

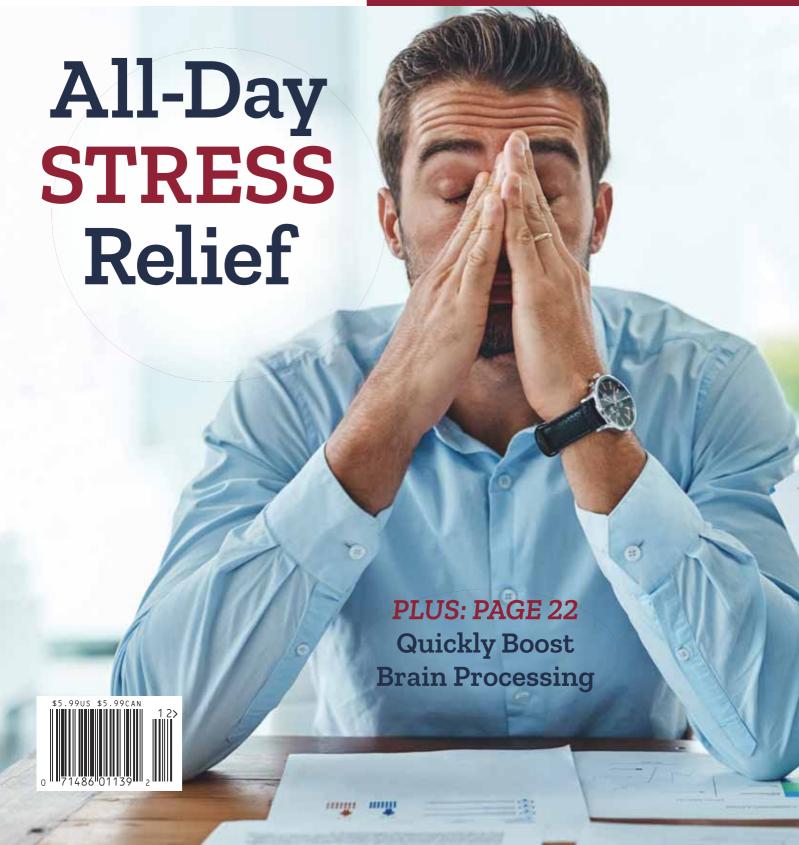
The Science of a Healthier Life®

LifeExtension.com

December 2021

FEATURE ARTICLES

- 7 Rapid Recognition of Healthy Aging
- 22 Enhance Brain Processing Speed
- 34 All-Day Stress Relief
- 42 Increase Probiotic Efficacy
- 56 Control Your Triglycerides
- 66 New Findings on Mediterranean Diet
- 79 Tom Brady's Longevity Program



Whole-Body Support

Everything good takes time.

Magnesium is essential for a healthy heart and sturdy bones; it's even great for your mood. But, most of us don't get enough from our diets.

Our innovative formula delivers both immediate and extended-release magnesium, so you get the maximum benefits—for the long haul.





Item #02107 60 250 mg vegetarian capsules

1 bottle **\$9.75** • 4 bottles \$8.75 each

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

ZümXR® is a registered trademark and protected by patents. See www.ZümXR.com

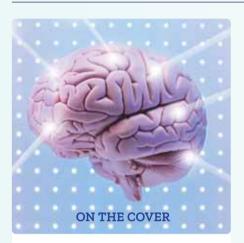




The Science of a Healthier Life®

LifeExtension.com

December 2021



22 BOOST BRAIN PROCESSING SPEED

"Smart drugs" quickly boost cognition. For those seeking a natural approach, four plant extracts improve brain processing speed, memory, learning, and concentration.

and

34 ALL-DAY STRESS RELIEF

Clinical studies show a tea extract enables calming relaxation. A sustained-release tea formula can help manage stress all day long.

7 RAPID RECOGNITION OF HEALTHY AGING

Major food companies are funding research and designing functional foods to extend healthy longevity in older people.

15 IN THE NEWS

Breast cancer drug reduces progression and death; PQQ enhances cognitive function; several supplements improve sleep quality; multivitamins linked to reduced hip-fracture risk.

REPORTS

42 FEED YOUR BENEFICIAL BACTERIA

With age, beneficial gut bacteria sharply decline to just 5% of youthful levels. A unique prebiotic repopulated bifidobacteria levels within weeks.

51 HEIGHTENED RISK FOR HEART FAILURE HOSPITALIZATION

A study published in **December 2020** found that people with low **DHEA** had an increased risk of heart failure, hospitalization, and cardiac death.

56 CONTROL YOUR TRIGLYCERIDES

The Mayo Clinic Proceedings links higher EPA and DHA intake to a 35% lower risk of fatal heart attacks. Omega-3 fatty acids (EPA/DHA) reduce high triglycerides and provide additional cardiovascular benefits.

66 MEDITERRANEAN DIET: NEW DATA

People who follow a **Mediterranean diet** live longer in good health. A 2021 published study corroborates previous findings showing sharp reductions in cardiovascular deaths.

DEPARTMENTS

79 WELLNESS PROFILE

NFL veteran Tom Brady believes his strategies-including holistic lifestyle and strategic supplement use-will work for anyone who also wants to defy aging and live their best life.

83 SUPER FOODS

Flower buds known as capers have been clinically shown to improve non-alcoholic fatty liver disease. They are also being studied for their antidiabetic and anti-inflammatory effects.

85 BOOK REVIEW

The book Oxidative Stress and Dietary Antioxidants in Neurological Diseases ties the oxidative stress processes involved in neurological disease with nutrient strategies to combat them.













The Science of a Healthier Life

LifeExtension.com

December 2021

Volume 27 • Number Twelve Publisher • LE Publications, Inc.



Connect with Life Extension Online!





Facebook.com/LifeExtension

Twitter.com/LifeExtension

Publisher Title			14. Name Date for City	14. Name Date for Circulation Care Serve	
LIFE EXT	ΈN	ISION	ОСТОВЕ	R 5, 2021	
Educi and Nature of Circulation			Streetupe No. Copies Easth Issue Dusting Proceeding 12 Months	No. Copies of Engle Issue Published Nearest to Piling Date	
a, Total Mumber of Copies, (Net press Art)			387, 447	371,963	
b Petr Desplation (By Med and Datases the Med)	έti	Mated Curistic County Point Subscriptions Stated on PS Form 3541 (Notice y debtholes: above normal rate, advertised's proof oppies, and exphange copies		355,574	
	a	Maked to County Field Schoolstown Stated on PS Form Staff, (hobols year) shallottion obtains representated as a free form's proof oppins, and excharge topins	5,018	5,261	
	(B)	Paid Destinator Custom the Male Including States Through Courses and Control Street Menture, Course Sales, and Other Fast Destitution Custom USFSP	42,010	19,800	
	(A)	Pact Detribution by Other Glasses of Hall Trinugh the USPS (e.g. Pres Class MatP)	67	68	
s. Triss Place Distribution (Num of 156 (1), (0), (6), and (4))			382,803	380,703	
E Free or humanut Hate Destroition dby blad and Outside the Med)	eti	Pleas or Novembel Radio Couloide-County Copies included on PS Form 3941	50,159	10,907	
	(Z)	Free or Numbed Rate In-County Copies Indicated on PS From 3541	736	153	
	on	Pine or Removal Rate Criptes Maked at Other Classes Through the USPE in g., Prof-Class Mel)	975	74	
	oti	Pres or Nameral Rate Distribution Dubtitle the Med (Carriers or other research	0	0	
e footbee		name figure (hamiltoning (films of 150 (T), (E), (E) and (A))	51,870	11,134	
Tried Destinator (Sum of 15s and 15s)			434,673	391,837	
© Claims Int Distributed (See Herrustons to Publishess #4 (ways #3))			67,000	5,800	
h. Total (Sum of 197 and gr			501,673	397,630	
Persons Paul (TS) shelded by TSP (mean 1985)			88.06%	95.74%	
po de come	4	etions copies, go in the 15 on page 1. If you are not claiming electrons copies	s, say to the 17 or page 3.		

#1 Rated Catalog/Internet Merchant 6 Time Winner!*

* Ratings based on results of the 2021 ConsumerLab.com survey of supplement users. More information at www.ConsumerLab.com/survey.

Editorial

Editor-in-Chief • Philip Smith

Executive Managing Editor • Renee Vermeulen

Medical Editor • Hernando Latorre, MD, MSc

Senior Editor • Dan Jewel

Senior Staff Writer • Michael Downey

Department Editor • Laurie Mathena

Associate Editor • Rivka Rosenberger, EdD

Creative Director • Robert Vergara

Art Director • Alexandra Maldonado

Chief Medical Officer

Chief Scientific Officer

Steven Joyal, MD

Andrew Swick, MS, PhD

Scientific Advisory Board

Richard Black, DO • John Boik, PhD • Aubrey de Grey, PhD

Deborah F. Harding, MD • Steven B. Harris, 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 • Jonathan V. Wright, MD • Xiaoxi Wei, PhD

Chancellor Faloon • Marina MacDonald, MS, PhD • Laurie Mathena Marsha McCulloch, RD • Caroline Miller • Michael Ozner, MD Deep Shukla, PhD

Advertising

Vice President of Marketing • 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. 27, No. 12 ©2021 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 40029967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L484R6. 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





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

Item #02407

500 mg, 60 vegetarian capsules

1 bottle **\$24** • 4 bottles \$22 each



Same 500 mg potency of patented **turmeric** and **fenugreek blend** with added benefits of **ginger** and other **turmeric** actives.

Item #02324

500 mg curcumin + gingerol, 30 softgels

1 bottle **\$20** • 4 bottles \$18 each





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

MEDICAL ADVISORY BOARD

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

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

Mark S. Bezzek, MD, FACP, FAARM, FAAEM, is boardcertified 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, antiaging, 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, D0, 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 antiaging 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.

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

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

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

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

Professor Francesco Marotta, MD, PhD, of Montenapoleone Medical Center, Milan, Italy, is a gastroenterologist and nutrigenomics expert with extensive international university experience. He is also a consulting professor at the WHO-affiliated Center for Biotech & 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 antiaging medicine and has worked for many years as flight surgeon at the European Space Agency. He is a pioneer in functional and antiaging medicine in Italy where he also works as a iournalist 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 boardcertified in anti-aging medicine.

SCIENTIFIC ADVISORY BOARD



Sandra C. Kaufmann, MD, is a fellowship-trained and board-certified pediatric anesthesiologist as well as the Chief of Anesthesia at the Joe DiMaggio Children's Hospital in Hollywood, Florida. She is the founder of The Kaufmann Anti-Aging Institute and the author of the book The Kaufmann Protocol: Why we Age and How to Stop it (2018). Her expertise is in the practical application of anti-aging research.



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



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



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



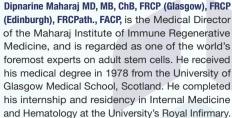
Deborah F. Harding, MD, is founder of the Harding Anti-Aging Center. She is double board-certified in internal medicine and sleep disorder medicine. She also earned the Cenegenics certification in age management medicine. She is a faculty member of the University of Central Florida Medical School.

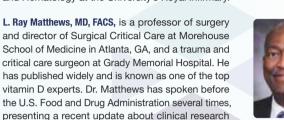


Steven B. Harris, MD, is president and director of research at Critical Care Research, a company that grew out of 21st Century Medicine in Rancho Cucamonga, CA, Dr. Harris participates in groundbreaking hypothermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction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



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

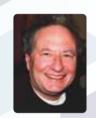






Ralph W. Moss, PhD, is the author of books such as Antioxidants Against Cancer, Cancer Therapy, Questioning Chemotherapy, and The Cancer Industry, as well as the award-winning PBS documentary The Cancer War. Dr. Moss has independently evaluated the claims of various cancer treatments and currently directs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

on vitamin D.



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



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



Xiaoxi Wei, PhD, is a chemist, expert in supramolecular assembly and development of synthetic transmembrane nanopores with distinguished selectivity via biomimetic nanoscience. She has expertise in ion channel function and characterization. She founded X-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.





Two-Per-Day Multivitamin Tablets

Item #02315 • 120 tablets (two-month supply)

1 bottle \$17.25 • 4 bottles \$15.50 each

Two-Per-Day Multivitamin Capsules

Item #02314 • 120 capsules (two-month supply)

1 bottle \$18 • 4 bottles \$16 each

Each bottle provides a two-month supply.

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





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

Rapid Recognition of Healthy Aging



WILLIAM FALOON

The *Financial Times* is a respected business journal based in London.

Earlier this year, the *Financial Times* published an article recognizing what *Life Extension* readers long ago understood:

Aging is a disease that can be decelerated!

The Financial Times predicts that:

"Some anti-aging therapies could prove as important in the 21st century as antibiotics were in the 20th."

In the last century, the advent of **antibiotics** made the leading causes of death (bacterial diseases) virtually disappear from the top of mortality charts.²

Nowadays, **age-related** disorders are the main killers.



A similar change may happen this century as it did with **antibiotics**. Scientists worldwide are making advances to control the causes of pathological aging.

Public interest in this science is <u>not</u> being overlooked by big business.

The **Wall Street Journal** published an article describing how corporate behemoths like **Nestlé** and **Colgate-Palmolive** are launching products aimed at consumers who are:

"increasingly interested in aging well."3

These companies have set up **healthy-aging** units to accelerate research into how "**nutrition impacts cognition and mobility**."

Contrast this with recent decades when normal **aging** was viewed as inevitable.

Ditto for regulatory agencies that claimed **nutrition** had nothing to do with one's risk of degenerative illnesses.

While enormous resources are being spent to fortify foods with **nutrients**, I am pleased that an armada of researchers are spearheading clinical trials aimed at **reversing aging** in elderly **humans**.

The key today is to **preserve your youth** to benefit from advances in **healthy longevity** that are rapidly nearing fruition.



Nestlé Launches Anti-Aging Functional Food

Swiss-based Nestlé is the largest food and beverage company in the world.

In December 2020, Nestlé announced plans to launch a functional food for middle-aged and elderly consumers in China consisting of:

"A unique combination of ingredients to support bone health, muscle strength, and joint functionality."4

The approval of these claims by the Chinese government is based on a human study of a fortified milk powder that has been "clinically proven to enhance mobility during aging."

It is one of the first products with functional-food claims allowed in China.

This fortified milk product was developed in collaboration with Beijing University Third Hospital. According to the lead Nestlé researcher:

"The results of the clinical study showed that the product in combination with tailored physical activity led to a significant increase in mobility of Chinese seniors with joint discomfort and thus improved their quality of life."5

In addition to this functional milk powder, another product named Yiyang Probiotic Protein Powder to boost immunity also received formal Chinese approval.6

It takes a long time to register and apply for "health food" status in China. Compared to the United States. there are far more advertising restrictions in China.

What's in this **Functional Milk Powder?**

As our Life Extension group learned nearly 41 years ago, inserting healthy nutrients into flavored powders or liquids is challenging. Most nutrients don't taste good.

When I first learned of this functional milk powder, I thought it might contain trivial potencies of nutrients that would not confer its purported benefits.

While Nestlé did not reveal the ingredients in their press releases, our investigation of patent office records indicates that this new milk powder provides in two daily servings:

INGREDIENT	MY COMMENTS
Glucosamine, 1,500 mg	This potency improves joint function.
Vitamin D, 800 IU	Confers some, but not optimal benefit.
Vitamin C, 35 mg	Not much, but more would cause bad taste.
Zinc, 6.5 mg	Better than nothing, but higher potencies needed.
Calcium, 850 mg	Good potency for bones.

I was pleasantly surprised to see this milk formula provides sufficient glucosamine to fulfill the claim of improved mobility.

In addition, a study published in 2019 found that people who supplement with 1,500 mg of glucosamine daily have a 22% lower risk of cardiovascular death.7

My compliments to Nestlé for validating and delivering a palatable drink mix that will improve healthy longevity of people living in China.

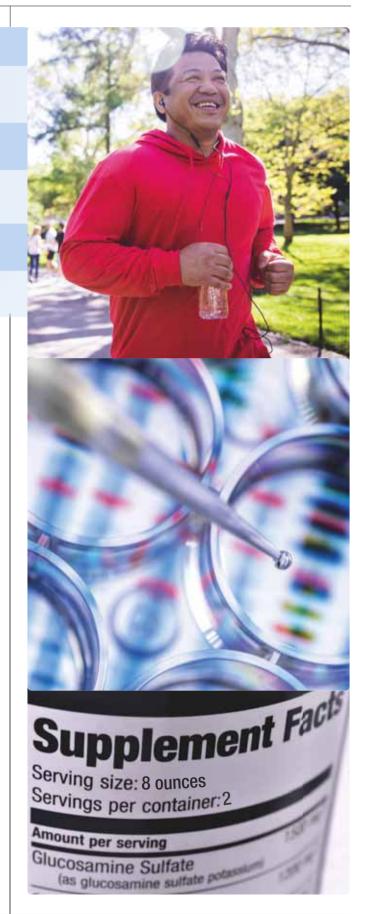
In this Month's Issue...

The role of dietary choices on human health continues to be validated in large-scale population studies. The article on page 66 of this month's issue reveals new findings on how what we eat can slash disease risks.

Elevated **triglycerides** are an independent risk factor for coronary artery disease. Page 56 reminds readers how easy it is to drop triglycerides to optimal safe ranges.

Record numbers of Americans are complaining of stress-related mental issues, yet the Japanese learned long ago how to use an extract from green tea to stay calm all day long. Page 34 of this month's issue describes this low-cost method.

New findings on the benefits of **DHEA** continue to appear in the published literature. Life Extension was the first to recommend DHEA as a low-cost supplement back in 1981. Page 51 provides updates on this natural hormone that declines in our bodies with normal aging.





Rapid Recognition of a Disease called "Aging"

In 1977, I incorporated what we now refer to as the Life Extension group of organizations that all seek to extend healthy human lifespans.

I garnered a lot of media coverage in those early days because no one thought it possible to delay biological aging.

I argued back then that published data showed that lifespans could be extended in animals, so why not emulate this for people?

The change in perception about controlling aging that occurred since 1977 is nothing short of astounding.

The FDA is increasingly recognizing aging as a disease and clinical trials are going on now to enable older people to grow biologically younger.

I expect rapid-fire advances, but to personally benefit, we must take steps now to remain healthy and alive.

Most of you are doing that. For those who are falling into the traps of unhealthy diets and lifestyles, I urge you to make a resolution to slowly cease bad habits and initiate actions to reduce degenerative risks.

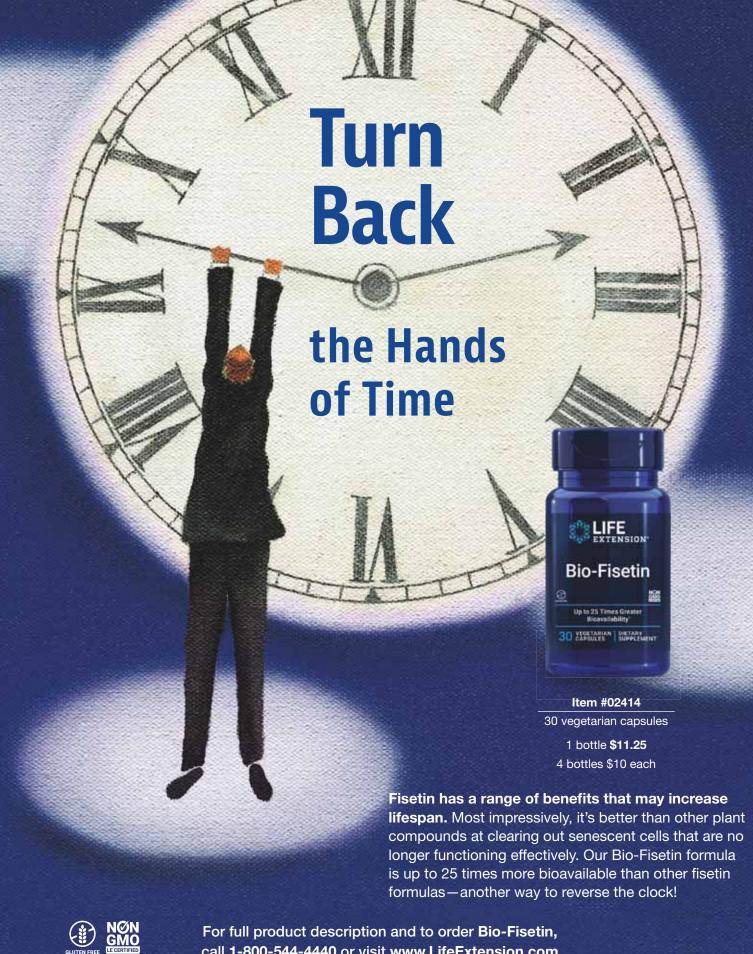
For longer life,

William Faloon, Co-Founder Life Extension Buyers Club

References

- 1. Available at: https://www.ft.com/content/d6d3cad8-f6e1-4a3c-b0cb-2b1afdeb95a0. Accessed August 30, 2021.
- Adedeji WA. THE TREASURE CALLED ANTIBIOTICS. Annals of Ibadan postgraduate medicine. 2016;14(2):56-7.
- 3. Available at: https://www.wsj.com/articles/older-shoppers-arethe-hot-new-thing-for-consumer-brands-11612002644. Accessed August 31, 2021.
- 4. Available at: https://www.nestle.com/randd/news/allnews/nestlelaunches-functional-food-supporting-mobility-during-aging-yiyangactive. Accessed August 31, 2021.
- 5. Available at: https://www.dairyreporter.com/Article/2020/12/17/ Nestle-launches-milk-product-in-China-to-support-mobility-duringaging. Accessed August 31, 2021.
- 6. Available at: https://foodtechnews.asia/nestle-to-launch-functionalfood-in-china/. Accessed August 31, 2021.
- 7. Ma H, Li X, Sun D, et al. Association of habitual glucosamine use with risk of cardiovascular disease: prospective study in UK Biobank. BMJ. 2019 May 14;365:I1628.







call 1-800-544-4440 or visit www.LifeExtension.com

BREATHE EASY







TARGET Cellular Debris

Item # 02415 30 vegetarian capsules 1 bottle \$19.50 4 bottles \$17.50 each

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



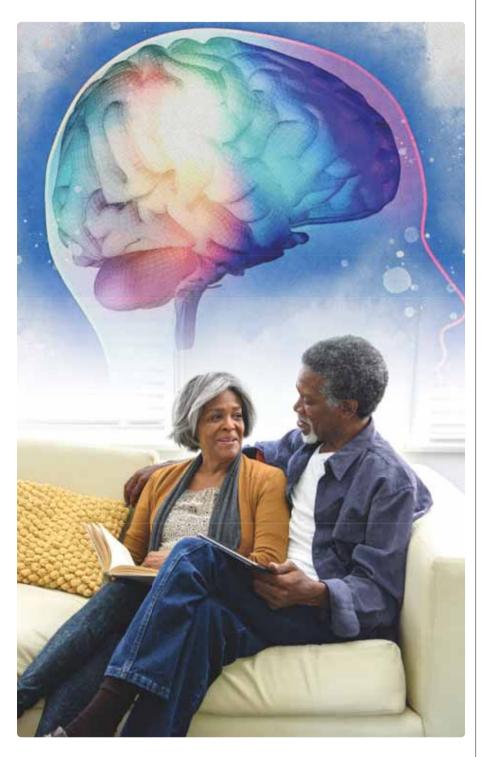
AUTOPHAGY is your body's way of recycling cellular debris to keep you vibrant and healthy, but this process begins to decline over time. Our formula combines nutrients that encourage healthy cellular upkeep, and benefit your longevity.

