



The Science of a Healthier Life®

LifeExtension.com

June 2022

FEATURE ARTICLES

- 7 Epidemic of Hidden Diabetes
- 20 Reduce Menopause Symptoms
- 31 Fish Oil and Brain Aging
- 36 What's in Your Multi-Vitamin?
- 44 Combat Visible Signs of Aging
- 52 Improve Joint Mobility

# Women OVER 40 Reclaim Youthful Energy

Page 20

**PLUS:**  
**Biggest Mistake  
Made by Longevity  
Enthusiasts**  
Page 7





"I feel much more mentally clear."

Judith

VERIFIED CUSTOMER REVIEW



# NEURO-MAG<sup>®</sup>

## THE SMART MAGNESIUM

SUPPORTS IMPROVEMENT IN OVERALL COGNITIVE ABILITY\*



With age, **synapses** that connect our brain cells wither.

Formulated by **MIT** scientists, **Neuro-Mag Magnesium L-Threonate** has been shown to improve **synaptic density** and other structural components of the brain.



Item #01603 • 90 vegetarian capsules

1 bottle \$30 • 4 bottles \$27 each



Item #02032 • 93.35 grams of powder

1 jar \$28.50 • 4 jars \$26 each

For full product description and to order **Neuro-Mag<sup>®</sup> Magnesium L-Threonate** or **Neuro-Mag<sup>®</sup> Magnesium L-Threonate Powder**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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

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

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

REPORTS

20 ON THE COVER

HOW WOMEN OVER 40  
CAN FEEL BETTER FAST

A clinically tested **rhubarb extract** has been shown to counteract common symptoms experienced by women over **age 40**. The addition of eight **essential B vitamins** further *improves energy and mood*.



31 FISH OIL & BRAIN HEALTH

Fish oil helps improve depression scores, reduce stroke damage, and preserve **cognition**.

36 WHAT'S IN YOUR MULTIVITAMIN FORMULA?

Commercial **multivitamins** often provide low potencies and fail to utilize enzymatically **active** forms of nutrients.

44 FIGHT BACK AGAINST VISIBLE SIGNS OF AGING

Oral ingestion of **collagen peptides**, **solubilized keratin**, and other nutrients helps restore **skin**, **hair**, and **nails**.

52 REDUCE JOINT PAIN & IMPROVE MOBILITY

A clinical trial of non-arthritic individuals shows *improved joint pain, walking distance and speed*, and **knee range-of-motion** with a blend of two **plant extracts**.

63 RAPAMYCIN UPDATE

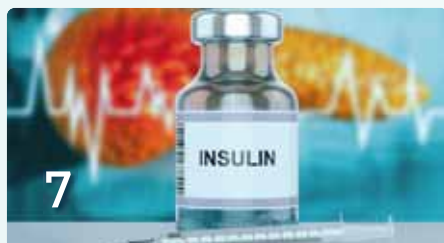
Ross Pelton discusses the **lifespan-enhancing** effects of a drug in **clinical trials** called **rapamycin** and alternative ways of attaining its benefits today.

DEPARTMENTS

7 WORST MISTAKE MADE  
BY LONGEVITY ENTHUSIASTS

Readers of **Life Extension Magazine®** are dedicated health enthusiasts, but too many are making a mistake that results in tragic outcomes.

Observations made over a **45-year** period reveal easy steps to protect against common degenerative disorders, including **type II diabetes**.



15 IN THE NEWS

Astaxanthin reduces blood glucose; exercise protects against bone-related illnesses; calorie restriction improves immune health; long-term omega-3 supplementation may reduce Alzheimer's risk.



71 ASK THE DOCTOR

Scott Fogle, ND, discusses blood tests for **toxic metals**, and two different **genetic** tests—one test uses **nutrigenomics** to assist with **weight management** goals, and the other offers **nutritional recommendations** based on your DNA.





# LIFE EXTENSION®

The Science of a Healthier Life®

LifeExtension.com

June 2022

Volume 28 • Number Six

Publisher • LE Publications, Inc.

**Introducing:**



**MY LIFE EXTENSION**

**A one-stop shop for all your health needs**

- All your available special offers
- Personalized product recommendations
- Reorder reminders to keep you on track
- Additional resources to empower you on your wellness journey



**LifeExtension.com/MyLifeExtension**

Customer care is available to take your calls  
24 hours a day, 7 days a week: 1-800-544-4440

### Visit the The Life Extension Health & Wellness Market

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



**NEW LOCATION**

**Nutrition Center of Florida, Inc., 900 North Federal Highway, Fort Lauderdale, FL 33304 • Phone: 954-766-8144**

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



**#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](http://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

Steven Joyal, MD

### Chief Scientific Officer

Andrew Swick, MS, PhD

### Scientific Advisory Board

- Richard Black, DO • John Boik, PhD • Aubrey de Grey, PhD  
Deborah F. Harding, MD • 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

### Contributors

- Adam Cruz, MMSc • Michael Downey • Scott Fogle, ND  
Laurie Mathena • Ross Pelton

### Advertising

- Vice President of Marketing • Rey Searles • [rsearles@lifeextension.com](mailto:rsearles@lifeextension.com)  
National Advertising Manager • JT Hroncich • 404-347-4170

### Senior Director of Sales and Business Development

Carolyn Bouchard • [cbouchard@lifeextension.com](mailto: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](mailto:customerservice@LifeExtension.com)

Wellness specialists: 800-226-2370 • Email: [wellness@LifeExtension.com](mailto: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](mailto:LEmagazine@LifeExtension.com)

*LIFE EXTENSION* (ISSN 1524-198X) Vol. 28, No. 6 ©2022 is published monthly except bi-monthly in April by LE Publications, Inc. at 3600 West Commercial Blvd., Fort Lauderdale, FL 33309-3338. LE Publications, Inc. All rights reserved. Published 13 times a year. Subscription rate: \$40 per year in the United States. US \$47 in Canada. US \$60 in other countries. Mail subscriptions or address changes to: LE Publications, Inc., P.O. Box 407198, Fort Lauderdale, FL 33340-7198, USA. Or phone us toll-free at: 1-800-841-5433. Canada Subscriptions: Publications mail agreement number 40028967. Return undeliverable Canadian addresses to PO Box 503, RPO West Beaver Creek, Richmond Hill, ON L4B4R6. You will be sent your first issue within six weeks after LE Publications, Inc. receives your subscription fee. Periodicals Postage paid at Fort Lauderdale, FL and at additional mailing offices. POSTMASTER: Send address changes to Life Extension, P.O. Box 407198, Ft. Lauderdale, Florida 33340-7198, USA. Printed in USA. The articles in this magazine are intended for informational purposes only. They are not intended to replace the attention or advice of a physician or other health-care professional. Anyone who wishes to embark on any dietary, drug, exercise, or other lifestyle change intended to prevent or treat a specific disease or condition should first consult with and seek clearance from a qualified health-care professional. LEGAL NOTICE: Health claims contained in articles and advertisements in this publication have not been approved by the FDA with the exception of FDA-approved, qualified health claims for calcium, antioxidant vitamins, folic acid and EPA and DHA omega-3 fatty acids, and selenium as noted where applicable. *Life Extension Magazine*® does not endorse any of the businesses or the products and/or services that may appear in advertisements for non-Life Extension branded products or services contained in it, except to state that they are advertisers who may have paid Life Extension for placement of an advertisement in this publication. Life Extension disclaims any and all responsibilities or warranties as to the accuracy of information contained in advertisements for non-Life Extension branded products or services. For Canadian customers send change of address information and blocks of undeliverable copies to P.O. Box 1051, Fort Erie, ON L2A 6C7.

# BREATHE EASY



## N-ACETYL-L-CYSTEINE Supports Healthy Respiratory Tract Function



**N-Acetyl-L-Cysteine (NAC)** supports healthy levels of *glutathione*, a molecule utilized by all cells for protection against free-radical damage and attacks from pathogens.

NAC is a powerful antioxidant that helps clear airways, and benefits bronchial, respiratory, liver, and immune health.

For full product description and to order **N-Acetyl-L-Cysteine**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Item #01534  
600 mg, 60 capsules

1 bottle **\$11.25**  
4 bottles \$10 each



Caution: Those who supplement with NAC should drink 6 to 8 glasses of water daily in order to prevent cysteine renal stones. Cysteine renal stones are rare but do occur.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



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



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



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



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



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



**Steven B. Harris, MD**, has participated in groundbreaking hypothermia, cryothermia, and ischemia research. His research interests include antioxidant and dietary-restriction effects in animals and humans.



