Stages of OSTEOPOROSIS



Magnesium is Needed to Activate Vitamin D

The graphic above depicts how **magnesium** is involved in the conversion of **vitamin D** from **supplements** and/or **sunlight** to a **biologically active** form.

Vitamin D from sunlight or supplements is converted by a **magnesium-dependent enzymatic** reaction to **25-hydroxyvitamin D** in the liver.

It then converts to its biologically active **1,25-dihydroxyvitamin D** form in the **kidneys** also via a **magnesium-dependent** enzymatic reaction.

Activated vitamin D (1,25-hydroxyvitamin D) is transported throughout the body in the blood via **vitamin D-binding protein**, for which **magnesium** is a cofactor.⁹

Vitamin D Levels in Life Extension Readers

While conventional doctors debate the need for vitamin D **blood testing**, we at **Life Extension** uncovered the value decades ago when analyzing tens of thousands of vitamin D (*25-hydroxyvitamin D*) test results.

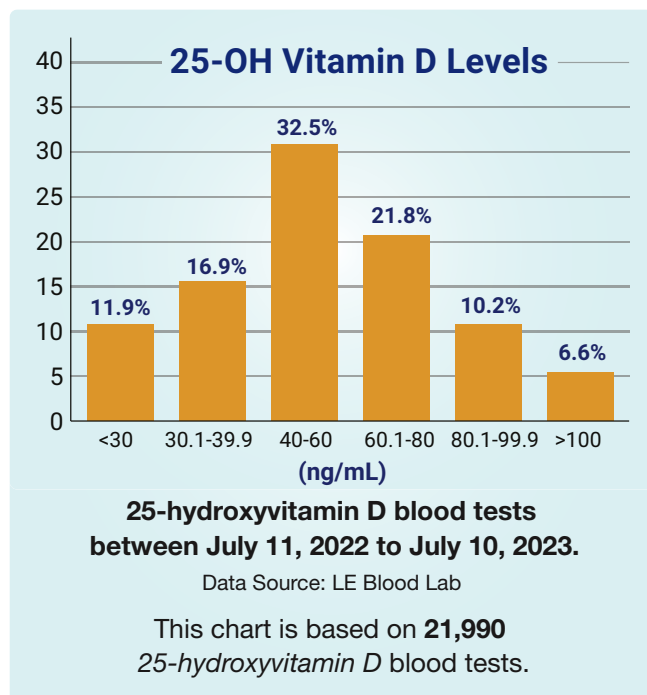
We found widespread **individual variability** even in people taking similar doses.

The chart on this page reveals the wide variation of **25-hydroxyvitamin D** blood levels among **Life Extension** supporters.

When **Life Extension** staff see a **25-hydroxyvitamin D** reading above **100 ng/mL**, we notify the person that they are supplementing with too much **vitamin D** and should reduce their dose.

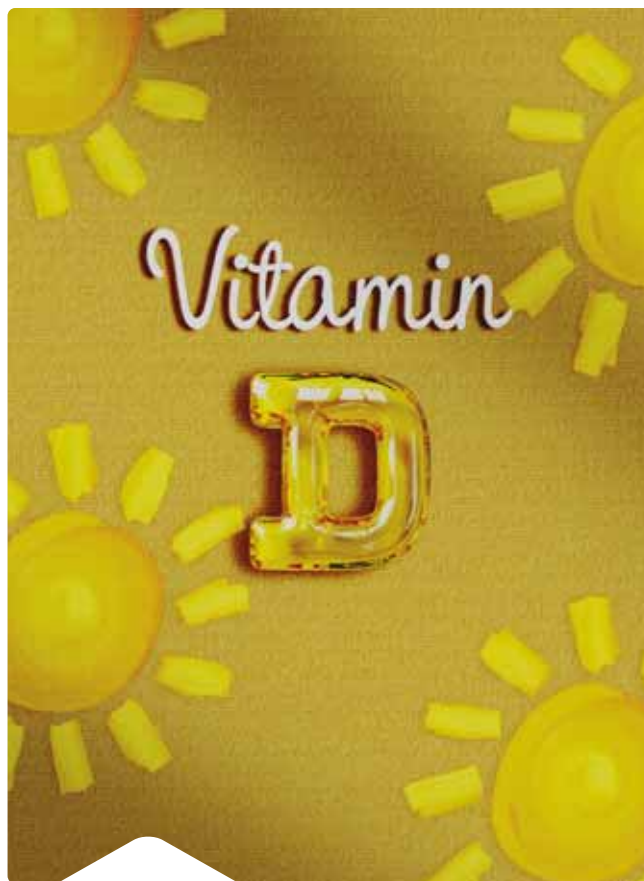
We reach out to those with very high **25-hydroxyvitamin D** blood levels by phone and advise they discontinue vitamin D supplements until levels return to what we view as an optimal range of around **50-80 ng/mL**.

We expect those in the low (**0-30 ng/mL**) range to know they need to increase their vitamin D intake.



Opinions on ideal ranges vary, but there is general consensus that **25-hydroxyvitamin D** levels between **30 ng/mL-80 ng/mL** confer protection and **71%** of our supporters are in this range.

The optimal range of **25-hydroxyvitamin D** to target is perhaps **50-80 ng/mL** with **54%** of our readers achieving this level.



Additional Critiques

In addition to not providing broad-spectrum skeletal support to study subjects, there were other defects in this *NEJM* study that warrant further investigation.

The mean **25-hydroxyvitamin D** level when the study began was **30.7 ng/mL**. This is not considered **deficient** by the conventional medical community.

Among participants who provided two-year blood samples, the mean **25-hydroxyvitamin D** increased from **29.2 ng/mL** to **41.2 ng/mL** in the vitamin D-supplemented group. It decreased slightly from **30.0 ng/mL** to **29.4 ng/mL** in the placebo arm.

An argument can be made that these differences are not clinically or statistically relevant in the context of this study. Neither vitamin D blood level meets **Life Extension's** optimal target range for **25-hydroxyvitamin D** of **50-80 ng/mL**.

The **placebo** group was allowed to supplement with up to **800 IU** of vitamin D per day, and up to **1,200 mg** per day of **calcium**. This hardly qualifies as a robust **placebo** group in the context of this study that sought to identify if **2,000 IU/day** of supplemental vitamin D would reduce **fracture** rates.

We regret that only **4.8%** of the participants were taking osteoporosis medications at baseline, yet **10.3%** had a history of fracture caused by minor trauma. As much as one has to be selective about bone-building **drugs**, when one's bones are crumbling from severe osteoporosis, the proper medications have demonstrated significant benefits.

How to Avoid Osteoporotic-Induced Fractures

A leading cause of disability in the elderly is a fall, and fracture, followed by long term recuperation that can deteriorate into pneumonia, sarcopenia, and further bone loss due to **lack of mobility**.¹¹

Aging men are particularly vulnerable to death from an osteoporotic fracture.^{12,13}

A mistake many make is avoiding most, but not all osteoporotic risks.

For instance, a health-conscious person may avoid smoking, maintain youthful hormone balance, guard against nutrient deficiencies, cut back on alcohol, stay away from bone-depleting drugs (steroids, cortisone, proton-pump inhibitors, others), and engage in some degree of resistance training (weight-bearing exercise).

But for those predisposed to osteoporosis because of small body frame, family history, or lack of prevention initiated in early life, a comprehensive bone-protecting program is essential.

Some argue that failure to engage in weight-bearing exercise alone can cause significant bone loss that is not offset by other beneficial practices.

Those with significant bone loss or fracture history should consider bone-building medications, which would require a long chapter to discuss the pros and cons of each different drug class.

Why Life Extension and USPSTF So Often Disagree

The **U.S. Preventive Services Task Force (USPSTF)** has a mission to advise what the **average** American should do to reduce disease risk. Their recommendations take into consideration life expectancy of the average (typically unhealthy) elderly American and side effects caused by invasive diagnostics like **colonoscopies** (which USPSTF recommended against in what now are considered *higher risk* age groups).¹⁴

(Continued on page 12.)



Doctors Harshly Critical of Anti-Vitamin D Study

Below are critiques by independent doctors about the **anti-vitamin D** study discussed in this editorial. These extracts were published on-line by the *New England Journal of Medicine*:¹⁰

“...the editorial on the VITAL trial...essentially advocates for clinicians to stop checking vitamin D levels or recommending supplementation. This advice is misguided and inconsistent with the data. The editorialists do not mention that the baseline vitamin D level in the participants was not low, which may be a reflection of the current era of supplementation by the general public. (More than **40%** of the participants in this study were already taking vitamin D supplements, including those in the control group). Previous randomized trials involving patients with low vitamin D levels have shown a significant reduction in fracture risk. The editorialists also ignore the subgroup of participants in the VITAL trial who were receiving osteoporosis medication and who had a **46%** reduction in fracture risk. Other outcomes from the same VITAL study showed a **22%** reduction in the risk of autoimmune disease in participants who had a normal vitamin D level at baseline. In addition, other robust data have shown a reduction in the risk of infection (**12%** risk reduction overall and **70%** risk reduction in patients with severe vitamin D deficiency). In light of data showing the benefits of vitamin D supplementation, the editorialists’ broad recommendation to stop screening and supplementing vitamin D seems irresponsible.”

“I would like to point out apparent errors in the editorial...on the VITAL study findings. The editorialists state that the VITAL trial showed decisively that vitamin D supplements do not significantly reduce the risk of bone fracture. However, the VITAL study population was not selected for vitamin D deficiency, and most participants had normal levels of vitamin D. Although 4,270 participants had a serum 25-hydroxyvitamin D level of less than **24 ng/mL** (lowest quartile), only 227 fractures occurred in that group. Do the editorialists really believe that the trial provides conclusive evidence that persons with low vitamin D levels do not benefit from vitamin D supplements? On the basis of previous reports from the VITAL trial and other trials showing a lack of effect of vitamin D in preventing numerous medical



conditions, the authors conclude that “providers should stop screening for 25-hydroxyvitamin D levels or recommending vitamin D supplements.” This is an inaccurate summary of the VITAL results and fails to mention that vitamin D supplementation has been found to prevent autoimmune diseases and advanced (metastatic and fatal) cancer, with the latter confirmed by meta-analyses. Thus, there is no justification for claiming that patients should stop taking vitamin D supplements on the basis of available research.”

“This article has received considerable coverage in the general media and has been inaccurately summarized as showing no benefit of supplemental vitamin D in patients with osteoporosis or vitamin D deficiency. As endocrinologists who care for patients with osteoporosis, we are concerned that this analysis, which was performed in a trial population with low fracture risk, will be used as evidence for not recommending vitamin D supplementation broadly and will negatively affect the treatment of patients at high fracture risk. The treatment of patients with osteoporosis, at a minimum, includes the intake of adequate calcium and vitamin D to reduce fracture risk.”

“...should we follow the advice of the U.S. Preventive Services Task Force, which recommends against the routine monitoring of vitamin D levels in the first place? I am skittish about following that advice, because I have seen many cases of mild hyperparathyroidism that normalized with corrections of vitamin D levels from less than **20 ng/mL** to **30 ng/mL** or more...”

Life Extension, on the other hand, seeks to radically extend the healthy human lifespan with no upper age limitation for when practical interventions should be considered.

As a result, there are often wide disparities on what the **USPSTF** advises for the “average” unhealthy American and what **Life Extension** suggests for supporters who are not average when it comes to protecting their precious health.

The USPSTF recommendation *against* routine vitamin D blood testing represents a tragic error that makes no sense in light of what we at **Life Extension** have studied and observed over many decades.

For longer life,



William Faloon, Co-Founder
Life Extension®

References

1. Available at: <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/vitamin-d-deficiency-screening>. Accessed April 12, 2024.
2. LeBoff MS, Chou SH, Ratliff KA, et al. Supplemental Vitamin D and Incident Fractures in Midlife and Older Adults. *N Engl J Med*. 2022 Jul 28;387(4):299-309.
3. Available at: https://www.washingtonpost.com/health/the-big-number-141-million-americans-50-and-older-suffer-osteoporosis/2021/04/09/7ae5f382-9885-11eb-962b-78c1d8228819_story.html. Accessed April 12, 2024.
4. Poursmaeili F, Kamalidehghan B, Kamarehei M, Goh YM. A comprehensive overview on osteoporosis and its risk factors. *Ther Clin Risk Manag*. 2018;14:2029-49.
5. Available at: <https://www.uptodate.com/contents/osteoporosis-prevention-and-treatment-beyond-the-basics>. Accessed April 15, 2024.
6. DiNicolantonio JJ, O’Keefe JH, Wilson W. Subclinical magnesium deficiency: a principal driver of cardiovascular disease and a public health crisis. *Open Heart*. 2018;5(1):e000668.
7. Hu L, Ji J, Li D, et al. The combined effect of vitamin K and calcium on bone mineral density in humans: a meta-analysis of randomized controlled trials. *J Orthop Surg Res*. 2021 Oct 14;16(1):592.
8. Lanham-New SA. Importance of calcium, vitamin D and vitamin K for osteoporosis prevention and treatment. *Proc Nutr Soc*. 2008 May;67(2):163-76.
9. Uwitonze AM, Razzaque MS. Role of Magnesium in Vitamin D Activation and Function. *J Am Osteopath Assoc*. 2018 Mar 1;118(3):181-9.
10. Vitamin D and Incident Fractures. *New England Journal of Medicine*. 2022;387(17):1625-8.
11. Available at: <https://www.nia.nih.gov/health/falls-and-falls-prevention/falls-and-fractures-older-adults-causes-and-prevention>. Accessed April 16, 2024.
12. Grewal S, Jawad AS. Morbidity associated with osteoporosis significant in older men. *Trends in Urology & Men’s Health*. 2022;13(4):22-6.
13. Available at: <https://www.sciencedaily.com/releases/2017/03/170314081643.htm>. Accessed April 12, 2024.
14. Available at: <https://www.uspreventiveservicestaskforce.org/uspstf/announcements/final-recommendation-statement-screening-colorectal-cancer-0>. Accessed April 12, 2024.



COMPREHENSIVE BLOOD TESTS AT LOW LAB SALE PRICES



Commercial labs charge around **\$2,500** for **blood tests** needed to evaluate cardiac, inflammatory, immune, and other degenerative risk factors.

Life Extension offers these same tests for **\$224** when the **Male** or **Female Panel** is ordered during the annual **Lab Test Sale**. This represents a savings of about **90%** compared to commercial labs.

Regular Price: \$299
Sale Price: \$224

LAB TEST SALE
ENDS JULY 8, 2024

To obtain these extensive **Male** or **Female Panels** at these low prices, call **1-800-208-3444** or visit www.LifeExtension.com/sales/lab-tests to order your requisition forms.

MALE PANEL

VITAMIN D
(25-hydroxyvitamin D)

CARDIAC MARKERS
C-Reactive Protein (high sensitivity)
Apolipoprotein B (ApoB)
Homocysteine
Total Cholesterol
LDL (low-density lipoprotein)
HDL (high-density lipoprotein)
Triglycerides

GLUCOSE PROFILE
Insulin
Hemoglobin A1c
Glucose

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

MINERALS
Magnesium (serum)
Ferritin (measure of iron status)
Calcium
Potassium
Phosphorus
Sodium
Iron
Chloride

ORGAN FUNCTION
Kidney: creatinine, BUN, uric acid, BUN/creatinine ratio
Liver: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase

COMPLETE BLOOD COUNT (CBC)
Blood proteins: albumin, globulin, total protein, albumin/globulin ratio
Immune Cells including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
Red Blood Cells including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
Platelets

CANCER MARKER
PSA (Prostate Specific Antigen)

After you order and receive our form, you can visit a blood-draw facility we suggest at your convenience in your area or the **Life Extension Nutrition Center** in Ft. Lauderdale.

FEMALE PANEL

VITAMIN D
(25-hydroxyvitamin D)

CARDIAC MARKERS
C-Reactive Protein (high sensitivity)
Apolipoprotein B (ApoB)
Homocysteine
Total Cholesterol
LDL (low-density lipoprotein)
HDL (high-density lipoprotein)
Triglycerides

GLUCOSE PROFILE
Insulin
Hemoglobin A1c
Glucose

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

MINERALS
Magnesium (serum)
Ferritin (measure of iron status)
Calcium
Potassium
Phosphorus
Sodium
Iron
Chloride

ORGAN FUNCTION
Kidney: creatinine, BUN, uric acid, BUN/creatinine ratio
Liver: AST, ALT, LDH, GGT, bilirubin, alkaline phosphatase

COMPLETE BLOOD COUNT (CBC)
Blood proteins: albumin, globulin, total protein, albumin/globulin ratio
Immune Cells including: lymphocytes, monocytes, eosinophils, neutrophils, basophils
Red Blood Cells including: hemoglobin, hematocrit, MCV, MCH, MCHC, RDW
Platelets

Lab tests are available in the continental United States and Anchorage, AK, only. Not available in Maryland.

Restrictions apply in MA, NY, NJ, and RI. Kits not available in PA. The Lab Test Sale expires on **July 8, 2024**.

Maintain Endothelial
Plaque Stability with

Arterial Protect



ARTERIAL PROTECT can help maintain endothelial plaque and promote healthy blood flow throughout the body.*

Each capsule provides the patented French Maritime **pine bark extract** used in clinical studies along with **Gotu Kola**.

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

Item #02004

30 vegetarian capsules

1 bottle **\$33**

4 bottles \$29 each

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

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



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.

Up Your Game

With Ultra Prostate Formula,
you'll always have a great play.

Ultra Prostate Formula addresses multiple factors essential to lasting prostate health, so you can stay on top of your game.

Our best prostate supplement is packed with ingredients like nettle root extract, pygeum and beta-sitosterol to promote healthy prostate function, healthy urine flow and more.



Item #02029
60 softgels
1 bottle \$29.25

4 bottles \$27 each



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

AprèsFlex® is a registered trademark of PLT Health Solutions-Laila Nutraceuticals LLC. HMRIignan™ is a trademark used under sublicense from Linnea S.A. Lyc-O-Mato® is a registered trademark of Lycored Corp. 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.

Tummy troubles?