- Helps your body function optimally, without cellular debris getting in the way
- Promotes healthy AMPK activity
- Encourages cells to recycle waste material
- Helps maintain cellular energy balance



[†]Developed in collaboration with Insilico Medicine, Inc.

In the News



Better Cognitive Function with POO

Individuals who received supplements containing pyrrologuinoline quinone (PQQ) had better cognitive function compared to those given a placebo, according to the results of a trial published in the Journal of the American College of Nutrition.*

The trial included 58 participants, 40 to 80 years old, with agingassociated cognitive impairment, who received either 21.5 mg of PQQ per day for 12 weeks, or a placebo.

In the group that received PQQ, improvement was observed in composite memory, verbal memory, reaction time, complex attention, cognitive flexibility, executive function (judgement), and subjective forgetfulness, compared to the placebo group.

Editor's Note: PQQ supports the growth of new mitochondria to promote cellular energy.

* J Am Coll Nutr. 2021 Aug 20;1-14.



Breast Cancer Drug Reduces Risk of Dying

The breast cancer drug Enhertu®, made by AstraZeneca PLC, has been found to significantly reduce the risk of dying or of tumor progression in women with advanced disease, according to a Wall Street Journal report.*

A phase 3 clinical trial called DESTINY-Breast03 compared Enhertu® to Kadcyla®, the current standard of care, in 500 women with metastatic breast cancer whose cancers didn't respond to earlier treatment, and whose tumors produced high levels of the HER2 protein.

HER2 stands for human epidermal growth factor receptor 2. It can be put into remission with drugs like Herceptin®, but often returns and requires further treatment. Mortality rates are high for HER2 positive cancers compared to estrogen-receptor positive breast tumors that respond better to curative therapy.

This study found that compared to the drug Kadcyla®. Enhertu® reduced the risk of death or of tumor progression by 72%.

After one year, **75.8%** of women treated with Enhertu® had no disease progression, compared to 34.1% of women treated with Kadcyla®.

According to the trial's lead investigator, metastatic breast cancer patients typically experience disease progression in less than one year.

"We've never seen a magnitude of benefit like this in metastatic breast cancer before," said Dave Fredrickson, AstraZeneca's head of oncology.

Enhertu® works by tracking down cancer cells and delivering a dose of chemotherapy at the site of the tumors, leaving healthy tissue unharmed.

Editor's Note: Enhertu® is currently used as a third-line treatment, which means it's only used after two previous treatments have failed. These results suggest that Enhertu® would be beneficial earlier on in the treatment process. AstraZeneca is hopeful that the drug could also be used to treat or cure early-stage disease.

* Available at: https://www.wsi.com/articles/astrazenecabreast-cancer-drug-found-to-reduce-risk-of-dying-11632146777. Accessed September 24, 2021.



Supplements Improve Sleep Quality

A systematic review and metaanalysis published in the Postgraduate Medical Journal found benefits for supplemental vitamin D, melatonin, and amino acids in improving people's quality of sleep.*

Researchers studied 15 randomized, controlled trials that examined the association between subjective sleep quality and supplementation with amino acids, the hormone melatonin, and vitamin D.

Pooled data for the two studies involving amino acid supplements, seven studies involving melatonin, and four studies involving vitamin D each showed significant differences between supplemented and control groups, with more favorable sleep scores occurring among those who received the supplements.

Editor's Note: Sleep quality was assessed by using the Pittsburgh Sleep Quality Index.

* Postgrad Med J. 2021 Jan 13.

Multivitamin Lowers Risk of Hip Fracture

A meta-analysis reported in the Archives of Osteoporosis found a link between the use of multivitamin supplements and a lower risk of sustaining a fragility hip fracture, a complication of osteoporosis.*

A fragility fracture is one that results from low-level trauma.

In eight studies that reported multivitamin use among a total of 80.148 men and women with osteoporotic hip fracture, multivitamin use was associated with a 51% lower risk of fragility hip fracture compared to non-use.

Editor's Note: "The protective effect of calcium and vitamin D supplementation on hip fracture risk has been a popular topic of study for decades," the authors observed. "In recent years, this focus has been extended to numerous other supplements such as carotenoids, fatty acids, minerals, and vitamins A, C, and E."

* Arch Osteoporos. 2021 Feb 11;16(1):29.







2 billion colony-forming units of S. salivarius K12 that:

- · Maintain a healthy inflammatory response
- Help provide probiotic balance for throat health
- · Maintain overall good health

BLIS K12® is the registered trademark of BLIS Technologies Limited.

Item #01920 • 30 vegetarian lozenges

1 bottle \$15 • 4 bottles \$13.50 each





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



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

Studies show **PQQ** supports heart health and cognitive function, complementing CoQ10.^{6,7}

In fact, just **20 mg** per day of **PQQ** plus **CoQ10** promotes memory and attention in aging individuals.⁸

This formulation contains **20 mg** of **PQQ** per capsule, which is the recommended daily dose.

For full product description and to order **PQQ** or any other **PQQ-containing formulas**, call 1-800-544-4440 or visit www.LifeExtension.com



Item #01647 • 30 vegetarian capsules

1 bottle **\$24** • 4 bottles \$18 each





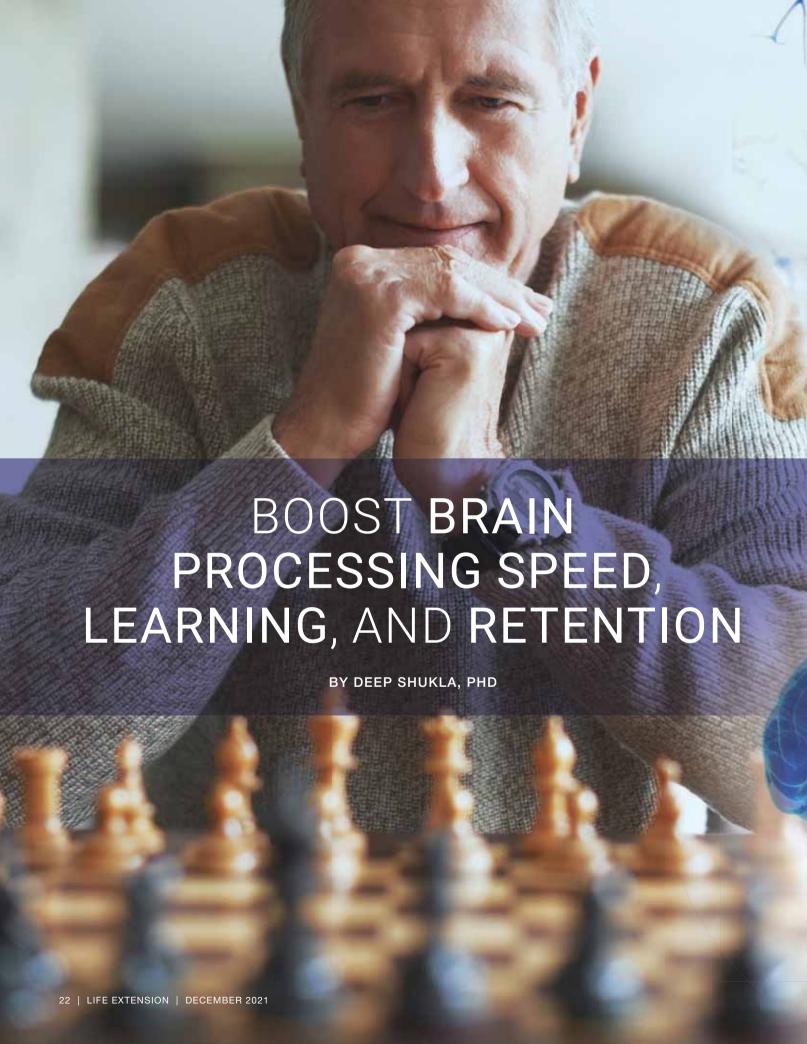


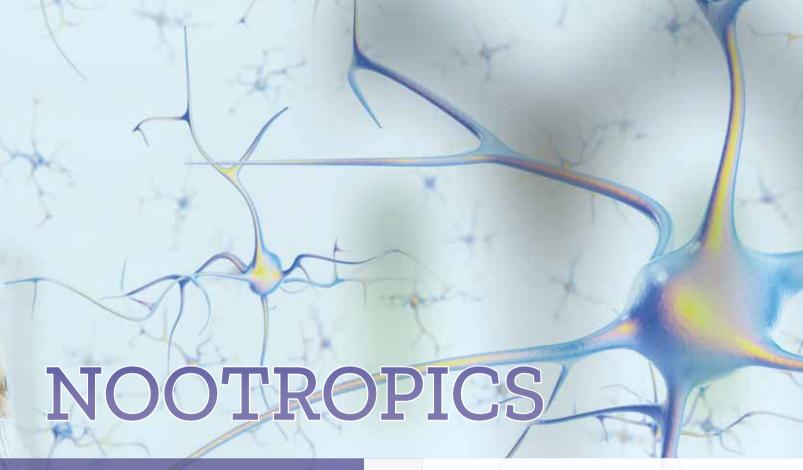
Also available are 10 mg PQQ caps (Item #01500) and 100 mg Super Ubiquinol CoQ10 with PQQ (Item #01733).

References1. *Alt Med Rev*. 2009; 14(3):268-77.
2. *J Nutr*. 2006 Feb;136(2):390-6.

3. Exp Biol Med (Maywood). 2003 Feb;228(2):160-6.

4. Biochim Biophys Acta. 2006 Nov;1760(11):1741-8. J Biol Chem. 2010 Jan 1;285:142-52.
 Cardiovasc Drugs Ther. 2004 Nov;18(6):421-31. 7. J Cardiovasc Pharmacol Ther. 2006 Jun;11 (2):119-28. 8. FOOD Style. 2009;21:13(7)50-3.







Nootropics are often called "smart drugs."

They enhance brain processing speed, learning, and alertness.

Many nootropics used today are off-label drugs that can have unwanted stimulating effects.

Those preferring a more tranquil approach may consider plant-based nootropics that have demonstrated cognitive-enhancing properties.

These clinically studied plant extracts have been shown to boost memory, enhance brain processing speed, and improve concentration and alertness.

What Are Nootropics?

Nootropics are *different* from compounds that protect against brain aging or cognitive decline.

They quickly boost cognitive performance, brain processing speed, mental alertness, and attention in healthy adults.

They may achieve this by increasing blood flow to the brain, combating inflammation, modulating levels of **neurotransmitters**, and increasing the number or effectiveness of synapses (that enable neurons to communicate).1-3

Scientists have identified **plant-based** compounds shown in human studies to improve cognitive function, processing speed, and memory.

Bacopa Monnieri Improves Cognition

Bacopa monnieri, is an herb traditionally used in Ayurvedic medicine to treat inflammation, pain, asthma, and dementia.4

Ancient texts dating back to the sixth century indicate that Bacopa monnieri was used to enhance memory and sharpen the intellect.3

Clinical studies suggest that Bacopa monnieri can improve cognitive performance in healthy young and elderly individuals.5-13

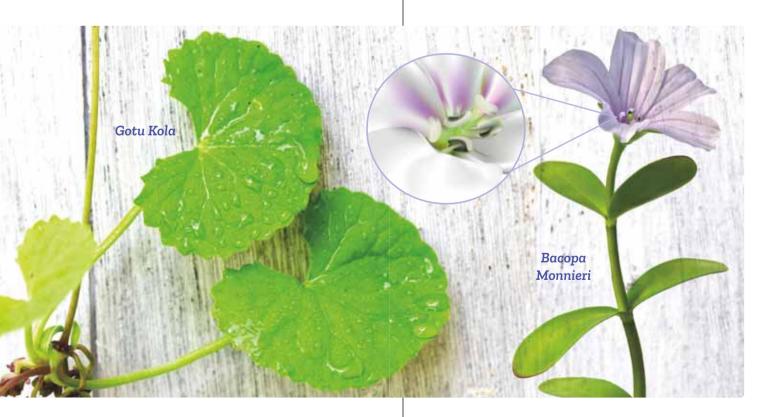
These studies indicate that Bacopa monnieri extracts may enhance:

- Acquisition of new memories
- Ability to retain and recall memories
- Ability to sustain attention and speed of attention
- Rate of learning
- Working memory
- Speed of information processing

One human study found that daily intake of Bacopa monnieri extract for 12 weeks led to an improvement in working memory (the ability to store and use shortterm information).8

Measurements of brain activity showed that those taking Bacopa had a more rapid onset of activity patterns associated with attention and information processing.8

Bacopa monnieri use also resulted in a decline in activity of the enzyme acetylcholinesterase.8 This enzyme breaks down the neurotransmitter acetylcholine, which is involved in memory and attention.¹⁴



Laboratory experiments suggest that **Bacopa** monnieri may also improve cognitive function by:

- Generating new nerve cells in the hippocampus, 15 a brain region that plays a critical role in learning and memory,16
- Enhancing the branching and length of dendrites (nerve cell extensions that receive signals from other nerve cells)1,17,18
- Improving cerebral blood flow, 19
- Inhibiting the release of inflammatory cytokines and blocking enzymes involved in inflammation,^{2,20}
- Modulating neurotransmitter production,²¹ and
- Improving the activity and levels of enzymes and nerve growth factors that are involved in maintaining and creating new synapses.3,15,22,23

Gotu Kola Boosts Brain Function

Gotu kola (Centella asiatica) is a flowering plant native to Asia. 24,25 It has long been used in Ayurvedic medicine to boost memory and cognition.²⁶

Clinical studies suggest that gotu kola can enhance cognitive functioning in healthy adults.^{26,27}

One study of adults ages 35 to 50 showed that intake of gotu kola daily for two months improved cognitive performance, including the retrieval of memories and speed of information processing.²⁷

In another study, daily intake of gotu kola extract for two months improved the **reaction time** and accuracy of working memory in healthy older adults.26 Researchers also found an increase in brain activity associated with attention during a cognitive task.26

Animal studies confirm that gotu kola can increase the number of synapses, reduce oxidative stress, and improve the function of energy-producing mitochondria in the hippocampus.^{28,29}

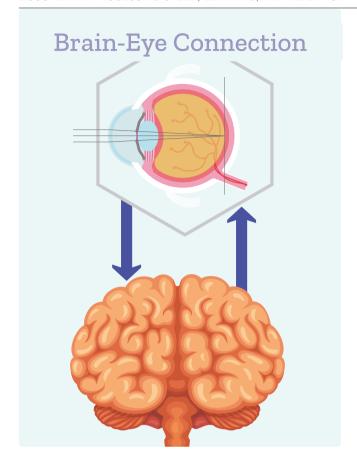
Treatment with gotu kola extract also stimulated the growth and maturation of nerve cells and the formation of synapses in lab cultures of nerve cells from the rat hippocampus.30

Like Bacopa, gotu kola enhances the elongation and branching of dendrites in the hippocampus and the amygdala in adult rats.31,32 These changes are associated with improvements in learning and memory.



Enhance Cognitive Function

- Nootropics are compounds that can enhance cognitive performance in healthy adults.
- Clinical trials show that extracts of the plants Bacopa monnieri and gotu kola and the carotenoids lutein and zeaxanthin can safely improve memory, learning, concentration, and information processing speed.
- These compounds reduce oxidative damage and inflammation in the brain and improve communication between brain cells.



Carotenoids and the Brain-Eye Connection

Carotenoids are a group of pigments found in many fruits and vegetables.

Lutein and zeaxanthin are closely related carotenoids that play a vital role in maintaining healthy vision. They help protect the macular density necessary for visual function.33-38

A majority of the lutein and zeaxanthin obtained from the diet is taken up by the retina, the innermost layer of the eye, and concentrated in a region near the center of the retina known as the macula.

The retina is composed of nerve cells and is an extension of the brain. Researchers have discovered that lutein and zeaxanthin also accumulate in the brain and play an important role in cognitive function. 39,40

Scientists are able to easily measure levels of lutein and zeaxanthin in the macula and have found that they correlate with levels in the brain.41,42

They have also determined that levels of lutein and zeaxanthin in the macula and blood serum are associated with cognitive function. 43-46 For instance, individuals with mild cognitive impairment or Alzheimer's disease have lower levels of these carotenoid pigments in the macula or blood serum. 43,47

Lutein and Zeaxanthin Enhance Mental Performance

Numerous clinical trials have explored the effects of lutein and zeaxanthin intake on cognitive performance in healthy young and older adults. 48-51

These human studies show that lutein and zeaxanthin intake can improve:

- Speed of information processing, 48,49
- Reasoning ability,50
- Memory,50,52
- Visual motor reaction,49
- Attention, 45,51
- Verbal and visual performance, 50,53 and
- Cognitive flexibility, the ability to shift mental strategies according to the task.51

A review of previous studies published in 2020 found that lutein and zeaxanthin were consistently effective in improving attention and long-term recollection of events, situations, and experiences.54

Using brain scanning, scientists have found that lutein and zeaxanthin levels in the serum and macula are associated with increased integrity of white matter (which consists of nerve fibers that connect brain cells) in older individuals.55

Carotenoids can also enhance the expression of proteins that form gap junctions.39 Gap junctions are channels that allow neighboring cells to directly communicate with each other. Increasing gap junction communication may enhance cognitive performance.40

Lutein and zeaxanthin appear to increase cooperation between brain regions that previously functioned in isolation,56 to increase blood flow to the brain,53 and to combat oxidative damage in the brain.^{57,58}

All of these actions can help improve cognitive performance.

Combining these carotenoids with Bacopa monnieri and gotu kola may help maximize the brain's full potential.

Summary

Nootropics can enhance cognitive performance in healthy individuals.

Animal and human studies show that the carotenoids lutein and zeaxanthin and extracts of the herbs Bacopa monnieri and gotu kola enhance various aspects of cognition in healthy young and old adults.

These natural nootropics have anti-inflammatory properties that protect nerve cells.

Natural nootropics can also modulate the connections between nerve cells to enhance learning and memory.

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. Vollala VR, Upadhya S, Nayak S. Enhanced dendritic arborization of hippocampal CA3 neurons by Bacopa monniera extract treatment in adult rats. Rom J Morphol Embryol. 2011;52(3):879-86.
- 2. Nemetchek MD, Stierle AA, Stierle DB, et al. The Ayurvedic plant Bacopa monnieri inhibits inflammatory pathways in the brain. J Ethnopharmacol. 2017 Feb 2;197:92-100.
- 3. Aguiar S, Borowski T. Neuropharmacological review of the nootropic herb Bacopa monnieri. Rejuvenation Res. 2013 Aug;16(4):313-26.
- Shailja C, Isha K, Shifali T, et al. Brahmi (Bacopa Monnieri)- a Potential Ayurvedic Cognitive Enhancer and Neuroprotective Herb. International Journal of Ayurveda and Pharma Research. 2021:41-9.

- 5. Benson S, Downey LA, Stough C, et al. An acute, double-blind, placebo-controlled cross-over study of 320 mg and 640 mg doses of Bacopa monnieri (CDRI 08) on multitasking stress reactivity and mood. Phytother Res. 2014 Apr;28(4):551-9.
- Calabrese C, Gregory WL, Leo M, et al. Effects of a standardized Bacopa monnieri extract on cognitive performance, anxiety, and depression in the elderly: a randomized, double-blind, placebocontrolled trial. J Altern Complement Med. 2008 Jul;14(6):707-13.
- 7. Morgan A, Stevens J. Does Bacopa monnieri improve memory performance in older persons? Results of a randomized, placebocontrolled, double-blind trial. J Altern Complement Med. 2010 Jul:16(7):753-9.
- 8. Peth-Nui T, Wattanathorn J, Muchimapura S, et al. Effects of 12-Week Bacopa monnieri Consumption on Attention, Cognitive Processing, Working Memory, and Functions of Both Cholinergic and Monoaminergic Systems in Healthy Elderly Volunteers. Evid Based Complement Alternat Med. 2012;2012:606424.
- 9. Raghav S, Singh H, Dalal PK, et al. Randomized controlled trial of standardized Bacopa monniera extract in age-associated memory impairment. Indian J Psychiatry. 2006 Oct;48(4):238-42.
- 10. Roodenrys S, Booth D, Bulzomi S, et al. Chronic effects of Brahmi (Bacopa monnieri) on human memory. Neuropsychopharmacology. 2002 Aug;27(2):279-81.
- 11. Stough C, Downey LA, Lloyd J, et al. Examining the nootropic effects of a special extract of Bacopa monniera on human cognitive functioning: 90 day double-blind placebo-controlled randomized trial. Phytother Res. 2008 Dec;22(12):1629-34.
- 12. Stough C, Lloyd J, Clarke J, et al. The chronic effects of an extract of Bacopa monniera (Brahmi) on cognitive function in healthy human subjects. Psychopharmacology (Berl). 2001 Aug;156(4):481-4.
- 13. Kumar N, Abichandani LG, Thawani V, et al. Efficacy of Standardized Extract of Bacopa monnieri (Bacognize(R)) on Cognitive Functions of Medical Students: A Six-Week, Randomized Placebo-Controlled Trial. Evid Based Complement Alternat Med. 2016 2016/10/10;2016:4103423.
- 14. Available at: https://www.ncbi.nlm.nih.gov/books/NBK539735/. Accessed September 23, 2021.
- 15. Kwon HJ, Jung HY, Hahn KR, et al. Bacopa monnieri extract improves novel object recognition, cell proliferation, neuroblast differentiation, brain-derived neurotrophic factor, and phosphorylation of cAMP response element-binding protein in the dentate gyrus. Lab Anim Res. 2018 Dec;34(4):239-47.