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

**Dipnarine Maharaj MD, MB, ChB, FRCP (Glasgow), FRCP (Edinburgh), FRCPath., FACP**, is the Medical Director of the Maharaj Institute of Immune Regenerative Medicine, and is regarded as one of the world's foremost experts on adult stem cells. He received his medical degree in 1978 from the University of Glasgow Medical School, Scotland. He completed his internship and residency in Internal Medicine and Hematology at the University's Royal Infirmary.



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



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



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

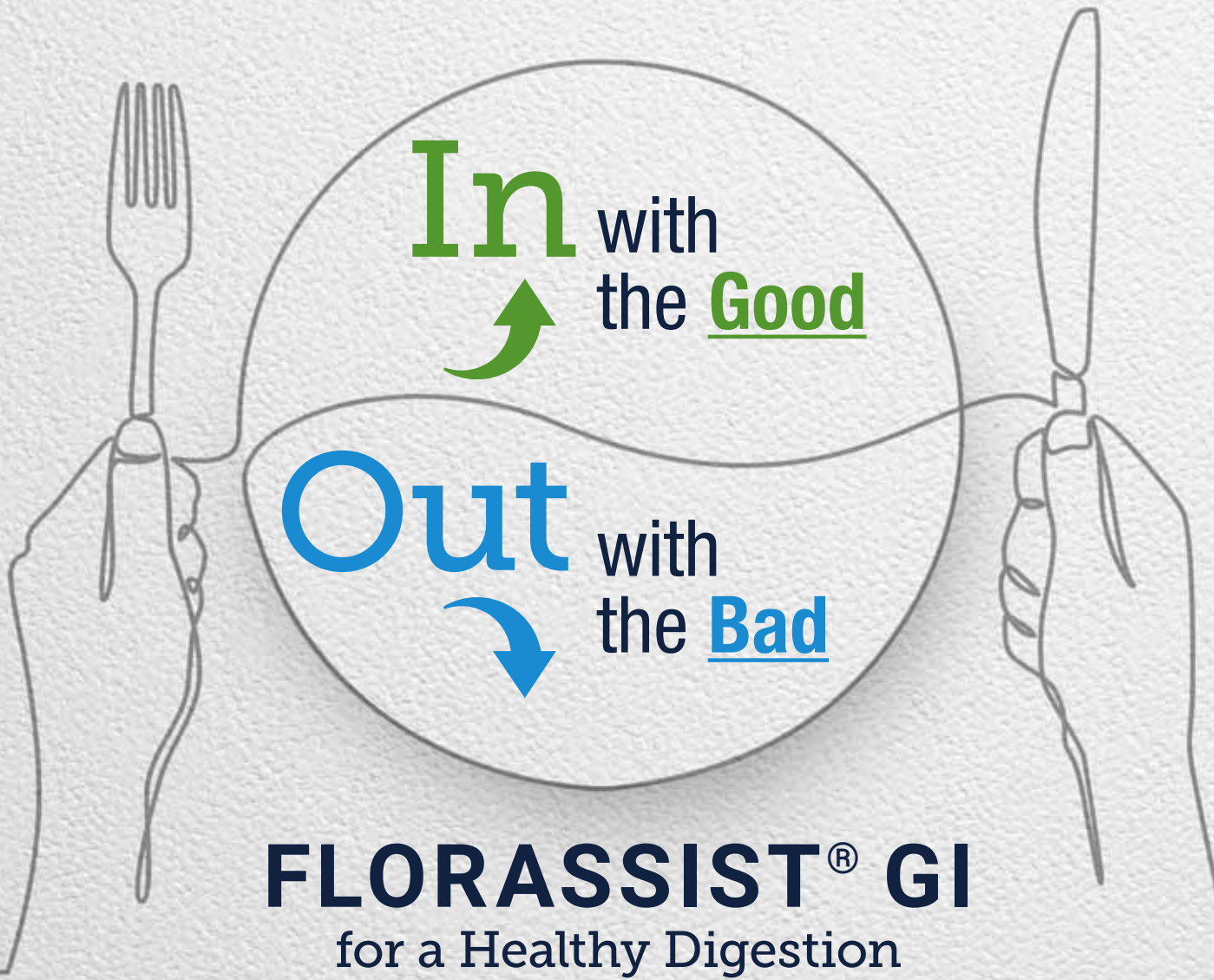


**Jonathan V. Wright, MD**, is medical director of the Tahoma Clinic in Tukwila, WA. He received his MD from the University of Michigan and has taught natural biochemical medical treatments since 1983. Dr. Wright pioneered the use of bioidentical estrogens and DHEA in daily medical practice. He has authored 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.





# FLORASSIST® GI

for a Healthy Digestion

**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.



GLUTEN FREE



NON-GMO  
LE CERTIFIED

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

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



# 45 Consecutive Years



WILLIAM FALOON

When I founded **Life Extension** in **1977**, our supporters had divergent theories about how to achieve **optimal** health and longevity.

Many advocated **plant-based** diets, others aggressive **exercise**, and some felt a single **nutrient** would confer meaningful benefits.

I was **22 years old** back then. That *early* age gave me the **privilege** of **observing** what happens to widely differing individuals over a **45-year** period.

When a **Life Extension** supporter contracted a premature illness or worse, I often knew a lot about their health history. I garnered more data from their family, physician, and in extreme cases, from autopsies I would arrange.

In virtually *every* instance, the disease had an underlying cause that was correctable.

What frustrated me is when supporters sent their medical records and asked for a lay opinion.

Many disregarded our suggestions to ask their physician to consider an important medication.

The typical reason was **side-effect** concerns that did not accurately reflect the **low risk/high reward** benefit (such as targeting systolic **blood pressure** under 120 mmHg).

When vascular **inflammation**, elevated **lipids** and/or high **blood pressure** were not corrected, the almost inevitable outcomes were **cardiovascular diseases**.

*Please don't let this happen to you.*

Readers of this magazine have annual **blood tests** that function as a “**report card**” on how well they and their doctors have managed their health.

A bad result such as **high blood sugar** (measured by **insulin + A1c + glucose**) is often reversible. Yet I still encounter pushback when encouraging clinically validated solutions.

I'm going to describe a tragic case of an educated person whom I identified as having **type II diabetes** in **2002**, but he chose to do nothing about it.

It's one of many similar **observations** over the past **45 years**.



## SAVING LIVES

### 1977-2022

Preserving Healthy Lifespans  
for 45 Consecutive Years

The origin of many scientific discoveries is an **observation** combined with meticulous follow-up.

**John Snow, MD**, is frequently identified as the founder of modern **epidemiology**.<sup>1</sup>

In the mid-1800s, **cholera** ravaged the city of **London**. Debates raged as to what caused it.

Dr. Snow observed *higher* cholera rates in certain **areas** of London. He then narrowed it down to specific sources of **drinking water**.

By translating **observations** into detailed maps, Dr. Snow identified patterns of **cholera** occurring in areas where drinking **water** was contaminated by nearby **cesspools**.

Dr. Snow did not know that microscopic **bacteria** caused cholera. The “**germ theory**” of disease had not yet been recognized. He nonetheless discovered that **contaminated water** was killing thousands of London residents.<sup>2</sup>

Few people of Dr. Snow’s era followed his admonition to boil drinking water.

### It’s Nearly as Bad Today

Rational decision making has not improved much on a relative basis since Dr. Snow’s time.

We live in the midst of an **obesity/type II diabetes** epidemic.

Even slightly elevated blood **glucose** silently damages **blood vessels**.

Sometimes, excess **insulin** secreted by the pancreas suppresses rising blood sugar levels.

This can cause **glucose** readings on a **blood test** to appear “normal,” or glucose may not reach a high enough level to diagnose **type II diabetes**.

An **oral glucose tolerance test** can be used to diagnose diabetes but is often not used because it consumes many hours of time. An overlooked ancillary method is to test blood for **fasting insulin**.