Be part of the solution—for you and others with digestive issues!



MKCRSY230701

100% remote! Recruiting volunteers who are experiencing gastrointestinal discomfort, bloating, heartburn, and other digestive complaints for a dietary supplement clinical study.

Enrolling Now:

GUT HEALTH Study

What's in It for Me?

- Up to \$500 in compensation
- \$50 referral bonus available after completing the study
- Personalized microbiome report
- Additional insights upon completion

Easy to Do

- From the comfort of your own home
- Follow the supplement plan
- Total duration ~28 days

Am I Eligible?

- Men and women ages 21-70
- Able to read, speak and write English
- Available by phone, email or text to schedule video visits



Results from Past Studies

Inflammation and Discomfort:

This at home study found that a marine oil/curcumin combo significantly reduced pain severity, intensity, and total pain scores over the course of 60 days.

Men's Bladder Clinical Study:

This study showed promise for men seeking non-pharmaceutical therapies for frequent, sleep-disrupting nighttime urination.

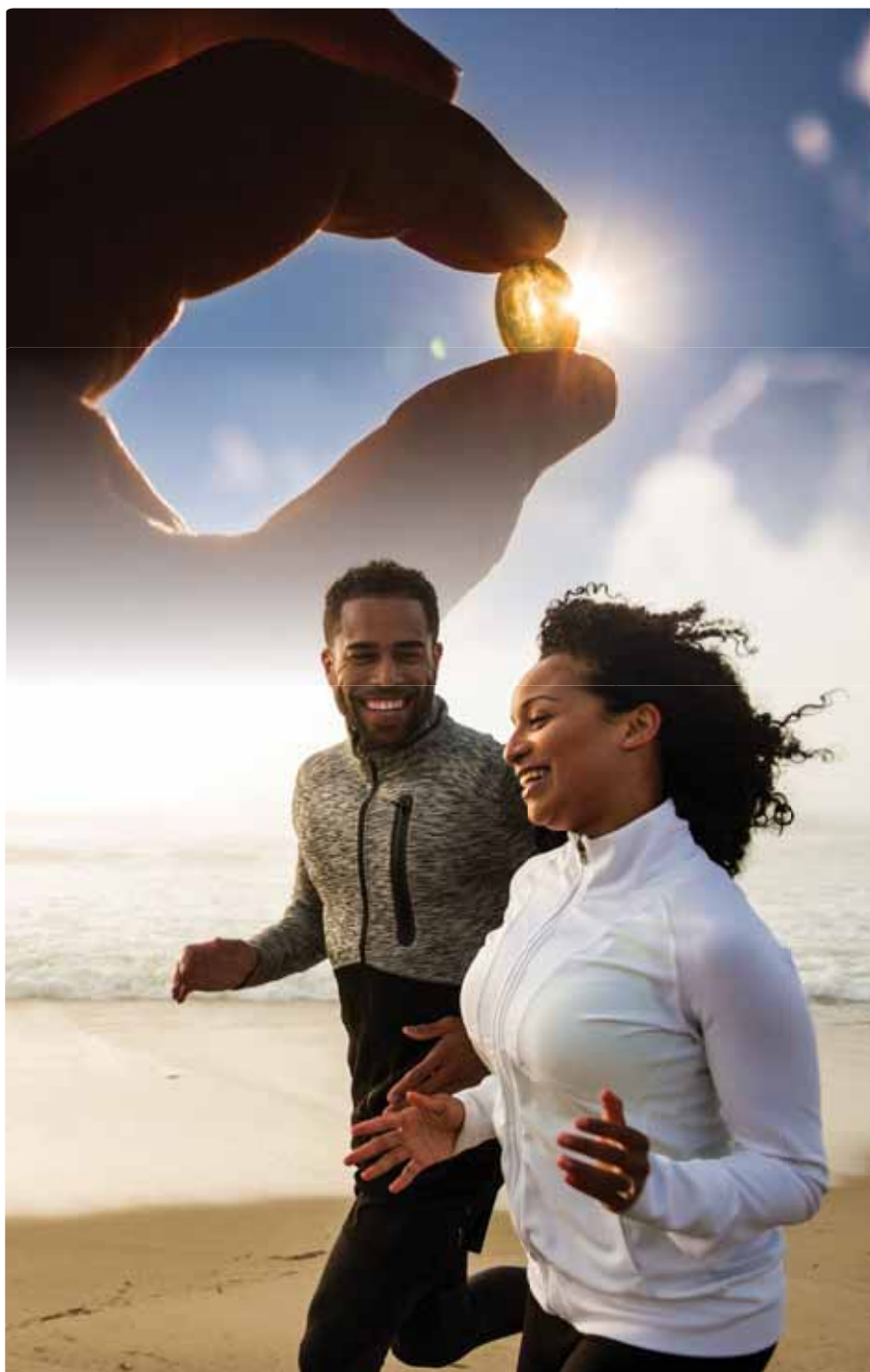


Scan to Learn More!



For more Information, contact us at LifeExtension.com/Solution or call us at 1-866-517-4536

In the News



Higher Vitamin D Levels Linked with Lower Risk of Cancer Deaths

A reduced risk of mortality from cancer or any cause was found among cancer patients who had *higher* vitamin D levels compared with those whose levels were lower, during a 70-month follow-up period, a recent study found.*

Researchers analyzed data from 2,463 men and women with cancer who were enrolled in the National Health and Nutrition Examination Survey 2007–2018 and had information available concerning serum *25-hydroxyvitamin D*. During follow-up through 2019, 567 people died, 194 of whom died from cancer.

Vitamin D deficiency, defined as a level of less than **20 ng/mL**, was significantly associated with an increased risk of all-cause mortality.

Patients whose vitamin D levels were among the highest **25%** and second highest **25%** of participants had respective **41%** and **40%** adjusted lower risks of death from any cause compared with patients whose levels were among the lowest 25%.

Editor's Note: "Multivariate adjustment was performed for demographic characteristics, lifestyle, dietary factors, 25-hydroxyvitamin D testing period, and cancer site," the authors stated.

* *Nutr Cancer*. 2024;76(1):89-97.

Greater Magnesium Intake Linked with Lower Risk of Mortality Following Stroke

People who consumed a *higher* amount of **magnesium** had a reduced risk of dying during a median 5.3-year period following a stroke compared with individuals whose intake of the mineral was lower.*

The study included 917 adults enrolled in the National Health and Nutrition Examination Survey 2007–2018 who had a history of stroke. Dietary interview responses were analyzed for magnesium content, including magnesium from food and magnesium provided by supplement capsules or tablets.

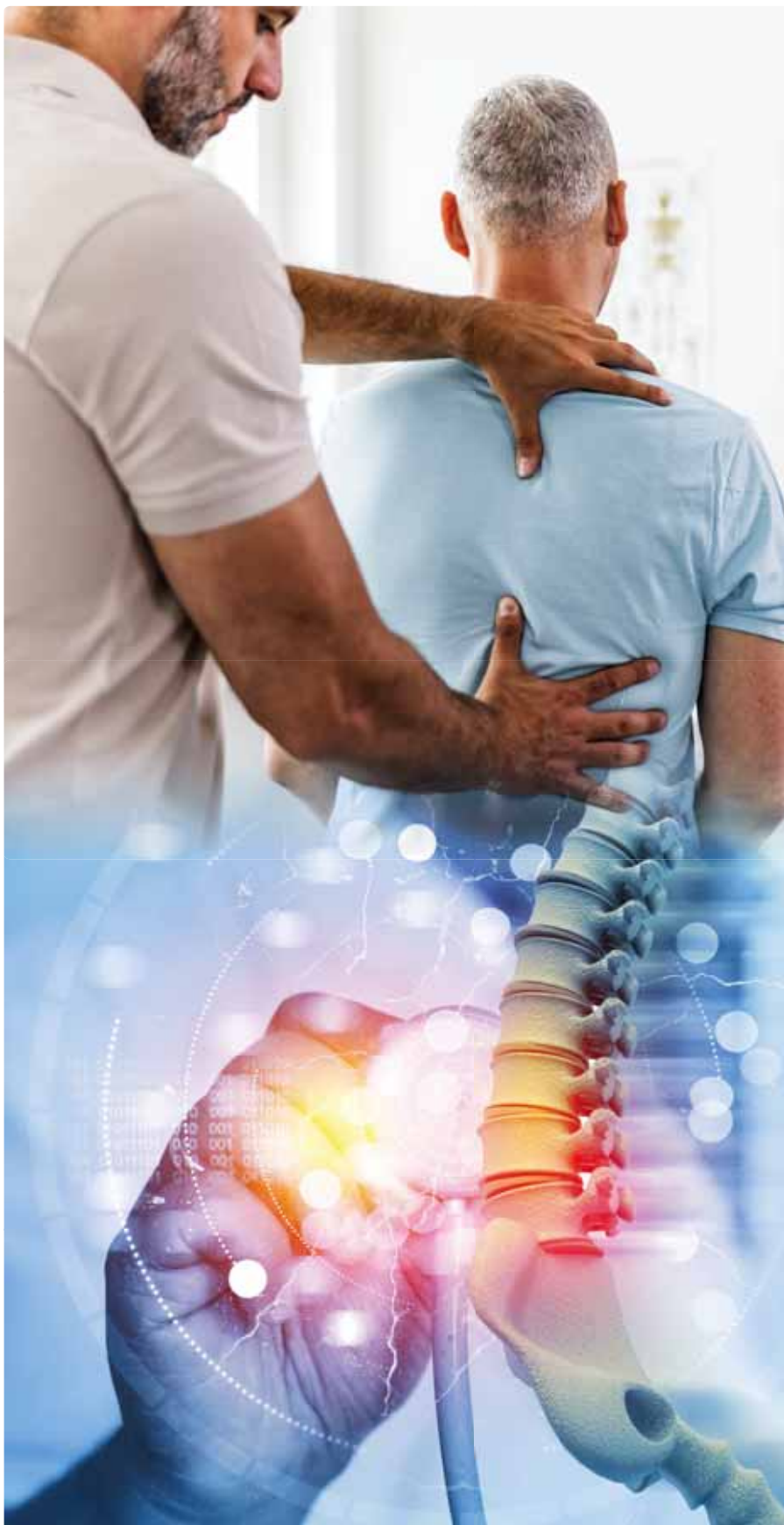
Each **1 mg per 100 kilocalories** per day increase in total magnesium intake was associated with a **3% lower** risk of death during a median follow-up period of 5.3 years.

Individuals whose magnesium intake was among the top **25%** of subjects had a **40% lower** risk of dying from *any* cause at the end of follow-up than those whose magnesium intake was among the lowest **25%**.

Editor’s Note: “Magnesium deficiency is associated with an increased risk of a wide range of diseases, including hypertension, diabetes, metabolic syndrome, coronary heart disease, and stroke,” the authors wrote. “Considering that insufficient magnesium intake is common in stroke patients, improving magnesium intake in stroke survivors is warranted.”

* *Nutr J.* 2023 Oct 30;22(1):54.





NAC Could Decrease Need for Pain Relief Following Spinal Surgery

An article in the journal *Pain Management* suggests a role for N-Acetyl-L-Cysteine (NAC) in the relief of pain following spinal surgery.*

In phase II of a randomized pilot trial, patients who received NAC during spinal surgery subsequently requested fewer opioid drugs and had lower pain scores than those who received a placebo.

Thirty participants were given large intravenous doses of NAC or a placebo during surgery in addition to standard pain medication.

In the two days following surgery, opioid consumption was reduced up to **24%** in patients who were given NAC compared with the placebo group.

Editor's Note: "NAC is a powerful anti-inflammatory drug," the authors stated. "It could help pain for patients after surgery."

* *Pain Manag.* 2023 Oct;13(10):593-602.

Consume More Fish, Fish Oil Supplements, to Reduce Frailty Risk

Recent research documented an association between *higher* blood **omega-3** fatty acid levels or greater intake of oily fish or fish oil supplements and a lower risk of frailty.*

Fish oil is a source of omega-3 fatty acids EPA and DHA, which support a healthy inflammatory response.

Data were evaluated from 18,802 UK Biobank participants aged 65 years and older who had information available concerning plasma fatty acid levels, and 79,330 participants whose dietary questionnaire responses provided information regarding the intake of oily fish and fish oil supplements.

Higher plasma omega-3 fatty acids, DHA and non-DHA omega-3 levels were associated with less frailty. Fish oil supplementation was associated with **28%** reduced odds of frailty. Two or more servings per week was associated with **41%** lower odds of frailty than never consuming oily fish.

Editor's Note: Frailty was defined using the Cardiovascular Health Study index. The criteria are shrinking, physical endurance/energy, low physical activity, weakness, and slow walking speed.

* *J Gerontol A Biol Sci Med Sci.* 2024 Mar 22;glae085.



YOUR BONE HEALTH...NOW **BOOSTED**



Bone Restore with Vitamin K2 combines skeletal-strengthening nutrients in one formula.

Item #01727

120 capsules

1 bottle **\$18**

4 bottles \$16.50 each



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

Caution: Those taking a vitamin K antagonist (e.g. warfarin) should use Bone Restore without vitamin K2. Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. patent #5,962,049.

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.

"I feel better about my immune system with it."

Mary

VERIFIED CUSTOMER REVIEW

SUSTAINED SUPPORT
24
HOURS
A DAY



Liposomal-Hydrogel™

VITAMIN

Buffered **ascorbate** encased in two plant extracts (liposomes plus hydrogel fenugreek) increases blood (plasma) exposure nearly **seven times more** compared to an equivalent dose of regular vitamin C.

It also maintains vitamin C levels throughout the day.¹

Just **one** vegetarian tablet daily provides **around-the-clock** vitamin C support.

Item #02501 • 60 vegetarian tablets

1 bottle \$25.50 • 4 bottles \$23 each

1. Akay Internal Study. Liposomal hydrogel vitamin C pharmacokinetics. Data on file. 2021.

For full product description and to order **Vitamin C 24-Hour Liposomal Hydrogel™ Formula**, call 1-800-544-4440 or visit www.LifeExtension.com

GLUTEN
FREE

NON
GMO
LE CERTIFIED

VEGETARIAN
LE CERTIFIED

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.



I want...
to get rewarded.



Get more from your healthy lifestyle with Life Extension's exclusive rewards program.

4% back on every purchase that you can use on any Life Extension® product or lab services

Unlimited FREE shipping in the U.S.—any size order

Exclusive savings including sneak peeks and flash sales

Rewards galore—get rewarded on your birthday month & for taking surveys

Premium content access to exclusive webinars and Premier's Facebook group

Costs \$49.95 a year...instant \$50 LE Dollar sign-up credit means zero cost to enroll.

LifeExtension.com/Premier

I want...
convenience & savings.



Life Extension's auto-delivery program makes it easy—and affordable—to stick to your health goals!

Easy to customize—Pick the day and frequency of shipments

Flexible—Pause, modify or cancel any time

Use for orders big & small—No minimum!

Shipping of your AutoShip item(s) is always FREE anywhere in the U.S.

Customers save an average of 16%—You'll always get the best available price on Life Extension® products automatically, even during a sale!

Free program—cancel anytime.

LifeExtension.com/AutoShip

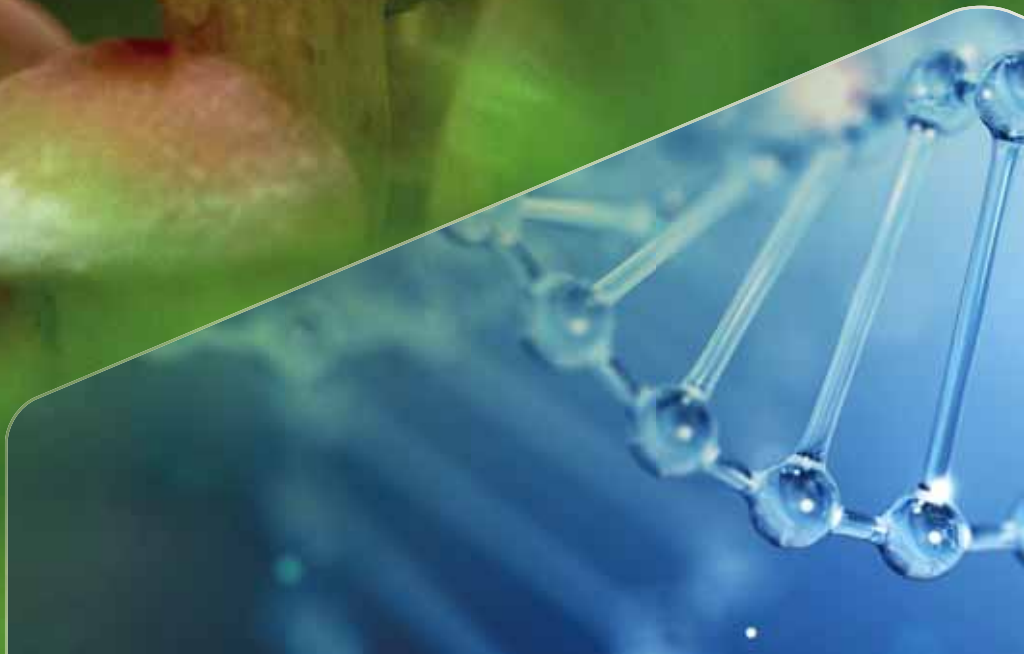
I WANT...IT ALL!

Good news! You can have convenience, savings AND rewards with Life Extension. Enroll in both programs to maximize your value.

For more information call 1-855-867-9361



The Hidden Power of **MUSHROOMS**





BY HEATHER L. MAKAR

The results of a population study published in 2021 were striking:

Among more than 15,000 participants followed over 20 years, those who regularly consumed **mushrooms** had a **16% lower risk of death**.

Those who had just **one** serving a day of mushrooms rather than red or processed meat saw a staggering **35% decrease** in all-cause mortality.¹

Scientists believe one particular amino acid found in mushrooms may be the secret to their health benefits: **L-ergothioneine**.

This compound is so essential to human health, our cell membranes have **transporters** to specifically deliver L-ergothioneine into cells.