- Bruel-Jungerman E, Rampon C, Laroche S. Adult hippocampal neurogenesis, synaptic plasticity and memory: facts and hypotheses. *Rev Neurosci.* 2007;18(2):93-114.
- Vollala VR, Upadhya S, Nayak S. Enhancement of basolateral amygdaloid neuronal dendritic arborization following Bacopa monniera extract treatment in adult rats. Clinics (Sao Paulo). 2011;66(4):663-71.
- Hermans EJ, Battaglia FP, Atsak P, et al. How the amygdala affects emotional memory by altering brain network properties. *Neurobiol Learn Mem.* 2014 Jul;112:2-16.
- Kamkaew N, Norman Scholfield C, Ingkaninan K, et al. Bacopa monnieri increases cerebral blood flow in rat independent of blood pressure. *Phytother Res.* 2013 Jan;27(1):135-8.
- Saini N, Singh D, Sandhir R. Bacopa monnieri prevents colchicineinduced dementia by anti-inflammatory action. *Metab Brain Dis.* 2019 Apr;34(2):505-18.
- 21. Charles PD, Ambigapathy G, Geraldine P, et al. Bacopa monniera leaf extract up-regulates tryptophan hydroxylase (TPH2) and serotonin transporter (SERT) expression: implications in memory formation. *J Ethnopharmacol.* 2011 Mar 8;134(1):55-61.
- Preethi J, Singh HK, Charles PD, et al. Participation of microRNA 124-CREB pathway: a parallel memory enhancing mechanism of standardised extract of Bacopa monniera (BESEB CDRI-08). Neurochem Res. 2012 Oct;37(10):2167-77.
- McPhee GM, Downey LA, Noble A, et al. Cognitive training and Bacopa monnieri: Evidence for a combined intervention to alleviate age associated cognitive decline. *Med Hypotheses*. 2016 Oct:95:71-6.
- Sabaragamuwa R, Perera CO, Fedrizzi B. Centella asiatica (Gotu kola) as a neuroprotectant and its potential role in healthy ageing. Trends in Food Science & Technology. 2018;79:88-97.
- Parker C. Centella asiatica (Asiatic pennywort). Invasive Species Compendium. 2014.
- Wattanathorn J, Mator L, Muchimapura S, et al. Positive modulation of cognition and mood in the healthy elderly volunteer following the administration of Centella asiatica. *J Ethnopharmacol*. 2008 Mar 5:116(2):325-32.
- 27. Dev RDO, Mohamed S, Hambali Z, et al. Comparison on cognitive effects of Centella asiatica in healthy middle age female and male volunteers. *European Journal of Scientific Research*. 2009;31(4):553-65.
- Gray NE, Harris CJ, Quinn JF, et al. Centella asiatica modulates antioxidant and mitochondrial pathways and improves cognitive function in mice. *J Ethnopharmacol.* 2016 Mar 2;180:78-86.
- 29. Gray NE, Zweig JA, Caruso M, et al. Centella asiatica increases hippocampal synaptic density and improves memory and executive function in aged mice. *Brain Behav.* 2018 Jul;8(7):e01024.
- Hannan MA, Haque MN, Munni YA, et al. Centella asiatica promotes early differentiation, axodendritic maturation and synaptic formation in primary hippocampal neurons. *Neurochem Int.* 2021 Mar; 144:104957
- 31. Mohandas Rao KG, Rao MS, Rao GS. Evaluation of amygdaloid neuronal dendritic arborization enhancing effect of Centella asiatica (Linn) fresh leaf extract in adult rats. Chin J Integr Med. 2012 Dec 3.
- Mohandas Rao KG, Muddanna Rao S, Gurumadhva Rao S. Enhancement of Amygdaloid Neuronal Dendritic Arborization by Fresh Leaf Juice of Centella asiatica (Linn) During Growth Spurt Period in Rats. Evid Based Complement Alternat Med. 2009 Jun;6(2):203-10.
- Bian Q, Gao S, Zhou J, et al. Lutein and zeaxanthin supplementation reduces photooxidative damage and modulates the expression of inflammation-related genes in retinal pigment epithelial cells. Free Radic Biol Med. 2012 Sep 15;53(6):1298-307.
- Chucair AJ, Rotstein NP, Sangiovanni JP, et al. Lutein and zeaxanthin protect photoreceptors from apoptosis induced by oxidative stress: relation with docosahexaenoic acid. *Invest Ophthalmol Vis Sci.* 2007 Nov;48(11):5168-77.
- 35. Kijlstra A, Tian Y, Kelly ER, et al. Lutein: more than just a filter for blue light. *Prog Retin Eye Res.* 2012 Jul;31(4):303-15.
- Loskutova E, Nolan J, Howard A, et al. Macular pigment and its contribution to vision. *Nutrients*. 2013 May 29;5(6):1962-9.
- 37. Strauss O. The retinal pigment epithelium in visual function. *Physiol Rev.* 2005 Jul;85(3):845-81.

- Xue C, Rosen R, Jordan A, et al. Management of Ocular Diseases Using Lutein and Zeaxanthin: What Have We Learned from Experimental Animal Studies? J Ophthalmol. 2015;2015;523027.
- Hix LM, Lockwood SF, Bertram JS. Bioactive carotenoids: potent antioxidants and regulators of gene expression. *Redox Rep.* 2004;9(4):181-91.
- 40. Johnson EJ. Role of lutein and zeaxanthin in visual and cognitive function throughout the lifespan. *Nutr Rev.* 2014 Sep;72(9):605-12.
- 41. Vishwanathan R, Neuringer M, Snodderly DM, et al. Macular lutein and zeaxanthin are related to brain lutein and zeaxanthin in primates. *Nutr Neurosci.* 2013 Jan;16(1):21-9.
- 42. Johnson EJ. A possible role for lutein and zeaxanthin in cognitive function in the elderly. *Am J Clin Nutr.* 2012 Nov;96(5):1161S-5S.
- Renzi LM, Dengler MJ, Puente A, et al. Relationships between macular pigment optical density and cognitive function in unimpaired and mildly cognitively impaired older adults. *Neurobiology of* aging. 2014;35(7):1695-9.
- Vishwanathan R, Iannaccone A, Scott TM, et al. Macular pigment optical density is related to cognitive function in older people. Age and ageing. 2014;43(2):271-5.
- Walk AM, Edwards CG, Baumgartner NW, et al. The Role of Retinal Carotenoids and Age on Neuroelectric Indices of Attentional Control among Early to Middle-Aged Adults. Front Aging Neurosci. 2017 2017-June-09;9(183):183.
- Johnson EJ, Vishwanathan R, Johnson MA, et al. Relationship between Serum and Brain Carotenoids, alpha-Tocopherol, and Retinol Concentrations and Cognitive Performance in the Oldest Old from the Georgia Centenarian Study. *J Aging Res.* 2013;2013:951786.
- Nolan JM, Loskutova E, Howard AN, et al. Macular pigment, visual function, and macular disease among subjects with Alzheimer's disease: an exploratory study. *Journal of Alzheimer's disease*. 2014;42(4):1191-202.
- Bovier ER, Hammond BR. A randomized placebo-controlled study on the effects of lutein and zeaxanthin on visual processing speed in young healthy subjects. *Arch Biochem Biophys.* 2015 Apr 15:572:54-7.
- Bovier ER, Renzi LM, Hammond BR. A double-blind, placebocontrolled study on the effects of lutein and zeaxanthin on neural processing speed and efficiency. *PLoS One*. 2014;9(9):e108178.
- Renzi-Hammond LM, Bovier ER, Fletcher LM, et al. Effects of a Lutein and Zeaxanthin Intervention on Cognitive Function: A Randomized, Double-Masked, Placebo-Controlled Trial of Younger Healthy Adults. *Nutrients*. 2017 Nov 14;9(11).
- 51. Hammond Jr BR, Miller LS, Bello MO, et al. Effects of lutein/zeaxanthin supplementation on the cognitive function of community dwelling older adults: a randomized, double-masked, placebo-controlled trial. Frontiers in aging neuroscience. 2017;9:254.
- 52. Power R, Coen RF, Beatty S, et al. Supplemental Retinal Carotenoids Enhance Memory in Healthy Individuals with Low Levels of Macular Pigment in A Randomized, Double-Blind, Placebo-Controlled Clinical Trial. J Alzheimers Dis. 2018;61(3):947-61.
- 53. Lindbergh CA, Renzi-Hammond LM, Hammond BR, et al. Lutein and Zeaxanthin Influence Brain Function in Older Adults: A Randomized Controlled Trial. J Int Neuropsychol Soc. 2018 Jan;24(1):77-90.
- 54. Nouchi R, Suiko T, Kimura E, et al. Effects of lutein and astaxanthin intake on the improvement of cognitive functions among healthy adults: a systematic review of randomized controlled trials. *Nutri*ents. 2020;12(3):617.
- 55. Mewborn CM, Terry DP, Renzi-Hammond LM, et al. Relation of Retinal and Serum Lutein and Zeaxanthin to White Matter Integrity in Older Adults: A Diffusion Tensor Imaging Study. *Arch Clin Neuro*psychol. 2018 Nov 1;33(7):861-74.
- 56. Lindbergh CA, Lv J, Zhao Y, et al. The effects of lutein and zeaxanthin on resting state functional connectivity in older Caucasian adults: a randomized controlled trial. *Brain Imaging Behav.* 2020 Jun;14(3):668-81.
- 57. Sindhu ER, Preethi KC, Kuttan R. Antioxidant activity of carotenoid lutein in vitro and in vivo. *Indian J Exp Biol.* 2010 Aug;48(8):843-8.
- Madhavan J, Chandrasekharan S, Priya MK, et al. Modulatory Effect of Carotenoid Supplement Constituting Lutein and Zeaxanthin (10:1) on Anti-oxidant Enzymes and Macular Pigments Level in Rats. *Pharmacogn Mag.* 2018 Apr-Jun;14(54):268-74.

ZINC UP

YOUR IMMUNE HEALTH



Item #01813

50 mg • 90 vegetarian capsules

1 bottle **\$6.75** • 4 bottles \$6 each





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

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

Zinc promotes critical **immune** functions and healthy **bones**.

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

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

Caution: Supplemental zinc can inhibit the absorption and availability of copper. If more than 50 mg of supplemental zinc is to be taken daily for more than four weeks, 2 mg of supplemental copper should also be taken to prevent copper deficiency.



You asked, we listened. Get rewarded for your healthy lifestyle with Life Extension's most exclusive loyalty program—now with even more perks!



Get 4% Back on Every Purchase Earn LE Dollars you can use on any Life Extension product & lab services!



Unlimited Free Shipping

No matter how big or small the order, U.S. shipping is always free.



Exclusive Savings

Get sneak peeks into sales & special pricing.



Premium Content

Exclusive webinars, plus a free subscription to Life Extension Magazine®!



Surprise Gifts

Not only will you get rewarded on your birthday month, but you'll get extra goodies—just because!



Rewards Galore

Earn rewards for taking surveys and posting reviews about your favorite products.

Costs \$49.95 a year...Instant \$50 sign-up credit means zero cost to enroll!

Visit LifeExtension.com/YourPremier or call 1-866-670-4147
Please use code YOURPREMIER

Premier service expires 12 mooths after date of purchase or renewal and can only be renewed 6 months after Premier purchase or renewal. Includes FREE standard delivery (3 to 5 business days) to any mailing address within the United States, excluding U.S. territories. Discounts on ron-standard and international shipping also wellable: International customers pay \$59.95 for Premier. During checkout, redeem LE Dollars (one is equal to \$1 U.S. Dollar) to purchase products, blood tests, sale items, and shipping fees.



LEARN, RETAIN and Think FAST!

QUICK BRAIN



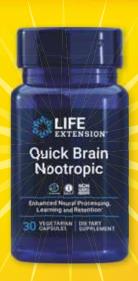
Nootropics speed up information processing in the brain, resulting in **faster thinking**.

Quick Brain Nootropic provides extracts from **bacopa**, **gotu kola**, and a **lutein-zeaxanthin** blend that have **clinical support** for:

- Cognitive enhancement and processing speed
- Learning function
- Healthy memory

Just <u>one</u> capsule daily to help stay "in the zone."

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



Item #02406 • 30 vegetarian capsules

1 bottle \$16.50 • 4 bottles \$15 each





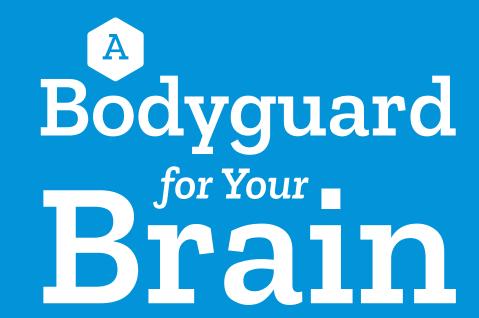


BACOGNIZE® ULTRA is a registered trademark of Verdure Sciences, Inc. FloraGLO® is a registered trademark of Kemin Industries, Inc.



4 boxes \$24 each

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



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!

LITHIUM

(1000 mcg of lithium per tiny cap) Item #02403

100 vegetarian capsules

1 bottle **\$12**

4 bottles **\$10.50** each

Each bottle lasts 100 days.

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





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

All-Day Stress Relief from L-THEANINE

BY CAROLINE MILLER





Chronic Stress and Burnout

Surveys and studies in recent years show that **stress** is extremely common in the U.S.^{4,5}

Besides work-related stress, relationships, health, and finances can be additional sources of anxiety.⁴

Ongoing, chronic stress increases the risk for anxiety disorders and depression.⁶

Some reports found that as many as **80**% of workers experience **job-related stress**.⁵

Recently, the **World Health Organization (WHO)** recognized the impact of **chronic workplace stress** on an occupation-related syndrome called **burnout**, and the need for evidence-based guidelines to address it.⁷

Burnout is marked by:7

- · Feelings of low energy or exhaustion,
- Increased "mental distance from one's job," or having cynical or negative feelings about work, and
- · Reduced ability to perform well at work.

A Superior Stress Reliever

Most medications designed to reduce stress and anxiety also **sedate** users or have other side effects that preclude their long-term use.¹

L-theanine is an amino acid primarily found in green tea. It has long been recognized for its ability to calm the mind and produce a state of "alert relaxation."

Its benefits are in large part due to its close resemblance to **glutamate**, an *excitatory* neurotransmitter in the brain which *rises* during times of stress.⁹

L-theanine *inhibits* the activity of glutamate by blocking it from binding to receptors in the brain, tamping down stress-related brain stimulation. L-theanine also *stimulates* production of the relaxing neurotransmitter **GABA**. ¹⁰⁻¹³

Numerous studies have shown that L-theanine is effective at **reducing stress**.^{2,8,14,15}

There has been a problem in that L-theanine is rapidly metabolized. That means, after consumption, it stays in your system for a short period of time.³

To get all-day stress relief benefits from L-theanine, people needed to take multiple doses spaced throughout the day.

Technology has solved this issue.

Using a **sustained-release delivery system**, a *single* dose of L-theanine can provide potent stress relief all day long.

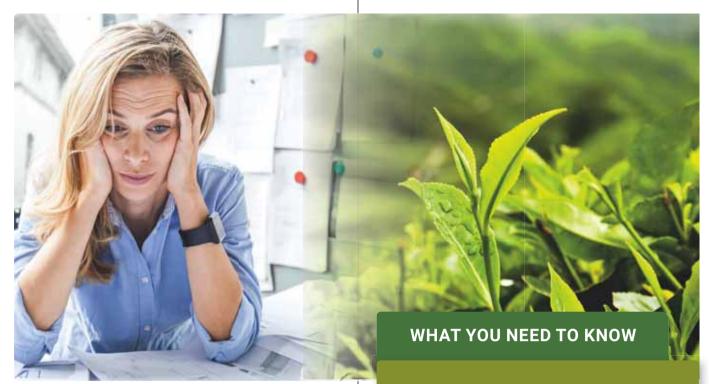
Unlike anti-anxiety **drugs** that can compromise brain functions, studies suggest that L-theanine <u>improves</u> **cognitive performance** under **stress**.^{11,16}

Reduce Stress and Fight Burnout

Several clinical trials have found that **L-theanine** relaxes the mind without inducing sleep or sedation.^{2,8,14,15} In one study, pharmacy students starting high-stress clinical training were randomized to receive **200 mg** of L-theanine twice per day or a placebo.¹⁷ Those taking L-theanine reported feeling significantly **less stress** than the placebo group.

Because **burnout** results from work-related stress, ¹⁸ the ability of L-theanine to help prevent and reduce burnout is promising.





Physical Benefits

L-theanine doesn't just make people feel less stressed. It has physical benefits as well.

During times of stress and anxiety, for example, the heart beats faster. Studies have shown that the heart rate response to a stressful task is reduced after consuming L-theanine, 19 suggesting a reduction in stress.

Cortisol is often referred to as a "stress hormone" because its levels tend to rise with stress. Chronically elevated cortisol and other stress hormones can contribute to weight gain, heart disease, impaired memory, and other problems.6

A study measuring cortisol levels in saliva found that it was reduced after intake of a nutrient drink containing L-theanine.20

Alpha waves are a type of brain wave that can be seen on an electroencephalogram (EEG). Their presence is associated with a relaxed but alert mental state which is necessary for focused attention.21

Studies of L-theanine have found that it *increases* alpha-wave activity in the brain, especially in individuals having high levels of anxiety. 15,20,22,23

These results show that L-theanine not only reduces feelings of stress, but also reduces the physical signs of stress in the body. This is an important indication that this amino acid may reduce the toll that chronic stress can take on overall health.

A Safe Way to De-Stress

- Chronic **stress** affects a large majority of adults. It contributes to poor general health and increased risk for anxiety and depression.
- Most available medications to manage stress cause **sedation** or other side effects and may be addictive.
- L-theanine is an amino acid found in green tea that has long been known to relax the mind and reduce stress, while maintaining alertness.
- Regular L-theanine is rapidly metabolized in humans, requiring repeat dosing throughout the day.
- A new **sustained-release** formulation provides continuous L-theanine to help manage stress and maintain productivity all day long.

Summary

Chronic, long-standing **stress** affects much of the adult population.

Most stress or anxiety drugs cause **sedation** and other negative side effects and may be addictive.

L-theanine, an amino acid found in green tea, has long been known to induce a state of *alert relaxation*. It relieves stress while maintaining mental clarity and sharpness.

L-theanine is rapidly metabolized in humans, requiring repeat dosing throughout the day to manage stress.

A novel **sustained-release formulation** of L-theanine solves this problem, providing continuous L-theanine to help maintain an alert but relaxed mind all day long. •

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

- Fluyau D, Revadigar N, Manobianco BE. Challenges of the pharmacological management of benzodiazepine withdrawal, dependence, and discontinuation. *Ther Adv Psychopharmacol.* 2018 May;8(5):147-68.
- Williams JL, Everett JM, D'Cunha NM, et al. The Effects of Green Tea Amino Acid L-Theanine Consumption on the Ability to Manage Stress and Anxiety Levels: a Systematic Review. *Plant Foods Hum Nutr.* 2020 Mar;75(1):12-23.
- van der Pijl PC, Chen L, Mulder TPJ. Human disposition of Ltheanine in tea or aqueous solution. *Journal of Functional Foods*. 2010 2010/10/01/;2(4):239-44.
- Available at: https://www.apa.org/news/press/releases/stress/2020/ report-october. Accessed September 8, 2021.
- Available at: https://www.stress.org/workplace-stress. Accessed July 7, 2021,
- Available at: https://www.mayoclinic.org/healthy-lifestyle/stressmanagement/in-depth/stress/art-20046037. Accessed September 8, 2021.
- Available at: https://www.who.int/news/item/28-05-2019-burnout-an-occupational-phenomenon-international-classification-ofdiseases. Accessed September 8, 2021.
- Mason R. 200 mg of Zen: L-Theanine Boosts Alpha Waves, Promotes Alert Relaxation. Alternative and Complementary Therapies. 2001;7(2):91-5.
- Moghaddam B, Bolinao ML, Stein-Behrens B, et al. Glucocorticoids mediate the stress-induced extracellular accumulation of glutamate. *Brain Res.* 1994 Aug 29;655(1-2):251-4.
- Yoto A, Motoki M, Murao S, et al. Effects of L-theanine or caffeine intake on changes in blood pressure under physical and psychological stresses. J Physiol Anthropol. 2012 Oct 29;31:28.
- Nathan PJ, Lu K, Gray M, et al. The neuropharmacology of Ltheanine(N-ethyl-L-glutamine): a possible neuroprotective and cognitive enhancing agent. J Herb Pharmacother. 2006;6(2):21-30.
- Vuong QV, Bowyer MC, Roach PD. L-Theanine: properties, synthesis and isolation from tea. J Sci Food Agric. 2011 Aug 30;91(11):1931-9.
- Di X, Yan J, Zhao Y, et al. L-theanine protects the APP (Swedish mutation) transgenic SH-SY5Y cell against glutamate-induced excitotoxicity via inhibition of the NMDA receptor pathway. *Neurosci*ence. 2010 Jul 14;168(3):778-86.

- Turkozu D, Sanlier N. L-theanine, unique amino acid of tea, and its metabolism, health effects, and safety. Crit Rev Food Sci Nutr. 2017 May 24:57(8):1681-7.
- Nobre AC, Rao A, Owen GN. L-theanine, a natural constituent in tea, and its effect on mental state. Asia Pac J Clin Nutr. 2008;17 Suppl 1:167-8.
- Tian X, Sun L, Gou L, et al. Protective effect of I-theanine on chronic restraint stress-induced cognitive impairments in mice. *Brain Res.* 2013 Mar 29;1503:24-32.
- Unno K, Tanida N, Ishii N, et al. Anti-stress effect of theanine on students during pharmacy practice: positive correlation among salivary alpha-amylase activity, trait anxiety and subjective stress. *Pharmacol Biochem Behav.* 2013 Oct;111:128-35.
- Available at: https://www.ncbi.nlm.nih.gov/books/NBK279286/. Accessed,
- Campbell A, Sixtus R. The Effects Of The Alphawave® L-Theanine Study Product On Relaxation, Clarity And Cognitive Function. 2016.
- White DJ, de Klerk S, Woods W, et al. Anti-Stress, Behavioural and Magnetoencephalography Effects of an L-Theanine-Based Nutrient Drink: A Randomised, Double-Blind, Placebo-Controlled, Crossover Trial. Nutrients. 2016 Jan 19:8(1).
- Foxe JJ, Snyder AC. The Role of Alpha-Band Brain Oscillations as a Sensory Suppression Mechanism during Selective Attention. *Front Psychol.* 2011 2011-July-05;2(154):154.
- Kobayashi K. Effects of L-theanine on the release of alpha-brain waves in human volunteers. *Journal of the Agricultural Chemical* Society of Japan. 1998;72(2):153-7.
- 23. Song CH, Jung JH, Oh JS, et al. Effects of theanine on the release of brain alpha waves in adult males. *Korean J Nutr.* 2003;36(9): 918-23.





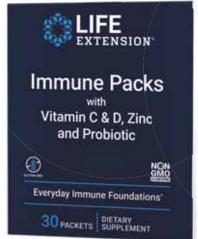
Everything you need for daily immune support in one easy-to-grab, travel-ready packet.