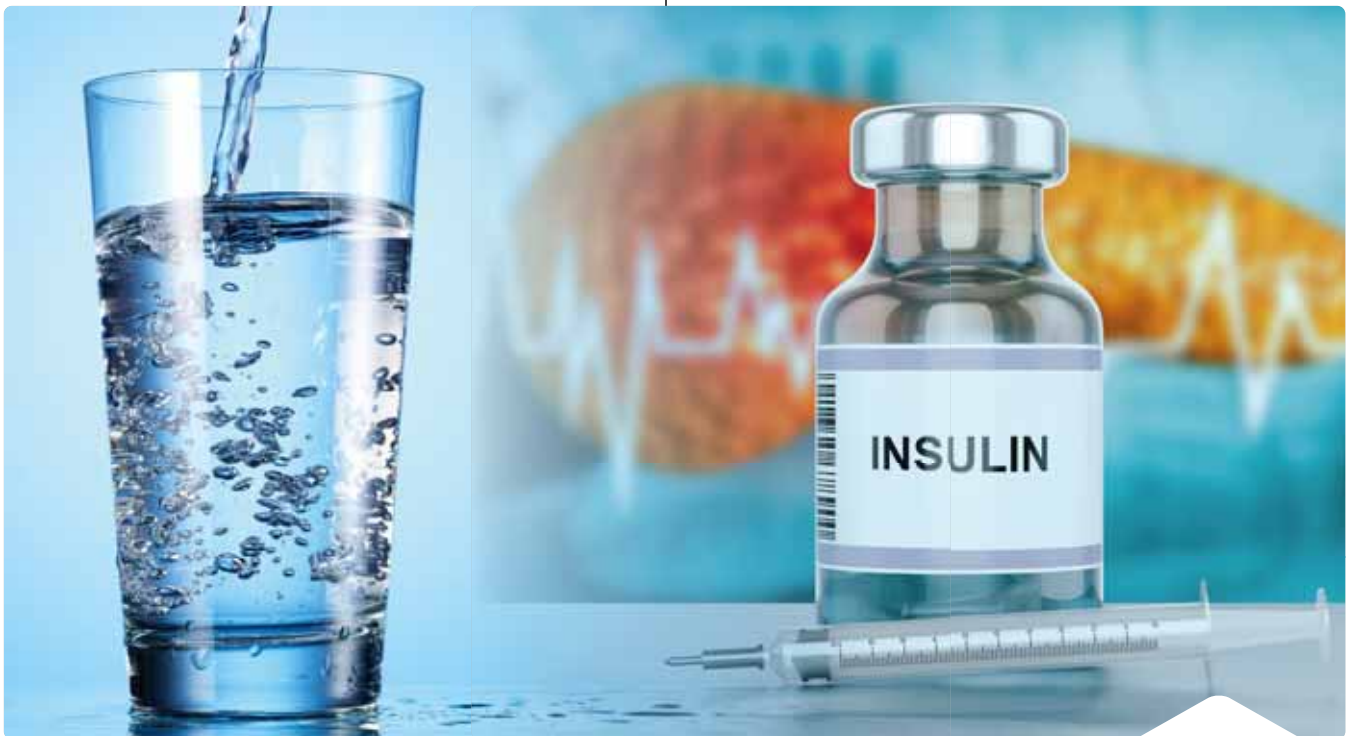
**Life Extension** believes an ideal **fasting insulin** level to be less than **5  $\mu$ U/mL**.

If **fasting insulin** levels are elevated above **5  $\mu$ U/mL** this may suggest an *early* **diabetic** state, despite **glucose** and **A1c** appearing “normal” or not reaching predefined conventional levels to diagnose **diabetes**.<sup>3-5</sup>

More practicing physicians today recognize that “**prediabetes**” causes nearly as much damage as full-blown **type II diabetes**.

Some physicians argue that the term “prediabetes” should be abolished and that anyone with **fasting glucose** over **99 mg/dL** and/or **A1c** over **5.7%** be treated with lifestyle modifications and drugs like metformin to prevent disease progression.

In **2021**, the **United States Preventive Task Force** (USPTF) recommended screening for **prediabetes** and



**type II diabetes** in adults aged 35 to 70 years who are overweight or obese.

Physicians were advised by the USPTF to offer patients with prediabetes effective preventive interventions.

These included both lifestyle interventions that focus on diet, physical activity, or both, and **metformin** to prevent or delay progression to diabetes in persons with prediabetes.<sup>6</sup>

## You Don't Get to Pick and Choose

**Vascular diseases** are our Achilles' heel.

If a person lives long enough, they are likely to encounter **arterial damage** that predisposes them to stroke, cognitive deficit, heart attack, and/or impaired kidney function.



## Pretending Does Not Work

In **2002**, I urged an overweight friend to have a **blood test** panel that included **fasting insulin**.

When his **glucose** and **A1c** readings came back "normal," he was elated to think he did not have **type II diabetes**.

I spoiled the day by pointing out that his **fasting insulin** was nearly **30 uIU/mL**. It should ideally be under **5 uIU/mL**.

I urged him to initiate **metformin** and **vitamin D** and lose some weight.

His comical response to my warning in **2002** was, "*I'll never have a blood test again.*"

Move forward to **2016**, and my friend started experiencing difficulties with his feet, which is often the first outward symptom of **diabetes**, i.e., lower leg **neuropathy**.

By **2018** the **chronic foot pain** reached a level that motivated him to have a comprehensive blood test. The results came back as full-blown **type II diabetes** with accompanying markers of **vascular inflammation** and **lipid imbalances**.

Several trips to the hospital spared my friend lower-leg amputation, as the nerves in his feet were significantly damaged. At the early age of 64-66, he is virtually crippled with relentless **neuropathic pain**.

Despite largely controlling his glucose and other diabetic blood markers (after developing severe neuropathy), he proceeded to suffer **kidney** and **heart failure** along with a host of other diabetic-related maladies. His feet never stop hurting.

When he complained in **2018-2020** about contracting so many diseases at the same time, I explained that elevated **fasting insulin** revealed underlying pathologies that were correctable long before clinically defined **type II diabetes** manifested.

This highly educated individual knows he could have avoided all of this by initiating anti-diabetic lifestyle and medical therapy in **2002**.

Comprehensive **blood tests** can identify more than **17 independent** risk factors linked to vascular disease, many of which can be easily corrected if simple steps are taken at the first sign of blood test abnormality.

Having discussed blood test results with **Life Extension** supporters since **1977**, I've heard every excuse for why certain risk markers (like **elevated LDL cholesterol**) aren't important to correct because the person engages in "other" healthy practices.

I am not a medical doctor, but a mere **observer** of people's behavior patterns in response to adverse **blood test** findings.

People who make the effort to **optimize** their blood test "report card" derive real-world benefits.

Those who ignore the **early** warnings are fortunate if they make it to a hospital in time for a **stent** insertion or other procedure to open a blocked artery in their **heart** or **brain**.

**Kidney damage** is challenging to reverse, yet it can be detected via comprehensive blood testing and mitigated when caught at an **early** stage depending on the underlying cause.

The bottom line is that aging humans are vulnerable to a host of diseases that are **detectable** and **preventable** long before onset of disabilities and premature death.

## Comprehensive Blood Tests at Discount Prices

Hurried physicians order **blood tests** that don't always include critical measures of future disease risk.

They also lack the time to fully review results. Patients are often **non-compliant** with physician-suggested lifestyle and medication treatments.

**Life Extension** long ago developed **Male** or **Female Blood Test Panels** that cost a fraction of what commercial labs charge.

These comprehensive panels provide the best validated tests to assess risk for cardiovascular disorders, cancer, dementia, and organ failure.

Results come back in a few days and Wellness Specialists are available at no charge to discuss results as they relate to the published scientific literature.

I could write a book about my **observations** of different individuals over the past **45 years** who needlessly suffered premature illnesses and death.

The next page describes the tests included in the **Male** and **Female Panels** that many of you do yearly... and take actions to **correct** when abnormalities are detected.

For longer life,



William Faloon  
Co-Founder, Life Extension

## References

1. Tulchinsky TH. John Snow, Cholera, the Broad Street Pump; Waterborne Diseases Then and Now. *Case Studies in Public Health*. 2018;77-99.
2. Markel H. A piece of my mind. Happy birthday, Dr Snow. *JAMA*. 2013 Mar 13;309(10):995-6.
3. Available at: <https://www.clinicaladvisor.com/home/topics/diabetes-information-center/fasting-insulin-vs-hemoglobin-a1c-are-we-getting-it-right/>. Accessed February 23, 2022.
4. Johnson JL, Duick DS, Chui MA, et al. Identifying prediabetes using fasting insulin levels. *Endocr Pract*. 2010 Jan-Feb;16(1):47-52.
5. Pennings N, Jaber J, Ahiawodzi P. Ten-year weight gain is associated with elevated fasting insulin levels and precedes glucose elevation. *Diabetes Metab Res Rev*. 2018 May;34(4):e2986.
6. Glauber H, Vollmer WM, Nichols GA. A Simple Model for Predicting Two-Year Risk of Diabetes Development in Individuals with Prediabetes. *Perm J*. 2018;22:17-050.



## COMPREHENSIVE BLOOD TESTS AT LOW LAB SALE PRICES

Commercial labs charge over **\$2,000** for blood tests needed to evaluate cardiac, inflammatory, immune, and other degenerative risk factors.