In preclinical studies this amino acid has been shown to defend against DNA damage^{2,3} and telomere shortening.⁴ Other preclinical studies show ergothioneine has brain-protective properties.^{5,6}

Multiple studies, including a prospective **randomized-placebo controlled trial**, have indicated an important role for **ergothioneine** in preserving brain and cognitive function.⁷⁻¹⁰

And an innovative prospective observational study found that higher ergothioneine was significantly associated with better **heart** health outcomes.¹¹

What Is L-Ergothioneine?

L-ergothioneine is an amino acid found in relatively high concentrations in **mushrooms** and other **fungi**, and in smaller amounts in a few other foods.^{12,13}

Our bodies can't produce it, yet we have dedicated **transporter proteins** that shuttle L-ergothioneine from our diet into cells throughout the body.¹⁰

Due to the high specificity of this transporter for ergothioneine, it can transport L-ergothioneine **100 times** more efficiently than other compounds. And this transporter can be found in cells and tissues throughout the body, so that ergothioneine is widely distributed.^{10,14}

Dysregulated **oxidative stress** may be a potential driver of aging and chronic disease.¹⁵ L-ergothioneine can promote the glutathione regeneration cycle.¹⁴ It may allow more glutathione to be **preserved**.^{9,13}

A preclinical study showed that **L-ergothioneine** can neutralize harmful oxidizing compounds before they damage mitochondria and other cellular structures.¹⁶

Promoting Healthier Aging

L-ergothioneine may be a powerful ally in **slowing aging**.

Tissues that are typically exposed to *higher* levels of damaging oxidative stress, such as eyes, brain, and red blood cells, have *higher* concentrations



of **L-ergothioneine transporters**, indicating that these tissues have a greater need for this beneficial compound.¹⁰

One study of 15,546 adults found that those who consumed mushrooms had a **16% lower mortality risk** over a 20-year period than those who did not eat mushrooms. Replacing a single serving of processed or red meat with mushrooms was associated with a **35% decrease in death** from all causes.¹ The study authors suggested that the benefits of the mushroom-rich diet may be attributable to their ergothioneine content.¹

Preserving Telomeres

Telomeres, the protective caps on the ends of chromosomes, shorten with age. This shortening is a marker of aging and has been associated with **decreased lifespan**.

Maintaining telomere length is a major focus of anti-aging research.

In a **human cell** study, researchers found that **L-ergothioneine** treatment significantly **reduced the rate of telomere shortening**.⁴ This action may help maintain cellular vitality and promote longevity.

This study achieved significant results in only a short **eight-week period**. Results were even more dramatic in cells exposed to additional **oxidative stress** conditions.⁴

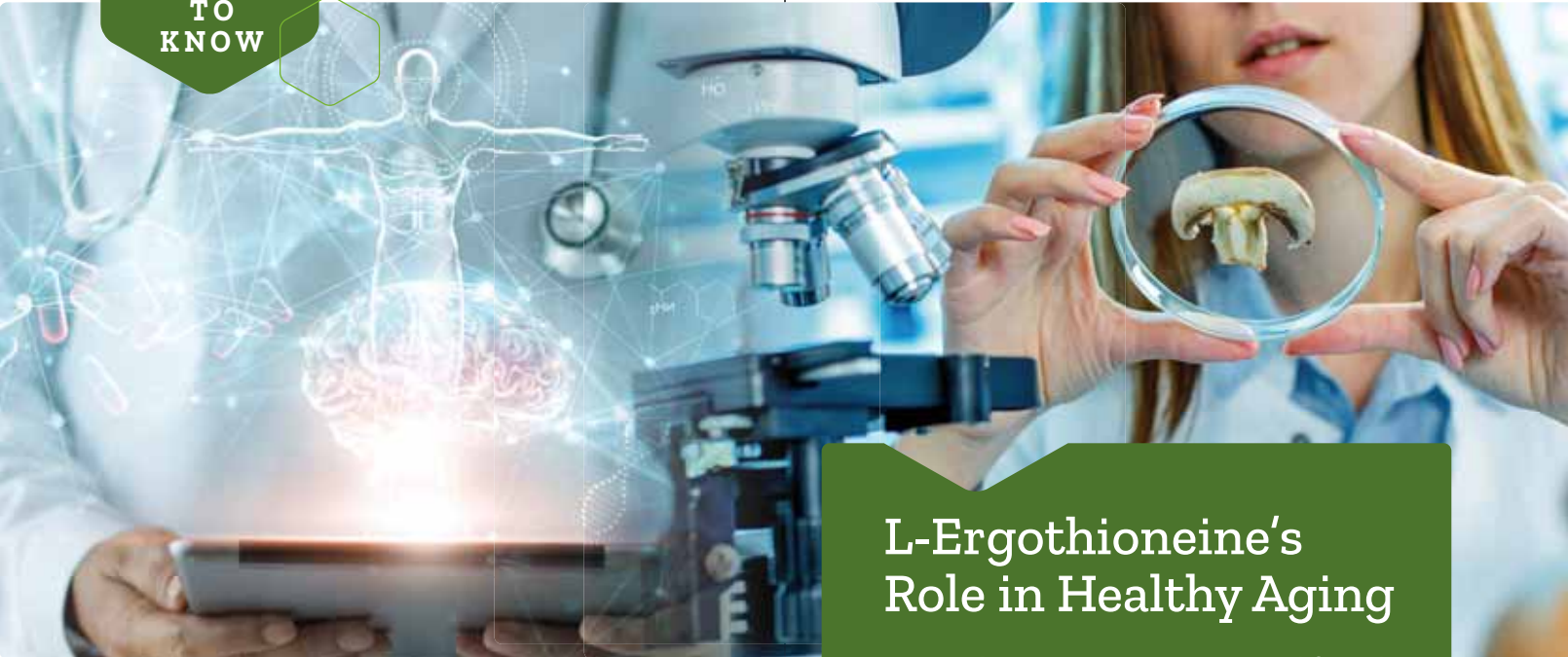
Researchers believe **L-ergothioneine** may preserve telomeres by activating **telomerase**, the enzyme that lengthens telomere caps, which typically isn't active in healthy adult cells.

Guarding DNA

Our **DNA** is constantly damaged, both by normal metabolic processes and by outside influences like ultraviolet (UV) radiation and pollution. Failure to repair damaged DNA can lead to mutations, cellular dysfunction, and increased risk of **cancer**.¹⁷

L-ergothioneine appears to be able to **protect DNA integrity** by enhancing cellular repair functions and blocking some of the damage that can cause breaks and mutations.

For example, it can absorb UV light at the same wavelengths that DNA does, acting as a **built-in sunscreen** in skin cells that may protect against skin cancer. Preclinical evidence also shows that it can help support DNA repair processes in cells exposed to UV radiation and other DNA-damaging agents.^{2,18}



Preserving Brain Function

L-ergothioneine and its transporter are present throughout the brain, in multiple regions, including those involved in cognitive function, learning and memory.⁶ Several studies have linked **L-ergothioneine** to better **brain health**.

Studies have found that the decline in blood levels of this amino acid have been observed in people showing signs of **cognitive decline** and **neurodegenerative conditions** more than in healthy adults.^{8,9,19} This suggests that L-ergothioneine has a potential role in maintaining **cognitive function** and brain health as we age.^{9,20}

In preclinical studies L-ergothioneine enhances memory by promoting nerve cell maturation²¹ and the formation of new neurons,⁶ vital for learning and memory.

By protecting brain cells from oxidative stress, L-ergothioneine may help preserve cognitive function. In one prospective observational study, people aged 60 and over had lower ergothioneine blood levels, and those with mild cognitive impairment had especially low levels.⁹

In a **trial** with both healthy adults and individuals with **mild cognitive impairment**, consumption of a mushroom extract containing **5 mg** of L-ergothioneine daily for 12 weeks resulted in significant *improvements* in verbal memory, working memory, sustained attention, and other measures of **cognitive function** compared to a placebo group.⁷

L-Ergothioneine's Role in Healthy Aging

- **L-ergothioneine** is an amino acid found in mushrooms. Though our bodies do not produce it, we have dedicated transporter proteins to shuttle it into cells, suggesting its importance.
- In a prospective observational study, those who consumed more mushrooms had a **16% lower risk of death** than those who didn't, an effect the authors suggested may result from high ergothioneine content.
- L-ergothioneine may promote healthy aging by combating oxidative stress, reducing the rate of telomere shortening, and enhancing DNA repair.
- In a randomized controlled trial of adults with mild cognitive impairment, taking **5 mg** of L-ergothioneine daily significantly improved measures of **cognitive function**.
- Higher L-ergothioneine levels in the body were associated with better heart health and a **21% reduction in cardiovascular mortality** in a prospective observational study.

Cardiovascular Health

Research also shows that higher **L-ergothioneine** levels are associated with improved cardiovascular health.¹¹

A population study involving more than 3,200 subjects found that higher levels of **L-ergothioneine in the body** were associated with a **15%** lower risk of **coronary artery disease**, a **21%** reduction in **cardiovascular mortality**, and a **14%** reduction in **overall mortality**.¹¹

Daily L-ergothioneine intake may promote improved heart, brain, and overall health well into older age.

Summary

Scientists believe that the amino acid **L-ergothioneine** may be the key compound in **mushrooms** responsible for their health-promoting benefits.

It can combat **oxidative stress**, slow the rate of **telomere shortening**, preserve **cardiovascular health** and **cognitive function**, and support **DNA repair**.

In a population study, those consuming mushrooms high in **L-ergothioneine** had a significantly lower risk of death.

Those who don't include mushrooms in their daily diet may consider L-ergothioneine supplements. •

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



References

1. Ba DM, Gao X, Muscat J, et al. Association of mushroom consumption with all-cause and cause-specific mortality among American adults: prospective cohort study findings from NHANES III. *Nutr J*. 2021 Apr 22;20(1):38.
2. Markova NG, Karaman-Jurukovska N, Dong KK, et al. Skin cells and tissue are capable of using L-ergothioneine as an integral component of their antioxidant defense system. *Free Radic Biol Med*. 2009 Apr 15;46(8):1168-76.
3. Ames BN. Prolonging healthy aging: Longevity vitamins and proteins. *Proc Natl Acad Sci USA*. 2018 Oct 23;115(43):10836-44.
4. Samuel P, Tsapekos M, de Pedro N, et al. Ergothioneine Mitigates Telomere Shortening under Oxidative Stress Conditions. *J Diet Suppl*. 2022;19(2):212-25.
5. Tong Z, Chu G, Wan C, et al. Multiple Metabolites Derived from Mushrooms and Their Beneficial Effect on Alzheimer's Diseases. *Nutrients*. 2023 Jun 15;15(12).
6. Ishimoto T, Kato Y. Ergothioneine in the brain. *FEBS Lett*. 2022 May;596(10):1290-8.
7. Watanabe N MS, Suzuki M, Fukaya T, Kato Y, Hashiya N. Effect of ergothioneine on the cognitive function improvement in healthy volunteers and mild cognitive impairment subjects—A randomized, double-blind, parallel-group comparison study. *Jpn Pharmacol Ther*. 2020;48:685-97.
8. Wu LY, Kan CN, Cheah IK, et al. Low Plasma Ergothioneine Predicts Cognitive and Functional Decline in an Elderly Cohort Attending Memory Clinics. *Antioxidants (Basel)*. 2022 Aug 30;11(9).
9. Cheah IK, Feng L, Tang RMY, et al. Ergothioneine levels in an elderly population decrease with age and incidence of cognitive decline: a risk factor for neurodegeneration? *Biochem Biophys Res Commun*. 2016 Sep 9;478(1):162-7.
10. Cheah IK, Halliwell B. Ergothioneine, recent developments. *Redox Biol*. 2021 Jun;42:101868.
11. Smith E, Ottosson F, Hellstrand S, et al. Ergothioneine is associated with reduced mortality and decreased risk of cardiovascular disease. *Heart*. 2020 May;106(9):691-7.
12. Beelman RB, Kalaras MD, Phillips AT, Richie JP, Jr. Is ergothioneine a 'longevity vitamin' limited in the American diet? *J Nutr Sci*. 2020;9:e52.
13. Borodina I, Kenny LC, McCarthy CM, et al. The biology of ergothioneine, an antioxidant nutraceutical. *Nutr Res Rev*. 2020 Dec;33(2):190-217.
14. Liu HM, Tang W, Wang XY, et al. Safe and Effective Antioxidant: The Biological Mechanism and Potential Pathways of Ergothioneine in the Skin. *Molecules*. 2023 Feb 8;28(4):1648.
15. Warraich UE, Hussain F, Kayani HUR. Aging - Oxidative stress, antioxidants and computational modeling. *Heliyon*. 2020 May;6(5):e04107.
16. Paul BD, Snyder SH. The unusual amino acid L-ergothioneine is a physiologic cytoprotectant. *Cell Death Differ*. 2010 Jul;17(7):1134-40.
17. Alhmod JF, Woolley JF, Al Moustafa AE, Malki MI. DNA Damage/Repair Management in Cancers. *Cancers (Basel)*. 2020 Apr 23;12(4).
18. Dong KK, Damaghi N, Kibitel J, et al. A comparison of the relative antioxidant potency of L-ergothioneine and idebenone. *J Cosmet Dermatol*. 2007 Sep;6(3):183-8.
19. Ramirez-Martinez A, Wesolek N, Yadan J-C, et al. Intake assessment of L-ergothioneine in some European countries and in the United States. *Human and Ecological Risk Assessment: An International Journal*. 2015 2016/04/02;22(3):667-77.
20. Paul BD. Ergothioneine: A Stress Vitamin with Antiaging, Vascular, and Neuroprotective Roles? *Antioxid Redox Signal*. 2022 Jun;36(16-18):1306-17.
21. Nakamichi N, Nakao S, Nishiyama M, et al. Oral Administration of the Food-Derived Hydrophilic Antioxidant Ergothioneine Enhances Object Recognition Memory in Mice. *Curr Mol Pharmacol*. 2021;14(2):220-33.



Let the Sunshine In

D3, the sunshine vitamin, is key to strong bones and immune health

Vitamin D3 is the ultimate whole-body health supporter. A daily dose of D3 even supports your heart and vascular health and helps you maintain those healthy blood pressure levels.

Item #01713 • 125 mcg (5000 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.

MAGNESIUM

CRITICAL FOR
WHOLE-BODY HEALTH

Magnesium is a critically important mineral, yet most Americans do not obtain enough from their diet.

Magnesium helps:^{1,2}

- Keep **heart rhythm** steady.
- Promote normal **blood pressure**.
- Maintain normal **muscle** and **nerve function**.
- Support a healthy **immune system**.
- Keep **bones strong**.
- Maintain **blood sugar levels** already within normal range.

The suggested intake of magnesium to maintain vascular health from Life Extension is **500 mg** or more a day.



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

Item #01459 • 100 vegetarian capsules

1 bottle \$9 • 4 bottles \$7.50 each

References

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

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

Fish Oil + Olive Fruit +
Sesame Lignans =

SUPER OMEGA-3

2,400 mg
of EPA/DHA Fish Oil,
Sesame Lignans &
Olive Extract in
four softgels

Item #01982*
120 softgels
1 bottle \$30.75
4 bottles \$29 each



2,520 mg
of EPA/DHA Fish Oil,
Sesame Lignans,
Olive Extract, Krill &
Astaxanthin in
four softgels

Item #01988
120 softgels
1 bottle \$40.50
4 bottles \$37 each



Fish oil is a popular supplement people use to boost **omega-3** levels in the **heart, brain, eyes**, and other tissues.

Super Omega-3 provides healthy components of the **Mediterranean diet** including highly purified **fish oil**, **sesame lignans**, and standardized **olive fruit** extracts.

* IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc. This product has been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

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



For full product description and to order **SUPER OMEGA-3** and **SUPER OMEGA-3 PLUS**, 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.



ARMOR UP



Protect your cells with this powerful antioxidant and glutathione precursor.

Help your body fight back against free radicals—and encourage liver and respiratory health—with this easily absorbed immune health all-star.

GLUTEN
FREE

NON
GMO
LE CERTIFIED

Item #01534 • 600 mg • 60 capsules

1 bottle \$12 • 4 bottles \$10.75 each

For full product description and to order **N-Acetyl-L-Cysteine**, 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.

The 'Healthy Aging' Amino Acid



Essential Youth with L-Ergothioneine

L-ergothioneine is a nutrient derived from the amino acid histidine and found naturally in mushrooms.

L-ergothioneine may support healthy aging by:

- Protecting *mitochondrial DNA* function¹
- Helping to maintain *telomere* length²
- Supporting **DNA function** in cells subjected to UV exposure³

One daily capsule of **Essential Youth** provides **5 mg** of **L-ergothioneine**.