- Vitamin C 1,000 mg with Bio-Quercetin Phytosome: promotes antibody-producing cells.¹
- Vitamin D3 5,000 IU (125 mcg): plays a critical role in healthy immune function.
- Zinc 50 mg: promotes normal development of NK cells.²
- Probiotic L rhamnosus CRL1505 and S. cerevisiae fermentate: promotes secretory IgA antibodies.³⁻⁵

Take <u>one</u> pack **daily** to help promote a healthy, balanced, year-round immune response.

References

- Available at: https://lpi.oregonstate.edu/mic/ vitamins/vitamin-C. Accessed June 24, 2021.
 Available at https://lpi.oregonstate.edu/mic/
- Available at: https://lpi.oregonstate.edu/mic/minerals/zinc. Accessed June 24, 2021.
- 3. The Open Nutrition Journal. 2008;2:pp.68-75.
- International Journal of Biotechnology for Wellness Industries. 2012;1:189-98.
- 5. Adv Ther. 2009 Aug;26(8):795-804.





1 box \$31.50 • 4 boxes \$28.50 each



NØN GMO

For full product description and to order IMMUNE PACKS WITH VITAMIN C & D, ZINC, AND PROBIOTIC, call 1-800-544-4440 or visit www.LifeExtension.com

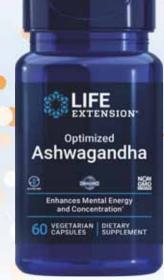
EpiCor® is a registered trademark of Embria Health Sciences, L.L.C.

REVITALIZE COMPONENTS OF YOUR AGING BRAIN!

OPTIMIZED ASHWAGAND EXTRACT

Ashwagandha has been shown to improve cognitive function, reduce stress, and help maintain more youthful brain cell structure.

Optimized Ashwagandha provides standardized leaf and root extracts at a low consumer cost.



Item #00888 • 60 vegetarian capsules

1 bottle **\$7.50** • 4 bottles \$6.75 each





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

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





BY MARINA MACDONALD, MS, PHD



Importance of Bifidobacteria

Bifidobacteria are an important part of the gut microbiome and play a valuable role in whole-body health.

Healthy bifidobacteria are estimated to account for about 60% of gut microbes in infancy.4

Researchers have suggested that by adulthood, bifidobacteria levels decline to 30%-40% of total gut microbes, then to about 10% in late middle age, and drop to less than 5% by old age.4

This is where **prebiotics** play an important role. Replenishing intestinal bifidobacteria restores their multiple healthful effects, while limiting room for harmful bacteria to live and grow.7

Bifidobacteria have been of great interest to researchers due to their ability to modulate so many areas of health, particularly immunity.8

A variety of research models, from animal to clinical trials, have found that bifidobacteria levels are reduced in some digestive disorders, infections, and in autoimmune arthritis.9

Bifidobacteria may be protective against an underlying mechanism of diabetes and obesity, along with improving blood sugar metabolism. An animal model found that bifidobacteria supplementation suppressed colon cancer.9

Just as bifidobacteria levels decrease over time, the incidence of degenerative diseases increases with age.

Scientists have discovered a prebiotic called xylooligosaccharide or XOS that increases the bifidobacteria population, helping to support a healthy gut microbiome and all the benefits that come with it.



What are Prebiotics?

The gut microbiota is made up of the trillions of microorganisms in your digestive tract. They impact immunity, metabolism, the endocrine system, mood, and cardiovascular health. 10-14

Foods that specifically nourish and promote healthy gut flora are called *prebiotics*. 15,16 Very few people ingest enough prebiotics from food sources to help foster a healthy gut microbiota filled with bifidobacteria.

For a food ingredient to be classified as a prebiotic, it must:17

- Resist digestion.
- Be fermented by intestinal microorganisms,
- Stimulate growth and/or activity of beneficial bacteria, and
- Enable healthy bacteria to grow and thrive.

Most commercial **prebiotics** require large doses to provide optimal digestive health support. This can cause excessive flatulence, bloating and general digestive discomfort.18

The XOS prebiotic is different, requiring only small doses.

Advantages of XOS

Xylooligosaccharides (XOS) are prebiotics usually made from corn cobs. They feed healthy bifidobacteria and help them grow and multiply.

XOS has demonstrated the following advantages:

- Human studies: XOS consumption created rapid increases in bifidobacteria in as little as two weeks.6,19
- Culture studies: Fermentation of XOS by bifidobacteria inhibited the growth of harmful bacteria Clostridium difficile, which can cause fever, diarrhea, and serious or fatal gastrointestinal disease.20
- **XOS** works at *lower doses*, minimizing gastrointestinal discomforts like gas and bloating that are often associated with other prebiotics that require higher doses.6,18



- The gut microbiota plays a pivotal role in gut, immune, and overall health.
- Lower levels of *bifidobacteria* have been associated, in a range of research models, with characteristics of several age-related diseases, and in many cases with the diseases themselves.
- Xylooligosaccharide or XOS is a prebiotic that specifically targets and boosts bifidobacteria. It has been validated in human studies to work in relatively low doses, without side effects, in as little as two weeks.
- XOS has also been shown to lower cholesterol, triglycerides, and blood sugar-risk factors for cardiovascular disease and diabetes, respectively.
- Taking XOS daily increased levels of butyrate in human subjects.²¹ Butyrate is a short-chain fatty acid that is the food for the cells that line the colon. In animal models, butyrate has been linked with gut and brain health.²²
- In a study of type II diabetics, taking XOS daily for eight weeks modestly improved blood sugar and cholesterol levels.23

Boosting Bifidobacteria with XOS

In an eight-week study conducted at UCLA School of Medicine, XOS significantly boosted levels of bifidobacteria.6

Researchers divided 32 healthy subjects into one of three groups:

- Placebo
- Low-dose XOS
- High-dose XOS

The preparation contained 70% XOS, so that the total amount of XOS ingested in the two study groups was one gram or two grams, respectively.

Both treatment groups had increases in bifidobacteria, but those taking two grams daily of XOS had significantly *larger* increases than the lower-dose group.

To achieve similar increases using another common prebiotic, FOS (fructooligosaccharides), you'd have to take 10 to 20 grams, which could cause cramps and other digestive problems.6

What the study showed was that XOS is an effective way to repopulate the gut with healthy bifidobacteria. By using the prebiotic XOS, researchers showed that they could rejuvenate an aging gut microbiome.

In another study using the same dose, those taking two grams of XOS daily achieved rapid increases in bifidobacteria in just 14 days.¹⁹

A **2020** rat study found that **XOS** supplementation modulates gut flora and reduces colon inflammation caused by high-fat-diet-induced obesity.²⁴

Wide-Ranging Health Benefits

XOS provides a way to improve bifidobacteria levels in the gut without the digestive discomforts often associated with other common prebiotics. One study found that taking two grams of XOS:19

- Increased fecal acidity, likely reflecting the presence of higher amounts of beneficial short chain fatty acids, produced by beneficial intestinal microbes including bifidobacteria.9
- Decreased blood sugar, an effect which could reduce the risk of metabolic syndrome and type II diabetes.
- Decreased blood cholesterol and triglycerides, while these were increased in stool, suggesting that excess lipids were removed from blood and transferred to the feces for excretion.

Research shows that bifidobacteria feed on precisely the types of carbohydrates that humans cannot digest, especially the group known as oligosaccharides. XOS (xylooligosaccharide) is an example of this oligosaccharide group of prebiotics.25

These findings add up to a viable method to rejuvenate the bifidobacteria of the gut microbiome.

Summary

The health benefits of *bifidobacteria* are well-known. By the time we reach an advanced age, however, this beneficial organism will have declined to just 5% of youthful levels.

Xylooligosaccharides (XOS) are prebiotics that can boost bifidobacteria populations.

In human studies, daily consumption of XOS increased numbers of bifidobacteria in as little as two weeks.

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://hmpdacc.org/. Accessed September 19, 2021.
- 2. Turroni F, Marchesi JR, Foroni E, et al. Microbiomic analysis of the bifidobacterial population in the human distal gut. ISME J. 2009 Jun;3(6):745-51.
- 3. Wei H, Chen L, Lian G, et al. Antitumor mechanisms of bifidobacteria. Oncol Lett. 2018 Jul;16(1):3-8.



- Arboleya S, Watkins C, Stanton C, et al. Gut Bifidobacteria Populations in Human Health and Aging. Front Microbiol. 2016;7:1204.
- 5. Ruiz L, Delgado S, Ruas-Madiedo P, et al. Bifidobacteria and Their Molecular Communication with the Immune System. Front Microbiol. 2017:8:2345
- 6. 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.
- 7. O'Callaghan A, van Sinderen D. Bifidobacteria and Their Role as Members of the Human Gut Microbiota. Front Microbiol. 2016;7:925.
- 8. Dong P, Yang Y, Wang WP. The role of intestinal bifidobacteria on immune system development in young rats. Early Hum Dev. 2010 Jan:86(1):51-8.
- 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.
- 10. 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.
- 11. Sudo N. Microbiome, HPA axis and production of endocrine hormones in the aut. Adv Exp Med Biol. 2014:817:177-94.
- 12. Johnson EL, Heaver SL, Walters WA, et al. Microbiome and metabolic disease: revisiting the bacterial phylum Bacteroidetes. J Mol Med (Berl). 2017 Jan;95(1):1-8.
- 13. Available at: https://www.nih.gov/news-events/news-releases/nihhuman-microbiome-project-defines-normal-bacterial-makeup-body. Accessed August 24, 2020.
- 14. Galland L. The gut microbiome and the brain. J Med Food. 2014 Dec;17(12):1261-72.
- 15. Gibson GR, Roberfroid MB. Dietary modulation of the human colonic microbiota: introducing the concept of prebiotics. J Nutr. 1995 Jun:125(6):1401-12.
- 16. Gibson GR, Scott KP, Rastall RA, et al. Dietary prebiotics: current status and new definition. Food Science & Technology Bulletin: Functional Foods. 2010 05/01;7(1):1-19.
- 17. Slavin J. Fiber and prebiotics: mechanisms and health benefits. Nutrients. 2013 Apr 22;5(4):1417-35.
- 18. Cummings JH, Macfarlane GT. Gastrointestinal effects of prebiotics. Br J Nutr. 2002 May;87 Suppl 2:S145-51.
- 19. Na MH, Kim WK. Effects of Xylooligosaccharide Intake on Fecal Bifidobacteria, Lactic acid and Lipid Metabolism in Korean Young Women. Korean J Nutr. 2007;40(2):154-61.
- 20. Kondepudi KK, Ambalam P, Nilsson I, et al. Prebiotic-non-digestible oligosaccharides preference of probiotic bifidobacteria and antimicrobial activity against Clostridium difficile. Anaerobe. 2012 Oct;18(5):489-97.
- 21. Lecerf JM, Depeint F, Clerc E, et al. Xylo-oligosaccharide (XOS) in combination with inulin modulates both the intestinal environment and immune status in healthy subjects, while XOS alone only shows prebiotic properties. Br J Nutr. 2012 Nov 28;108(10):1847-58.
- 22. Matt SM, Allen JM, Lawson MA, et al. Butyrate and Dietary Soluble Fiber Improve Neuroinflammation Associated With Aging in Mice. Front Immunol. 2018;9:1832.
- 23. Sheu WH, Lee IT, Chen W, et al. Effects of xylooligosaccharides in type 2 diabetes mellitus. J Nutr Sci Vitaminol (Tokyo). 2008 Oct;54(5):396-401.
- 24. Fei Y, Wang Y, Pang Y, et al. Xylooligosaccharide Modulates Gut Microbiota and Alleviates Colonic Inflammation Caused by High Fat Diet Induced Obesity. Front Physiol. 2019 2020-January-22;10(1601):1601.
- 25. Pokusaeva K, Fitzgerald GF, van Sinderen D. Carbohydrate metabolism in Bifidobacteria. Genes Nutr. 2011 Aug;6(3):285-306.



INTRODUCING



These FREE interactive workshops offer you science-based insights about nutrition, mindfulness and more...so you can learn how to live your healthiest life.



Explore our course catalog—and stay tuned for new offerings!

The Power of Probiotics: Bringing Your Body in Balance

Learn more about the wide-ranging influence of the microbiome on health.

Featuring:

Life Extension's Dr. Michael A. Smith, MD, with weight loss expert, Dr. Lori Shemek

The Mind/Body Connection

Discover how your physical health is tied to your emotional well-being.

Featuring:

Dr. Michael A. Smith, MD, with psychotherapist, Dr. Robi Ludwig

Eating for Energy

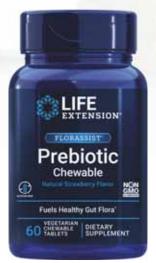
Find out how to get the most from every bite. PLUS: feel-good food recipes!

Featuring:

Life Extension's Dr. Crystal M. Gossard, DCN, with lifestyle expert, Dzung Lewis







RESTORE YOUTHFUL GUT BALANCE

With Strawberry Flavored FLORASSIST® Prebiotic Chewable

- With age, our bifidobacteria levels <u>decline</u> to as little as 5%, creating gut imbalance.¹
- Increasing bifidobacteria levels enhances digestion and carbohydrate metabolism.
- Strawberry flavored FLORASSIST®
 Prebiotic Chewable helps restore healthy bifidobacteria levels in as little as 14 days using XOS prebiotic.²
- 1,000 mg of XOS (xylooligosaccharides) per prebiotic chewable.





Item #02203 • 60 vegetarian chewable tablets

1 bottle **\$15** • 4 bottles \$13 each

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

References

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

PreticX™ is a trademark of AIDP, Inc.



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

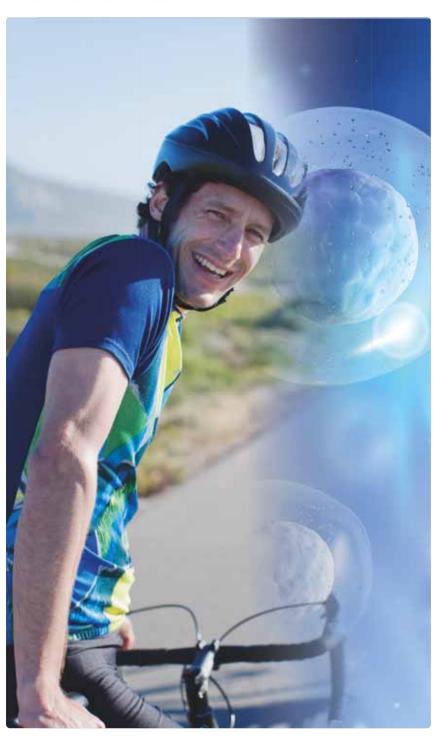
1 bottle \$24.75 • 4 bottles \$22.50 each

Note: Color of inner capsule may vary but does not affect ingredients.

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

What is **DHEA**?

BY CHANCELLOR FALOON



DHEA (dehydroepiandrosterone) is a hormone that has been shown to help:1

- Improve immune function
- Maintain bone density
- Reduce cardiovascular risk
- Enhance sexual well-being

Like most hormones, **DHEA** declines with age.

From a peak in our 20s, DHEA levels fall 80%-90% as we reach our 70s 1

Improved measures of healthy longevity have been reported when DHEA is restored to more youthful ranges for men and women.

Research Supporting Men's Health:

- In a large-scale study of older men followed for 12 years, higher circulating levels of **DHEA-S** (a metabolite of DHEA) were associated with a reduced risk of death from any cause by 36%.2
- In a study of non-diabetic patients followed for an average of four years, men (but not women) with the highest DHEA-S levels had a significantly reduced risk of developing type II diabetes.3

Research Supporting Women's Health:

- A pooled analysis of randomized, controlled trials concluded that "DHEA therapy may be an effective approach for preserving bone and muscle mass in women."⁴
- In an observational study of premenopausal women, DHEA use was associated with significantly improved parameters of sexual function in those who had the lowest scores on a sexual function index.⁵
- In a study of women with diminished ovarian reserve who were trying to conceive by in vitro fertilization, DHEA intake was associated with increased pregnancy rates.⁶

Multiple other studies have found benefits that apply equally to men and women.

One clinical trial showed that DHEA intake can improve mood and emotional health by enhancing connectivity between the **amygdala** (the brain region that involves emotion) and the **hippocampus** (the region central to memory).⁷

Another human trial showed that just six months of DHEA use can decrease insulin resistance and pro-inflammatory cytokines in elderly patients.⁸

An important observational study published in **December 2020** found that *low* DHEA-S levels were associated with an *increased* risk for **subclinical myocardial injury**, **heart failure hospitalization**, and **death**. The study evaluated more than 11,000 men and women, following some for 15 years.

Published studies continue to support the value of maintaining youthful DHEA levels. •

Restoring DHEA Levels

A cost-effective way to raise DHEA levels in the blood in older adults is by taking it orally.

For women, an ideal DHEA-S blood level is 275 ug/dL-400 ug/dL.

For men, it's 350 ug/dL-500 ug/dL.

A **DHEA-S** blood test can be used to assess levels three to four weeks after starting daily supplementation. The results can provide individual guidance to optimize dosage.

Women often need only 15 mg/day of oral DHEA whereas men usually take 25-50 mg daily.

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

References

- Bentley C, Hazeldine J, Greig C, et al. Dehydroepiandrosterone: a potential therapeutic agent in the treatment and rehabilitation of the traumatically injured patient. *Burns Trauma*. 2019;7:26.
- Barrett-Connor E, Khaw KT, Yen SS. A prospective study of dehydroepiandrosterone sulfate, mortality, and cardiovascular disease. N Engl J Med. 1986 Dec 11;315(24):1519-24.
- Veronese N, Trevisan C, De Rui M, et al. Serum Dehydroepiandrosterone Sulfate and Risk for Type 2 Diabetes in Older Men and Women: The Pro.V.A Study. Can J Diabetes. 2016 Apr;40(2):158-63.
- Jankowski CM, Wolfe P, Schmiege SJ, et al. Sex-specific effects of dehydroepiandrosterone (DHEA) on bone mineral density and body composition: A pooled analysis of four clinical trials. Clin Endocrinol (Oxf). 2019 Feb;90(2):293-300.
- Kushnir VA, Darmon SK, Barad DH, et al. Effects of dehydroepiandrosterone (DHEA) supplementation on sexual function in premenopausal infertile women. *Endocrine*. 2019 Mar;63(3):632-8.
- Chen SN, Tsui KH, Wang PH, et al. Dehydroepiandrosterone Supplementation Improves the Outcomes of in vitro Fertilization Cycles in Older Patients With Diminished Ovarian Reserve. Front Endocrinol (Lausanne). 2019;10:800.
- Sripada RK, Marx CE, King AP, et al. DHEA enhances emotion regulation neurocircuits and modulates memory for emotional stimuli. Neuropsychopharmacology. 2013 Aug;38(9):1798-807.

- Weiss EP, Villareal DT, Fontana L, et al. Dehydroepiandrosterone (DHEA) replacement decreases insulin resistance and lowers inflammatory cytokines in aging humans. *Aging (Albany NY)*. 2011 May;3(5):533-42.
- Jia X, Sun C, Tang O, et al. Plasma Dehydroepiandrosterone Sulfate and Cardiovascular Disease Risk in Older Men and Women. J Clin Endocrinol Metab. 2020 Dec 1;105(12):e4304-27.





BIOACTIVE FORMS OF VITAMIN B12

Only <u>two</u> **bioactive** coenzyme forms of vitamin B12 can be used directly by the body and brain.

The new **B12 Elite** provides both:

ADENOSYLCOBALAMIN

- Active in brain cell mitochondria.
- Preclinical evidence suggests that it may support already healthy levels of dopamine.
- Supports cellular energy production.

METHYLCOBALAMIN

- · Supports cognition within brain cells.
- 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





DHEA

DHEA supports immune function, mood, and lean muscle mass.

<u>Low</u> **DHEA** levels have been correlated with higher percent **body fat**.