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

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



**+** Add a **Hepatitis C Antibody Test** for only **\$34** during our annual **Lab Test Sale**.

**LAB TEST SALE**  
**ENDS JULY 11, 2022**

To obtain these comprehensive **Male** or **Female Panels** at these low prices, call **1-800-208-3444** or visit [www.LifeExtension.com/blood](http://www.LifeExtension.com/blood) to order your requisition forms.

### Male Panel

#### METABOLIC PROFILE

Glucose  
Insulin  
Hemoglobin A1c

#### ORGAN FUNCTION

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

#### CARDIAC MARKERS

Apolipoprotein B (ApoB)  
Homocysteine  
C-Reactive Protein (high sensitivity)

#### LIPID PROFILE

Total Cholesterol  
LDL (low-density lipoprotein)  
HDL (high-density lipoprotein)  
Triglycerides

#### MINERALS AND PROTEINS

Serum Magnesium  
Ferritin (measure of iron status)  
**Blood minerals:** calcium, potassium, phosphorus, sodium, chloride, iron  
**Blood proteins:** albumin, globulin, total protein, albumin/globulin ratio

#### COMPLETE BLOOD COUNT (CBC)

**Red Blood Cell count including:** hemoglobin, hematocrit, MCV, MCH, MCHC, RDW  
**White Blood Cell count including:** lymphocytes, monocytes, eosinophils, neutrophils, basophils  
Platelet count

#### CANCER MARKER

PSA (Prostate Specific Antigen)

#### HORMONES

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

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

### Female Panel

#### METABOLIC PROFILE

Glucose  
Insulin  
Hemoglobin A1c

#### ORGAN FUNCTION

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

#### CARDIAC MARKERS

Apolipoprotein B (ApoB)  
Homocysteine  
C-Reactive Protein (high sensitivity)

#### LIPID PROFILE

Total Cholesterol  
LDL (low-density lipoprotein)  
HDL (high-density lipoprotein)  
Triglycerides

#### MINERALS AND PROTEINS

Serum Magnesium  
Ferritin (measure of iron status)  
**Blood minerals:** calcium, potassium, phosphorus, sodium, chloride, iron  
**Blood proteins:** albumin, globulin, total protein, albumin/globulin ratio

#### COMPLETE BLOOD COUNT (CBC)

**Red Blood Cell count including:** hemoglobin, hematocrit, MCV, MCH, MCHC, RDW  
**White Blood Cell count including:** lymphocytes, monocytes, eosinophils, neutrophils, basophils  
Platelet count

#### HORMONES

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

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

Restrictions apply in MA, NY, NJ, and RI. Kits not available in PA. The Blood Test Super Sale expires on **July 11, 2022**.



# Annual Lab Test Sale

Through July 11, 2022



## 1-2-3 EASY How it works:

### ORDER

Call 1- 800-208-3444 toll-free or visit [LifeExtension.com/LabServices](http://LifeExtension.com/LabServices).

### DRAW

For blood tests, take your form to a local lab. Collect at home for saliva, breath, etc.

### REVIEW

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

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

#### For Our Local Customers:

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

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

#### Terms and Conditions

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

Save  
**25%**  
on ALL  
Lab Tests

SALE  
PRICE

### MALE AND FEMALE PANELS

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

### CARDIAC RISK ASSESSMENTS

- **NMR LIPOPROFILE® (LC123810)** **\$74.25**  
 The NMR Lipoprofile® directly measures LDL particle size and number as well as HDL particle number, total cholesterol, and triglycerides. It also provides a calculation of one's risk of insulin resistance by assessing abnormalities in lipoprotein markers.
- **NMR LIPOPROFILE PLUS\* (LC100049)** **\$201.75**  
 In-depth analysis of cardiovascular risk markers including: NMR LipoProfile, C-Reactive Protein, Myeloperoxidase, and **Oxidized LDL**.
- **OXIDIZED LDL (LC123023)** **\$56.25**  
 Oxidized low-density lipoprotein (LDL) cholesterol is one of the main causes of the formation of atherosclerotic plaque in the arterial wall. This blood test measures levels of oxidized LDL.
- **MYELOPEROXIDASE (MPO)\* (LC123006)** **\$74.25**  
 The myeloperoxidase (MPO) test measures levels of an enzyme that oxidizes low-density lipoprotein (LDL) cholesterol, which could lead to increased arterial plaque formation.
- **ADVANCED OXIDIZED LDL PANEL\* (LC100035)** **\$198.75**  
 This panel looks at vascular inflammatory biomarkers, beginning with lifestyle choices to the development of metabolic and cardiovascular disease as well as the formation of vulnerable plaque. The panel contains the following tests: F2-Isoprostanes, Myeloperoxidase, and Oxidized LDL.

- **OMEGA-3 INDEX COMPLETE\*\* (LC100066)** **\$74.25**  
 Beneficial for everyone! People not taking omega-3/fish oil should check their baseline Omega-3 Index to see if it is in the desirable or concerning range. Those taking Omega-3/fish oil supplements should take the test to see if they need to adjust their dosage. You want to target a range of **8%-12%** for your Omega-3 Index score.

### CONDITION-SPECIFIC TESTS

- **PERSONALIZED AMINO ACID HEALTH ASSESSMENT\*\* (LC100090)** **\$224.25**  
 An in-depth analysis of amino acid metabolism provides insight into various health concerns, such as maldigestion, GI dysbiosis, neurological issues and more, with a personalized report of diet and supplementation suggestions. Provided as an at-home urine collection kit.
- **COMPREHENSIVE VAGINOSIS PROFILE\*\*\* (LC100091)** **\$111.75**  
 This test uses a simple, self-collection swab to measure both healthy and unhealthy vaginal microflora to determine if there's a problem. Susceptibility testing is performed on problematic microorganisms to determine effective remedies.

# Know YOUR NUMBERS



SALE PRICE

- **BLOOD METALS PANEL BLOOD SPOT KIT \*\*\* (LC100092) NEW \$111.75**  
 Convenient at-home test for blood levels of 8 important metals, providing insight into toxic metal burden and nutritional status with a quick and easy finger stick. Detects toxic metals: Lead, Mercury, Cadmium, Arsenic, Antimony and nutritional elements: Copper, Zinc, Selenium
- **TOXIC METALS PANEL (FECAL)\*\* (LC100076) \$127.50**  
 The results of fecal elemental analysis can help you identify and eliminate dietary exposure to toxic metals, while also assessing the body's natural excretion of metals. The panel tests Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Platinum, Thallium, Tungsten, and Uranium.
- **NEUROTRANSMITTER PANEL-COMPREHENSIVE\*\*\* (LC100085) \$221.25**  
 Serotonin, Dopamine, Epinephrine, Norepinephrine, GABA, Glutamate, Glycine, Histamine, PEA, DOPAC, 3-MT, Normetanephrine, Metanephrine, 5-HIAA, Tryptamine, Tyrosine, Tyramine, Taurine. Alterations in neurotransmitters play a significant role in contributing to symptoms such as cognitive disorders, depression, anxiety, diminished drive, fatigue and sleep difficulties, craving, addictions, pain, and more. Not available in NY.
- **MTHFR/COMT GENETIC METHYLATION PROFILE\*\* (LC100045) \$111.75**  
 Detect genetic variation in methylation, important for brain health, cardiovascular health, and more.
- **APOE GENETIC TEST FOR ALZHEIMER'S AND CARDIAC RISK\*\* (LC100059) \$111.75**  
 Apolipoprotein E (ApoE) is an important regulator of cholesterol and triglyceride levels in your blood and supports lipid transport and injury repair in your brain. Genetically, E4 is the strongest risk factor for developing late onset Alzheimer's disease. According to the National Institutes of Health, inheriting a single copy of ApoE4 increases the risk of Alzheimer's disease by about three-fold. Inheriting two copies increases the risk by about 12-fold. In fact, almost 40% of AD patients have inherited an E4 allele.
- **FOOD SENSITIVITY PANEL-ELITE\*\*\* (LC100096) NEW \$336.75**  
 This in-depth food sensitivity assessment measures both IgG and IgA response to 208 foods.

## GUT MICROBIOME TESTING

- **CPP STOOL ANALYSIS (CPP) \*\*\* (LC100093) NEW \$224.25**  
 Good starting point for evaluating microbiome-related gastrointestinal concerns. Identifying presence of common pathogenic microorganisms associated with acute GI distress. Includes advanced bacteria/yeast culture, pathogen detection by PCR, and parasitology.
- **COMPREHENSIVE STOOL ANALYSIS (CSAP) \*\*\* (LC100083) \$299.25**  
 Better assessment of the gut microbiome and digestive health. Contains all the tests in the CPP Stool Analysis with additional markers of digestive function, inflammation & immune function (stool chemistry), important for ongoing chronic and acute GI concerns.
- **GI360™ \*\*\* STOOL ANALYSIS (LC100088) \$379.25**  
 Best and most advanced assessment of microbiome dysbiosis, diversity and digestive health, the GI360 provides the most information about gut and microbiome health. Contains all the tests contained in the CPP and CSAP along with cutting-edge markers of microbiome diversity and dysbiosis.