One daily capsule provides as much **L-ergothioneine** as up to 2 to 5 cups of white button mushrooms.^{4,5}

Item #02431
30 vegetarian capsules
1 bottle **\$19.50**
4 bottles \$17.50 each

For full product description and to order **Essential Youth L-Ergothioneine**, call **1-800-544-4440** or visit www.LifeExtension.com

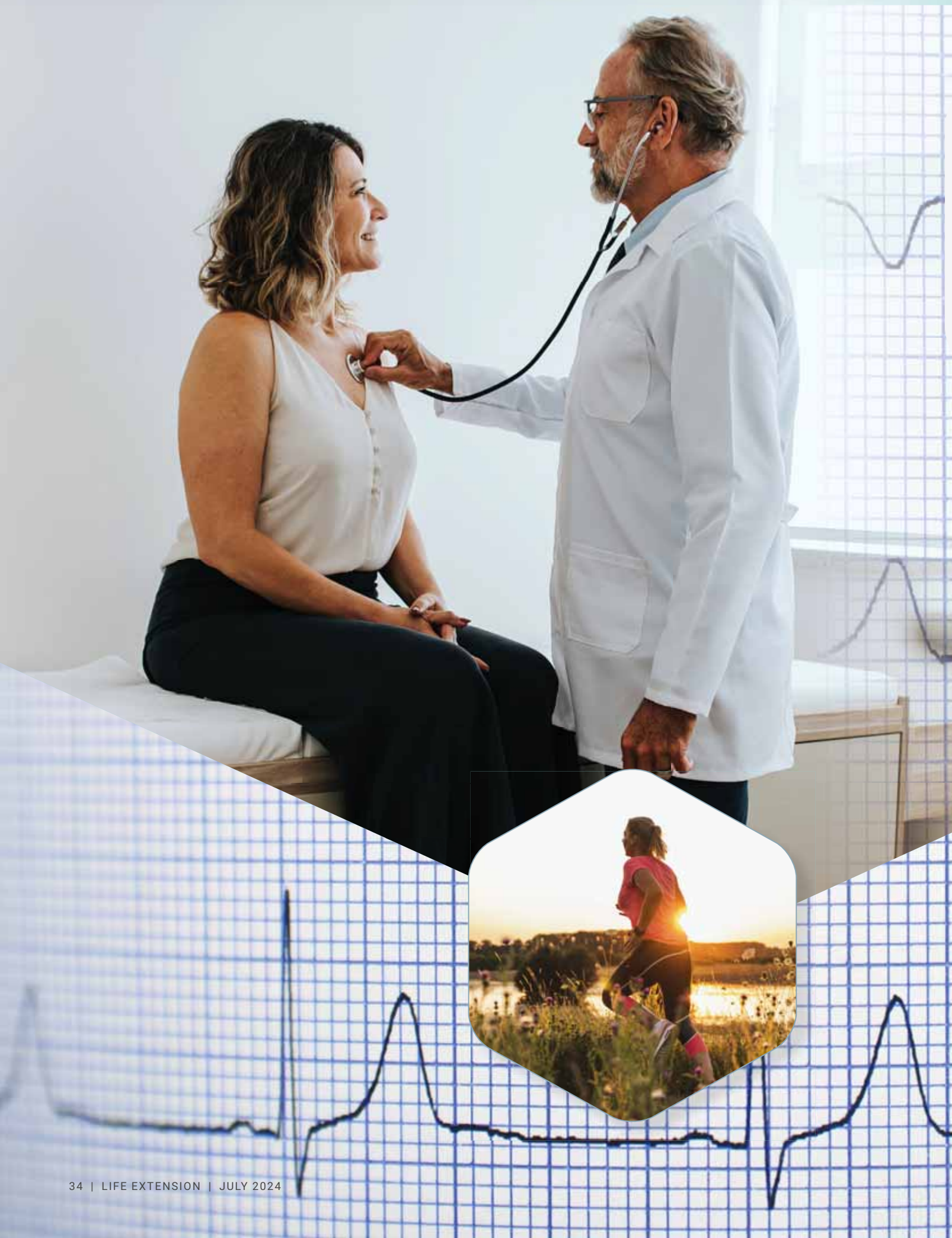
References

1. *Cell Death Differ.* 2010 Jul;17(7):1134-40.
2. *J Diet Suppl.* 2020 Dec 7:1-14.
3. *Free Radic Biol Med.* 2009 Apr 15;46(8):1168-76.
4. *FEBS Lett.* 2018 Oct;592(20):3357-66.
5. *Food Chem.* 2017 Oct 15;233:429-33.



ErgoActive® is a registered mark of Blue California.

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





How Aged Black Garlic Protects the HEART

BY MICHAEL DOWNEY

Heart disease remains America's leading cause of death.¹

Conventional recommendations for improving cardiovascular health include maintaining optimal levels of **blood pressure, low density lipoprotein, and glucose.**²

A new form of garlic known as **aged black garlic** has been shown in a recent **clinical study** to improve these and all other heart disease risk factors measured.³⁻⁶

Aged black garlic appears to offer another way to support cardiovascular health.

What is Aged Black Garlic?

Many people are aware of garlic’s broad health benefits, but few have heard of aged black garlic.

Garlic is known for its pungent odor/taste and methods have been developed to utilize the benefits of garlic and avoid the odor.⁵

Aged black garlic is formed when fresh, raw garlic is aged at high temperatures, between **140-** and **190-degrees F** for up to **90 days**.⁴⁻⁶

Aging alters garlic substantially. It develops a chewy texture, loses its pungent odor and flavor, and becomes sweet-tasting. This is due, in part, to the reduction of allicin content, after exposure to high temperature.^{5,6} Allicin is a sulfur compound in fresh garlic.^{4,6}

These changes produce beneficial compounds, including **flavonoids** and **polyphenols**.^{5,7} They also increase the amount of **S-allyl-cysteine (SAC)**,⁵ a garlic constituent that has been shown to provide **cardiovascular** health benefits.⁴⁻⁶

The concentration of **S-allyl-cysteine (SAC)** in raw, white garlic is low, but present in high amounts in **aged black garlic**. After oral ingestion, the beneficial **SAC** is easily absorbed in the gastrointestinal tract.⁴

Cardiovascular Benefits of SAC

S-allyl-cysteine (SAC) is associated with **cardio-protective** effects that include:⁴

- Inhibiting lipid peroxidation and oxidation of **LDL cholesterol**, a step in the development of **atherosclerosis**,
- Decreasing the synthesis and absorption of **cholesterol**,
- Lowering fasting **glucose** and **triglyceride** blood levels,
- Inhibiting activation of **nuclear factor-kappa B**, a pro-inflammatory protein, in cells lining the blood vessels,
- Helping prevent the **death** of cardiac muscle cells, and
- Enhancing production of **hydrogen sulfide**, which has a broad array of cardioprotective effects.

To maximize these cardiovascular benefits, scientists developed a **patented** process for producing an **aged black garlic extract**, with an *even higher* concentration of **SAC** than other forms.



With levels standardized to **0.5%**, this superior **black garlic extract** provides **2.5 mg** of **SAC** per single dose of a **500 mg** tablet.³

In a study published in **2023**, a research team tested its cardioprotective effects on **human** participants.³

Clinical Results

For this randomized, placebo-controlled trial, researchers enlisted 56 adults who were considered healthy but with a *borderline-degree risk* of **cardiovascular disease**.³

Subjects were given either a **placebo** or a capsule containing **500 mg** of aged **black garlic extract** providing **2.5 mg** of **S-allyl-cysteine** once daily.

Within just **12 weeks**, **eight different** markers for cardiovascular risk were dramatically improved:³

- Serum **triglycerides** were reduced by **12.3%**, compared to **2.5%** for placebo,
- **Total cholesterol** was lowered by **11.8%**, compared to **0.63%** for placebo,
- Protective **HDL** (“good” cholesterol) was *increased* by **11.5%**, compared to **0.17%** for placebo,
- The *ratio* of **total cholesterol** to **HDL** was reduced by **20.8%**, compared to **0.4%** for placebo,
- **LDL** cholesterol was lowered by **13%**, compared to **3%** for placebo,
- **Systolic blood pressure** (upper reading) decreased by **5.3%**, compared to **1.26%** for placebo,
- **Diastolic blood pressure** (lower reading) was reduced by **6.5%**, compared to **2.24%** for placebo, and
- **Fasting blood glucose** was lowered by **10.1%**, compared to **1.21%** for placebo.

These improvements represent a substantial shift toward improved cardiovascular health and reduced risk for occlusive coronary artery and valvular disorders that so many maturing individuals confront.

WHAT
YOU
NEED
TO
KNOW



The Cardiovascular Benefits of Aged Black Garlic

- A compound called **S-allyl-cysteine (SAC)** is known for its powerful **cardio-protective** effects.
- Unlike raw, fresh garlic, **aged black garlic** contains high levels of active, easily absorbable **SAC**.
- Scientists have developed an optimized **aged black garlic extract** that provides an even *higher* **SAC** concentration than other extracts.
- Results from a clinical study published in 2023 show that this **aged black garlic** extract improved **eight** critical markers of cardiovascular health. It lowered blood pressure, total and LDL cholesterol, fasting blood glucose levels, triglycerides, and more.
- These effects may help reduce the risk of **heart disease** and promote better cardiovascular health.

Summary

Aged black garlic contains high concentrations of a compound called **S-allyl-cysteine (SAC)**, which has been shown to provide potent support for **cardiovascular health**.

Scientists have developed an **aged black garlic extract** with an even *higher* concentration of **S-allyl-cysteine** content than other extracts, standardized to **0.5%**.

A recent clinical trial demonstrated that taking a single daily dose of this optimized **aged black garlic extract** significantly improved **eight** different markers for cardiovascular health. •

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

References

1. Available at: <https://www.cdc.gov/heartdisease/facts.htm>. Accessed April 1, 2024.
2. Available at: <https://www.cdc.gov/heartdisease/prevention.htm>. Accessed April 1, 2024.
3. Nirvanashetty S. High Potency Aged Garlic Extract reduces Cardiovascular Disease Risk Factors in Healthy Participants: A Randomized, Double-Blind, Placebo Controlled Study. *Journal of Complementary and Alternative Medicine*. 2023 September 20, 2023;6(1).
4. Rais N, Ved A, Ahmad R, et al. S-Allyl-L-Cysteine — A garlic Bioactive: Physicochemical Nature, Mechanism, Pharmacokinetics, and health promoting activities. *Journal of Functional Foods*. 2023 2023/08/01;107:105657.
5. Ryu JH, Kang D. Physicochemical Properties, Biological Activity, Health Benefits, and General Limitations of Aged Black Garlic: A Review. *Molecules*. 2017 Jun 1;22(6).
6. Ahmed T, Wang CK. Black Garlic and Its Bioactive Compounds on Human Health Diseases: A Review. *Molecules*. 2021 Aug 19;26(16).
7. Choi IS, Cha HS, Lee YS. Physicochemical and antioxidant properties of black garlic. *Molecules*. 2014 Oct 20;19(10):16811-23.



Re-Energize Heart and Brain Cells

Three Choices of
Superior
Ubiquinol CoQ10
Mitochondrial
Delivery System

"My gift to my
heart."

Donna

VERIFIED CUSTOMER
REVIEW



100 mg CoQ10

Item #01426 • 100 mg, 60 softgels

1 bottle **\$42**

4 bottles \$37.50 each



200 mg CoQ10

Item #01431 • 200 mg, 30 softgels

1 bottle **\$39**

4 bottles \$35 each



100 mg CoQ10 + 10 mg PQQ

Item #01733 • 100 mg, 30 softgels

1 bottle **\$33.75**

4 bottles \$29 each

#1 Rated CoQ10 Products - 5 Time Winner!*



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.

*2023 Consumer Satisfaction, Rated #1 Catalog/Internet Merchant. Ratings based on results of the 2023 ConsumerLab.com Survey of Supplement Users. More information at www.consumerlab.com/survey.



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.



Annual Lab Test Sale

Through July 8, 2024

Save **25%**
on ALL
Lab Tests

Over 250 Labs to choose from.
Find Out if You're at Risk for Heart Disease,
Cancer, Alzheimer's, Diabetes & More.



1-2-3 EASY How it works:

ORDER

Call **1-800-208-3444** or visit
www.LifeExtension.com/sales/lab-tests

DRAW

For your blood draw, bring the requisition we send you to your nearest LabCorp location. Nearest locations are included with your requisition papers.

At-Home tests (denoted by *) are collected in the convenience of your home.

REVIEW

Go over results **for free** with our Wellness Specialists by calling **1-800-226-2370**. You may wish to review them with your doctor as well.

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

For Our Local Customers:

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

**900 NORTH FEDERAL HIGHWAY
FT. LAUDERDALE, FL, 33304**

Terms and Conditions

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

	REGULAR PRICE	SALE PRICE
--	---------------	------------

MALE AND FEMALE PANELS

- MALE PANEL (LC322582)** ~~\$299~~ **\$224**
CBC/Chemistry/Lipids Panel • DHEA-S • PSA (prostate-specific antigen) • Homocysteine • C-Reactive Protein (high sensitivity) • ApoB • Free Testosterone • Total Testosterone • Estradiol • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c • Insulin • Magnesium
- FEMALE PANEL (LC322535)** ~~\$299~~ **\$224**
CBC/Chemistry/Lipids Panel • DHEA-S • Estradiol • Homocysteine • ApoB • C-Reactive Protein (high sensitivity) • Progesterone • Free Testosterone • Total Testosterone • TSH for thyroid function • Vitamin D (25-hydroxyvitamin D) • Hemoglobin A1c • Insulin • Magnesium

HEART HEALTH

- CARDIO CORE ESSENTIALS (LC100086)** ~~\$89~~ **\$66.75**
 Essential cardiovascular risk factors provide a low-cost analysis of your heart and vascular function. CBC • Chem/Metabolic Panel • Lipid/Cholesterol Profile • ApoB • C-Reactive Protein (high sensitivity)
- NMR LIPOPROFILE® (LC123810)** ~~\$99~~ **\$74.25**
 The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.
- NMR LIPOPROFILE PLUS* (LC100049)** ~~\$269~~ **\$201.75**
 In-depth analysis of cardiovascular risk markers including: NMR LipoProfile, C-Reactive Protein, **Myeloperoxidase**, and **Oxidized LDL**.
- OXIDIZED LDL (LC123023)** ~~\$75~~ **\$56.25**
 Oxidized low-density lipoprotein (LDL) cholesterol is one of the main causes of the formation of atherosclerotic plaque in the arterial wall. This blood test measures levels of oxidized LDL.
- MYELOPEROXIDASE (MPO)* (LC123006)** ~~\$99~~ **\$74.25**
 The myeloperoxidase (MPO) test measures levels of an enzyme that oxidizes low-density lipoprotein (LDL) cholesterol, which could lead to increased arterial plaque formation.
- OMEGA-3 INDEX COMPLETE* (LC100066)** ~~\$99~~ **\$74.25**
 Beneficial for everyone! People **not** taking omega-3/fish oil should check their baseline Omega-3 Index to see if it is in the desirable or concerning range. Those taking Omega-3/fish oil supplements should take the test to see if they need to adjust their dosage. You want to target a range of **8%-12%** for your Omega-3 Index score.

CONDITION-SPECIFIC TESTS

- PERSONALIZED AMINO ACID HEALTH ASSESSMENT* (LC100090)** ~~\$299~~ **\$224.25**
 An in-depth analysis of amino acid metabolism provides insight into various health concerns, such as maldigestion, GI dysbiosis, neurological issues and more, with a personalized report of diet and supplementation suggestions. Provided as an at-home urine collection kit.
- ENVIRONMENTAL POLLUTANTS PROFILE** (LC100089)** ~~\$149~~ **\$111.75**
 Toxic pollutants affect our bodies in several different ways. This test helps assess possible exposure to several common environmental pollutants by measuring their urinary metabolites.

Know YOUR NUMBERS



- | | REGULAR PRICE | SALE PRICE |
|--|------------------|-----------------|
| ○ GI360™ ** STOOL ANALYSIS (LC100088)
Best and most advanced assessment of microbiome dysbiosis, diversity and digestive health, the GI360™ provides the most information about gut and microbiome health. Contains all the tests included in the CPP and CSAP along with cutting-edge markers of microbiome diversity and dysbiosis. | \$499 | \$379.25 |
| ○ TOXIC METALS PANEL (FECAL)*† (LC100076)
The results of fecal elemental analysis can help you identify and eliminate dietary exposure to toxic metals, while also assessing the body's natural excretion of metals. The panel tests Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Platinum, Thallium, Tungsten, and Uranium. | \$170 | \$127.50 |
| ○ NEUROTRANSMITTER PANEL-COMP.*† (LC100085)
Serotonin, Dopamine, Epinephrine, Norepinephrine, GABA, Glutamate, Glycine, Histamine, PEA, DOPAC, 3-MT, Normetanephrine, Metanephrine, 5-HIAA, Tryptamine, Tyrosine, Tyramine, Taurine. Alterations in neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, craving, addictions, pain, and more. | \$295 | \$221.25 |
| ○ PRO7 ADVANCED NUTRIGENOMIC PROFILE* (LC100097)
Analyzes genetics in 7 key areas of health (methylation, neurotransmitters, mitochondrial health, detoxification, inflammation, and more) and provides genetically targeted nutritional suggestions. | \$299 | \$224.25 |
| ○ APOE GENETIC TEST FOR ALZHEIMER'S AND CARDIAC RISK* (LC100059)
This simple at-home cheek swab reveals your ApoE genotype and association with risk of Alzheimer's and cardiovascular disease. | \$149 | \$111.75 |
| ○ FOOD SENSITIVITY PANEL-ELITE*† (LC100096)
This in-depth food sensitivity assessment measures both IgG and IgA response to 240 foods. | \$449 | \$336.75 |
| ○ GUT BARRIER PANEL** (LC900004)
Measure immune response (IgG/C3d & IgA) to three key GI markers associated with intestinal permeability and leaky gut: Candida, Zonulin, and Occludin. | \$165 | \$123.75 |

NEW TESTS

- | | | |
|--|------------------|-----------------|
| ○ HAIR LOSS PANEL (COMPREHENSIVE) (LC900005)
Deep dive into various factors underlying hair loss concerns, including hormones, thyroid, inflammation, and more! • E2 • Testosterone DHEA-s • DHT • TSH • fT4 • fT3 • rT3 • cortisol • insulin • ferritin • CRP | \$250 | \$187.50 |
| ○ HAIR LOSS PANEL (BASIC) (LC900006)
Check common factors associated with hair loss, like stress, thyroid concerns and inflammation. • DHT • TSH • Cortisol • Ferritin • CRP | \$99 | \$74.25 |
| ○ MOLD EXPOSURE MYCOTOXIN URINE TEST* (LC900007)
Concerned about mold exposure? This convenient at-home urine test detects exposure to 16 common mycotoxins (toxins produced by mold). | \$399 | \$299.25 |
| ○ ENVIRONMENTAL MOLD & MYCOTOXIN ANALYSIS* (LC900008)
Worried about mold in your home or office? Check for mold and mycotoxins by swabbing a dusty area in your home! | \$399 | \$299.25 |
| ○ BODY AND HOME MOLD & MYCOTOXIN COMBO TEST* (LC900009)
Combine the two tests above for additional savings to check if the mycotoxins in your body are the same as those in your home! | \$749 | \$561.75 |

WHOLE-BODY HEALTH

- | | REGULAR PRICE | SALE PRICE |
|--|------------------|-----------------|
| ○ MALE ELITE PANEL* (LC100016)
CBC/Chemistry/Lipids Panel • Free and Total Testosterone • Estradiol • Total Estrogens • DHEA-S • Progesterone • Pregnenolone • TSH • DHT • FSH • LH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Free and Total PSA • Vitamin D 25-OH • hs-CRP • Ferritin • TIBC • Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium | \$575 | \$431.25 |
| ○ MALE BASIC HORMONE PANEL (LC100012)
DHEA-S • Estradiol • Total and Free Testosterone • PSA | \$75 | \$56.25 |
| ○ FEMALE ELITE PANEL (LC100017)
CBC/Chemistry/Lipids Panel • Free and total Testosterone • Estradiol • Total Lipids • Estrone • DHEA-S • Progesterone • Pregnenolone • DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • Ferritin • TIBC • Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium | \$575 | \$431.25 |
| ○ FEMALE BASIC HORMONE PANEL (LC100013)
DHEA-S • Estradiol • Total and Free Testosterone • Progesterone | \$75 | \$56.25 |
| ○ WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028)
CBC/Chemistry/Lipids Panel • DHEA-S • Free and Total Testosterone • Estradiol • Progesterone • Cortisol • TSH • Free T3 • Free T4 • Reverse T3 • Insulin • Hemoglobin A1c • Vitamin D 25-hydroxy • Ferritin • C-reactive protein (high sensitivity) | \$275 | \$206.25 |
| ○ HEALTHY AGING PANEL-COMPREHENSIVE (LC100026)
CBC/Chemistry/Lipids Panel • C-reactive protein (high sensitivity) • Vitamin B12 • Folate • Homocysteine • Vitamin D 25-hydroxy • Hemoglobin A1c • TSH • Free T3 • Free T4 • Ferritin • Urinalysis • ApoB • Insulin | \$249 | \$186.75 |
| ○ COMPLETE HORMONE & METABOLITES PROFILE (HUMAP)*† (LC900001)
Comprehensive assessment of hormones and their metabolites. This urine test helps assess how your body metabolizes hormones, providing insight into endogenous hormone secretion, supplemental hormone utilization, enzyme activity, oxidative stress. | \$299 | \$224.25 |

CBC/CHEMISTRY/LIPIDS PANEL

These **CBC/Chemistry/Lipids Panel** tests are included in the popular **Male and Female Panels**, and other panels on this page so you don't have to order them separately.