Item #00454 • 100 capsules 1 bottle **\$10.50**

4 bottles \$9 each



DHEA 25 mg

1 bottle **\$12**

4 bottles \$11 each



DHEA 100 mg

Item #01689 • 60 vegetarian capsules 1 bottle **\$18**

4 bottles \$16.50 each



DHEA 50 mg

Item #00882 • 60 capsules 1 bottle **\$14.25**

4 bottles \$12.75 each



7-Keto® DHEA Metabolite 100 mg

Item #02479 • 60 vegetarian capsules
1 bottle \$30

4 bottles \$27 each



DHEA Complete 100 mg 7-Keto DHEA and 25 mg DHEA

Item #02478 • 60 vegetarian capsules 1 bottle **\$36**

4 bottles \$32 each

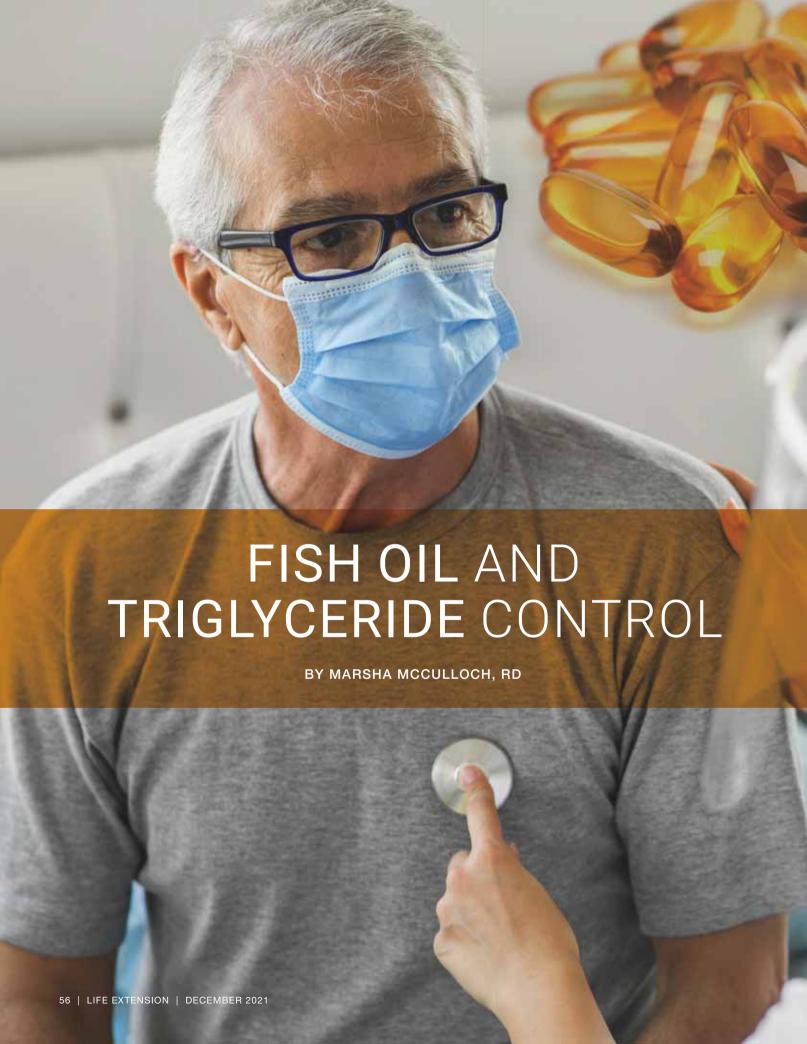


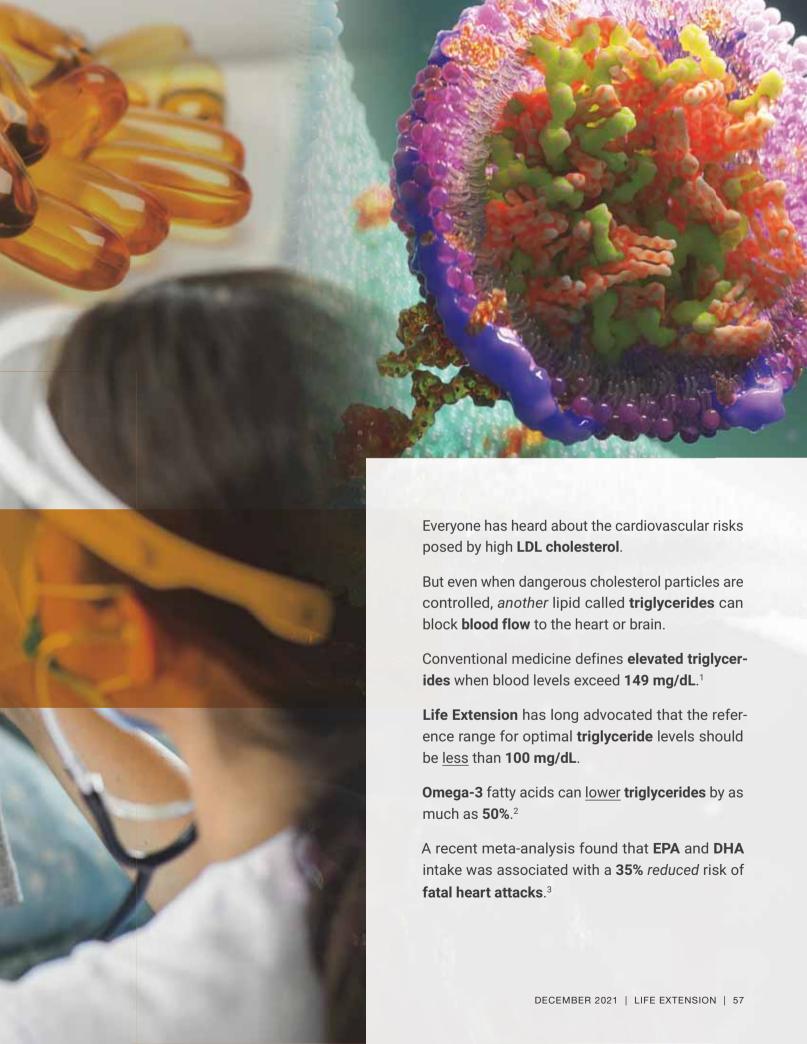
This supplement should be taken in conjunction with a healthy diet and regular exercise program. Individual results are not guaranteed, and results may vary.

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









Why Triglycerides Matter

Triglycerides consist of three ("tri") fatty acids attached to a glycerol (sugar alcohol) backbone. They are in food and in our body fat.4,5

After eating, your body converts some calories it doesn't need to triglycerides that are stored in fat cells. Triglycerides are released from fat storage for energy production between meals. Your body also makes triglycerides.

High triglyceride levels are strongly associated with metabolic disturbances that increase heart attack and ischemic stroke risk.6

Elevated levels are also associated with dangerous small-dense LDL particles. very low-density lipoproteins (VLDL),8 and cholesterol-enriched remnant lipoprotein particles.9 These are all known promoters of atherosclerosis. 10-12

Life Extension considers optimal fasting triglyceride levels to be below 100 mg/dL. Individuals at high risk for cardiovascular events should strive for even lower levels.

How Fish Oil Lowers Triglycerides

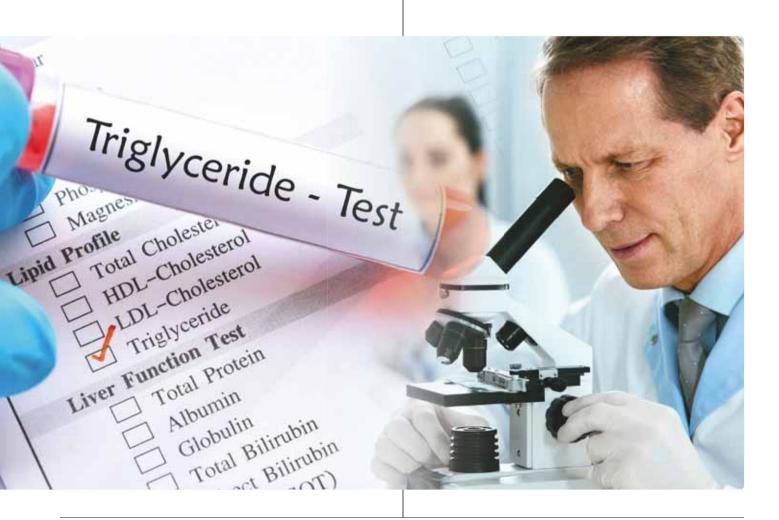
Oral intake of fish oil containing the omega-3 fatty acids EPA and DHA is a proven way to bring trialycerides down.

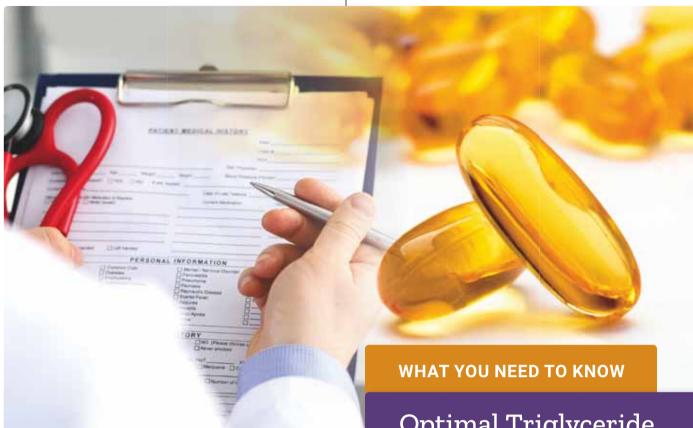
Fish oil lowers triglycerides by:13-17

- Increasing the clearance of triglyceride-rich lipoproteins from the bloodstream,
- Decreasing the liver's production and secretion of triglyceride-rich lipoproteins, and
- Increasing the activity of lipoprotein lipase, which breaks down triglycerides so the body's tissues can use the fatty acids.

Fish Oil for Prevention

Scientists reviewed 22 clinical trials of EPA and/ or DHA use in 1,637 healthy adults with normal or borderline-high triglycerides.18





In studies ranging from two weeks to a year, daily oral intake of 300-4,900 mg of omega-3s reduced fasting triglyceride levels by 4%-51%.18

Higher doses and longer time periods of taking fish oil generally produced greater benefits.18

A recent meta-analysis of 40 clinical trials found that EPA and DHA intake was associated with significant reductions in the risk for cardiovascular disease death.3

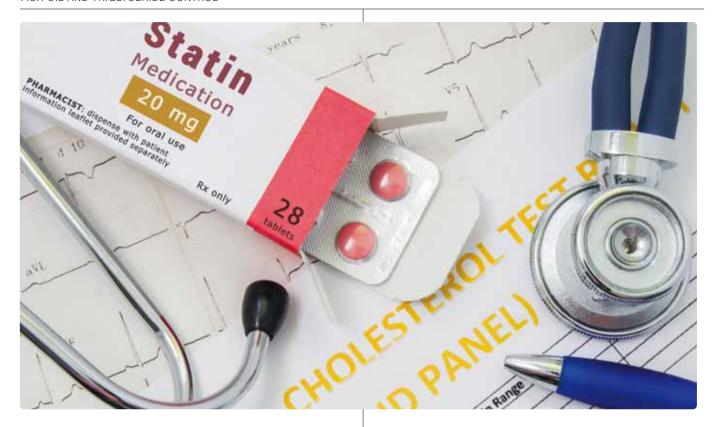
Specifically, this study found that EPA and DHA supplementation is associated with a reduced risk of:

- Fatal heart attack (35%)
- Heart attack (13%)
- Coronary heart disease events (10%)
- Coronary heart disease mortality (9%)

The study, published in the *Mayo Clinic Proceedings*, concluded that supplementation with EPA and DHA reduced the risk of coronary heart disease, including heart attack.

Optimal Triglyceride Control with Fish Oil

- Elevated **triglycerides** promote atherosclerosis and cardiovascular disease.
- Life Extension considers optimal fasting triglyceride levels to be well below 100 mg/dL.
- **Fish oil**, which includes the omega-3 fatty acids **EPA** and **DHA**, lowers triglycerides by increasing their removal from the bloodstream and decreasing their release from the liver.
- Omega-3 fatty acids can reduce triglycerides by up to 50% in people with high levels. They also lower triglycerides in people with moderately elevated levels.¹⁸
- One meta-analysis found that EPA and DHA intake was associated with a 35% reduced risk of fatal heart attacks.3



Triglycerides in Obesity

Triglycerides tend to rise with increasing body weight. Fish oil helps combat this.

When 210 overweight or obese adults supplemented with 3,000 mg of omega-3 daily for six weeks, fasting triglycerides decreased by 15% in men and 17% in women.19

In a longer, 16-week placebo-controlled trial of 152 overweight or obese older adults, daily oral intake of fish oil reduced triglycerides by 24%.20

In these studies, fish oil helped bring triglycerides closer to optimal levels.

Benefits in Other Conditions

High triglycerides are often related to type II diabetes and non-alcoholic fatty liver disease.

Insulin resistance, which contributes to diabetes, is associated with an increase in the liver's secretion of triglycerides. Clearance of triglycerides from the circulation tends to be slower in people with insulin resistance.21

In a three-month trial of 64 overweight/obese adults at increased risk for type II diabetes, oral intake of 2,000 mg fish oil daily led to a 16.54% decrease in fasting triglyceride levels.21

Excess fat buildup in the liver, such as in nonalcoholic fatty liver disease, is associated with an increased incidence of cardiovascular disease.²²

Recently, scientists reviewed 18 placebo-controlled trials of fish oil in individuals with non-alcoholic fatty liver disease. Fish oil significantly lowered triglycerides in an impressive 89% of the trials.23

Fish Oil with Statins

Some drugs that lower LDL cholesterol also decrease triglycerides. But they may not do enough.17,24,25

About one-third of all patients taking statin medications still have fasting triglyceride levels over 150 mg/dL. This leaves them vulnerable to cardiovascular problems.26

Fish oil has proven to be effective for reducing major adverse cardiovascular events.27

A major trial called REDUCE-IT included 8,179 highrisk heart patients who had LDL cholesterol controlled by statins yet still had elevated triglycerides. They were given 4,000 mg of a prescription EPA-only fish oil or a placebo daily for about five years.28

The fish oil group had a median reduction from baseline in fasting triglycerides of 19.7% within one year

compared to placebo. The placebo group had a slight increase in triglycerides.

The fish oil group also had a 25% reduction in the risk of major cardiovascular events (beyond that provided by statin treatment), compared to the placebo group.

Summary

Elevated triglycerides increase risk of heart attack and stroke.

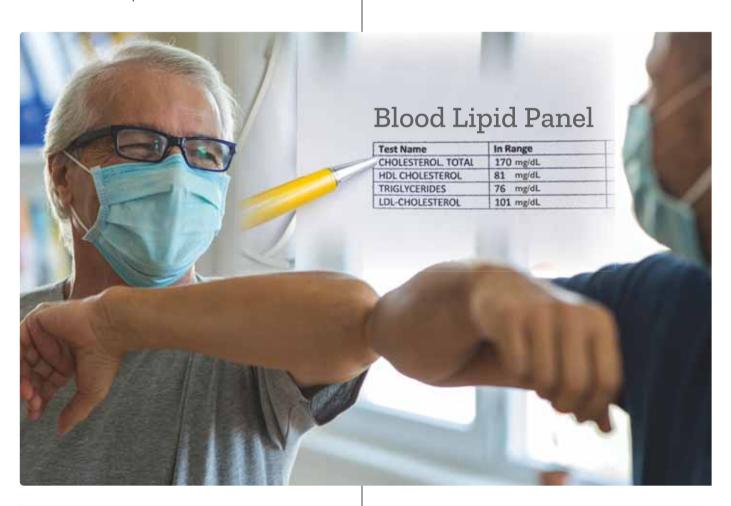
Fish oil containing the omega-3 fatty acids EPA and **DHA** can significantly *lower* triglycerides when consumed in sufficient amounts.

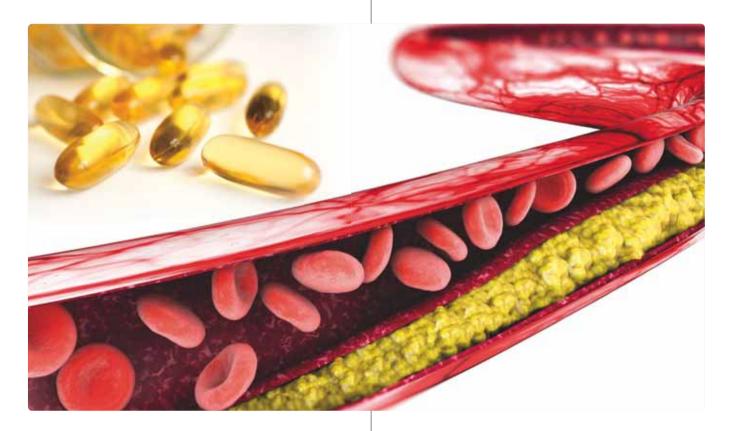
To promote healthy triglyceride levels, Life Extension suggests daily consumption of at least 2,000 mg of EPA/DHA from high-quality fish oil and/or regular consumption of cold-water fish. •

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.uptodate.com/contents/hypertriglyceridemia. Accessed September 13, 2021.
- 2. Available at: https://www.ncbi.nlm.nih.gov/books/NBK459368/. Accessed September 13, 2021.
- 3. Bernasconi AA, Wiest MM, Lavie CJ, et al. Effect of Omega-3 Dosage on Cardiovascular Outcomes: An Updated Meta-Analysis and Meta-Regression of Interventional Trials. Mayo Clin Proc. 2021 Feb;96(2):304-13.
- 4. Bayly GR. Lipids and disorders of lipoprotein metabolism. In: Marshall WJ, Lapsley M, Day AP, Ayling RM, editors. Clinical Biochemistry: Metabolic and Clinical Aspects: Churchill Livingstone; 2014:702-36.
- 5. Available at: https://www.mayoclinic.org/diseases-conditions/highblood-cholesterol/in-depth/triglycerides/art-20048186. Accessed September 14, 2021.
- 6. Ninomiya JK, L'Italien G, Criqui MH, et al. Association of the metabolic syndrome with history of myocardial infarction and stroke in the Third National Health and Nutrition Examination Survey. Circulation. 2004 Jan 6;109(1):42-6.
- 7. Austin MA, Breslow JL, Hennekens CH, et al. Low-density lipoprotein subclass patterns and risk of myocardial infarction. JAMA. 1988 Oct 7;260(13):1917-21.
- 8. Berglund L, Brunzell JD, Goldberg AC, et al. Evaluation and treatment of hypertriglyceridemia: an Endocrine Society clinical practice quideline. J Clin Endocrinol Metab. 2012 Sep;97(9):2969-89.
- 9. Nordestgaard BG, Benn M, Schnohr P, et al. Nonfasting triglycerides and risk of myocardial infarction, ischemic heart disease, and death in men and women. JAMA. 2007 Jul 18;298(3):299-308.
- 10. Hodis HN, Mack WJ, Dunn M, et al. Intermediate-density lipoproteins and progression of carotid arterial wall intima-media thickness. Circulation. 1997 Apr 15;95(8):2022-6.





- 11. Hodis HN, Mack WJ. Triglyceride-rich lipoproteins and progression of atherosclerosis. Eur Heart J. 1998 Feb;19 Suppl A:A40-4.
- 12. Austin MA, Krauss RM. LDL density and atherosclerosis. JAMA. 1995 Jan 11;273(2):115.
- 13. Shabrina A, Tung TH, Nguyen NTK, et al. n-3 PUFA and caloric restriction diet alters lipidomic profiles in obese men with metabolic syndrome: a preliminary open study. Eur J Nutr. 2020 Oct;59(7):3103-12.
- 14. Skulas-Ray AC, Wilson PWF, Harris WS, et al. Omega-3 Fatty Acids for the Management of Hypertriglyceridemia: A Science Advisory From the American Heart Association. Circulation. 2019 Sep
- 15. Guo XF, Li X, Shi M, et al. n-3 Polyunsaturated Fatty Acids and Metabolic Syndrome Risk: A Meta-Analysis. Nutrients. 2017 Jul 6:9(7):703
- 16. Oscarsson J, Hurt-Camejo E. Omega-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid and their mechanisms of action on apolipoprotein B-containing lipoproteins in humans: a review. Lipids Health Dis. 2017 Aug 10;16(1):149.
- 17. Backes J, Anzalone D, Hilleman D, et al. The clinical relevance of omega-3 fatty acids in the management of hypertriglyceridemia. Lipids Health Dis. 2016 Jul 22;15(1):118.
- 18. Leslie MA, Cohen DJ, Liddle DM, et al. A review of the effect of omega-3 polyunsaturated fatty acids on blood triacylglycerol levels in normolipidemic and borderline hyperlipidemic individuals. Lipids Health Dis. 2015 Jun 6:14:53.
- 19. Rudkowska I, Julien P, Couture P, et al. Cardiometabolic risk factors are influenced by Stearoyl-CoA Desaturase (SCD) -1 gene polymorphisms and n-3 polyunsaturated fatty acid supplementation. Mol Nutr Food Res. 2014 May;58(5):1079-86.
- 20. Kuszewski JC, Wong RHX, Wood LG, et al. Effects of fish oil and curcumin supplementation on cerebrovascular function in older adults: A randomized controlled trial. Nutr Metab Cardiovasc Dis. 2020 Apr 12;30(4):625-33.

- 21. Thota RN, Acharya SH, Garg ML. Curcumin and/or omega-3 polyunsaturated fatty acids supplementation reduces insulin resistance and blood lipids in individuals with high risk of type 2 diabetes: a randomised controlled trial. Lipids Health Dis. 2019 Jan 26;18(1):31.
- 22. Kasper P, Martin A, Lang S, et al. NAFLD and cardiovascular diseases: a clinical review. Clin Res Cardiol. 2021 Jul:110(7):921-37.
- 23. Lee CH, Fu Y, Yang SJ, et al. Effects of Omega-3 Polyunsaturated Fatty Acid Supplementation on Non-Alcoholic Fatty Liver: A Systematic Review and Meta-Analysis. Nutrients. 2020 Sep 11;12(9).
- 24. Laufs U, Parhofer KG, Ginsberg HN, et al. Clinical review on triglycerides. Eur Heart J. 2020 Jan 1;41(1):99-109c.
- 25. Farnier M, Zeller M, Masson D, et al. Triglycerides and risk of atherosclerotic cardiovascular disease: An update. Arch Cardiovasc Dis. 2021 Feb;114(2):132-9.
- 26. Boden WE. Bhatt DL. Toth PP. et al. Profound reductions in first and total cardiovascular events with icosapent ethyl in the REDUCE-IT trial: why these results usher in a new era in dyslipidaemia therapeutics. Eur Heart J. 2020 Jun 21;41(24):2304-12.
- 27. O'Keefe JH, Jacob D, Lavie CJ. Omega-3 Fatty Acid Therapy: The Tide Turns for a Fish Story. Mayo Clin Proc. 2017 Jan;92(1):1-3.
- 28. Bhatt DL, Steg PG, Miller M, et al. Cardiovascular Risk Reduction with Icosapent Ethyl for Hypertriglyceridemia. N Engl J Med. 2019 Jan 3;380(1):11-22.



A placebo-controlled clinical trial* shows these plant extracts help:

- Support you to walk farther and faster
- Promote knee flexibility and range of motion
- Reduce occasional knee discomfort
- Inhibit inflammation to support continued joint health



Item #02424 • 60 vegetarian capsules

Each capsule provides 200 mg of standardized tamarind-curcumin extract

1 bottle \$18.75 • 4 bottles \$17 each

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





*Int J Med Sci. 2019;16(6):845-53.

TamaFlex® is a trademark of NXT USA, Inc. Patents pending.



Go Green.

Your heart will love the benefits of Life Extension®

Mega Green Tea Extract.

Help maintain already-healthy blood cholesterol,

LDL and triglyceride levels with our innovative formula.

Item #00954 or Item #00953 100 vegetarian capsules

- 1 bottle **\$22.50**
- 4 bottles \$18 each









For full product description and to order either Mega Green

Tea Extract, call 1-800-544-4440 or visit www.LifeExtension.com



EPA/DHA FISH OIL +
SESAME LIGNANS + OLIVE EXTRACT +
KRILL + ASTAXANTHIN

EPA/DHA FISH OIL +
SESAME LIGNANS + OLIVE EXTRACT



Super Omega-3
provides components found
in Mediterranean diets,
including sesame lignans
to extend the stability
of DHA in the blood.