SALE PRICE

## WHOLE-BODY HEALTH

- **MALE ELITE PANEL\* (LC100016) \$431.25**  
**CBC/Chemistry/Lipids Panel** • Free and Total Testosterone • Estradiol • Total Estrogens • DHEA-S • Progesterone • Pregnenolone • TSH • DHT • FSH • LH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Free and Total PSA • Vitamin D 25-OH • hs-CRP, ferritin • Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium
- **MALE BASIC HORMONE PANEL (LC100012) \$56.25**  
 DHEA-S • Estradiol • Total and Free Testosterone • PSA
- **FEMALE ELITE PANEL\* (LC100017) \$431.25**  
**CBC/Chemistry/Lipids Panel** • Free and total Testosterone • Estradiol • Total Lipids • Estrone • DHEA-S • Progesterone • Pregnenolone • DHT • FSH • LH • TSH • Free T3 • Free T4 • Reverse T3 • IGF-1 • SHBG • Vitamin D 25-OH • hs-CRP • Ferritin Homocysteine • Insulin • Hemoglobin A1c • Cortisol • ApoB • Magnesium
- **FEMALE BASIC HORMONE PANEL (LC100013) \$56.25**  
 DHEA-S • Estradiol • Total and Free Testosterone • Progesterone
- **WEIGHT LOSS PANEL-COMPREHENSIVE (LC100028) \$206.25**  
**CBC/Chemistry/Lipids Panel** • DHEA-S • Free and Total Testosterone • Estradiol • Progesterone • Cortisol • TSH • Free T3 • Free T4 • Reverse T3 • Insulin • Hemoglobin A1c • Vitamin D 25-hydroxy • Ferritin • C-reactive protein (high sensitivity)
- **HEALTHY AGING PANEL-COMPREHENSIVE\* (LC100026) \$186.75**  
**CBC/Chemistry/Lipids Panel** • C-reactive protein (high sensitivity) • Vitamin B12 • Folate • Homocysteine • Vitamin D 25-hydroxy • Hemoglobin A1c • TSH • Free T3 • Free T4 • Ferritin • Urinalysis • ApoB • Insulin

### CBC/CHEMISTRY/LIPIDS PANEL

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

#### CARDIOVASCULAR RISK

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

#### LIVER FUNCTION

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

#### KIDNEY FUNCTION

BUN • Creatinine • BUN/Creatinine Ratio • Uric Acid

#### BLOOD PROTEINS

Total Protein • Albumin • Globulin • Albumin/Globulin Ratio

#### BLOOD COUNTS

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

#### BLOOD MINERALS

Calcium • Potassium • Sodium • Chloride • Iron

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

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

\* This test requires samples to be shipped to the lab on dry ice for customers using a Blood Draw Kit. Customer is responsible for obtaining dry ice.

\*\* This test is packaged as a kit.

† Not available in NY.

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

# 2 WAYS TO SAVE



## PREMIER REWARDS

**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*®.

**Rewards Galore**  
Earn rewards for taking surveys, plus get rewarded on your birthday month.

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

[LifeExtension.com/YourPremier](http://LifeExtension.com/YourPremier)



## AUTOSHIP & SAVE

Save an average of 16% on your supplements!\*

**Free Shipping**  
We ship to any address in the United States (including Alaska and Hawaii) regardless of order size.

**Lowest Prices**  
Always pay the lowest price for your favorite Life Extension® products.

**Newest Formulations**  
Always receive the latest version of our innovative formulas.

Complimentary program! Cancel any time  
[LifeExtension.com/AutoShip](http://LifeExtension.com/AutoShip)

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

\*Average savings based on the average AutoShip discount across all products.



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



# In the News



## Astaxanthin has Beneficial Effects on Glucose Metabolism

The journal *Nutrients* published the results of a randomized, placebo-controlled trial in which 53 participants with prediabetes took **12 mg** of astaxanthin once daily or a placebo for 12 weeks.\*

This study used a two-hour oral glucose tolerance test as a way of measuring *after-meal* sugar spikes.

The researchers found that **glucose** blood levels significantly **decreased** in these study subjects compared to what they were before **astaxanthin** supplementation.

Various markers of glucose metabolism, such as A1c, Apo E, and malondialdehyde-modified low-density lipoprotein, were beneficially reduced. The Matsuda index (a parameter of insulin resistance) also improved after supplementation with **astaxanthin**.

**Editor's Note:** "Our results suggest that oral astaxanthin may have preventive effects against diabetes and atherosclerosis and may be a novel complementary treatment option for the prevention of diabetes in healthy volunteers, including subjects with prediabetes, without adverse effects," the authors concluded.

\* *Nutrients*. 2021 Dec 07; 13(12), 4381.

## Exercise Helps Protect Against Bone-Related Illnesses

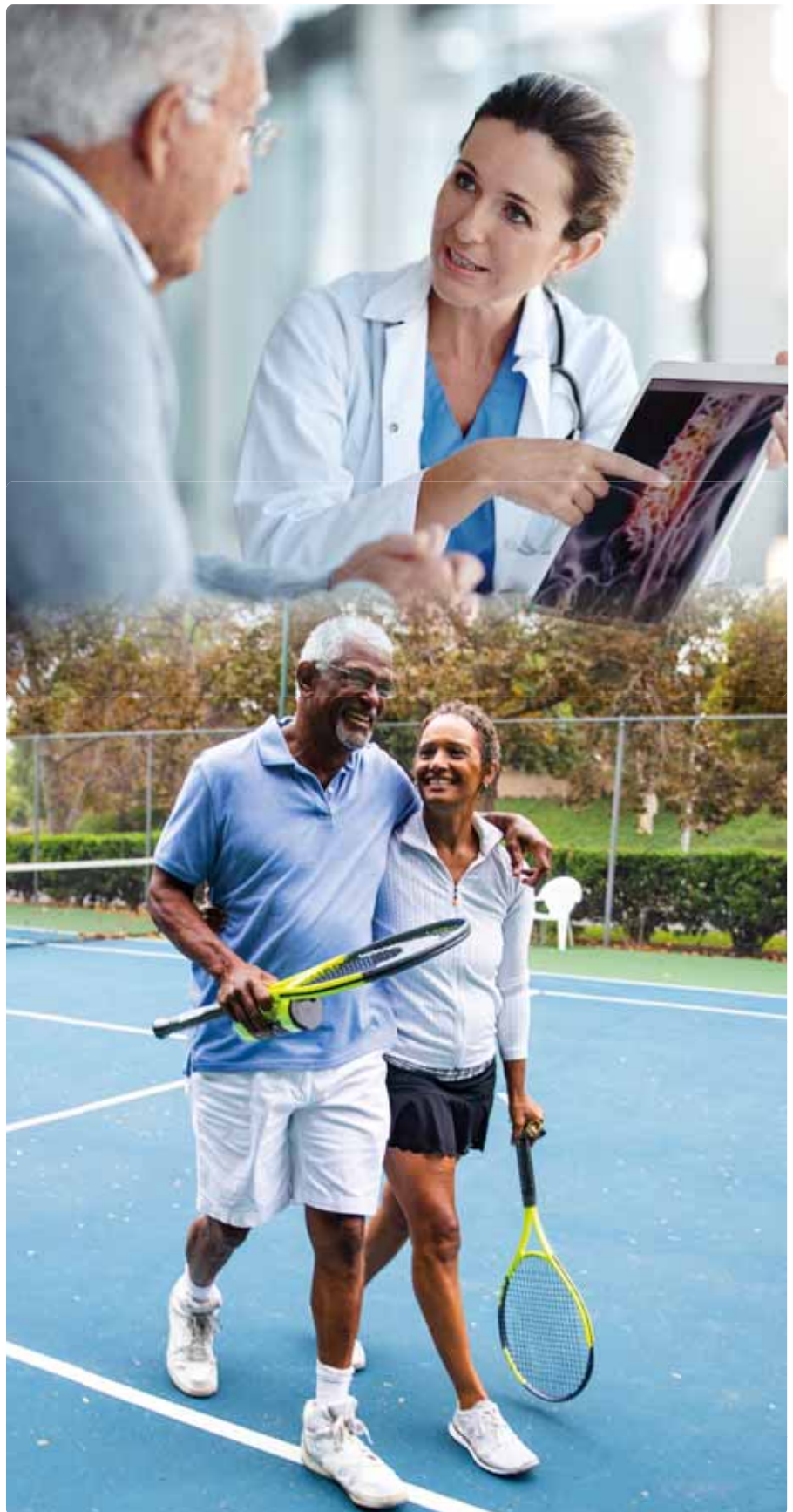
A study published in *Nature Regenerative Medicine* reported that exercise could help protect against bone cancer and other bone-related illnesses.\*

Using innovative technology to recreate the strain that bone cells experience during exercise, researchers found that a single exercise session caused bone cells to activate DNA repair, the cell cycle, and the P53 gene (a gene that suppresses tumors and fights cancer).