CARDIOVASCULAR RISK

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

LIVER FUNCTION

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

KIDNEY FUNCTION

BUN • Creatinine • BUN/Creatinine Ratio • Uric Acid

BLOOD PROTEINS

Total Protein • Albumin • Globulin • Albumin/Globulin Ratio

BLOOD COUNTS

Red Blood Cell Count • White Blood Cell Count • Eosinophils Neutrophils (Absolute) • Lymphs (Absolute) • Eos (Absolute) Baso (Absolute) • RDW • Monocytes (Absolute) • Monocytes Lymphocytes • Platelet Count • Hemoglobin • Hematocrit MCV • MCH • MCHC • Neutrophils

BLOOD MINERALS

Calcium • Potassium • Sodium • Chloride • Iron

The sale price for the **CBC/Chemistry/Lipids Panel** alone is **\$26.25**.
(LC381822)

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

* This test is packaged as a kit.

† Not available in NY.

Lab tests available in the continental United States and Anchorage, AK only.
Restrictions apply in NY, NJ, RI, and MA. Not available in MD. Kits not available in PA.



Don't Weight Around

MEAL PLAN

	BREAKFAST	LUNCH	DINNER
DAY 1			
DAY 2			
DAY 3			
DAY 4			
DAY 5			

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.



Item #02478
60 vegetarian capsules
1 bottle **\$36**
4 bottles \$32 each



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[®] is a Lonza trademark registered in USA.

Some Things
Get Better With Age.

Aged
**Black
Garlic**
For Heart Health.



Item #02530

500 mg

30 vegetarian capsules

1 bottle \$18

4 bottles \$17 each

Garzac® is a registered trademark of
Olene Life Sciences Pvt. Ltd.

Black garlic is created through a patent-pending, solvent-free, 30-90-day **aging** process.

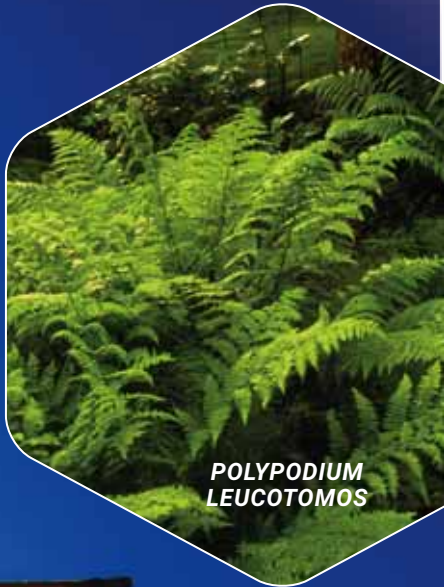
This produces a high content of **S-allyl-cysteine**, a phytochemical associated with cardiovascular health.¹⁻⁴

Clinical research has shown that, **aged black garlic** provides targeted support for healthy serum triglycerides, blood pressure, and cholesterol within normal range.⁴

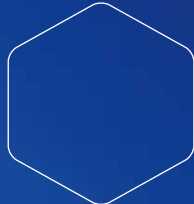
For full product description and to order **Aged Black Garlic**, call **1-800-544-4440** or visit **www.LifeExtension.com**

References: 1. *Molecules*. 2021 Aug 19;26(16):5028. 2. *Journal of Functional Foods*. 107(2023):105657 3. *Molecules*. 2017 Jun 1;22(6) : 919. 4. *OAJCAM*. September 20, 2023;6(1).

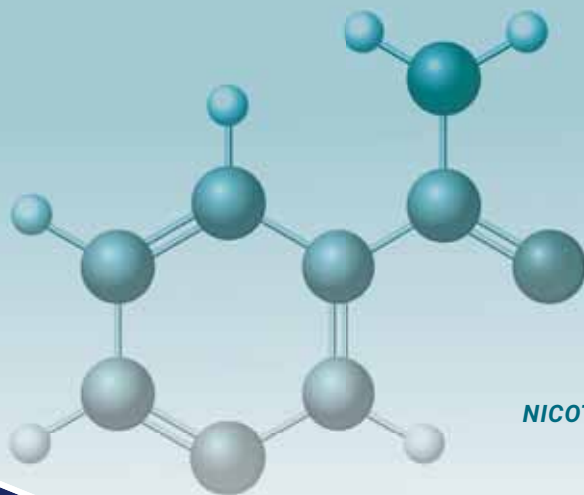
These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.



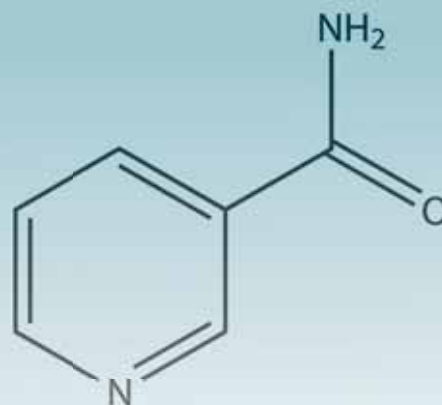
POLYPODIUM
LEUCOTOMOS



More
Complete
SUN
PROTECTION



NICOTINAMIDE



BY MICHAEL DOWNEY



SICILIAN RED ORANGE

Nothing ages skin faster than the sun's **ultraviolet (UV)** rays.¹

Sun exposure causes DNA damage that leads to **prema-ture skin aging** and increases the risk of **skin cancer**.¹⁻³

Daily sunscreen use is essential. But even this won't provide total protection.^{2,4}

An extract of a Central American fern called ***Polypodium leucotomos***, when taken orally, helps prevent ultraviolet rays from damaging your skin and potentially increasing cancer risk.

This extract protects skin cells all over your body, from the *inside out*.

A clinical trial showed that taking ***Polypodium*** extract before UV exposure led to a striking **84% decrease** in a UV-induced DNA mutation.⁵

Two additional oral compounds, **Sicilian red orange extract**⁶ and **nicotinamide**,^{7,8} provide further protection against damage from exposure to the sun's harmful rays.

Together, these ingredients can serve as a kind of "**oral sunscreen**." Used along with a topical sunblock, they provide all-day, **whole-body** protection.

Why Sunscreen Isn't Enough

Getting too much sun can lead to sunburn, **photo-aging** (premature skin aging), and skin **cancer**.

However, topical sunblocks and sunscreens cannot provide *total* protection because they:

- Don't protect the scalp or eyelids,
- May be rubbed or washed off by clothing or moisture/swimming,
- May be labeled incorrectly,⁹
- Don't protect areas of the body that UV rays reach by penetrating clothing,¹⁰
- Mostly shield against UVB rays (which are responsible for sunburns) but may not protect sufficiently against UVA rays (which promote DNA damage and skin aging),^{9,11} and
- May contain potentially harmful chemicals.¹²

There's a way to protect against damage done by the sun comprehensively: with sunscreen, protective clothing, and a combination of **three nutrients** taken orally. These nutrients, in separate studies, have been shown to guard against the harm done by UV rays.



Polypodium Protects Against UV Radiation

Polypodium leucotomos is a tropical fern containing polyphenols that protect the skin against sun damage.

Preclinical research shows that **Polypodium** extract has the ability to:^{13,14}

- Inhibit harmful **oxidative stress**,¹³
- Increase **glutathione**, the body's natural antioxidant,¹³
- Reduce **inflammation**,^{13,15}
- Protect the skin's tissue, a barrier against infection and environmental toxins,¹⁴
- Inhibit the breakdown of **elastin** and **collagen**, proteins that keep skin firm and youthful looking,¹⁴ and
- Support the immune system's **tumor surveillance**, the ability to identify and destroy cancerous cells.^{14,16}

Based on these effects, scientists set out to test *Polypodium leucotomos* in **humans**.

Preventing DNA Mutations

DNA mutations are a main cause of **skin cancer** and one of the causes of prematurely aged skin. This led investigators to study the DNA-protective effects of **Polypodium**.

In a **clinical trial**, volunteers aged 29 to 54 took either **240 mg** of **Polypodium leucotomos** extract or a **placebo** two times: eight hours and two hours *before* being exposed to ultraviolet rays.⁵

When exposed to a **low** dose of UV light:⁵

- Placebo participants had a **217% increase** in a damaging DNA mutation, while,
- **Polypodium**-taking participants had a striking **84% decrease** in that mutation.

When exposed to a **higher** dose of UV light:⁵

- The DNA mutation in the **placebo** group increased by a shocking **760%**, while
- The DNA mutation in the **Polypodium** group increased by only **61%**.

Another clinical study showed that a similar dose of **Polypodium** extract taken two hours and one hour before UV exposure helped prevent **redness** and **reduced**:¹⁵

- A **DNA damage** marker by **32%**,
- An **inflammation** marker by **78%**, and
- **Tumor** progression markers by an astonishing **85%-100%**.

Sun Defense with Nicotinamide

Nicotinamide is a form of vitamin B3.

Preclinical and human studies show that, taken **orally**, it helps prevent UV-light-induced **skin cancer** by:^{7,17-20}

- Protecting against skin cancer mutations,^{19,21}
- Enhancing DNA repair,^{17,18}
- Reducing inflammation and skin pigmentation,^{18,19}
- Preventing skin immune suppression,^{17,18,20}
- Boosting skin barrier function,⁷ and
- Preventing cellular energy depletion and *restoring* these energy levels after UV exposure.¹⁹

A clinical study enlisted healthy adults at high risk for skin cancer. In those given **500 mg** of **nicotinamide** twice daily for 12 months, the rate of new, non-melanoma **skin cancers** was reduced by **23%**, compared to a placebo.²²

Red Orange Protects Against Sunburn

An extract derived from Sicilian red orange contains high levels of anthocyanins, flavonoids, and polyphenols, which protect against UV-induced inflammation and oxidative stress.

A lab investigation showed that **red orange extract**:²³

- Reduced inflammatory markers,
- Inhibited cell damage, and
- Decreased skin cell death.



WHAT
YOU
NEED
TO
KNOW

Protect Against Sun Damage

- The sun's ultraviolet radiation is a major cause of **skin cancer** and premature **skin aging**.
- Taken orally, an extract of a fern called **Polypodium leucotomos** prevents UV-induced, cancer-causing DNA damage and promotes DNA repair.
- Two other nutrients, **nicotinamide** (a form of vitamin B3) and **Sicilian red orange extract**, further boost sun protection.
- An oral combination of all three ingredients can decrease sunburn intensity and inflammation and protect against **skin cancer** and **skin aging**.
- Combined with a topical sunblock, these compounds can provide *optimal* whole-body sun protection.

When **human** skin cells were treated with **Sicilian red orange extract** before being exposed to UV radiation:²⁴

- UV damage was prevented,
- DNA was protected,
- Oxidative stress was reduced, and
- Photoaging responses and inflammatory markers were decreased.

In a **clinical** study, volunteers took **100 mg** of **Sicilian red orange** extract daily for 15 days and were regularly exposed to a solar lamp. The extract decreased **redness** and **sunburn** by **40%** and skin pigment changes by **20%**.⁶

The lifetime number of severe sunburns is closely correlated to **skin cancer** development, making this protection extremely significant.

Red orange, combined with *Polypodium* and nicotinamide, helps protect against the damage sun exposure can do.

Summary

The sun's ultraviolet rays accelerate **skin aging** and increase **skin cancer** risk.

Taken **orally**, an extract of a fern called ***Polypodium leucotomos*** protects against UV-induced DNA mutations and inflammation, while promoting DNA repair.

Nicotinamide and **Sicilian red orange extract** provide additional support for sun protection.

Combined with a topical sunblock, these three nutrients can maximize total-body sun defense for the skin. •

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



References

1. Ansary TM, Hossain MR, Kamiya K, et al. Inflammatory Molecules Associated with Ultraviolet Radiation-Mediated Skin Aging. *Int J Mol Sci*. 2021 Apr 12;22(8):3974.
2. Available at: <https://www.skincancer.org/risk-factors/uv-radiation/>. Accessed 03/08/2023,
3. Available at: <https://www.cancer.gov/about-cancer/causes-prevention/risk/sunlight>. Accessed April 9, 2024.
4. Sander M, Sander M, Burbidge T, Beecker J. The efficacy and safety of sunscreen use for the prevention of skin cancer. *Cmaj*. 2020 Dec 14;192(50):E1802-e8.
5. Villa A, Viera MH, Amini S, et al. Decrease of ultraviolet A light-induced "common deletion" in healthy volunteers after oral *Polypodium leucotomos* extract supplement in a randomized clinical trial. *J Am Acad Dermatol*. 2010 Mar;62(3):511-3.
6. Puglia C, Offerta A, Saija A, et al. Protective effect of red orange extract supplementation against UV-induced skin damages: photoaging and solar lentigines. *J Cosmet Dermatol*. 2014 Jun;13(2):151-7.
7. Snaird VA, Damian DL, Halliday GM. Nicotinamide for photoprotection and skin cancer chemoprevention: A review of efficacy and safety. *Exp Dermatol*. 2019 Feb;28 Suppl 1:15-22.
8. Parrado C, Philips N, Gilaberte Y, et al. Oral Photoprotection: Effective Agents and Potential Candidates. *Front Med (Lausanne)*. 2018;5:188.
9. Andrews DQ, Rauhe K, Burns C, et al. Laboratory testing of sunscreens on the US market finds lower in vitro SPF values than on labels and even less UVA protection. *Photodermatol Photoimmunol Photomed*. 2022 May;38(3):224-32.
10. Available at: <https://www.skincancer.org/skin-cancer-prevention/sun-protection/sun-protective-clothing/>. Accessed 03/18/2023,
11. Available at: <https://www.ewg.org/sunscreen/report/whats-wrong-with-high-spf/>. Accessed 03/18/2023,
12. Available at: <https://www.ewg.org/sunscreen/imperfect-protection/>. Accessed, April 2024.
13. Segars K, McCarver V, Miller RA. Dermatologic Applications of *Polypodium leucotomos*: A Literature Review. *J Clin Aesthet Dermatol*. 2021 Feb;14(2):50-60.
14. Calzari P, Vaianti S, Nazzaro G. Uses of *Polypodium leucotomos* Extract in Oncodermatology. *J Clin Med*. 2023 Jan 14;12(2):673.
15. Kohli I, Shafi R, Isedeh P, et al. The impact of oral *Polypodium leucotomos* extract on ultraviolet B response: A human clinical study. *J Am Acad Dermatol*. 2017 Jul;77(1):33-41 e1.
16. Chen AC, Halliday GM, Damian DL. Non-melanoma skin cancer: carcinogenesis and chemoprevention. *Pathology*. 2013 Apr;45(3):331-41.
17. Damian DL. Nicotinamide for skin cancer chemoprevention. *Australas J Dermatol*. 2017 Aug;58(3):174-80.
18. Minocha R, Damian DL, Halliday GM. Melanoma and non-melanoma skin cancer chemoprevention: A role for nicotinamide? *Photodermatol Photoimmunol Photomed*. 2018 Jan;34(1):5-12.
19. Boo YC. Mechanistic Basis and Clinical Evidence for the Applications of Nicotinamide (Niacinamide) to Control Skin Aging and Pigmentation. *Antioxidants (Basel)*. 2021 Aug 21;10(8):1315.
20. Yiasemides E, Sivapirabu G, Halliday GM, et al. Oral nicotinamide protects against ultraviolet radiation-induced immunosuppression in humans. *Carcinogenesis*. 2009 Jan;30(1):101-5.
21. Fania L, Mazzanti C, Campione E, et al. Role of Nicotinamide in Genomic Stability and Skin Cancer Chemoprevention. *Int J Mol Sci*. 2019 Nov 26;20(23).
22. Chen AC, Martin AJ, Choy B, et al. A Phase 3 Randomized Trial of Nicotinamide for Skin-Cancer Chemoprevention. *N Engl J Med*. 2015 Oct 22;373(17):1618-26.
23. Cimino F, Cristani M, Saija A, et al. Protective effects of a red orange extract on UVB-induced damage in human keratinocytes. *Biofactors*. 2007;30(2):129-38.
24. Tomasello B, Malfa GA, Acquaviva R, et al. Phytocomplex of a Standardized Extract from Red Orange (*Citrus sinensis* L. Osbeck) against Photoaging. *Cells*. 2022 Apr 25;11(9).