SUPER OMEGA-3*
EPA/DHA Fish Oil,
Sesame Lignans & Olive Extract
(2,400 mg of EPA + DHA in four softgels)

SUPER OMEGA-3 PLUS
EPA/DHA Fish Oil, Sesame Lignans,
Olive Extract, Krill & Astaxanthin
(2,520 mg of EPA + DHA in four softgels)

Item #01988 • 120 softgels
1 bottle \$33.75 • 4 bottles \$31.50 each





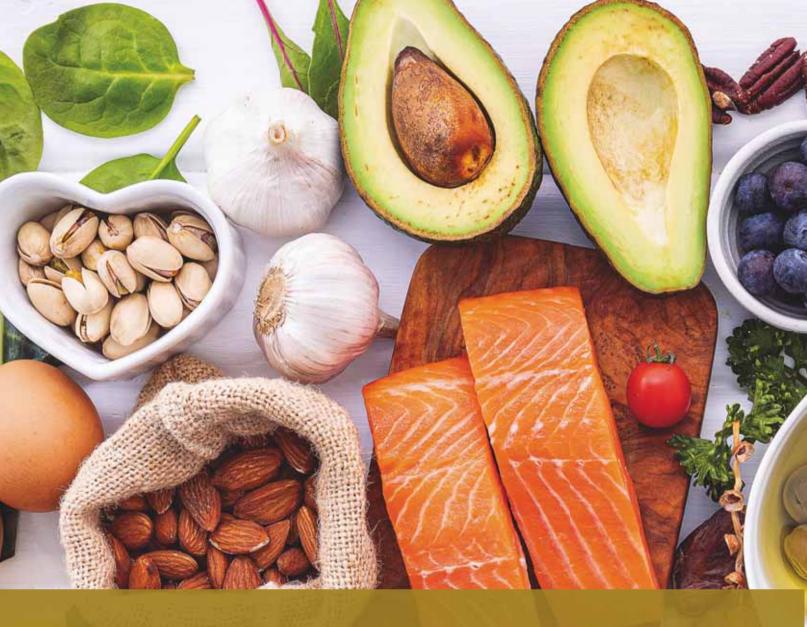
Item #01982 • 120 softgels
1 bottle \$24 • 4 bottles \$21 each

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

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

* Highest Independent 5-star rating, International Fish Oil Society For Over Nine Years. IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc.

These products have been tested to the quality and purity standards of the IFOS™ program conducted at Nutrasource Diagnostics, Inc.

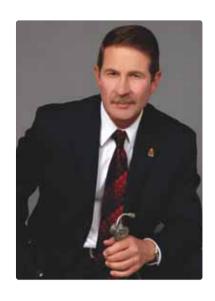


THE MEDITERRANEAN DIET:

A Prescription for Healthy Aging and Longevity

BY MICHAEL OZNER, MD





MICHAEL OZNER, MD PREVENTIVE CARDIOLOGIST

In thousands of published studies, the Mediterranean diet has proven again and again to be one of the best lifestyle strategies for extending longevity and avoiding common disorders of aging, including heart disease and cancer.

A 2021 clinical trial showed that those who adhered most closely to a traditional Mediterranean diet appeared less likely to suffer sudden cardiac death than those who least adhered to this diet.1

This landmark trial showed that a Mediterranean diet rich in extra-virgin olive oil reduced the risk of major cardiovascular events (including heart attack, stroke, and cardiovascular death) by 31%.2

In an observational study, greater adherence to a Mediterranean diet in midlife was related to a 46% better chance of healthy aging, defined as living to 70 years or older with no major physical or mental impairments.3

Of all the many diets currently recommended, the **Mediterranean diet** is clearly the winner for achieving longevity and heart health.

What Is the Mediterranean Diet?

As a cardiologist, I've become convinced that we need to focus on *prevention of heart disease* rather than waiting for this deadly disease to strike. Our first goal as doctors should be to prevent disease with a healthy lifestyle.

The **Mediterranean diet** is a vital part of that.

It can help prevent cardiovascular disasters such as heart attacks and strokes. It has also been shown to lower cancer risk and reduce the likelihood of developing Alzheimer's disease and chronic inflammatory disorders

The traditional Mediterranean diet is characterized by:4

- High consumption of extra virgin olive oil, vegetables, cereals, fruits, legumes, and nuts
- Moderate intake of fish
- Low intake of dairy products, poultry, meat and meat products, and sweets
- Red wine in moderation, consumed with meals

In the early 1990s, a non-profit group called the Oldways Preservation Trust, in cooperation with the Harvard School of Public Health and the World Health Organization, created the first Mediterranean diet pyramid.⁵⁻⁷

Then, in 1995, in an article in the *American Journal* of *Clinical Nutrition*, Walter Willet, MD, who was the Chairman of Nutrition at the Harvard T.H. Chan School of Public Health until 2017, published the first peerreviewed paper on the Mediterranean diet pyramid.

It was based on food patterns seen in the Mediterranean region including Greece (especially the island of Crete) and southern Italy in the 1960s, where, he has noted:

"adult life expectancy was among the highest in the world and rates of coronary heart disease, certain cancers, and other diet-related chronic diseases were among the lowest."8

Why This Diet Works

There are several components to the Mediterranean diet with proven health benefits.

Extra Virgin Olive Oil

Rather than butter or margarine, extra virgin **olive oil** is consumed in a Mediterranean diet. Studies have shown it can:

- Improve lipid profiles, including decreasing LDL ("bad") and increasing HDL ("good") cholesterol.9
- Lower post-meal glucose levels,¹⁰
- Reduce chronic inflammation,¹¹
- Fight damaging oxidative stress, 12,13
- Reduce blood clot formation,¹⁴
- Reduce high blood pressure,⁹
- Aid in preventing breast cancer,¹⁵
- Help prevent arrythmias,¹⁶
- Lower heart attack and stroke risk,¹⁶
- Help lower risk of Alzheimer's disease,¹⁷
- Reduce risk of depression, 18



WHAT YOU NEED TO KNOW

The Benefits of the Mediterranean Diet

- Medical and nutritional experts have voted the Mediterranean diet the best overall diet
- The diet focuses on eating **high** amounts of extra virgin olive oil, whole grains, vegetables, fruits, nuts, beans, and fish and other seafood. Red meat and sweets are avoided.
- Studies have found that adhering to this diet can reduce risk of many chronic illnesses, including heart disease, some cancers, diabetes, metabolic syndrome, and Alzheimer's disease.
- This diet has also been shown to extend **longevity**. One study found that older individuals who followed the Mediterranean diet, were physically active, consumed alcohol only in moderation, and didn't smoke had a more than 65% lower rate of death from all causes.

Omega-3 Fatty Acids

A Mediterranean diet is abundant in marine and plant sources of essential omega-3 fatty acids.

Fish oil contains the omega-3s EPA and DHA, which are both critical for optimal health. Plants contain **ALA**, another omega-3 fat, which is converted in small amounts to EPA and DHA.

Unfortunately, most Americans are deficient in EPA and DHA,22 potentially leading to a number of healthrelated issues.



Among many cardiovascular benefits, omega-3s can: 23

- Lower triglycerides (a fat found in the blood),
- · Reduce inflammation and oxidative stress,
- · Reduce high blood pressure,
- Lower resting heart rate,
- · Reduce the risk of fatal arrhythmias,
- Improve insulin sensitivity,
- · Mildly inhibit platelet function, preventing clotting,
- Improve endothelial function, vital to the health of heart and blood vessels, and
- Reduce inflammatory atherosclerotic plaque.

Vegetables and Fruits

Eating a wide variety of colorful plants provides:24-27

- Dietary fiber, which helps with weight control, can help to maintain a healthy gut, and reduces risk of colorectal cancer, and
- A range of polyphenols, plant nutrients that help fight a wide array of diseases, including heart disease, cancer, type II diabetes, and dementia.

Whole Grains

Brown rice, quinoa, oats, and whole wheat or whole grain breads and pastas are sources of **whole grains**. These types of grains:^{28,29}

- Contain a variety of important nutrients, including vitamins, minerals, protein, and fiber.
- Lower the risk of cardiovascular disease.
- Contribute to satiety (feeling full) and lower the risk of obesity, and
- · Reduce the risk of diabetes.

Nuts

Regular consumption of unprocessed **nuts** is recommended in any healthy diet. Among the reasons:³⁰

- Five large studies found that increased nut consumption reduces coronary heart disease risk.
- Most fats in nuts are mono- and polyunsaturated fats, which lower LDL ("bad") cholesterol levels.
- Substitution of nut fat for saturated fat was associated with a 45% reduction in coronary heart disease risk.

Red Wine

Red wine is often consumed in moderation with the main meal of the day. Studies have shown that it can:³¹

- Lower risk of cardiovascular disease,
- Raise protective HDL cholesterol levels,
- · Reduce inflammation,
- Lower oxidative stress,
- Prevent harmful blood clots, and
- Decrease post-meal blood sugar levels.



Preventing Cardiovascular Disease

Clinical and observational studies have found particularly strong evidence that the Mediterranean diet protects the **heart** and lowers the risk of **heart attacks**. strokes, and cardiovascular death.

A landmark study of 7,447 participants (ages 55 to 80 years) found that a Mediterranean diet rich in extravirgin olive oil prevented 31% of major cardiovascular events (including heart attack, stroke, and cardiovascular death) in high-risk individuals over nearly 10 years of follow-up.2

The **REGARDS** (Reasons for Geographic and Racial Differences in Stroke) study, for example, found a trend indicating those who adhered most closely to a traditional Mediterranean diet appeared less likely to suffer sudden cardiac death than those with least adherence to this diet.1

Those who have already suffered heart attacks can find powerful protection in following the diet.

In a study of more than 11,000 men and women with a history of heart attacks, those who most closely adopted a Mediterranean diet had the lowest risk of death over the next 6.5 years.32

And in the 46-month Lyon Diet Heart Study, a randomized, controlled trial of people who had suffered a first heart attack, those who followed a Mediterraneantype diet had an approximately 50% to 70% lower risk of recurrent heart disease than those on a control diet.33

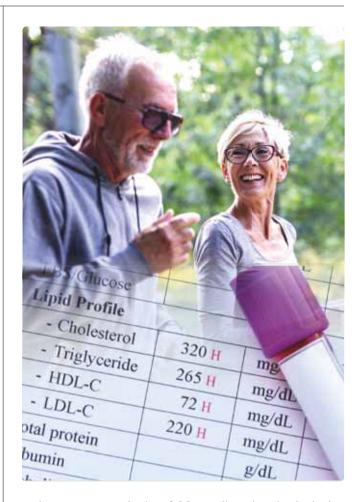
Fighting Other Diseases

Published medical studies show that the diet can reduce risk for a wide range of other age-related diseases.

A meta-analysis of 50 studies including nearly **535,000** people found that following the Mediterranean diet was associated with reduced risk of metabolic syndrome. The diet increased HDL ("good") cholesterol and reduced waist circumference, high blood pressure, high glucose levels, and elevated triglyceride levels.34

Another study of subjects at high cardiovascular risk showed that a Mediterranean diet reduced the risk of developing diabetes by 52% compared to a low-fat diet.35

In a study lasting four years, in patients showing no signs of dementia at baseline, greater adherence to the Mediterranean diet was associated with a significant reduction in risk of developing Alzheimer's disease.36



In a meta-analysis of 83 studies that included a whopping 2,130,753 subjects, the highest adherence to a Mediterranean diet was associated with the lowest rates of many cancers, including of the colon, breast, stomach, liver, and prostate.37

Those who most closely followed the diet also had the lowest risk of cancer mortality. The study authors' data analysis found that the diet's benefits mostly likely resulted from intake of fruits, vegetables, and whole grains.37

Promoting Longevity

Preventing heart disease, cancer, diabetes, and other causes of death can obviously increase overall lifespan.

Several studies have specifically shown that this diet increases longevity.

One study analyzed the diets of 10,670 women in mid-life (with a median age of 59 years). Greater adherence to the Mediterranean diet was related to 46% greater odds of surviving to 70 years or older with no major impairments in physical function or mental health.3



The **HALE** study of people aged 70 to 90 years found that a Mediterranean diet and healthful lifestyle (including physical activity, moderate alcohol use, and not smoking) was associated with a more than a **65%** lower rate of *death from all causes*.³⁸

Another study of adults 65 and over also found that closer adherence to the Mediterranean diet was associated with **prolonged survival**.³⁹

There are a few ways in which this diet promotes longevity.

Chronic inflammation is so closely tied to accelerated aging that it is sometimes referred to as *inflammaging*. Many staples of the Mediterranean diet, including omega-3 fatty acids from fish oil and polyphenols from fruits and vegetables, *reduce* chronic inflammation.⁴⁰

Telomeres are protective caps on DNA that shorten as we age. Telomere length is believed to be closely associated with lifespan. High adherence to a Mediterranean diet has been found to be associated with longer telomeres, and greater activity of an enzyme that maintains telomere length.⁴¹

These benefits, along with its proven diseasepreventing capabilities, explain why doctors so often recommend the Mediterranean diet.

Summary

The **Mediterranean diet** is a highly palatable eating pattern that has been shown to control body weight, improve cardiovascular health, and lower the risk of diabetes, metabolic syndrome, cardiovascular disease, Alzheimer's disease, and cancer.

It has also been shown to increase overall **longevity**. Everyone should follow a healthy lifestyle which includes optimal nutrition and regular physical activity. The Mediterranean diet should be at the center of that. Don't wait—the time to act is now. •

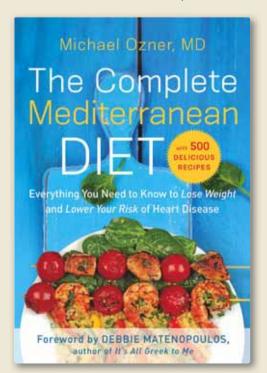
If you have any questions on the scientific content of this article, please call a **Life Extension**Wellness Specialist at 1-866-864-3027.

Michael Ozner, MD, FACC, FAHA, is one of America's leading advocates for heart disease prevention. He is a board-certified cardiologist, a Fellow of the American College of Cardiology and of the American Heart Association. Medical Director of Wellness & Prevention at Baptist Health South Florida, and a well-known regional and national speaker in the field of preventive cardiology. Dr. Ozner is on the Scientific Advisory Board of Life Extension Magazine® and is the Symposium Director for "Cardiovascular Disease Prevention," an annual international meeting highlighting advances in preventive cardiology and dedicated to treatment and prevention of heart attack and stroke. He is also the author of The Great American Heart Hoax, Heart Attack Proof, The Complete Mediterranean Diet, and Heart Attacks Are Not Worth Dying For.

Dr. Ozner's definitive book, The Complete Mediterranean Diet, explains the vast health benefits of the Mediterranean Diet and provides over 500 easy-to-follow recipes.

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

> > Item #33867 • Price: \$9.99





References

- 1. Shikany JM, Safford MM, Soroka O, et al. Mediterranean Diet Score, Dietary Patterns, and Risk of Sudden Cardiac Death in the REGARDS Study. J Am Heart Assoc. 2021 Jul 6;10(13):e019158.
- 2. Estruch R, Ros E, Salas-Salvado J, et al. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet Supplemented with Extra-Virgin Olive Oil or Nuts. N Engl J Med. 2018 Jun 21:378(25):e34.
- 3. Samieri C, Sun Q, Townsend MK, et al. The association between dietary patterns at midlife and health in aging: an observational study. Ann Intern Med. 2013 Nov 5;159(9):584-91.
- 4. Davis C, Bryan J, Hodgson J, et al. Definition of the Mediterranean Diet; a Literature Review. Nutrients. 2015 Nov 5;7(11):9139-53.
- 5. Available at: https://oldwayspt.org/traditional-diets/mediterraneandiet. Accessed September 24, 2021.
- 6. Available at: https://www.sevencountriesstudy.com/mediterraneandietary-patterns/. Accessed September 24, 2021.
- Available at: https://www.sevencountriesstudy.com/about-thestudy/history/. Accessed September 24, 2021.
- 8. Wang DD, Nguyen LH, Li Y, et al. The gut microbiome modulates the protective association between a Mediterranean diet and cardiometabolic disease risk. Nat Med. 2021 Feb;27(2):333-43.
- 9. Kontogianni MD, Panagiotakos DB, Chrysohoou C, et al. The impact of olive oil consumption pattern on the risk of acute coronary syndromes: The CARDIO2000 case-control study. Clin Cardiol. 2007 Mar:30(3):125-9.
- 10. Carnevale R, Silvestri R, Loffredo L, et al. Oleuropein, a component of extra virgin olive oil, lowers postprandial glycaemia in healthy subjects. Br J Clin Pharmacol. 2018 Jul;84(7):1566-74.
- 11. Casas R, Estruch R, Sacanella E. The Protective Effects of Extra Virgin Olive Oil on Immune-mediated Inflammatory Responses. Endocr Metab Immune Disord Drug Targets. 2018;18(1):23-35.
- 12. Yazihan N, Akdas S, Olgar Y, et al. Olive oil attenuates oxidative damage by improving mitochondrial functions in human keratinocytes. Journal of Functional Foods. 2020 2020/08/01/;71:104008.
- 13. Marcelino G, Hiane PA, Freitas KC, et al. Effects of Olive Oil and Its Minor Components on Cardiovascular Diseases, Inflammation, and Gut Microbiota. Nutrients. 2019 Aug 7;11(8):1826.
- 14. Ruano J, Lopez-Miranda J, de la Torre R, et al. Intake of phenol-rich virgin olive oil improves the postprandial prothrombotic profile in hypercholesterolemic patients. Am J Clin Nutr. 2007 Aug;86(2):341-6.
- 15. Sealy N, Hankinson SE, Houghton SC. Olive oil and risk of breast cancer: a systematic review and dose-response meta-analysis of observational studies. Br J Nutr. 2021 May 28;125(10):1148-56.
- 16. Martinez-Gonzalez MA, Toledo E, Aros F, et al. Extravirgin olive oil consumption reduces risk of atrial fibrillation: the PREDIMED (Prevencion con Dieta Mediterranea) trial. Circulation. 2014 Jul 1;130(1):18-26.

- Abuznait AH, Qosa H, Busnena BA, et al. Olive-oil-derived oleocanthal enhances beta-amyloid clearance as a potential neuroprotective mechanism against Alzheimer's disease: in vitro and in vivo studies. ACS Chem Neurosci. 2013 Jun 19;4(6):973-82.
- Li Y, Lv MR, Wei YJ, et al. Dietary patterns and depression risk: A meta-analysis. Psychiatry Res. 2017 Jul;253:373-82.
- Laino C. Olive Oil May Protect Against Ulcerative Colitis. webMD. 2010.
- Millán MBL. Virgin olive oil & fish fatty acids help prevent acute pancreatitis. EurkaAlert. 2011.
- 21. Pinto X, Fanlo-Maresma M, Corbella E, et al. A Mediterranean Diet Rich in Extra-Virgin Olive Oil Is Associated with a Reduced Prevalence of Nonalcoholic Fatty Liver Disease in Older Individuals at High Cardiovascular Risk. J Nutr. 2019 Nov 1;149(11):1920-9.
- 22. Murphy RA, Devarshi PP, Ekimura S, et al. Long-chain omega-3 fatty acid serum concentrations across life stages in the USA: an analysis of NHANES 2011-2012. BMJ Open. 2021 May 10;11(5):e043301.
- 23. De Caterina R. n-3 fatty acids in cardiovascular disease. N Engl J Med. 2011 Jun 23;364(25):2439-50.
- Slavin JL, Lloyd B. Health benefits of fruits and vegetables. Adv Nutr. 2012 Jul 1;3(4):506-16.
- 25. Lee J, Shin A, Oh JH, et al. Colors of vegetables and fruits and the risks of colorectal cancer. *World J Gastroenterol*. 2017 Apr 14:23(14):2527-38.
- Dai Q, Borenstein AR, Wu Y, et al. Fruit and vegetable juices and Alzheimer's disease: the Kame Project. Am J Med. 2006 Sep;119(9):751-9.
- Koch W. Dietary Polyphenols-Important Non-Nutrients in the Prevention of Chronic Noncommunicable Diseases. A Systematic Review. *Nutrients*. 2019 May 9:11(5).
- Aune D, Keum N, Giovannucci E, et al. Whole grain consumption and risk of cardiovascular disease, cancer, and all cause and cause specific mortality: systematic review and dose-response metaanalysis of prospective studies. *BMJ*. 2016 Jun 14;353:i2716.
- 29. Karl JP, Saltzman E. The role of whole grains in body weight regulation. *Adv Nutr.* 2012 Sep 1;3(5):697-707.
- Hu FB, Stampfer MJ. Nut consumption and risk of coronary heart disease: a review of epidemiologic evidence. Curr Atheroscler Rep. 1999 Nov;1(3):204-9.

- 31. Ditano-Vazquez P, Torres-Pena JD, Galeano-Valle F, et al. The Fluid Aspect of the Mediterranean Diet in the Prevention and Management of Cardiovascular Disease and Diabetes: The Role of Polyphenol Content in Moderate Consumption of Wine and Olive Oil. *Nutrients*. 2019 Nov 19;11(11):2833.
- 32. Barzi F, Woodward M, Marfisi RM, et al. Mediterranean diet and all-causes mortality after myocardial infarction: results from the GISSI-Prevenzione trial. *Eur J Clin Nutr.* 2003 Apr;57(4):604-11.
- 33. de Lorgeril M, Salen P, Martin JL, et al. Mediterranean diet, traditional risk factors, and the rate of cardiovascular complications after myocardial infarction: final report of the Lyon Diet Heart Study. *Circulation*. 1999 Feb 16:99(6):779-85.
- 34. Kastorini CM, Milionis HJ, Esposito K, et al. The effect of Mediterranean diet on metabolic syndrome and its components: a meta-analysis of 50 studies and 534,906 individuals. J Am Coll Cardiol. 2011 Mar 15;57(11):1299-313.
- 35. Salas-Salvado J, Bullo M, Babio N, et al. Reduction in the incidence of type 2 diabetes with the Mediterranean diet: results of the PREDIMED-Reus nutrition intervention randomized trial. Diabetes Care. 2011 Jan;34(1):14-9.
- 36. Scarmeas N, Stern Y, Tang MX, et al. Mediterranean diet and risk for Alzheimer's disease. *Ann Neurol.* 2006 Jun;59(6):912-21.
- Schwingshackl L, Schwedhelm C, Galbete C, et al. Adherence to Mediterranean Diet and Risk of Cancer: An Updated Systematic Review and Meta-Analysis. *Nutrients*. 2017 Sep 26:9(10).
- Knoops KT, de Groot LC, Kromhout D, et al. Mediterranean diet, lifestyle factors, and 10-year mortality in elderly European men and women: the HALE project. *JAMA*. 2004 Sep 22:292(12):1433-9.
- Bonaccio M, Di Castelnuovo A, Costanzo S, et al. Mediterranean diet and mortality in the elderly: a prospective cohort study and a meta-analysis. Br J Nutr. 2018 Oct;120(8):841-54.
- Casas R, Estruch R. Dietary Patterns, Foods, Nutrients and Chronic Inflammatory Disorders. Immunome Research. 2016;12(2).
- Boccardi V, Esposito A, Rizzo MR, et al. Mediterranean diet, telomere maintenance and health status among elderly. *PLoS One*. 2013;8(4):e62781.





BULK UP YOUR INTAKE OF HEALTHY FRUITS AND VEGETABLES

Plant-Based Multivitamin contains 1,600 mg of phytonutrients from 12 different fruits and vegetables.*

Three capsules deliver:

- The flavonoid content of three servings of vegetables
- The proanthocyanidin content of two servings of fruit
- Food-sourced vitamins and minerals



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





Item #02428 • 90 vegetarian capsules

1 bottle \$28.50 • 4 bottles \$26 each

* Plant-Based Multivitamin provides phytonutrients derived from quinoa sprouts, amla fruit, onion, grapeseed, broccoli, African oil palm fruit, European elder fruit, blackberry, sweet cherry, cranberry, plum, and persimmon. It also provides key vitamins derived from whole foods.