Exercise also started *ossification*, a process that helps build new bone and strengthen existing bone.

**Editor's Note:** "Individuals with chronic diseases like osteoporosis or cancer can benefit from exercise...since this limits the amount of bone loss and improves survival rates, respectively," the authors stated.

\* *npj Regen Med*, 2021; 6, 32.





## Calorie Restriction Can Positively Affect Immune Health

Research reported in the journal *Science* explored the relationship of consuming fewer calories to human immune response and inflammation.\*

The thymus gland produces immune cells known as T cells. However, the gland accumulates fat and produces fewer of these cells during aging, contributing to a decline in immune function.

Magnetic resonance imaging of the thymus glands of participants in a calorie restriction study revealed less thymus fat and a greater ability to generate T cells in healthy people who restricted calories by about **14%** for two years. Those who didn't restrict their calories experienced no change.

Although no alterations in gene expression were observed in the T cells of calorie-restricted individuals, changes were detected in fat tissue. Expression of the gene that encodes PLA2G7, a protein involved in a mechanism of inflammation, was inhibited by calorie restriction.

**Editor's Note:** "Moderately decreased food intake that does not cause malnutrition (caloric restriction) has beneficial effects on healthspan and lifespan in model organisms," the authors stated.

\* *Science*. 2022 Feb 11;375(6581):671-677.

## Long-Term Omega-3 Supplementation May Reduce Risk for Alzheimer's Disease

Use of omega-3 fatty acids over a longer term was associated with a reduced likelihood of developing late-onset Alzheimer's disease among individuals with a genetic variant associated with increased risk, an article in the *European Journal of Neurology* reported.\*

Researchers analyzed data from 1,670 individuals who did not have dementia upon enrollment in the Alzheimer's Disease Neuroimaging Initiative cohort.

**Forty-one percent** of the participants in the study were carriers of the APOE4 variant of the APOE gene, which is the strongest genetic determinant of late-onset Alzheimer's disease. Participants were followed for up to 10 years, during which progression from normal cognition or mild cognitive impairment to Alzheimer's dementia was tracked.

Ten years or more duration of **omega-3** use was associated with preserved cognition, as well as a reduction in cerebral amyloid and Alzheimer's disease risk, among APOE4 carriers.

**Editor's Note:** The authors concluded that, "These findings also indicated that genetic risk factors of Alzheimer's disease could be modified, and their adverse effects can be attenuated and even neutralized by long-term omega-3 supplementation."

\* *Eur J Neurol.* 2022 Feb;29(2):422-31.



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

Mary

VERIFIED CUSTOMER REVIEW

SUSTAINED SUPPORT  
24  
HOURS  
A DAY



Liposomal-Hydrogel

VITAMIN C

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

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

It also maintains *higher* vitamin levels throughout the day.<sup>1</sup>

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

Item #02501 • 60 vegetarian tablets

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



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

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

A smiling woman with blonde hair tied up, wearing a bright yellow sweater, is holding a wooden crate filled with various green herbs. The crate has the words "WOOD BOX" printed on it. The background is a soft-focus outdoor setting with green foliage and a bokeh effect from light sources.

# How Women Over 40 Can Feel Better Fast



SIBERIAN RHUBARB

BY MICHAEL DOWNEY

It starts around age **40**. Some women feel a little “off,” while others experience significant changes in **mood, energy, and stress**.

This can signal the *first stages* of the hormonal rollercoaster that culminates in **menopause**.

Up to this point, women may experience any of **11 menopausal symptoms**, including hot flashes, mood swings, sleep problems, and vaginal dryness.<sup>1</sup>

Many women want to avoid conventional hormone treatments.

Scientists have developed a **hormone-free** alternative that can reduce symptoms of hormonal imbalance and the related **symptoms of menopause**.

The unique ingredient, a patented **Siberian rhubarb extract**, has been shown to improve all 11 menopause symptoms.

**Human** studies show that **Siberian rhubarb** extract can reduce overall symptom severity by **up to 83%**.<sup>2</sup>

This **Siberian rhubarb** can now be found in a formula with essential **B vitamins** also shown to improve energy, mood, and stress.

## Common Symptoms of Menopause

Most women go through **menopause** at around age **51**.<sup>3</sup>

But *any time* after age **40**, a decline in levels of the hormones **estrogen** and **progesterone** can begin to affect women physically and psychologically.<sup>3,4</sup>

Symptoms often include **mood** changes, low **energy** levels, and feelings of stress.<sup>3</sup>

Women may start experiencing these symptoms as early as in their mid-40s, a period known as **perimenopause**.<sup>5</sup>

During this time, regular menstrual cycling ceases and estrogen and progesterone levels sharply decrease.<sup>4</sup>

Experts have identified **11** common symptoms included in the **Menopause Rating Scale**. These symptoms, which may begin **years** before menopause, are:<sup>1</sup>

1. Hot flashes and excessive sweating,
2. Heart discomfort,
3. Sleep problems,
4. Joint and muscle discomfort,
5. Depressive mood,
6. Irritability,
7. Anxiety,
8. Physical and mental exhaustion,
9. Sexual problems,
10. Bladder issues, and
11. Vaginal dryness.

For women who prefer to avoid hormone treatments, there's an alternative solution.

Scientists developed a **hormone-free** formula for women over 40 that combines a patented **Siberian rhubarb** root extract with eight essential **B vitamins**.

The **Siberian rhubarb** has been found to counteract **all menopause symptoms** while B vitamins additionally help improve energy and mood.



## How Siberian Rhubarb Works

The root of the **Siberian rhubarb** plant is rich in compounds that bind to the same **receptors** in cells to which **estrogen** normally binds.<sup>6</sup> By doing this, they trigger **beneficial estrogen-like** effects throughout the body, helping to relieve menopause symptoms.

There are different kinds of **estrogen receptors**, and the difference is critical:

- Activating the **ER-alpha** receptor can produce undesirable growth in some tissues, including initiating and promoting cancer.<sup>7</sup> Activation of this receptor by conventional **hormone replacement therapy** is believed to be the cause of many of the ill effects of this treatment.<sup>8</sup>
- Activating the **ER-beta** receptor promotes beneficial effects on skin, brain, metabolism, blood vessels, and other tissues—and relieves menopausal symptoms.<sup>8,9</sup> The proprietary patented extract of **Siberian rhubarb** has been shown in preclinical studies to selectively activate **ER-beta** but not **ER-alpha**.<sup>6</sup>

**Siberian rhubarb extract** has been recommended by doctors since the **1950s** for relieving **menopause symptoms**, and its use is further supported by numerous clinical studies in recent years.<sup>10</sup>

In Germany, **6.7 million doses** are sold *annually*. Scientists have reviewed safety data collected there over **two decades** and concluded that the extract is extremely **safe** for long-term use.<sup>10</sup>

## Improving Common Symptoms

To test its benefits, researchers conducted a series of **human** studies.