COMPREHENSIVE EYE HEALTH FORMULA

MACUGUARD® OCULAR SUPPORT PROVIDES:

- **Lutein, trans-zeaxanthin, and meso-zeaxanthin** help maintain structural integrity of the **macula** and **retina**.¹⁻⁵
- **Saffron** has been shown to help support **vision** as demonstrated by doctors' eye exams.¹
- **Alpha-carotene** further helps support **macular density**.¹

For full product description and to order either of these **MACUGUARD®** formulas, call **1-800-544-4440** or visit **www.LifeExtension.com**

References

1. *JAMA Ophthalmol.* 2015;133(12):1415-24.
2. *Nutrients.* 2013 April;5(4):1169-85.
3. *Nutrition.* 2011 Sep;27(9):960-6.
4. *Free Radic Biol Med.* 2012;53(6):1298-307.
5. *J Ophthalmol.* 2015;2015:523027.



MACUGUARD® OCULAR SUPPORT WITH SAFFRON + ASTAXANTHIN

Item #01993 • 60 softgels

1 bottle **\$32.25** • 4 bottles \$29 each



MACUGUARD® OCULAR SUPPORT WITH SAFFRON

Item #01992 • 60 softgels

1 bottle **\$18** • 4 bottles \$17 each

"This is a great
item for me."

Martin

VERIFIED CUSTOMER
REVIEW

(Each bottle lasts for two months.)

MacuGuard® Ocular Support is available with or without astaxanthin.

MacuGuard® Ocular Support with Saffron has met ConsumerLab.com standards for ingredient and product quality for Lutein and Zeaxanthin in independent testing. More information at www.consumerlab.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.



Dryness and loss of firmness are outward signs of normal aging.

One reason is loss of **ceramides** that are required for skin to retain its **moisture** and youthful suppleness.

Skin Restoring Ceramides contains wheat-derived ceramide lipids in an **oral** capsule that **hydrate** the skin and smooth the appearance of fine lines and wrinkles.

Restore Smoother, Youthful-Looking Skin from the Inside Out

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

Item #02096
30 liquid vegetarian capsules
1 bottle \$18.75
4 bottles \$17.25 each

Ceratiq® is a registered joint-trademark of PLT Health Solutions and Arco, Robertet Group, France.

Contains wheat. Gluten free.



GLUTEN
FREE

1
DAILY

NON
GMO
LE CERTIFIED

VEGETARIAN
LE CERTIFIED

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.

"I like what I see when
I look in my mirror!"

Nancy

VERIFIED CUSTOMER
REVIEW

*The quickest way to
betray your age is with
a tired appearance...*



Revive Hair, Skin, and Nails from Within

For full product description and to order Hair,
Skin & Nails Collagen Plus Formula, call
1-800-544-4440 or visit www.LifeExtension.com

Working from the inside out, **Hair, Skin & Nails Collagen Plus Formula** is an oral supplement with nutrients shown to benefit the hair, skin, and nails to keep them looking vibrant and healthy.

Rejuvenating nutrients include:

- **VERISOL® Bioactive Collagen Peptides®**—Stimulates the formation of new collagen and elastin to promote skin suppleness and elasticity¹
- **Cynatine® HNS Plus**—Provides solubilized keratin, zinc, B vitamins, biotin, and copper to boost production of keratin for strong hair, skin, and nails
- **Biotin**—Supports nail strength and integrity²
- **Silicon**—For the formation of collagen and keratin molecules³

Item #02322 • 120 tablets

1 bottle **\$24.75**

4 bottles \$22.50 each

Caution: Individuals with inborn errors of copper metabolism (e.g. Wilson's disease) should avoid daily, chronic use of this product.

Cynatine® is a registered trademark of Roxlor, LLC. VERISOL® and Bioactive Collagen Peptides® are registered trademarks of GELITA AG.

References

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



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.

NEURO-MAG[®]

THE SMART MAGNESIUM



Supports
Improvement in
Overall Cognitive
Ability



Neuro-Mag[®] Magnesium L-Threonate was formulated by MIT scientists to be uniquely absorbable into the **brain**.

Magnesium L-Threonate has been shown to improve **synaptic density** and other structural components of the brain.¹⁻³



Item #01603 • 90 vegetarian capsules
1 bottle **\$30.75** • 4 bottles \$27.50 each



Item #02032 • 93.35 grams of powder
1 jar **\$30.75** • 4 jars \$27.50 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

References: 1. *Neuropharmacology*. 2016 2016/09/01;108:426-39. 2. *Journal of Cellular Physiology*. 2016;231(9):1903-12. 3. *J Alzheimers Dis*. 2016;49(4):971-90.

Magtein[®] is a trademark of Magceutics[®], Inc. and is distributed exclusively by AIDP, Inc.

Magtein[®] is protected under a family of US patents, pending patents, and is protected worldwide.

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.

Love the Sun?

Unique ORAL formula provides *Polypodium leucotomos* fern extract along with nicotinamide and red orange extract.

Shield Your Skin
from Within



"I now have peace of mind knowing I'm doing what I can to protect myself."

Elaine

VERIFIED CUSTOMER
REVIEW

Item #01938

120 vegetarian capsules

1 bottle \$33

2 bottles \$30 each




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

CAUTION: This product is not a substitute for topical sunscreens. Gastric disturbances may occur. Consult with your healthcare provider before taking this product if you have gout or liver disease.

Red Orange Complex™ is a trademark of Bionap S.r.l.

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.



Some people want *extra* support for optimal bone strength and flexibility.

Bone Strength Collagen Formula provides **collagen** as a patented **chelated calcium** designed to support bone health.

Magnesium, silicon, vitamin D3, and boron are included to further skeletal support.

STRONGER BONES STRONGER YOU

KoAct® is a patented form of bone collagen with calcium designed to support bone strength and maintain optimal bone health. KoAct® is a registered trademark of AIDP, Inc. Fruitex B® and OsteoBoron® are registered trademarks of VDF Futureceuticals, Inc. U.S. Patent No. 5,962,049.

Item #01725 • 120 capsules

1 bottle **\$33.75** • 4 bottles \$30 each



For full product description and to order **Bone Strength Collagen Formula**, 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.

What are Prebiotics?



BY LAURIE MATHENA

Prebiotics and **probiotics** work hand-in-hand to promote optimal digestive health.

Probiotics are live microorganisms that help keep you healthy when consumed in appropriate amounts, while **prebiotics** are non-digestible fermentable fibers that feed the growth and activity of **healthy bacteria**.

One prebiotic type is called **xylo-oligosaccharides**—sometimes shortened to **XOS**—and is particularly beneficial for two key reasons.

First, it helps restore healthy levels of *Bifidobacteria*.¹⁻³ These are beneficial bacteria associated with protection against allergies, high cholesterol levels, respiratory diseases, and more.⁴

Second, it works at small doses, minimizing unpleasant side effects often associated with other prebiotics.³

XOS prebiotics have been shown to safely reduce levels of cholesterol, triglycerides, and blood sugar.^{5,6}

A New and Improved Prebiotic

Prebiotics are foods that nourish and promote healthy gut flora.^{7,8}

For a food ingredient to be classified as a prebiotic, it must resist digestion, be fermented by intestinal microorganisms, and stimulate the growth and/or activity of beneficial bacteria.^{8,9}

Prebiotics are essential for a healthy gut by supporting and feeding the trillions of friendly bacteria residing in the digestive tract. These helpful bacteria support immunity, healthy metabolism, cardiovascular health, and even mood.¹⁰⁻¹³

Many commercial **prebiotics** require large doses to provide optimal digestive health support. This can cause flatulence, bloating, and general digestive discomfort.¹⁴

Xylooligosaccharides (XOS) are a unique prebiotic, made from corn cobs. Since only a small dose is required,^{3,15} this may help avoid the unpleasant side effects of commercial prebiotics.³

XOS Works Fast, With Fewer Side Effects

Up to **60%** of the gut microbiota of infants is composed of a group of bacteria known as **Bifidobacteria**.

By adulthood this level declines to **30%-40%** of total gut microbes, to **10%** in late middle age, and by old age it drops to less than **5%** of original youthful levels. These beneficial bacteria are associated with protection against conditions including allergies, high cholesterol levels, and respiratory diseases.⁴

A variety of research models, from animal to clinical trials, have found that **Bifidobacteria** levels are reduced in some digestive disorders, infections, and in auto-immune arthritis.¹⁶

XOS significantly boosts levels of *bifidobacteria*.^{3,17}

In a **double-blind, randomized, placebo-controlled study**, 32 healthy subjects were divided into three groups that took either:³

- **A placebo,**
- **1.4 grams** of XOS, or
- **2.8 grams** of XOS.

After eight weeks of daily supplementation, both treatment groups had increases in *Bifidobacteria*, with no significant side effects. However, those taking **2.8 grams** daily of XOS had significantly *larger* increases than the lower-dose group.

Even the larger XOS dose is less than what other prebiotics require to increase the beneficial bacteria.

For example, you'd have to take **10 grams** to **20 grams** of a common prebiotic called FOS (**fructooligosaccharides**) to achieve

similar increases in *Bifidobacteria*. Doses this high can cause gastrointestinal discomfort.

In addition to the *smaller dose* required, XOS produces results in a *shorter amount of time*.

A second study found that people taking **2.8 grams** of XOS daily achieved significant increases in *bifidobacteria* in **just 14 days**.¹⁷

Gastrointestinal and Metabolic Improvements

Increasing levels of *Bifidobacteria* with the prebiotic **XOS** produces important metabolic and gastrointestinal improvements such as:¹⁷

- **Decreased triglycerides and cholesterol** in the blood and increased levels in feces.
- **Decreased blood sugar**, protecting against type II diabetes and metabolic syndrome.
- **Increased fecal acidity**, which inhibits less-desirable bacteria and promotes healthy bacteria.¹⁶



Summary

Higher levels of *Bifidobacteria* in the gastrointestinal tract are associated with resistance to a wide range of age-related diseases. Unfortunately, the levels decline with age.

Human studies show that a **prebiotic** called **XOS** (xylooligosaccharide) boosts bifidobacteria in as little as two weeks.

It also works at **low doses**, which helps avoid uncomfortable side effects often associated with other prebiotics.

XOS has also been shown to reduce cholesterol, triglycerides, and blood sugar, which are risk factors for conditions like cardiovascular disease and diabetes. •

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

- Chung Y-C, Hsu C-K, Ko C-Y, Chan Y-C. Dietary intake of xylooligosaccharides improves the intestinal microbiota, fecal moisture, and pH value in the elderly. *Nutrition Research*. 2007 2007/12/01;27(12):756-61.
- Yang J, Summanen PH, Henning SM, et al. Xylooligosaccharide supplementation alters gut bacteria in both healthy and prediabetic adults: a pilot study. *Front Physiol*. 2015;6:216.
- Finegold SM, Li Z, Summanen PH, et al. Xylooligosaccharide increases bifidobacteria but not lactobacilli in human gut microbiota. *Food Funct*. 2014 Mar;5(3):436-45.
- Arboleya S, Watkins C, Stanton C, Ross RP. Gut Bifidobacteria Populations in Human Health and Aging. *Front Microbiol*. 2016;7:1204.
- Yan F, Tian S, Du K, et al. Preparation and nutritional properties of xylooligosaccharide from agricultural and forestry byproducts: A comprehensive review. *Front Nutr*. 2022;9:977548.
- Bang MH, Chio OS, Kim WK. Soyoligosaccharide increases fecal bifidobacteria counts, short-chain fatty acids, and fecal lipid concentrations in young Korean women. *J Med Food*. 2007 Jun;10(2):366-70.
- Megur A, Daliri EB, Baltrikiene D, Burokas A. Prebiotics as a Tool for the Prevention and Treatment of Obesity and Diabetes: Classification and Ability to Modulate the Gut Microbiota. *Int J Mol Sci*. 2022 May 29;23(11).
- Wang S, Xiao Y, Tian F, et al. Rational use of prebiotics for gut microbiota alterations: Specific bacterial phylotypes and related mechanisms. *Journal of Functional Foods*. 2020 2020/03/01;66:103838.
- Slavin J. Fiber and prebiotics: mechanisms and health benefits. *Nutrients*. 2013 Apr 22;5(4):1417-35.
- Galland L. The gut microbiome and the brain. *J Med Food*. 2014 Dec;17(12):1261-72.
- Khanna S, Tosh PK. A clinician's primer on the role of the microbiome in human health and disease. *Mayo Clin Proc*. 2014 Jan;89(1):107-14.
- Sudo N. Microbiome, HPA axis and production of endocrine hormones in the gut. *Adv Exp Med Biol*. 2014;817:177-94.
- Johnson EL, Heaver SL, Walters WA, Ley RE. Microbiome and metabolic disease: revisiting the bacterial phylum Bacteroidetes. *J Mol Med (Berl)*. 2017 Jan;95(1):1-8.
- Davani-Davari D, Negahdaripour M, Karimzadeh I, et al. Prebiotics: Definition, Types, Sources, Mechanisms, and Clinical Applications. *Foods*. 2019 Mar 9;8(3).
- Valladares-Diestra KK, de Souza Vandenberghe LP, Vieira S, et al. The Potential of Xylooligosaccharides as Prebiotics and Their Sustainable Production from Agro-Industrial by-Products. *Foods*. 2023;12(14):2681.
- Zhang YJ, Li S, Gan RY, et al. Impacts of gut bacteria on human health and diseases. *Int J Mol Sci*. 2015 Apr 2;16(4):7493-519.
- MH N. Effects of Xylooligosaccharide Intake on Fecal Bifidobacteria, Lactic acid and Lipid Metabolism in Korean Young Women. *Korean J Nutr*. 2007;40:154-61.



B

SMART

Body & Brain



BIOACTIVE FORMS OF VITAMIN B12

B12 Elite provides both:

ADENOSYLCOBALAMIN

- Active in brain cell mitochondria.
- Supports nerve cell function.
- Supports cellular energy production.

METHYLCOBALAMIN

- Supports brain cell function.
- Promotes red blood cell production.
- Helps maintain healthy homocysteine levels.

Dissolve in the mouth or chew one vegetarian lozenge daily.

Item #02419

60 vegetarian lozenges

1 bottle **\$8.25**

4 bottles \$7.50 each



For full product description and to order **B12 Elite**, call **1-800-544-4440** or visit www.LifeExtension.com

GAMIE ON



Clinical trials demonstrate that the plant extracts in once-daily **ArthroMax® Elite** help:

- Support a healthy inflammatory response
- Maintain healthy connective cartilage tissue
- Promote comfortable joint function

Take advantage of the benefits of **Mobile-Ease™ Chinese skullcap, catch tree and white mulberry** TODAY!

Item #02138

30 vegetarian tablets

1 bottle \$22.50

4 bottles \$20 each

For full product description and to order **ArthroMax® Elite**, 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.

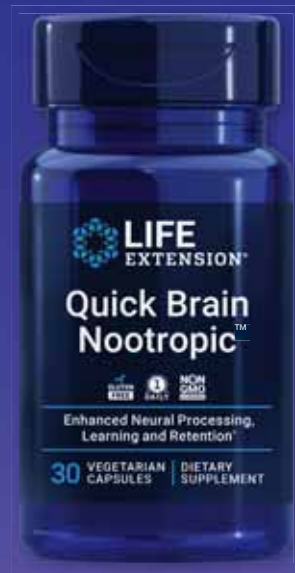
Set Boosters to Brain Health

"This supplement
is amazing."

Linda

VERIFIED CUSTOMER
REVIEW

Maximize your mental powers to infinity and beyond with **Quick Brain Nootropic™**. With ingredients for learning, retention, and faster neural processing speeds, this brain boosting formula will have you blasting off to better health—no rocket required.



Item #02406 • 30 vegetarian capsules
1 bottle \$17.25 • 4 bottles \$15.50 each



Lutemax® 2020 is a registered trademark of
OmniActive Health Technologies Ltd.

For full product description and to order **Quick Brain Nootropic™**,
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.



B

Brainy, Bubbly, Bold, Brave,
Brilliant, Boundless.



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



B your best...with our very best vitamin B.

Supercharge your mental and physical superpowers with BioActive Complete B-Complex, a full-spectrum and highly absorbable vitamin B formula.

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.

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.



“I have taken this supplement for a long time. It works!”

Ingrid

VERIFIED CUSTOMER REVIEW

Tilt Your Bacteria Ratio for a Healthy Digestive Tract

Phages target bad intestinal bacteria, allowing beneficial strains to flourish.

FLORASSIST® GI provides a 7-strain blend of **probiotics** in a **dual encapsulation** formula to deliver beneficial bacteria and **phages** where you need them the most.



Dual-Encapsulation Delivery



Item #02125

30 liquid vegetarian capsules

1 bottle **\$24.75**

4 bottles \$22.50 each

GLUTEN
FREE

NON
GMO
LE CERTIFIED

VEGETARIAN
LE CERTIFIED

For full product description and to order **FLORASSIST® GI with Phage Technology**, call **1-800-544-4440** or visit www.LifeExtension.com

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



PreticX®
IN A TASTY
STRAWBERRY
CHEWABLE

RESTORE YOUTHFUL Gut BALANCE

With Strawberry Flavored
FLORASSIST® Prebiotic Chewable

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

- 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 using **XOS** prebiotic.²*
- **1,000 mg of XOS** (xylooligosaccharides) per prebiotic chewable.

Item #02203 • 60 vegetarian chewable tablets
1 bottle **\$15.75** • 4 bottles \$14 each

References

1. *Front Microbiol.* 2016;7:1204.
2. *Korean J Nutr.* 2007;40(2):154-61.