(Whey Concentrate)

(Whey Isolate)

(Whey + Creatine + Glutamine)

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

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

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

References

Int J Gen Med. 2011 Jan 25;4:105-13.
 Br J Nutr. 2000 Nov;84 Suppl 1:S81-9.
 J Dairy Sci. 2000 Jun;83(6):1187-95.

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

Choose the Best Whey for You!

- WHEY PROTEIN CONCENTRATE (chocolate or vanilla flavor)
 Pure whey with the water removed.
 Contains 80% easy-to-digest protein.
 Item #02260 Vanilla Item #02261 Chocolate
 1 container \$22.50 2 containers \$19.95 each
- WHEY PROTEIN ISOLATE (chocolate or vanilla flavor)
 Filtered to reduce carbohydrates, lactose and fat.
 Contains 98% protein with some lactose.
 Item #02242 Vanilla* Item #02243 Chocolate*
 1 container \$22,50 2 containers \$19,50 each
- ADVANCED WHEY PROTEIN ISOLATE
 with GLUTAMINE and CREATINE
 A premium isolate for greater strength and
 e, exercise performance. Item #02246 Vanilla*

1 container \$22.50 • 2 containers \$19.50 each

Contains milk. Use these products as a food supplement only. Do not use for weight reduction.





+ Provon® is a registered trademark of Glanbia plc.

Maintain Endothelial Plaque Stability with

ARTERIAL PROTECT



Arterial Protect can help stabilize endothelial plaque and promote healthy blood flow throughout the body.*

Just <u>one</u> capsule a day provides the patented French Maritime **pine bark extract** used in clinical studies along with **Gotu Kola**.

Item #02004 • 30 vegetarian capsules

1 bottle **\$33**

4 bottles \$29 each

Reference

* 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.





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

HEALTHY BONES = HEALTHY HEART



THREE WAYS TO GET VITAMIN





SUPER K

SUPER K is the best-selling **vitamin K** formula for bone and heart health. It costs only **25 cents** a day and provides in one softgel:

Vitamin K1 1,500 mcg (converts to K2 in some people)

Vitamin K2 (MK-4) 1,000 mcg (for bone & vascular health)

Vitamin K2 (MK-7) 100 mcg (long-acting protection)

SUPER K ELITE

Super K Elite provides 2 <u>additional</u> forms of vitamin K and even *higher* potencies of K1, MK4, and MK7. **Super K Elite** costs **60 cents** a day and provides in one softgel:

Vitamin K1 2,000 mcg (converts to K2 in some people)

Vitamin K2 (MK-4) 1,500 mcg (for bone & vascular health)

Vitamin K2 (MK-7) 181 mcg (long-acting protection)

Vitamin K2 (MK-9) 43 mcg (added cardiovascular support)

Vitamin K2 (MK-6) 11 mcg (added cardiovascular support)

LIFE EXTENSION Super K

Elite

30 SOFTORLS SUPPLEMENT

MEGA VITAMIN K2

Japanese physicians use *high-dose* vitamin K2 for those with challenges in maintaining healthy bone density.

Mega Vitamin K2 costs 95 cents a day and provides in one daily capsule:

Vitamin K2 (MK-4) 45,000 mcg (for bone & vascular health)



MEGA VITAMIN K2 Item #02417 • 30 capsules

1 bottle \$28.50 • 4 bottles \$26 each

LIFE EXTENSION
Super K

Pau Forms of KZ Plus K1

Safteris Supplement

SUPER K Item #02334 • 90 softgels

1 bottle **\$22.50** • 4 bottles \$20.25 each

SUPER K ELITE Item #02335 • 30 softgels

1 bottle **\$18** • 4 bottles \$16 each

For full product description and to order these **VITAMIN K** formulas call 1-800-544-4440 or visit www.LifeExtension.com







CAUTION: If you are taking a vitamin K antagonist (e.g. warfarin), consult your healthcare practitioner before taking this product.

Tom Brady

NFL Quarterback Shares His Secrets to Peak Performance and Longevity

BY LAURIE MATHENA HOW TO DO WHAT YOU LOVE, **BETTER AND FOR LONGER** TOM BRADY

Some say Tom Brady has found the Fountain of Youth.

Earlier this year, at age 43, he secured his seventh NFL Super Bowl victory during his 20th season of professional football—two impressive records in a sport where the average career is just 3.3 years.

But he is far from slowing down. In fact, according to Brady, "Not only do I feel as healthy as I ever have, but I'm proud to still be playing at the highest level and standard for my game" said Brady in his book, The TB12 Method.

He doesn't credit his longevity to good luck or good genes.

Instead, Brady recognizes his holistic lifestyle, strategic supplement use, a novel muscle therapy and an unwavering commitment to hard work—for his unparalleled longevity and success in professional football.

More importantly, he believes these same strategies can be effective for anyone-of any agewho wants to defy aging and live their best life for as long as possible.

The Underdog

Brady is the first to acknowledge that his sports successes have not come easy for him.

During college, he didn't become the starting quarterback at the University of Michigan until his senior year.

In the 2000 NFL draft, the New England Patriots chose him as the NFL's 199th draft pick. That means he was passed over by every team in the NFL about five times.

And it's no wonder.

While his scouting report listed many positives, it ultimately described him as "a system-type player who's not what you're looking for in terms of physical stature, strength, arm strength, and mobility."

Brady's response to this description?

They were right.

But none of that discouraged Brady; it drove him to work even harder.

In his book, he discusses hard work as the key to his success.

"In my first season with the Patriots, I was mostly the fourth quarterback on the depth chart. As usual, it was because I didn't have the natural ability some athletes had at that age. In order to compete, I had to work harder than ever before."

Even as a New England Patriot, Brady didn't get a chance to play until starting quarterback Drew Bledsoe was injured.

But Brady's hard work and competitive drive prepared him for the challenge, and during that Cinderella season, he led his team to victory at Super Bowl XXXVI.

That year he earned the first of 17 division titles, 13 AFC Championship Games, and seven Super Bowl titles.

But behind the scenes during those early years, Brady was in pain and at risk of losing everything—until a meeting with a body coach changed his approach to fitness, peak performance, and healthy longevity.

The Pliability Technique

Brady was no stranger to pain—something he had been taught was just part of playing the game. But by his late 20s, the tendonitis in his elbow was severe enough to potentially end his career.

With his coach, Brady utilized targeted, deep-force muscle work that lengthened and softened the muscles surrounding Brady's elbow joint.

This stopped his muscles from tugging on his tendons and allowed his muscles to work in a more relaxed, optimal state.

Ultimately, these pliability treatments eliminated Brady's pain—and it hasn't returned since.

Now, pliability work makes up roughly half of Brady's training sessions (which also includes strength and conditioning), and he does a pliability training regimen before and after every workout.

Brady says pliability techniques—which can be done by a practitioner, or by utilizing tools like vibrating balls or rollers that can target your body's trigger points—can help resolve existing pain while preventing future injury as well.

This applies whether you're a professional athlete or a weekend golfer, and can be used to help resolve common issues like tennis elbow, plantar fasciitis, and lower back pain.

Discipline On and Off the Field

As Brady enters his 21st year in the NFL, he has more than doubled the length of a good NFL career.

When he led the Tampa Bay Buccaneers to victory earlier this





year at Super Bowl LV, Brady became the oldest player to win a Super Bowl as a starting quarterback and the oldest player to be named Super Bowl MVP. He is also the only quarterback to win a Super Bowl in three separate decades.

Yet he continues to get better with age.

He savs he has been faster every year for the last six years, and he has broken his own personal bests in agility and functional strength tests.

"Over the same period, according to conventional wisdom, this doesn't happen to athletes in their late thirties and early forties," said Brady.

Pliability is a big part of these impressive results, but it's just one piece of the puzzle.

Over the years, Brady and his coach developed a holistic regimen that has become Brady's secret weapon to his success. It includes healthy nutrition, proper hydration, supplementation, promoting oxygen-rich blood flow, promoting antiinflammatory responses in the body, and more.

"Once I began understanding that the things I put inside my body had a direct effect on my performance on and off the field, I took a long look at my diet and the nutritional choices I was making or not making," said Brady. "Hydration and nutrition are the foundation of healthy

muscles, and if your muscles aren't healthy, it's that much harder to attain optimal pliability."

Brady eats an anti-inflammatory diet of fresh, seasonal, organic foods from local sources. He eats 80% plant-based and 20% animalbased foods, and lots of fiber and essential fatty acids. He doesn't eat refined carbohydrates or unhealthy fats, and limits inflammatory foods and alcohol.

"Eating healthy is an investment I make in myself," said Brady. "We all have one body and one life. I've made it a priority to treat that body and life as respectfully as possible."

He drinks a minimum of half his body weight in ounces of water every day. And for the past 20 years, Brady has used supplements to help boost his performance and recovery.

"It would be great if everyone had the benefits of a mostly plant-based, real-food nutritional regimen, but that often doesn't happen because of our busy lives," said Brady. "The right supplements can't take the place of proper nutrition, but they can help ensure that you get the daily vitamins, minerals, and nutrients your body may be lacking."

Every day, Brady takes electrolytes and trace mineral drops, a multivitamin, vitamin D, vitamin B complex, an antioxidant, essential fish oils, protein powder, and a probiotic.

It's all part of a program designed to optimize his performance on and off the field.

"I define good health and being healthy as vitality—and feeling it. That means I have the energy to do the things I want to do and love to do," said Brady. "It also means doing all those activities without pain, and with energy, enthusiasm, passion, and endurance."

His principles aren't just for athletes but are valuable for anyone who wants to live a healthy, holistic

"I'm proud of playing football and of our team, and I'm also excited to educate people and inspire a movement that can change the lives of people from many walks and stages of life," said Brady. "If I've learned one thing as I go into my 21st NFL season, it's how important it is to devote yourself to an attitude oriented toward longevity and extended peak performance that never wavers in its longer-term perspective." •

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

Tom Brady is a quarterback in the National Football League (NFL) who played 20 seasons with the New England Patriots and started his second season with the Tampa Bay Buccaneers in 2021. He holds numerous career quarterback records, including passing yards, completions, touchdown passes, games started, and pro bowl selections. He is also the NFL leader in career quarterback wins, regular-season wins, playoff wins, and Super Bowl MVP awards.



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





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

Capers

BY LAURIE MATHENA



Sometimes the smallest foods pack the biggest health punch. That is the case with capers, the pea-sized flower buds of the caper bush.

Capers are the star ingredient in modern-day dishes like chicken piccata and smoked salmon, but they have been consumed for thousands of years. Archaeological evidence of capers has been found in soil deposits from Stone Age cave dwellings in Greece and Israel.

In traditional Avurvedic medicine. capers were used to promote healthy liver function. Modern research supports this use.

In one clinical trial, 44 people with non-alcoholic fatty liver disease who ate 40-50 grams of caper fruit pickles with their meals for 12 weeks experienced reduced disease severity and a reduction in two markers of liver damage (ALT and AST).1

Capers are also being studied for their potential anti-diabetic and anti-inflammatory properties.

In a rat study, caper extracts had antidiabetic effects, such as reducing high blood sugar levels, lowering LDL cholesterol levels, improving liver functioning, and increasing HDL cholesterol.2

They have also been found to exert significant anti-inflammatory activity in rats, supporting their traditional use as a treatment for inflammatory conditions like rheumatism, arthritis, and gout.3

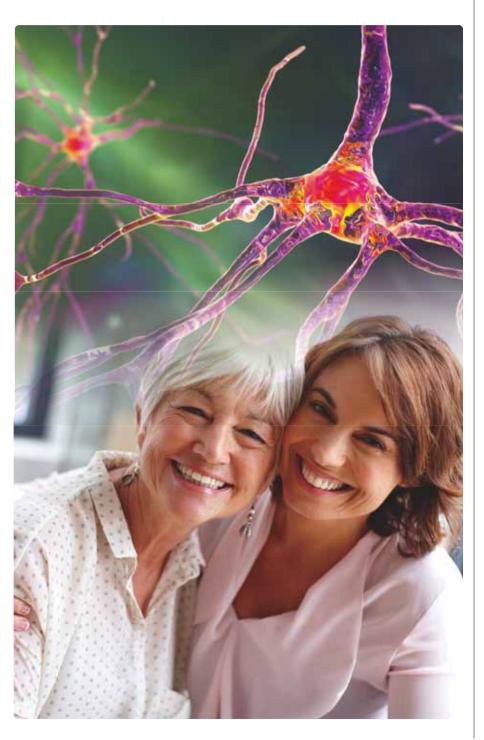
Capers are typically pickled, which brings out their tangy, lemon-like flavor and adds a burst of texture and flavor to dishes like fish, stews, and sauces.



Oxidative Stress and Dietary Antioxidants in Neurological Diseases

EDITED BY COLIN R. MARTIN AND VICTOR R. PREEDY

BY LAURIE MATHENA



Oxidative stress is an underlying feature of neurological diseases like Alzheimer's, Parkinson's, and multiple sclerosis.

Dietary antioxidants can help combat oxidative stress, providing valuable tools for helping protect the brain against aging and disease.

Currently, there is a divide between physicians and clinical workers, on the one hand, and nutritionists and dietitians, on the other.

Physicians understand the processes in neurological disease and associated conditions but are less knowledgeable about the science of nutrition and dietetics.

Nutritionists and dietitians on the other hand aren't as familiar with the molecular and cell science of neurological disease.

This divide needs to be bridged so that medical science can advance, and preventive and treatment strategies can be devised.

The book Oxidative Stress and Dietary Antioxidants in Neurological Diseases aims to help bridge that

It provides a comprehensive overview of the role of oxidative stress in neurological diseases. Then it goes on to discuss the therapeutic use of antioxidants via diet and supplementation to combat oxidative stress.

This evidence-based book brings together leading experts in this area to showcase cutting-edge research. It is sure to be an invaluable text for professionals working in the field, as well as for individuals who seek to take proactive steps for their health.

Here, Life Extension® highlights some of the key concepts from the book that bring together both the basic processes involved in neurological disease—and nutrient strategies that aim to combat it.



Oxidative Stress and **Neurological Diseases**

PART I: Oxidative Stress and Neurological Diseases, covers the basic processes of oxidative imbalance, including topics such as molecular biology, blood-brain barrier, neuroinflammation, aging, neuroprotection, and other areas.

The body produces reactive, unstable agents known as free radicals during normal metabolism, and following exposure to environmental toxins. Antioxidants serve as natural antidotes to these free radicals. While internally produced antioxidants are abundant in youth, their levels decline with age.

The imbalance between free radicals and the antioxidants needed to inactivate, or "quench" them, leads to a generalized state of oxidative stress that can damage lipids, proteins, DNA, and mitochondria throughout the body.

The brain is particularly susceptible to oxidative damage because of its high rate of oxygen consumption. Numerous chapters in the book delve into studies showing that oxidative stress plays a critical role in the initiation and progression of neurodegenerative diseases such as Alzheimer's, Parkinson's, and Huntington's, which are characterized by a slow, progressive loss of neurons.1

Data from people with mild cognitive impairment provide evidence that oxidative stress usually precedes the development of Alzheimer's disease.2 Furthermore, alterations in the levels of antioxidants and antioxidant enzyme activities has been reported in Alzheimer's disease and other neurodegenerative disorders.3

The book also details the impact of oxidative stress on the bloodbrain barrier, the protective barrier that regulates the transport of molecules between the brain and the circulation.

Evidence has indicated that the breakdown of the blood-brain barrier is involved in the pathogenesis of neurodegenerative diseases like Parkinson's disease. Alzheimer's disease, ALS (amyotrophic lateral sclerosis), and MS (multiple sclerosis), as well as neurovascular disorders like stroke and vascular dementia.4

Oxidative stress in the brain also triggers neuroinflammation, another damaging factor often present during neurological disorders. In addition, aging itself is associated with a chronic state of inflammation known as inflammaging that has been associated with age-related neurological diseases.

The body has a natural signaling ability to ward off oxidative stress and neuroinflammation. But in neurological disease, pathways such as the endogenous antioxidant response pathway, and uncoupling pathway, are altered, preventing proper control of oxidative stress and neuroinflammation.

Antioxidant Therapy in Neurological Disorders

PART II: Antioxidants and Neurological Diseases, covers numerous antioxidants found in plants, vitamins, and various compounds that have been found to have therapeutic potential for various aspects of neurological disorders.

Antioxidants are beneficial because they delay or prevent oxidation. Because oxidative stress is well documented as a factor in the initiation and progression of neurological diseases and neurodegenerative disorders, it is rational to

consider the use of antioxidants to help alleviate the negative effects of oxidative stress.

Antioxidant properties are found in dietary compounds such as polyphenols (flavonoids), beta-carotene, vitamin C, and vitamin E (alphatocopherol).

Epidemiological and clinical studies have demonstrated that polyphenols and flavonoids exert a protective effect against neurodegenerative diseases.5 And numerous studies have shown that diets that include fruits and vegetables rich in antioxidants (such as carrots, blueberries, strawberries, and spinach) can produce a beneficial effect against age-related decline in cognitive functions in old rats.

The book features in-depth information on the following nutrients and compounds:

- Mediterranean oils like argan oil, olive oil, and milk thistle seed oil
- Aspidosperma pyrifolium Mart.
- Carnosic acid and carnosol
- Curcumin
- Ginkgo biloba
- Morinda citrifolia Linn. (Noni) fruit
- Naringin and naringenin
- · Nigella sativa L. and thymoquinone
- Resveratrol
- Saffron
- Sulforaphane

Here, we will expound on two key nutrients discussed in the book: curcumin and ginkgo biloba.

Curcumin

Curcumin, the main, biologically active component of the spice turmeric, has well-documented antioxidant and anti-inflammatory properties.6

Studies have demonstrated that curcumin exerts antioxidant effects by scavenging free radicals, alleviating lipid peroxidation, modulating antioxidant defense systems such as catalase and SOD, activating the Nrf2 pathway, and more.

In one in vitro study, curcumin protected glial cells (important brain cells that make up the white matter in your brain) against oxidative stress and inflammation caused by numerous damaging toxins.7

Curcumin could also be a key agent in the treatment of Alzheimer's disease.8 Both in vitro and in vivo studies have shown that curcumin improves cognitive decline and synaptic functions and restores synaptic plasticity.9

Through its antioxidant effect, curcumin therapy has been proven to have beneficial effects in additional neurodegenerative disorders such as Parkinson's, Huntington's, and multiple sclerosis.

In addition, studies have shown that curcumin can help:

- Alleviate anxiety and depression,10
- Improve cerebral ischemic injury,11
- Protect the brain during traumatic brain injury, 12
- Treat neuropathic pain,13 and
- Enhance memory and learning.14



Ginkgo Biloba

Ginkgo biloba extract is known to have antioxidant properties, making it ideal for combating the oxidative stress that contributes to neurotoxicity and dysfunction in the brain.

Ginkgo biloba contains natural flavonoids (such as quercetin) that are free-radical scavengers, and metal chelators, and that enhance cellular antioxidant systems.

Ginkgo biloba has been shown to exert its neuroprotective effects through mechanisms such as combating inflammation,15 improving blood flow, inhibiting amyloid-beta aggregation, regulating neurotransmitters, and improving mitochondrial function.

Mitochondria help turn energy from food into energy your cells can use. These cells are particularly vulnerable to attack by reactive oxygen species (ROS), which leads to mitochondrial dysfunction.

These mitochondrial changes in the brain can contribute to the impairment of synaptic function and neuronal loss that manifests as cognitive deficits in oxidative stressrelated neurodegenerative diseases such as Alzheimer's disease.

Studies show that ginkgo biloba extract exerts protective effects against mitochondrial oxidative injury, helping maintain mitochondrial function.16

Summary

Oxidative stress is a feature of neurological disease and other associated conditions. It can arise due to molecular and cellular processes, or as a result of nutritional imbalances, either before the onset of disease or during its development.

Oxidative Stress and Dietary Antioxidants in Neurological Diseases provides a comprehensive overview of oxidative stress in neurological diseases, as well as the potentially therapeutic uses of natural antioxidants such as curcumin, ginkgo biloba, and others.

Since diseases are often multifactorial, the book does not describe oxidative stress in isolation, but in concert with other processes such as apoptosis, cell signaling, receptor-mediated responses, and others.

In the forward to the book, Professor Una Macleod, Dean of the Hull York Medical School and Professor of Primary Care Medicine, in the United Kingdom, writes, "Oxidative stress, antioxidant status and function, and the impact of dietary antioxidants within the context of neurological disease represent an exciting area of research which may ultimately contribute to improved quality of life in those experiencing neurological disease,

particularly as the area matures and penetrates direct clinical care more extensively than at present."

The book was designed for nutritionists, dietitians, food scientists, physicians and clinical workers, neurologists, healthcare workers, and research scientists.

We believe informed Life Extension® readers will also benefit from this comprehensive look at neurological diseases, as it provides both the background knowledge and specific practical applications for protecting against brain aging and neurodegeneration.

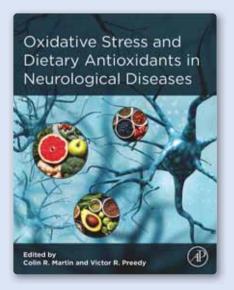
If you have any questions on the scientific content of this article, please call a Life Extension Wellness Specialist at 1-866-864-3027.

References

- 1. Kim GH, Kim JE, Rhie SJ, Yoon S. The role of oxidative stress in neurodegenerative diseases. Exp Neurobiol 2015:24(4):325-40.
- Tramutola A, Lanzillotta C, Perluigi M, Butterfield DA. Oxidative stress, protein modification and Alzheimer's disease. Brain Res Bull 2017;133:88-96.
- Wang X, Wang @, Li L, Perry G, Lee H-g, Zhu X. Oxidative stress and mitochondrial dysfunction in Alzheimer's disease. Biochim Biophys Acta (BBA)-Mol Basis Dis 2014;1842(8):1240-7.
- 4. Tramutola A, Lanzillotta C, Perluigi M, Butterfield DA. Oxidative stress, protein modification and Alzheimer's disease. Brain Res Bull 2017;133:88-96.
- Samieri C. Epidemilogy and risk factors of Alzheimer's disease: a focus on diet. In: Biomarkers for preclinical Alzheimer's disease. Springer; 2018. p. 15-42.
- 6. Hewlings SJ, Kalman DS. Curcumin: a review of its effects on human health. Foods 2017;6(10):92.
- Parada E, Buendia I, Navarro E, Avendano C, Egea J, Lopez MG. Microglial HO-1 induction by curcumin provides antioxidant, antineuroinflammatory, and glioprotective effects. Mol Nutr Food Res 2015;59(9):1690-700.
- 8. Mukhopadhyay C, Ruidas B, Chaudhury S. Role of curcumin in treatment of Alzheimer's disease. Int J Neurorehabil 2017:4:3.
- Brondino N, Fusar-Poli L, Panisi C, Politi P. Potential neuroprotective effects of curcumin against dementia. In: Neuroprotective effects of phytochemical in neurological disorders. Hoboken, New Jersey: John Wiley & Sons, Inc; 2017. P. 435-46.