In all of the following studies, taking **4 mg** of the patented Siberian rhubarb extract daily resulted in significant improvement in **every one** of the **11** common menopause symptoms.<sup>2,11-13</sup>

- In a clinical trial of symptomatic perimenopausal women, taking **Siberian rhubarb** extract significantly reduced the number and severity of **hot flashes** within **just one month**. After three months, it led to a **54% reduction** in overall severity of symptoms on the **Menopause Rating Scale**.<sup>11</sup>



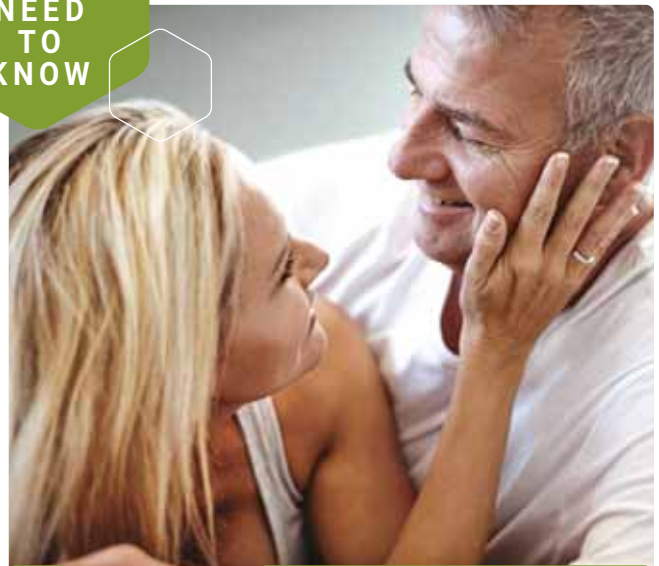
WHAT  
YOU  
NEED  
TO  
KNOW

- After using the extract for **one year**, women who continued to take the product had a remarkable **83% reduction** in overall severity of symptoms. These improvements were *maintained* in the women who continued taking **Siberian rhubarb** for a second year.<sup>2</sup>
- In another study of perimenopausal women, taking **Siberian rhubarb** extract for just 12 weeks led to a reduction in daily hot flashes from a median of 12 to just two, an astonishing **83% decline**.<sup>13</sup>
- An observational study found that **56%** of symptomatic perimenopausal or postmenopausal women who took **Siberian rhubarb** for six months reported *major improvements*, with pronounced improvements in **hot flashes, sleep problems, and irritability**.<sup>12</sup>

### Compelling Clinical Data

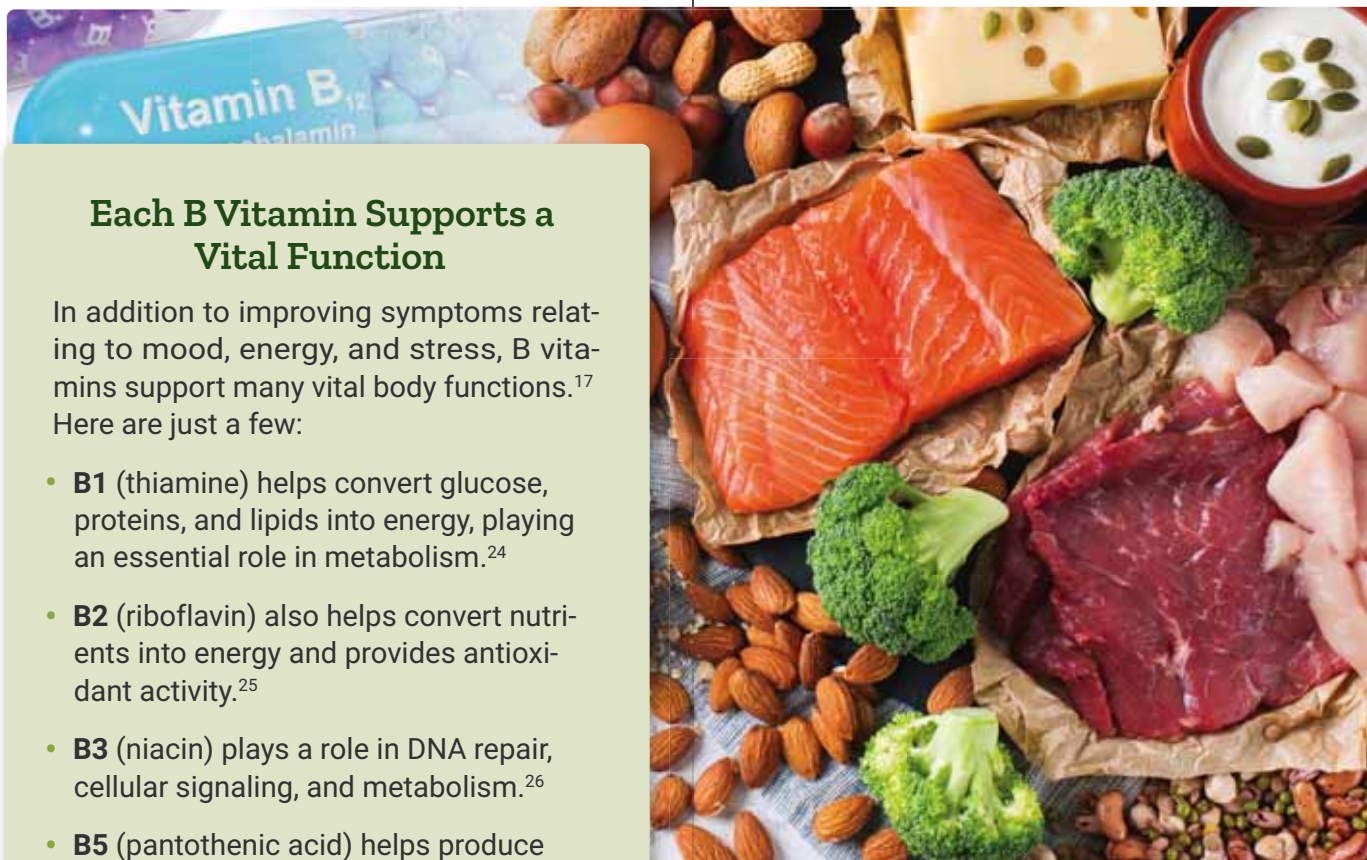
Clinical trials demonstrate consistent findings in response to daily use of **Siberian rhubarb extract**. Some of the most dramatic benefits include:

- A decrease in the severity of **sleep problems** up to **69%**.<sup>2,13</sup>
- An **up to 67%** reduction in **urogenital symptoms**,<sup>2</sup> which include bladder problems (such as incontinence or difficulty urinating), vaginal dryness, and sexual problems (including loss of sexual desire).<sup>14</sup>
- An average **58%** improvement in **physical and mental exhaustion** after just three months and an average **73%** improvement in feelings of exhaustion after a year.<sup>2</sup>
- A reduction in **heart discomfort** like **palpitations** by **as much as 60%** in three months.<sup>2,13</sup>
- Improvements in **joint and muscle discomfort** by up to **50%**.<sup>2,13</sup>
- A **66%** reduction in total anxiety scores, on a recognized scale, after three months.<sup>15</sup>



## Relief for Menopause Symptoms and More

- **Perimenopause** and **menopause** are marked by 11 common symptoms, including hot flashes, irritability, bladder issues, and sexual problems.
- In addition, some **women over 40** begin noticing hormone-related symptoms like **mood** problems, low **energy**, and feelings of **stress**.
- Human studies show that taking **4 mg** of **Siberian rhubarb extract** provides relief from all **11** menopause symptoms and reduces overall symptom severity by up to **83%**.
- Research has also shown that **B vitamins** can improve **mood, energy, and stress** symptoms.
- Combining all essential **B vitamins** with **Siberian rhubarb** provides an alternative to conventional hormone therapy to address a broad range of symptoms experienced by women over 40.



## Each B Vitamin Supports a Vital Function

In addition to improving symptoms relating to mood, energy, and stress, B vitamins support many vital body functions.<sup>17</sup> Here are just a few:

- **B1** (thiamine) helps convert glucose, proteins, and lipids into energy, playing an essential role in metabolism.<sup>24</sup>
- **B2** (riboflavin) also helps convert nutrients into energy and provides antioxidant activity.<sup>25</sup>
- **B3** (niacin) plays a role in DNA repair, cellular signaling, and metabolism.<sup>26</sup>
- **B5** (pantothenic acid) helps produce hormones and converts proteins, carbohydrates, and fatty acids to energy.<sup>27</sup>
- **B6** (pyridoxine) helps metabolize amino acids and supports neurotransmitters and red blood cells' production.<sup>28</sup>
- **B7** (biotin) regulates gene expression and is required for metabolism of fat and carbohydrates.<sup>29</sup> It is also important for healthy hair and skin.<sup>30</sup>
- **B9** (folic acid or, for superior absorption, 5-MTHF<sup>31</sup>) is vital for cell growth, amino acid metabolism, production of red and white blood cells, healthy cell division, and proper fetal growth and development.<sup>32-35</sup>
- **B12** (cobalamin or methylcobalamin) is important for neurological function, development of red blood cells, production of DNA, and promoting healthy homocysteine levels.<sup>36-38</sup>

## Benefits of B Vitamins

To provide additional benefits for women over 40, scientists combined this **Siberian rhubarb extract** with eight essential **B vitamins**:

- **B1** (thiamine),
- **B2** (riboflavin),
- **B3** (niacin),
- **B5** (pantothenic acid),
- **B6** (pyridoxine),
- **B7** (biotin),
- **B9** (folic acid), and
- **B12** (cobalamin).