PreticX® is a registered trademark of AIDP, 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.



Sweet DREAMS

Fast-Acting Liquid Melatonin is a popular way to achieve more rapid sleep onset.

The nice-tasting, citrus-vanilla flavor enables convenient “drop” dosing of **Fast-Acting Liquid Melatonin** for occasional sleeplessness.

Life Extension also offers a full range of melatonin in solid forms and a variety of dosages.



Item #02234 • 3 mg per 20 drops, 2 fl. oz
1 bottle **\$9** • 4 bottles \$8.25 each



FOR OCCASIONAL SLEEPLESSNESS.

For full product description and to order **Fast-Acting Liquid Melatonin**, call **1-800-544-4440** or visit **www.LifeExtension.com**

CAUTION: Do not consume alcohol, drive or operate heavy machinery after 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.

Sauerkraut

BY LAURIE MATHENA



Before refrigeration, people utilized fermentation to preserve the shelf life of food. The process of fermentation can transform a *healthy* food into a **super** food.

Sauerkraut, which is a type of fermented cabbage, is a perfect example.

Fermentation promotes the growth of beneficial bacteria (or **probiotics**) that promote a healthy gut microbiome.¹ These gut microbes can help improve digestion, ward off inflammation, strengthen the immune system, and boost metabolic health.^{2,3}

Just one serving of sauerkraut can contain up to **28 different strains** of beneficial bacteria.⁴

Sauerkraut's impact on gut health was demonstrated in a randomized, double-blind intervention in which 34 patients with irritable bowel syndrome (IBS) consumed either pasteurized or unpasteurized sauerkraut every day for six weeks.

Eating sauerkraut (pasteurized or not) led to significant beneficial changes in gut microbiota and also led to significant improvements in the IBS-symptom severity score.⁵

Another study indicated sauerkraut's potential to help regulate intestinal immune function by helping to resolve inflammation.⁶

Consuming sauerkraut even has the potential to protect against cancer.

For example, evidence shows that while women in Poland have a lower risk of breast cancer as compared to the U.S., Polish women who migrate to the U.S. have nearly the same risks as U.S. women. Increased intake of fermented foods such as sauerkraut could be a reason why women in Poland have a reduced risk.

One study found that greater consumption of sauerkraut among Polish women during adolescence or adulthood was associated with a significantly reduced risk of breast cancer among this population of women.⁷

To obtain the most benefit from sauerkraut, be sure to purchase a brand that is raw, unpasteurized, and naturally fermented. This type will contain the live probiotic cultures that provide the health benefits listed here. These brands will be located in the refrigerated section of your grocery store.

References

- Valdes AM, Walter J, Segal E, Spector TD. Role of the gut microbiota in nutrition and health. *BMJ*. 2018 Jun 13;361:k2179.
- Available at: <https://www.health.harvard.edu/staying-healthy/fermented-foods-can-add-depth-to-your-diet>. Accessed April 24, 2024.
- Mazziotta C, Tognon M, Martini F, et al. Probiotics Mechanism of Action on Immune Cells and Beneficial Effects on Human Health. *Cells*. 2023 Jan 2;12(1).
- Lu Z, Breidt F, Plengvidhya V, Fleming HP. Bacteriophage ecology in commercial sauerkraut fermentations. *Appl Environ Microbiol*. 2003 Jun;69(6):3192-202.
- Nielsen ES, Garnas E, Jensen KJ, et al. Lacto-fermented sauerkraut improves symptoms in IBS patients independent of product pasteurisation—a pilot study. *Food Funct*. 2018 Oct 17;9(10):5323-35.
- Gaudio G, Weil T, Marzorati G, et al. Microbial and metabolic characterization of organic artisanal sauerkraut fermentation and study of gut health-promoting properties of sauerkraut brine. *Front Microbiol*. 2022;13:929738.
- Pathak DR, Stein AD, He JP, et al. Cabbage and Sauerkraut Consumption in Adolescence and Adulthood and Breast Cancer Risk among US-Resident Polish Migrant Women. *Int J Environ Res Public Health*. 2021 Oct 14;18(20).

Get Boosted at a **GREAT PRICE**

Health Booster provides **plant extracts** that complement multivitamin formulas.

Just one daily softgel provides **standardized nutrients** at a lower cost than if taken separately.

VITAMINS K1, MK4 AND MK7

Same potencies of K1 and two forms of K2 as Super K for heart and bone health.

MIXED TOCOTRIENOLS

Tocotrienols can boost defenses against oxidative stress, and more.

LYCOPENE

Helps maintain cardiovascular and prostate health.

LUTEIN-ZEAXANTHIN

Same eye-protecting nutrients as contained in the popular MacuGuard® formula.

CHLOROPHYLLIN

Shown to have DNA-protective properties.

SAFFRON

Helps maintain visual acuity.



Item #02291 • 60 softgels
1 bottle \$45 • 4 bottles \$40 each
(Two-month supply)

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

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

CAUTION: If you are taking a vitamin K antagonist (e.g. warfarin),
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.

Selenium

Promotes New Brain Cell Growth

BY STEVE CLARK



Studies have long suggested that the mineral **selenium** may have powerful brain benefits.

For example, age-related *decreases* in selenium levels correlate with an *increased* risk of **cognitive decline**.¹⁻⁶

Now, a promising animal study confirms that selenium can *reduce* age-related cognitive decline by increasing the formation of **new brain cells**. And it does so in the area of the brain important for **learning** and **memory** formation.⁷

Neurogenesis and Cognitive Decline

The **hippocampus** is a brain region that is critical for learning and the formation of new memories.⁸⁻¹⁰

Unlike most regions of the brain, some of the cells here retain the ability to divide and grow throughout life. This formation of new brain cells is called **neurogenesis**.¹¹

Adult neurogenesis is considered to be one of the main reasons brains have the ability to adapt, learn, and form new memories even in later life.^{10,12}

Unfortunately, neurogenesis tends to decline with advancing age. This inability to refresh the cells of the hippocampus may be an important contributor to age-related **cognitive decline**.⁷

Boosting neurogenesis, on the other hand, could provide a way to reduce or even prevent cognitive decline.^{12,13} That's where **selenium** comes in.

Selenium's Protective Effects

Animal studies have shown that selenium may play a role in protecting against normal brain aging.¹⁴ The transporter protein for selenium has been shown to protect the brain against selenium deficiency, promote neurogenesis, and prevent cognitive decline.¹⁵

In human studies, *low* selenium levels have been associated with a *rapid decline* in cognitive function.⁵

In a study of 320 heart failure patients, subjects with *higher* selenoprotein levels (a marker of plasma selenium status) performed *better* in global cognitive test scales as compared to those with lower levels.¹⁶

There is also preclinical evidence that **selenium deficiency** induces **inflammation** in the **brain**,¹⁷ and is associated with age-related disorders such as Alzheimer's disease.^{15,18,19}

Studies have highlighted the potential role of selenium in neurodegenerative diseases. A meta-analysis compared brain tissue selenium levels' status of Alzheimer's patients with those without Alzheimer's. This study found that the Alzheimer's patients had significantly *lower* selenium status in their brains as compared to those without Alzheimer's.²

Another meta-analysis indicated that Alzheimer's patients are strongly associated with *lower* selenium concentrations compared to healthy people.²⁰

In animal models of Alzheimer's disease, selenium intake also *reduces* the accumulation of abnormal proteins associated with the disease, including hyperphosphorylated **tau** and **beta-amyloid**.^{15,18,19}

Boosting Neurogenesis in Older Adults

A preclinical study showed that **exercise** can trigger the growth of new brain cells in the hippocampus and enhance cognitive function.⁷

In a mouse study published in 2022, researchers demonstrated that with exercise comes a significant increase in blood levels of **SEPP1**, the main protein that supplies **selenium** to the brain. Exercise led to more than a **doubling** of SEPP1 levels.⁷

To test whether increased **selenium** brain levels *directly* led to **neurogenesis**, scientists applied selenium to brain cells in cell culture. The mineral stimulated their proliferation and signs of neurogenesis.





Supplying selenium to mice had the same effect, resulting in more than a **three-fold** increase in the number of dividing cells in the hippocampus.

Most impressively, when elderly mice were given selenium in their drinking water, increased neurogenesis was accompanied by significant improvements in tests of **learning** and **memory**.

Summary

The mineral **selenium** has been shown to be a crucial component in maintaining brain health into older age.

A recent animal study found that delivery of selenium to the brain promotes **neurogenesis**, the ability of the brain to grow new cells. In the **hippocampus**, these cells support cognitive function and support memory and learning. This could be a crucial area in the search for defenders against age-related decline.

Lower selenium levels have also been tied to **cognitive decline** and Alzheimer's disease in humans.

Oral intake of selenium is an effective way to increase delivery of the nutrient to the brain and support healthy cognitive 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

1. Akbaraly TN, Hininger-Favier I, Carriere I, et al. Plasma selenium over time and cognitive decline in the elderly. *Epidemiology*. 2007 Jan;18(1):52-8.
2. Varikasuvu SR, Prasad VS, Kothapalli J, Manne M. Brain Selenium in Alzheimer's Disease (BRAIN SEAD Study): a Systematic Review and Meta-Analysis. *Biol Trace Elem Res*. 2019 Jun;189(2):361-9.
3. Chen J, Berry MJ. Selenium and selenoproteins in the brain and brain diseases. *J Neurochem*. 2003 Jul;86(1):1-12.
4. Schweizer U, Brauer AU, Kohrle J, et al. Selenium and brain function: a poorly recognized liaison. *Brain Res Brain Res Rev*. 2004 Jul;45(3):164-78.
5. Steinbrenner H, Sies H. Selenium homeostasis and antioxidant selenoproteins in brain: implications for disorders in the central nervous system. *Arch Biochem Biophys*. 2013 Aug 15;536(2):152-7.
6. Torres DJ, Alfulaij N, Berry MJ. Stress and the Brain: An Emerging Role for Selenium. *Front Neurosci*. 2021;15:666601.
7. Leiter O, Zhuo Z, Rust R, et al. Selenium mediates exercise-induced adult neurogenesis and reverses learning deficits induced by hippocampal injury and aging. *Cell Metab*. 2022 Mar 1;34(3):408-23 e8.
8. Anand KS, Dhikav V. Hippocampus in health and disease: An overview. *Ann Indian Acad Neurol*. 2012 Oct;15(4):239-46.
9. Wiltgen BJ, Zhou M, Cai Y, et al. The hippocampus plays a selective role in the retrieval of detailed contextual memories. *Curr Biol*. 2010 Aug 10;20(15):1336-44.
10. Yau SY, Li A, So KF. Involvement of Adult Hippocampal Neurogenesis in Learning and Forgetting. *Neural Plast*. 2015;2015:717958.
11. Available at: <https://www.health.harvard.edu/mind-and-mood/the-book-of-neurogenesis>. Accessed April 25, 2024.
12. Kumar A, Pareek V, Faiq MA, et al. ADULT NEUROGENESIS IN HUMANS: A Review of Basic Concepts, History, Current Research, and Clinical Implications. *Innov Clin Neurosci*. 2019 May 1;16(5-6):30-7.
13. Zhou XA, Blackmore DG, Zhuo J, et al. Neurogenic-dependent changes in hippocampal circuitry underlie the procognitive effect of exercise in aging mice. *iScience*. 2021 Dec 17;24(12):103450.
14. Alehagen U, Opstad TB, Alexander J, et al. Impact of Selenium on Biomarkers and Clinical Aspects Related to Ageing. A Review. *Biomolecules*. 2021 Oct 7;11(10).
15. Zheng R, Zhang ZH, Chen C, et al. Selenomethionine promoted hippocampal neurogenesis via the PI3K-Akt-GSK3beta-Wnt pathway in a mouse model of Alzheimer's disease. *Biochem Biophys Res Commun*. 2017 Mar 25;485(1):6-15.
16. Jujic A, Molvin J, Nilsson ED, et al. Low Levels of Selenoprotein P Are Associated With Cognitive Impairment in Patients Hospitalized for Heart Failure. *J Card Fail*. 2024 Feb 15.
17. Zhang Y, Cui J, Lu Y, et al. Selenium Deficiency Induces Inflammation via the iNOS/NF-kappaB Pathway in the Brain of Pigs. *Biol Trace Elem Res*. 2020 Jul;196(1):103-9.
18. Zhang ZH, Wu QY, Chen C, et al. Selenomethionine Attenuates the Amyloid-beta Level by Both Inhibiting Amyloid-beta Production and Modulating Autophagy in Neuron-2a/AbetaPPsw Cells. *J Alzheimers Dis*. 2017;59(2):591-602.
19. Zhang ZH, Wu QY, Zheng R, et al. Selenomethionine Mitigates Cognitive Decline by Targeting Both Tau Hyperphosphorylation and Autophagic Clearance in an Alzheimer's Disease Mouse Model. *J Neurosci*. 2017 Mar 1;37(9):2449-62.
20. Zhou J, Zhang W, Cao Z, et al. Association of Selenium Levels with Neurodegenerative Disease: A Systemic Review and Meta-Analysis. *Nutrients*. 2023 Aug 24;15(17).



For Optimal Brain Health

Cognitex® Elite contains important brain nutrients to support cognitive health and function.

Sage extract SIBELIUS™ by itself demonstrated support for maintaining attention and memory in healthy, older volunteers.

Cognitex® Elite combines sage with other studied ingredients for brain health:

Sage extract SIBELIUS™: SAGE	333 mg
Wild blueberry extract blend (fruit)	200 mg
Sensoril® ashwagandha extract	125 mg
Phosphatidylserine	100 mg
Uridine-5'-monophosphate, disodium	50 mg
Vinpocetine	20 mg

Cognitex® Elite Pregnenolone contains these same powerful ingredients but with **50 mg** of pregnenolone added.

Feed Your Brain

Cognitex® Elite Pregnenolone

Item #02397 • 60 vegetarian tablets (with pregnenolone)
 1 bottle **\$43.50**
 4 bottles \$40 each

Cognitex® Elite

Item #02396 • 60 vegetarian tablets (without pregnenolone)
 1 bottle **\$42**
 4 bottles \$38 each



CAUTION: Do not use if you are of childbearing age, pregnant or planning to become pregnant. Consult your healthcare practitioner before taking this product if you are at risk for or have been diagnosed with prostate or breast cancer. Do not take this product if you have a history of seizures.

For a full product description and to order **Cognitex® Elite** or **Cognitex® Elite Pregnenolone**, call 1-800-544-4440 or visit www.LifeExtension.com

SIBELIUS is a trademark of Sibelius Limited. CHRONOSCREEN™ Sensoril® is protected under US Patent No. 7,318,938 and is a registered trademark 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.

Back ⁱⁿ Action



Item #02529 | 60 vegetarian capsules

1 bottle \$19.50 | 4 bottles \$18 each

Lower back discomfort benching you?

A dual-blend of Chinese chaste tree (also known as Five-leaf chaste tree) and ginger has been shown to *support functional activity and flexibility*. These two plant extracts have been clinically studied to help relieve lower back discomfort and occasional back stiffness due to daily activities.*

Embrace your back's flexibility and full range of motion with Lower Back Relief!

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

Muvz™ is a trademark of ENovate Biolife. * *J Back Musculoskelet Rehabil.* 2023 Nov 20. BMR-230197.

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.

HIGH-DOSE GLYCINE CAPSULES

For Restful
Sleep and
Much More



Item #01669

100 vegetarian capsules

1 bottle **\$12**
4 bottles \$11 each



Glycine is an amino acid that functions as a precursor to *multiple* bodily functions.¹

Glycine has properties for promoting calming sleep.^{1,2}

It also plays a role in gene expression,¹ and metabolic,^{1,2} cardiovascular,² and brain health.^{1,2}

A randomized controlled trial in a small number of older adults suggests that relatively high doses of glycine plus N-acetylcysteine may help support several functional and structural factors associated with normal aging.³

Life Extension® Glycine comes in **1,000 mg** capsules. This dose is *higher* than many traditional glycine supplements.

For occasional sleeplessness.

References

1. *Oxid Med Cell Longev.* 2017;2017:1716701.
2. *Ochsner J.* 2018 Spring;18(1):81-7.
3. *J Gerontol A Biol Sci Med Sci.* 2023;78(1):75-89.

For full product description and to order **Life Extension® Glycine**, call **1-800-544-4440** or visit **www.LifeExtension.com**



Soothe **DIGESTIVE** Discomfort with Berry Flavor Chewables



GLUTEN
FREE

NON
GMO
LE CERTIFIED

VEGETARIAN
LE CERTIFIED

Item #02033

60 vegetarian chewable tablets

1 bottle \$9 | 4 bottles \$8 each

EsophaCool™ maintains **healthy digestive function** and supports **esophagus health** with **standardized licorice root extract** and **calcium carbonate**.

GutGard® is a trademark of Natural Remedies PVT. LTD.

EsophaCool™ Benefits:

- Maintains healthy **pH balance** in the esophagus
- Encourages healthy **digestive function**
- Promotes **esophageal muscle** health
- Promotes **gut mobility**

For full product description and to order **EsophaCool™**, 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.

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

Item #02004
30 vegetarian capsules
1 bottle **\$33**
4 bottles \$29 each

1
DAILY



†**VENOFLOW™

Item #02102
30 vegetarian capsules
1 bottle **\$39**
4 bottles \$36 each

1
DAILY



†PYCNOGENOL®

French Maritime Pine Bark Extract
Item #01637
60 vegetarian capsules
1 bottle **\$48**
4 bottles \$45 each

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: If you are taking anticoagulant or antiplatelet medications, or have a bleeding disorder, consult your healthcare provider 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.



share a
longer
life



GLUTEN
FREE

1
DAILY

NON
GMO
LE CERTIFIED

VEGETARIAN
LE CERTIFIED

Linked to Longevity

Selenium has been shown to confer whole-body protection including supporting the heart, brain, and healthy cell division.^{1,2}

Super Selenium Complex provides three different forms of selenium—each of which uniquely acts along a different pathway.