- 10. Chimakurthy J, Talasila M. Effects of curcumin on pentylenetetrazole-induced anxiety-like behaviors and associated changes in cognition and monoamine levels. Psychol Neurosci 2010;3(2):267-76.
- 11. Huang L, Chen C, Zhang X, Li X, Chen Z, Yang C, et al. Neuroprotective effect of curcumin against cerebral ischemia-reperfusion via mediating autophagy and inflammation. J Mol Neurosci 2018:64(1):129-39.
- 12. Dai W, Wang H, Fang J, Zhu Y, Zhou J, Wang X, et al. Curcumin provides neuroprotection in model of traumatic brain injury via the Nrf2-ARE signaling pathway. Brain Res Bull 2018;346:28-36.
- 13. Zhu X, Li Q, Chang R, Yang D, Song Z, Guo Q, et al. Curcumin alleviates neuropathic pain by inhibiting p300/CBP histone acetyltransferase activity-regulated expression of BDNF and cox-2 in a rat model. PLoS One
- 14. Nam SM, Choi JH, Yoo DY, Kim W, Jung HY, Kim JW, et al. Effects of curcumin (Curcuma longa) on learning and spatial memory as well as cell proliferation and neuroblast differentiation in adult and aged mice by upregulating brain-derived neurotrophic factor and CREB signaling. J Med Food 2014;17:641-9.
- 15. Kim M-S, Bang JH, Lee J, Han J-S, Baik TG, Jeon WK. Ginkgo biloba L. extract protects against chronic cerebral hypoperfusion by modulating neuroinflammation and the cholinergic system. Phytomedicine 2016; 23(12):1356-64.
- 16. Sastre J, Millan A, de la Asuncion JG, et al. A Ginkgo biloba extract (EGb 761) prevents cmitochondrial aging by protecting against oxidative stress. Free Radic Biol Med 1998:24(2):298-304.

To order a copy of Oxidative Stress and Dietary Antioxidants in Neurological Diseases, visit www.elsevier.com



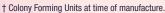


Discovered in New Zealand yogurt, this unique **probiotic** formula contains **17.2 billion CFU**[†] of **Bifidobacterium lactis HN019**.

This probiotic has been clinically studied to help maintain a healthy colonic transit time, combat occasional constipation, and support bowel regularity.¹

One capsule daily of this new **FLORASSIST® Daily Bowel Regularity** formula can help promote healthy, daily movement through the **colon**.

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



1. Scand J Gastroenterol. 2011;46:1057-64.





Item # 02421 • 30 vegetarian capsules

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







YOUR HEART LOVES GARLIC!



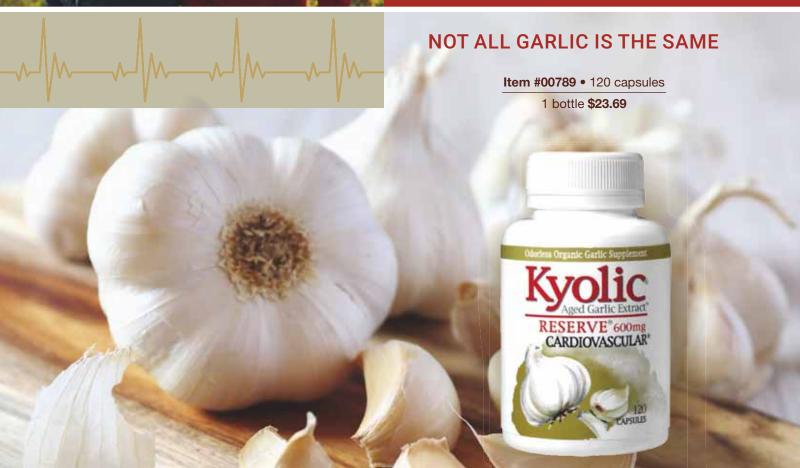
The secret to **Kyolic**® garlic's health benefits lies in its proprietary aging process.

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

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

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

Each capsule supplies **600 mg** of standardized aged organic garlic.



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



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

ACTIVE LIFESTYLE & FITNESS

- 01529 Creatine Capsules
- 02318 Keto Brain and Body Boost
- 02020 Super Carnosine
- 02023 Tart Cherry with CherryPURE®
- 02146 Wellness Bar-Chocolate Brownie
- 02147 Wellness Bar-Cookie Dough
- 02246 Wellness Code® Advanced Whey Protein Isolate Vanilla
- 02221 Wellness Code® Muscle Strength & Restore Formula
- 02127 Wellness Code® Plant Protein Complete & Amino Acid Complex
- 02261 Wellness Code® Whey Protein Concentrate Chocolate
- 02260 Wellness Code® Whey Protein Concentrate Vanilla
- 02243 Wellness Code® Whey Protein Isolate Chocolate
- 02242 Wellness Code® Whey Protein Isolate Vanilla

AMINO ACIDS

- 01039 Arginine & Ornithine Capsules
- 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
- 00326 Tyrosine Tablets

BLOOD PRESSURE & VASCULAR SUPPORT

- 01824 Advanced Olive Leaf Vascular Support
- 02004 Arterial Protect
- 70000 Blood Pressure Monitor Arm Cuff
- 02497 Endothelial Defense™ Pomegranate Plus
- 02320 NitroVasc™ Boost
- 00984 Optimal BP Management
- 01953 Pomegranate Complete
- 00956 Pomegranate Fruit Extract
- 02024 Triple Action Blood Pressure AM/PM
- 02102 VenoFlow™

BONE HEALTH

- 01726 Bone Restore
- 02123 Bone Restore Chewable Tablet
- 02416 Bone Restore Elite with Super Potent K2
- 01727 Bone Restore with Vitamin K2
- 01725 Bone Strength Collagen Formula
- 00313 Bone-Up™
- 01963 Calcium Citrate with Vitamin D
- 01506 Dr. Strum's Intensive Bone Formula
- 02417 Mega Vitamin K2
- 01476 Strontium Caps
- 02422 Vegan Vitamin D3

BRAIN HEALTH

- 01524 Acetyl-L-Carnitine
- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 02321 Cognitex® Basics
- 02396 Cognitex® Elite
- 02397 Cognitex® Elite Pregnenolone
- 01540 DMAE Bitartrate
- 02006 Dopa-Mind™
- 02413 Dopamine Advantage
- 02212 Focus Tea™
- 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
- 01359 Cho-Less™
- 01910 CHOL-Support™
- 01030 Red Yeast Rice
- 01304 Theaflavins Standardized Extract
- 00372 Vitamin B3 Niacin Capsules

DIGESTION SUPPORT

- 53348 Betaine HCI
- 02412 Bloat Relief
- 30747 Digest RC®
- 07136 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™
- 01122 Ginger Force™
- 00605 Regimint
- 01386 TruFiber®

ENERGY MANAGEMENT

- 01628 Adrenal Energy Formula 60 veg capsules
- 01630 Adrenal Energy Formula 120 veg capsules
- 00972 D-Ribose Powder
- 01473 D-Ribose Tablets
- 01900 Energy Renew
- 01544 Forskolin
- 01805 Ginseng Energy Boost
- 00668 Metabolic Advantage Thyroid Formula™
- 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
- 01500 PQQ Caps 10 mg, 30 vegetarian capsules
- 01647 PQQ Caps 20 mg, 30 vegetarian capsules
- 00889 Rhodiola Extract
- 02003 Triple Action Thyroid

EYE HEALTH

- 01923 Astaxanthin with Phospholipids
- 00893 Brite Eyes III
- 02323 Digital Eye Support
- 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

- 02311 Clearly EPA/DHA Fish Oil
- 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, 02425 Immune Packs with Vitamin C & D, Zinc and Probiotic Sesame Lignans & Olive Extract • 120 softgels 02005 Immune Senescence Protection Formula™ 01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & 00316 Kyolic® Garlic Formula 102 Olive Extract • 60 enteric coated softgels 00789 Kyolic® Reserve 01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & 01681 Lactoferrin (Apolactoferrin) Caps Olive Extract • 120 enteric coated softgels 02426 Mushroom Immune with Beta Glucans 01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & 01903 NK Cell Activator™ Olive Extract • 240 softgels 01394 Optimized Garlic 01812 Provinal® Purified Omega-7 01309 Optimized Quercetin 01640 Vegetarian DHA 01811 Peony Immune 00525 ProBoost Thymic Protein A FOOD 01708 Reishi Extract Mushroom Complex 02008 California Estate Extra Virgin Olive Oil 01906 Standardized Cistanche 02170 Rainforest Blend Decaf Ground Coffee 13685 Ten Mushroom Formula® 02169 Rainforest Blend Ground Coffee 01097 Ultra Soy Extract 02171 Rainforest Blend Whole Bean Coffee 01561 Zinc Lozenges 00438 Stevia™ Organic Liquid Sweetner **INFLAMMATION MANAGEMENT** 00432 Stevia™ Sweetener 01639 5-LOX Inhibitor with AprèsFlex® **GLUCOSE MANAGEMENT** 02324 Advanced Curcumin Elite™ 01503 CinSulin® with InSea2® and Crominex® 3+ Turmeric Extract, Ginger & Turmerones 01620 CoffeeGenic® Green Coffee Extract 01709 Black Cumin Seed Oil 02122 Glycemic Guard™ 02310 Black Cumin Seed Oil and Curcumin Elite™ 00925 Mega Benfotiamine 00202 Boswella 01803 Tri Sugar Shield® 02467 Curcumin Elite™ Turmeric Extract • 30 veg capsules **HEART HEALTH** 02407 Curcumin Elite™ Turmeric Extract • 60 veg capsules 01804 Cytokine Suppress® with EGCG 01066 Aspirin (Enteric Coated) 02223 Pro-Resolving Mediators 01842 BioActive Folate & Vitamin B12 Caps 00318 Serraflazyme 01700 Cardio Peak™ 01203 Specially-Coated Bromelain 02121 Homocysteine Resist 00407 Super Bio-Curcumin® Turmeric Extract 02018 Optimized Carnitine 01254 Zyflamend™ Whole Body 01949 Super-Absorbable CoQ10 Ubiquinone with d-Limonene • 50 mg, 60 softgels **JOINT SUPPORT** 01951 Super-Absorbable CoQ10 Ubiquinone with 02404 Arthro-Immune Joint Support d-Limonene • 100 mg, 60 softgels 02238 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex® 01929 Super Ubiquinol CoQ10 01617 ArthroMax® with Theaflavins & AprèsFlex® 01427 Super Ubiquinol CoQ10 with Enh Mitochondrial 02138 ArthroMax® Elite Support[™] • 50 mg, 30 softgels 00965 Fast-Acting Joint Formula 01425 Super Ubiquinol CoQ10 with Enh Mitochondrial 00522 Glucosamine/Chondroitin Capsules Support[™] • 50 mg, 100 softgels 02420 Glucosamine Sulfate 01437 Super Ubiquinol CoQ10 with Enh Mitochondrial 02424 Joint Mobility Support[™] • 100 mg, 30 softgels 01600 Krill Healthy Joint Formula 01426 Super Ubiquinol CoQ10 with Enh Mitochondrial 01050 Krill Oil Support[™] • 100 mg, 60 softgels 00451 MSM (Methylsulfonylmethane) 01431 Super Ubiquinol CoQ10 with Enh Mitochondrial 02231 NT2 Collagen™ Support[™] • 200 mg, 30 softgels **KIDNEY & BLADDER SUPPORT** 01733 Super Ubiquinol CoQ10 with PQQ 01859 TMG Liquid Capsules 00862 Cran-Max® Cranberry Whole Fruit Concentrate 00349 TMG Powder 01424 Optimized Cran-Max® with Ellirose™ 01921 Uric Acid Control **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 and Cruciferous Blend

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

02411 5 Day Elderberry Immune

00681 AHCC®

02302 Bio-Ouercetin®

02410 Black Elderberry + Vitamin C

01961 Enhanced Zinc Lozenges

01704 Immune Modulator with Tinofend®

01209 Water-Soluble Pumpkin Seed Extract

LIVER HEALTH & DETOXIFICATION

01922 Advanced Milk Thistle • 60 softgels

01925 Advanced Milk Thistle • 120 softgels

02240 Anti-Alcohol Complex

01651 Calcium D-Glucarate

01571 Chlorophyllin

01522 Milk Thistle • 60 veg capsules

02402 FLORASSIST® Liver Restore™

01541 Glutathione, Cysteine & C

01393 HepatoPro

01608 Liver Efficiency Formula

01534 N-Acetyl-L-Cysteine

00342 PectaSol-C® Modified Citrus Pectin Powder

01080 PectaSol-C® Modified Citrus Pectin Capsules

01884 Silymarin

02361 SOD Booster

LONGEVITY & WELLNESS

- 00457 Alpha-Lipoic Acid
- 01625 AppleWise
- 02414 Bio-Fisetin
- 01214 Blueberry Extract
- 01438 Blueberry Extract and Pomegranate
- 02270 DNA Protection Formula
- 02405 Endocannabinoid System Booster
- 02119 GEROPROTECT® Ageless Cell™
- 02415 GEROPROTECT® Autophagy Renew
- 02133 GEROPROTECT® Longevity A.I.™
- 02401 GEROPROTECT® Stem Cell
- 02211 Grapeseed Extract
- 00954 Mega Green Tea Extract (decaffeinated)
- 00953 Mega Green Tea Extract (lightly caffeinated)
- 01513 Optimized Fucoidan with Maritech® 926
- 02230 Optimized Resveratrol
- 01637 Pycnogenol® French Maritime Pine Bark Extract
- 02210 Resveratrol
- 00070 RNA (Ribonucleic Acid)
- 02301 Senolytic Activator®
- 01208 Super R-Lipoic Acid
- 01919 X-R Shield

MEN'S HEALTH

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

MINERALS

- 01661 Boron
- 02107 Extend-Release Magnesium
- 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 lodide
- 00657 Solarshield® Sunglasses

MOOD & STRESS MANAGEMENT

- 02312 Cortisol-Stress Balance
- 00987 Enhanced Stress Relief
- 01074 5 HTP
- 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™
- 02498 Comprehensive Nutrient Packs ADVANCED
- 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
- 02428 Plant-Based Multivitamin
- 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

NERVE & COMFORT SUPPORT

- 02202 ComfortMAX™
- 02303 Discomfort Relief

PERSONAL CARE

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

PET CARE

- 01932 Cat Mix
- 01931 Dog Mix

PROBIOTICS

- 01622 Bifido GI Balance 01825 FLORASSIST® Balance
- 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
- 01920 FLORASSIST® Throat Health
- 02400 FLORASSIST® Winter Immune Support
- 52142 Jarro-Dophilus® for Women
- 00056 Jarro-Dophilus EPS® 60 veg capsules
- 21201 Jarro-Dophilus EPS® 120 veg capsules
- 01038 Theralac® Probiotics
- 01389 TruFlora® Probiotics

SKIN CARE

- 80157 Advanced Anti-Glycation Peptide Serum
- 80165 Advanced Growth Factor Serum
- 80170 Advanced Hyaluronic Acid Serum
- 80154 Advanced Lightening Cream
- 80155 Advanced Peptide Hand Therapy
- 80175 Advanced Probiotic-Fermented Eye Serum
- 80177 Advanced Retinol Serum
- 80152 Advanced Triple Peptide Serum
- 80140 Advanced Under Eye Serum with Stem Cells
- 80137 All-Purpose Soothing Relief Cream
- 80139 Amber Self MicroDermAbrasion
- 80118 Anti-Aging Mask

- 80151 Anti-Aging Rejuvenating Face Cream 80153 Anti-Aging Rejuvenating Scalp Serum 80179 Brightening Peptide Serum 80176 Collagen Boosting Peptide Cream 80156 Collagen Boosting Peptide Serum 02408 Collagen Peptides for Skin & Joints 80180 CoQ10 and Stem Cell Rejuvenation Cream 80169 Cucumber Hydra Peptide Eye Cream 02423 Daily Skin Defense 80141 DNA Support Cream 80163 Eye Lift Cream 80123 Face Rejuvenating Anti-Oxidant Cream 80109 Hyaluronic Facial Moisturizer 80110 Hyaluronic Oil-Free Facial Moisturizer 80138 Hydrating Anti-Oxidant Facial Mist 00661 Hydroderm 55495 Instensive Moisturizing Cream 80103 Lifting & Tightening Complex 80168 Melatonin Advanced Peptide Cream 80114 Mild Facial Cleanser 80172 Multi Stem Cell Hydration Cream 80159 Multi Stem Cell Skin Tightening Complex 80122 Neck Rejuvenating Anti-Oxidant Cream 80174 Purifying Facial Mask 80150 Renewing Eye Cream 80142 Resveratrol Anti-Oxidant Serum 01938 Shade Factor™ 02129 Skin Care Collection Anti-Aging Serum 02130 Skin Care Collection Day Cream 02131 Skin Care Collection Night Cream 80166 Skin Firming Complex 02096 Skin Restoring Ceramides 80130 Skin Stem Cell Serum 80164 Skin Tone Equalizer 80143 Stem Cell Cream with Alpine Rose 80148 Tightening & Firming Neck Cream 80161 Triple-Action Vitamin C Cream 80162 Ultimate MicroDermabrasion 80173 Ultimate Peptide Serum 80178 Ultimate Telomere Cream 80160 Ultra Eyelash Booster 80101 Ultra Wrinkle Relaxer
- 80113 Under Eye Refining Serum 80104 Under Eye Rescue Cream 80171 Vitamin C Lip Rejuvenator 80129 Vitamin C Serum 80136 Vitamin D Lotion 80102 Vitamin K Cream

SLEEP

- 01512 Bioactive Milk Peptides
- 02300 Circadian Sleep
- 01551 Enhanced Sleep with Melatonin
- 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 tablets
- 01721 Optimized Tryptophan Plus
- 01444 Quiet Sleep
- 01445 Quiet Sleep Melatonin

VITAMINS

- 01533 Ascorbyl Palmitate
- 00920 Benfotiamine with Thiamine
- 00664 Beta-Carotene
- 01945 BioActive Complete B-Complex
- 00102 Biotin
- 00084 Buffered Vitamin C Powder
- 02229 Fast-C® and Bio-Quercetin Phytosome
- 02075 Gamma E Mixed Tocopherol Enhanced with Sesame Lignans
- 02070 Gamma E Mixed Tocopherol & Tocotrienols
- 01913 High Potency Optimized Folate
- 01674 Inositol Caps
- 02244 Liquid Vitamin D3 50 mcg (2000 IU)
- 02232 Liquid Vitamin D3 (Mint) 50 mcg (2000 IU)
- 01936 Low-Dose Vitamin K2
- 00065 MK-7
- 00373 No Flush Niacin
- 01939 Optimized Folate (L-Methylfolate)
- 01217 Pyridoxal 5'-Phosphate Caps
- 01400 Super Absorbable Tocotrienols
- 02334 Super K
- 02335 Super K Elite
- 01863 Super Vitamin E
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin 1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin 5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin Phytosome 60 veg tablets
- 02227 Vitamin C and Bio-Ouercetin Phytosome 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-lodine™
- 02040 Vitamins D and K with Sea-lodine™

WEIGHT MANAGEMENT & BODY COMPOSITION

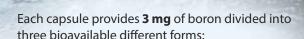
- 02479 7-Keto® DHEA Metabolite 100 mg, 60 veg capsules
- 01509 Advanced Anti-Adipocyte Formula
- 01807 Advanced Appetite Suppress
- 02207 AMPK Metabolic Activator
- 02478 DHEA Complete
- 01738 Garcinia HCA
- 01908 Mediterranean Trim with Sinetrol™-XPur
- 01432 Optimized Saffron
- 00818 Super CLA Blend with Sesame Lignans

WOMEN'S HEALTH

- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 01064 Femmenessence MacaPause®
- 02204 Menopause 731™
- 02319 Prenatal Advantage
- 01441 Progesta-Care®
- 01649 Super-Absorbable Soy Isoflavones



Promotes Healthy Prostate Function and Healthy Bones



- · Boron citrate
- · Boron aspartate
- Boron glycinate

There are **3 mg** of boron in the daily dose of <u>each</u> of the following **Life Extension**® formulas:

- Two-Per-Day
- Bone Restore
- · Ultra Prostate Formula
- Life Extension Mix™

The suggested daily dose for most adults is 6-9 mg of boron.^{1,2} If you are already obtaining this potency in your multi-nutrient formulas, you may not need additional boron.

Item #01661 • 100 vegetarian capsules

1 bottle **\$4.46**

4 bottles \$3.94 each

References

- Open Orthop J. 2012;6:143-9.
 Altern Med Rev. 2004 Dec;9(4):434-7.

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







Boron

Advanced Chelate Complex 100 VEGETARIAN DIETARY SUPPLEMENT

RESTORE Connections Between YOUR NEURONS



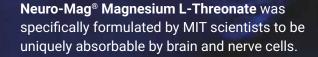
Item #01603 • 90 vegetarian capsules

1 bottle **\$30** • 4 bottles \$27 each



Item #02032 • 93.35 grams of powder

1 jar \$28.50 • 4 jars \$26 each



The number of **synapses** that connect brain cells decline with aging.

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

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

Reference: * Gerontology. 1996;42(3):170-80.

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







The Science of a Healthier Life®

PO BOX 407198 FORT LAUDERDALE, FLORIDA 33340-7198

IN THIS EDITION OF LIFE EXTENSION MAGAZINE®













7 RAPID RECOGNITION OF HEALTHY AGING

Major food companies are funding research and designing functional foods to extend healthy longevity in older people.

22 BOOST BRAIN PROCESSING SPEED

Four plant extracts improve brain processing speed, memory, learning, and concentration.

34 ALL-DAY STRESS RELIEF

Clinical studies show a **tea extract** enables calming relaxation. A sustained-release tea formula can help manage stress all day.

42 FEED YOUR BENEFICIAL BACTERIA

With age, beneficial gut bacteria sharply decline. A unique prebiotic quickly repopulates health-promoting intestinal bacteria.

51 HEIGHTENED RISK FOR HEART FAILURE HOSPITALIZATION

A study found that people with low **DHEA** had an *increased* risk for heart failure hospitalization and cardiac death.

56 CONTROL YOUR TRIGLYCERIDES

The Mayo Clinic Proceedings links higher EPA/DHA omega-3 intake to a 35% lower risk of fatal heart attacks.