1. **Sodium selenite**
2. **L-selenomethionine**
3. **Selenium-Methyl L-Selenocysteine**

Item #01778

100 vegetarian capsules

1 bottle **\$10.50**

4 bottles \$9 each

Each bottle provides a supply that lasts more than three months.

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

References

1. *Biol Trace Elem Res.* 2004 Oct;101(1):73-86.
2. *Biol Trace Elem Res.* 2011 Sep;142(3):274-83.

ACTIVE LIFESTYLE & FITNESS

- 01529 Creatine Capsules
- 02020 Super Carnosine
- 02023 Tart Cherry with CherryPURE®
- 02186 Wellness Bar - Chocolate Brownie
- 02518 Wellness Bar - Peanut Butter Chocolate Chip
- 02246C Wellness Code® Advanced Whey Protein Isolate Vanilla
- 02221 Wellness Code® Muscle Strength & Restore Formula
- 02127 Wellness Code® Plant Protein Complete & Amino Acid Complex
- 02261C Wellness Code® Whey Protein Concentrate Chocolate
- 02260 Wellness Code® Whey Protein Concentrate Vanilla
- 02243C Wellness Code® Whey Protein Isolate Chocolate
- 02242 Wellness Code® Whey Protein Isolate Vanilla

AMINO ACIDS

- 00038 Arginine Ornithine Powder
- 01253 Branched Chain Amino Acids
- 01829 Carnosine
- 01671 D,L-Phenylalanine Capsules
- 01624 L-Arginine Caps
- 01532 L-Carnitine
- 00345 L-Glutamine
- 00141 L-Glutamine Powder
- 01678 L-Lysine
- 01827 Taurine
- 00133 Taurine Powder

BLOOD PRESSURE & VASCULAR SUPPORT

- 01824 Advanced Olive Leaf Vascular Support
- 02004 Arterial Protect
- 02497 Endothelial Defense™ Pomegranate Plus
- 56885 Natto Activ Cardiovascular & Respiratory Support
- 02320 NitroVasc™ Boost
- 01953 Pomegranate Complete
- 00956 Pomegranate Fruit Extract
- 02024 Triple Action Blood Pressure AM/PM
- 02102 VenoFlow™

BONE HEALTH

- 01726 Bone Restore Calcium Supplement
- 02123 Bone Restore Calcium Supplement Chewable Tablet
- 02416 Bone Restore Elite with Super Potent K2
- 01727 Bone Restore Calcium Supplement w/ Vitamin K2
- 01725 Bone Strength Collagen Formula
- 01963 Calcium Citrate with Vitamin D
- 01506C Dr. Strum's Intensive Bone Formula
- 02417 Mega Vitamin K2
- 01476 Strontium Caps

BRAIN HEALTH

- 01524 Acetyl-L-Carnitine
- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 02510 Brain Fog Relief
- 01659 CDP Choline
- 02321 Cognitex® Alpha GPC
- 02396 Cognitex® Elite
- 02397 Cognitex® Elite Pregnenolone

- 01540 DMAE Bitartrate
- 02006 Dopa-Mind™
- 02413 Dopamine Advantage
- 01658 Ginkgo Biloba Certified Extract™
- 01527 Huperzine A
- 00020 Lecithin
- 02101 Memory Protect
- 00709 Migra-Eeze™
- 01603 Neuro-Mag® Magnesium L-Threonate Caps
- 02032 Neuro-Mag® Magnesium L-Threonate Powder
- 00888 Optimized Ashwagandha
- 01676 PS (Phosphatidylserine) Caps
- 02406 Quick Brain Nootropic
- 01327 Vinpocetine

CHOLESTEROL MANAGEMENT

- 01828 Advanced Lipid Control
- 01910 CHOL-Support™
- 01304 Theaflavins Standardized Extract
- 00372 Vitamin B3 Niacin Capsules

DIGESTION SUPPORT

- 02412 Bloat Relief
- 02514 Easy Fiber
- 01736 Effervescent Vitamin C - Magnesium Crystals
- 02021 Enhanced Super Digestive Enzymes
- 02022 Enhanced Super Digestive Enzymes and Probiotics
- 02033 EsophaCool™
- 01737 Esophageal Guardian
- 01706 Extraordinary Enzymes
- 02100 Gastro-Ease™

ENERGY MANAGEMENT

- 01628C Adrenal Energy Formula • 60 veg capsules
- 01630C Adrenal Energy Formula • 120 veg capsules
- 00972 D-Ribose Powder
- 01473 D-Ribose Tablets
- 01900 Energy Renew
- 01544 Forskolin
- 01805 Ginseng Energy Boost
- 01869 Mitochondrial Basics with PQQ
- 01868 Mitochondrial Energy Optimizer with PQQ
- 01904 NAD+ Cell Regenerator™ • 100 mg, 30 veg capsules
- 02344 NAD+ Cell Regenerator™ 300 mg, 30 veg capsules
- 02348 NAD+ Cell Regenerator™ and Resveratrol Elite™
- 01500 PQQ Caps • 10 mg, 30 vegetarian capsules
- 01647 PQQ Caps • 20 mg, 30 vegetarian capsules
- 00889 Rhodiola Extract
- 02003 Thyroid Support Complex

EYE HEALTH

- 01923 Astaxanthin with Phospholipids
- 01514 Eye Pressure Support with Mirtogenol®
- 01992 MacuGuard® Ocular Support with Saffron
- 01993 MacuGuard® Ocular Support with Saffron & Astaxanthin
- 01873 Standardized European Bilberry Extract
- 01918 Tear Support with MaquiBright®

FISH OIL & OMEGAS

- 01937 Mega EPA/DHA
- 02218 Mega GLA Sesame Lignans
- 01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 softgels
- 01988 Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
- 01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 softgels
- 01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 enteric coated softgels
- 01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 enteric coated softgels
- 01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 240 softgels
- 01812 Provinal® Purified Omega-7
- 01640 Vegetarian DHA

FOOD

- 02008 California Estate Extra Virgin Olive Oil
- 02170 Rainforest Blend Decaf Ground Coffee
- 02169 Rainforest Blend Ground Coffee
- 02171 Rainforest Blend Whole Bean Coffee

GLUCOSE MANAGEMENT

- 01503 CinSulin® with InSea²® and Crominex® 3+
- 01620 CoffeeGenic® Green Coffee Extract
- 02122 Glycemic Guard™
- 00925 Mega Benfotiamine
- 01803 Tri Sugar Shield®

HEART HEALTH

- 02530 Aged Black Garlic
- 01066 Aspirin (Enteric Coated)
- 01842 BioActive Folate & Vitamin B12 Caps
- 01700 Cardio Peak™
- 02121 Homocysteine Resist
- 02508 Omega-3 Fish Oil Gummy Bites
- 02018 Optimized Carnitine
- 01949 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 50 mg, 60 softgels
- 01951 Super-Absorbable CoQ10 Ubiquinone with *d*-Limonene • 100 mg, 60 softgels
- 01929 Super Ubiquinol CoQ10
- 01427 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 30 softgels
- 01425 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 50 mg, 100 softgels
- 01437 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 30 softgels
- 01426 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 100 mg, 60 softgels
- 01431 Super Ubiquinol CoQ10 with Enh Mitochondrial Support™ • 200 mg, 30 softgels
- 01733 Super Ubiquinol CoQ10 with PQQ
- 01859 TMG Liquid Capsules
- 00349 TMG Powder

HORMONE BALANCE

- 00454 DHEA • 15 mg, 100 capsules
- 00335 DHEA • 25 mg, 100 capsules

- 00882 DHEA • 50 mg, 60 capsules
- 00607 DHEA • 25 mg, 100 vegetarian dissolve in mouth tablets
- 01689 DHEA • 100 mg, 60 veg capsules
- 02368 Optimized Broccoli with Myrosinase
- 00302 Pregnenolone • 50 mg, 100 capsules
- 00700 Pregnenolone • 100 mg, 100 capsules
- 01468 Triple Action Cruciferous Vegetable Extract
- 01469 Triple Action Cruciferous Vegetable Extract and Resveratrol

IMMUNE SUPPORT

- 02302 Bio-Quercetin®
- 02410 Black Elderberry + Vitamin C
- 02433 Echinacea Elite
- 01961 Enhanced Zinc Lozenges
- 02425 Immune Packs with Vitamin C & D, Zinc and Probiotic
- 02005 Immune Senescence Protection Formula™
- 01681 Lactoferrin (Apolactoferrin) Caps
- 02426 Mushroom Immune with Beta Glucans
- 01903 NK Cell Activator™
- 01394 Optimized Garlic
- 01309 Optimized Quercetin
- 01811 Peony Immune
- 01708 Reishi Extract Mushroom Complex
- 01906 Standardized Cistanche
- 01097 Ultra Soy Extract
- 01561 Zinc Lozenges

INFLAMMATION HEALTH SUPPORT

- 01639 5-LOX Inhibitor with AprèsFlex®
- 02324 Advanced Curcumin Elite™
Turmeric Extract, Ginger & Turmerones
- 01709 Black Cumin Seed Oil
- 02310 Black Cumin Seed Oil and Curcumin Elite™
- 02467 Curcumin Elite™ Turmeric Extract
30 veg capsules
- 02407 Curcumin Elite™ Turmeric Extract
60 veg capsules
- 01804 Cytokine Suppress® with EGCG
- 02223 Pro-Resolving Mediators
- 56886 Restore Activ Joint Muscle & Tissue
- 01203 Specially-Coated Bromelain
- 00407 Super Bio-Curcumin® Turmeric Extract

JOINT SUPPORT

- 02404 Arthro-Immune Joint Support
- 02238 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
- 02138 ArthroMax® Elite
- 00965 Fast-Acting Joint Formula
- 02430 Fast Acting Relief
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 02424 Joint Mobility
- 01600 Krill Healthy Joint Formula
- 02529 Lower Back Relief
- 00451 MSM (Methylsulfonylmethane)
- 02231 NT2 Collagen™

KIDNEY & BLADDER SUPPORT

- 00862 Cran-Max® Cranberry Whole Fruit Concentrate
- 01424 Optimized Cran-Max®
- 01921 Uric Acid Control
- 01209 Water-Soluble Pumpkin Seed Extract

LIVER HEALTH & DETOXIFICATION

- 01922 Advanced Milk Thistle • 60 softgels
- 01925 Advanced Milk Thistle • 120 softgels
- 02240C Anti-Alcohol Complex
- 01651 Calcium D-Glucarate
- 01571 Chlorophyllin
- 02402 FLORASSIST® Liver Restore™
- 02521 Glutathione
- 01541 Glutathione, Cysteine & C
- 01393 HepatoPro
- 01608 Liver Efficiency Formula
- 01522 Milk Thistle • 60 veg capsules
- 01534 N-Acetyl-L-Cysteine
- 01884 Silymarin
- 02361 SOD Booster

LONGEVITY & WELLNESS

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin™
- 01214 Blueberry Extract
- 01438 Blueberry Extract and Pomegranate
- 02270 DNA Protection Formula
- 02431 Essential Youth - L-Ergothioneine
- 02119 GEROPROTECT® Ageless Cell™
- 02415 GEROPROTECT® Autophagy Renew
- 02401 GEROPROTECT® Stem Cell
- 02211 Grapeseed Extract
- 02527 Healthy Aging Powder
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol Elite™
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol Elite™
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

LUNG HEALTH

- 02512 Healthy Lungs

MEN'S HEALTH

- 02209 Male Vascular Sexual Support
- 00455 Mega Lycopene Extract
- 02306 Men's Bladder Control
- 02515 Men's Vitality Packs
- 01789 PalmettoGuard® Saw Palmetto and Beta-Sitosterol
- 01790 PalmettoGuard® Saw Palmetto/Nettle Root Formula and Beta-Sitosterol
- 01373 Prelox® Enhanced Sex for Men
- 01940 Super MiraForte with Standardized Lignans
- 02500 Testosterone Elite
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

MINERALS

- 01661 Boron
- 02107 Extend-Release Magnesium
- 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

MOOD & STRESS MANAGEMENT

- 02519 Ashwagandha Plus
- 02434 Calm-Mag
- 02312 Cortisol-Stress Balance
- 00987 Enhanced Stress Relief
- 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
- 02429 Theanine XR™ Stress Relief

MULTIVITAMINS

- 02199 Children's Formula Life Extension Mix™
- 02354 Life Extension Mix™ Capsules
- 02364 Life Extension Mix™ Capsules without Copper
- 02356 Life Extension Mix™ Powder
- 02355 Life Extension Mix™ Tablets
- 02357 Life Extension Mix™ Tablets with Extra Niacin
- 02365 Life Extension Mix™ Tablets without Copper
- 02292 Once-Daily Health Booster • 30 softgels
- 02291 Once-Daily Health Booster • 60 softgels
- 02313 One-Per-Day Tablets
- 02317 Two-Per-Day Capsules • 60 capsules
- 02314 Two-Per-Day Capsules • 120 capsules
- 02316 Two-Per-Day Tablets • 60 tablets
- 02315 Two-Per-Day Tablets • 120 tablets
- 02428 Whole Food Multivitamin

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

- 02322 Hair, Skin & Nails Collagen Plus Formula
- 01278 Life Extension Toothpaste
- 00408 Venotone
- 02252 Youthful Legs

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix
- 02523 DOG Hip & Joints
- 02524 DOG Multivitamin & Probiotics
- 02522 DOG Skin & Coat
- 02525 DOG Stress & Behavior

PROBIOTICS

- 01622 Bifido GI Balance
- 01825 FLORASSIST® Balance
- 02421 FLORASSIST® Daily Bowel Regularity
- 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
- 02505 FLORASSIST® Probiotic Women's Health

SKIN CARE

- 02423 Daily Skin Defense
- 01938 Shade Factor™
- 02129 Skin Care Collection Anti-Aging Serum
- 02130 Skin Care Collection Day Cream
- 02131 Skin Care Collection Night Cream
- 02096 Skin Restoring Ceramides

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 01511 Enhanced Sleep without Melatonin
- 02234 Fast-Acting Liquid Melatonin
- 01669 Glycine
- 02308 Herbal Sleep PM
- 01722 L-Tryptophan
- 01668 Melatonin • 300 mcg, 100 veg capsules
- 01083 Melatonin • 500 mcg, 200 veg capsules
- 00329 Melatonin • 1 mg, 60 capsules
- 00330 Melatonin • 3 mg, 60 veg capsules
- 00331 Melatonin • 10 mg, 60 veg capsules
- 00332 Melatonin • 3 mg, 60 veg lozenges
- 02201 Melatonin IR/XR
- 01787 Melatonin 6 Hour Timed Release
300 mcg, 100 veg tablets
- 01788 Melatonin 6 Hour Timed Release
750 mcg, 60 veg tablets
- 01786 Melatonin 6 Hour Timed Release
3 mg, 60 veg tabs
- 01721 Optimized Tryptophan Plus
- 01445 Quiet Sleep Melatonin • 5 mg, 60 veg capsules
- 02502 Rest & Renew
- 02526 Serene Sleep

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 01945 BioActive Complete B-Complex
- 00102 Biotin

- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin®
- 02075 Gamma E Mixed Tocopherol Enhanced with
Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 • 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) • 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 01863 Super Vitamin E
- 02422 Vegan Vitamin D3
- 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®
60 veg tablets
- 02227 Vitamin C and Bio-Quercetin®
250 veg tablets
- 01753 Vitamin D3 • 25 mcg (1000 IU), 90 softgels
- 01751 Vitamin D3 • 25 mcg (1000 IU), 250 softgels
- 01713 Vitamin D3 • 125 mcg (5000 IU), 60 softgels
- 01718 Vitamin D3 • 175 mcg (7000 IU), 60 softgels
- 01758 Vitamin D3 with Sea-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

- 02479 7-Keto® DHEA Metabolite
100 mg, 60 veg capsules
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 01432 Optimized Saffron
- 02511 Thermo Weight Control
- 02509 Waistline Control™

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 02204 Menopause Relief
- 02319 Prenatal Advantage
- 01649 Soy Isoflavones
- 02513 Women's Bladder Support

A Therapeutic Foot Massage with Every Step

Wearing Kenkohs daily, even for short periods of time, Kenkoh helps to increase circulation while providing a non-intrusive way of reducing pain in the feet, ankles, knees, legs, hips and back.

The precisely designed footbeds of a Kenkoh Massage Sandal work by using acupressure to revitalize and stimulate the nerve endings in your feet.



Spirit V
Silver Metallic



Chai V Champagne

- Relieves stress, eases fatigue, eliminates toxins, and improves circulation.
- Over 1,000 rubber nodules on the footbed provides a relaxing foot massage while you walk.
- Fully contoured footbed that supports all three arches, allowing pressure to be spread evenly over the foot.

Take the

**14
DAY**

Kenkoh Challenge

HappyFeet.com/KENKOH
1-800-336-6657

Kenkoh®
Japanese Massage Footwear



UP TO 45 TIMES GREATER
BIOAVAILABILITY

Curcumin

Patented **turmeric** and **fenugreek** blend
(500 mg) results in up to **45 times** greater
bioavailability of free **curcuminoids**.

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

Item #02407

500 mg

60 vegetarian capsules

1 bottle \$24

4 bottles \$22 each





IN THIS EDITION OF *LIFE EXTENSION* MAGAZINE®



7 ANOTHER TRAGIC ERROR

A government-supported group recommends *against* testing **vitamin D** blood levels.



24 HIDDEN POWER OF MUSHROOMS

A compound found in **mushrooms** *protects* against **telomere shortening** and may reduce all-cause mortality by **35%**.



34 NOVEL CARDIOVASCULAR SUPPORT

Clinical data show **aged black garlic** *improved* numerous cardiovascular markers.



44 MORE COMPLETE SUN PROTECTION

An oral **fern extract** *decreased* UV-radiation-induced DNA skin mutations by **84%**.



55 WHAT ARE PREBIOTICS?

Prebiotics help restore healthy ***Bifidobacteria***, while *reducing* cholesterol, triglycerides, and blood sugar.



67 PROMOTE NEW BRAIN CELL GROWTH

A recent animal study found **selenium** *promotes* the growth of **new brain cells**, while protecting against cognitive decline in humans.