These vitamins are needed to help the body carry out necessary daily functions, including protein, fat, and carbohydrate metabolism, DNA and RNA synthesis, red blood cell production, and neurotransmitter metabolism.<sup>16,17</sup>

B vitamins also assist in maintaining the function of the **brain** and **nervous system** and have been shown in numerous studies to reduce symptoms that include **low energy** and **fatigue**, **mood swings**, and **stress**, and improve **mental well-being**.<sup>18,19</sup>

**Deficiencies** in B vitamins may become increasingly common with aging due to declining food intake, medication interactions, and poor gastrointestinal absorption of nutrients.<sup>20</sup> Direct oral supplementation can correct these deficiencies.

### Boosting Energy and Mood

**B vitamins** work together and are essential for healthy **brain** function and **energy** metabolism.<sup>16</sup>

A review and meta-analysis of randomized controlled trials revealed that intake of different **B vitamins** was associated with **reduced stress** symptoms and may benefit **mood** in healthy and at-risk individuals.<sup>21</sup>

An observational study following 3,503 older adults for an average of more than seven years found that **higher intakes** of **vitamin B6** and **vitamin B12** were associated with a **lower likelihood** of **depression**.<sup>22</sup>

And a placebo-controlled study of healthy older women found that taking **vitamin B1** daily led to a **69%** improvement in general **well-being** and a **78%** decrease in **fatigue** in just six weeks.<sup>23</sup>

Combining **B vitamins** with **Siberian rhubarb** extract may provide **greater relief** for women over 40 suffering from symptoms like fatigue and anxiety.

### Summary

After age **40**, many women begin to suffer from perimenopausal symptoms of low energy, mood problems, and feelings of stress.

As women approach **menopause**, most also experience some of the 11 common menopausal symptoms, including hot flashes, irritability, and sexual problems.

Multiple human studies show that **4 mg of Siberian rhubarb root extract** provides safe, effective relief of all these common menopausal symptoms.

Scientists have developed a formula that includes **eight essential B vitamins** combined with **Siberian rhubarb extract** for women seeking **hormone-free** benefits after age 40. •

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



### Siberian Rhubarb Improves Depressive Symptoms

In a clinical study, perimenopausal women with **depressive mood** symptoms had the following improvements after taking **Siberian rhubarb** extract.<sup>15</sup>

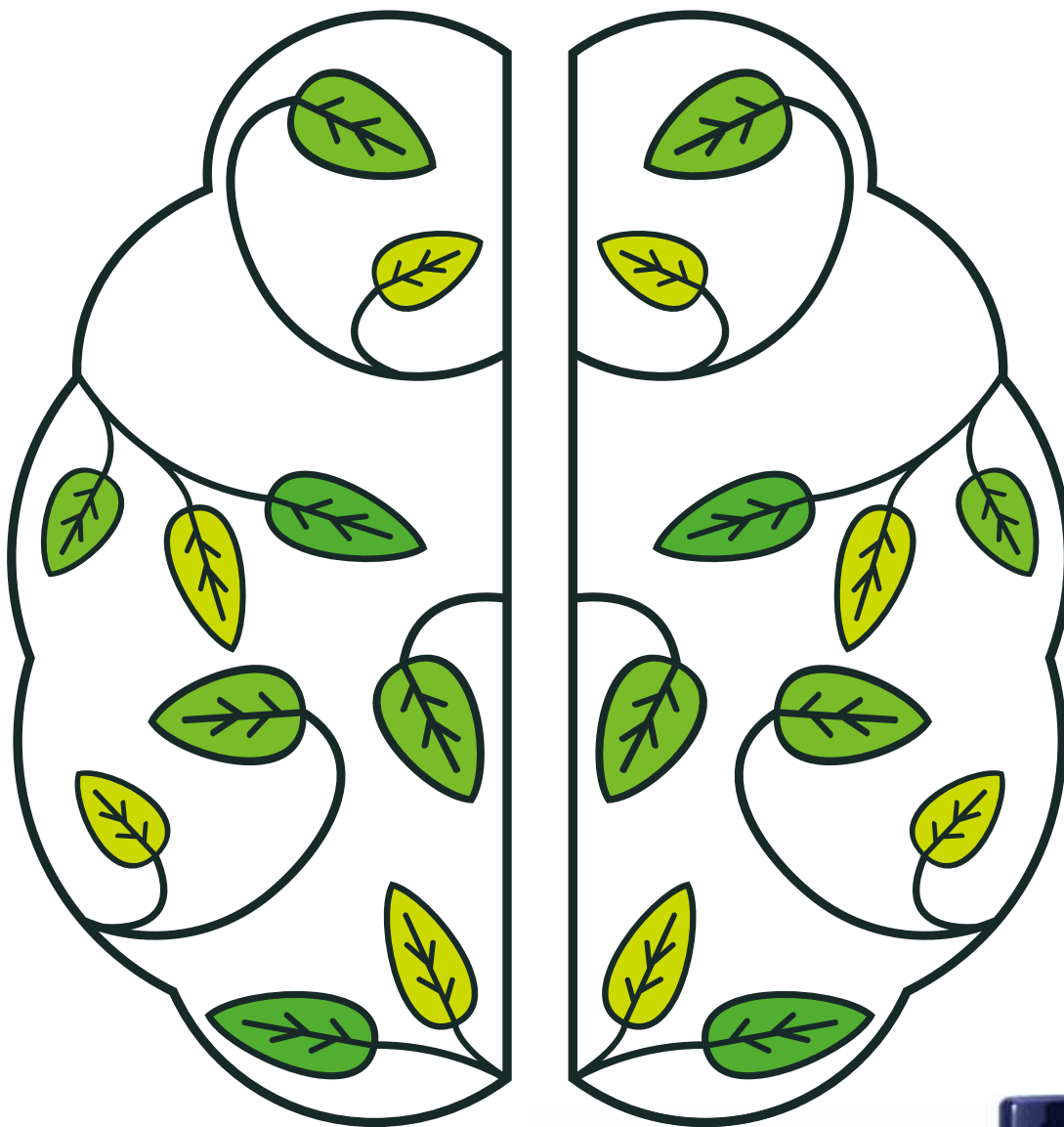
	SIBERIAN RHUBARB	PLACEBO
Patients with <b>remission</b> of depression symptoms	<b>30.2%</b>	<b>1.8%</b>
Patients with <b>improvement</b> of symptoms	<b>60.4%</b>	<b>23.6%</b>
Patients with <b>no change</b> in symptoms	<b>9.4%</b>	<b>69.1%</b>

## Not All Extracts are the Same

Only the clinically studied form of Siberian rhubarb extract has been shown to relieve 11 symptoms of menopause. These are extracts that have been standardized to more than **54% rhaponticin** and more than **27% desoxyrhaponticin**.

### References

- Blumel JE, Arteaga E, Parra J, et al. Decision-making for the treatment of climacteric symptoms using the Menopause Rating Scale. *Maturitas*. 2018 May;111:15-9.
- Hasper I, Ventskovskiy BM, Rettenberger R, et al. Long-term efficacy and safety of the special extract ERr 731 of Rheum raphanistrum in perimenopausal women with menopausal symptoms. *Menopause*. 2009 Jan-Feb;16(1):117-31.
- Marlatt KL, Beyl RA, Redman LM. A qualitative assessment of health behaviors and experiences during menopause: A cross-sectional, observational study. *Maturitas*. 2018 Oct;116:36-42.
- O'Connor KA, Ferrell R, Brindle E, et al. Progesterone and ovulation across stages of the transition to menopause. *Menopause*. 2009 Nov-Dec;16(6):1178-87.
- Available at: <https://my.clevelandclinic.org/health/diseases/21608-perimenopause>. Accessed March 16, 2022.
- Wober J, Moller F, Richter T, et al. Activation of estrogen receptor-beta by a special extract of Rheum raphanistrum (ERr 731), its aglycones and structurally related compounds. *J Steroid Biochem Mol Biol*. 2007 Nov-Dec;107(3-5):191-201.
- Caldon CE. Estrogen signaling and the DNA damage response in hormone dependent breast cancers. *Front Oncol*. 2014;4:106.
- Paterni I, Granchi C, Katzenellenbogen JA, et al. Estrogen receptors alpha (ERalpha) and beta (ERbeta): subtype-selective ligands and clinical potential. *Steroids*. 2014 Nov;90:13-29.
- Thornton MJ, Taylor AH, Mulligan K, et al. The distribution of estrogen receptor beta is distinct to that of estrogen receptor alpha and the androgen receptor in human skin and the pilosebaceous unit. *J Invest Dermatol Symp Proc*. 2003 Jun;8(1):100-3.
- Chang JL, Montalto MB, Heger PW, et al. Rheum raphanistrum Extract (ERr 731): Postmarketing Data on Safety Surveillance and Consumer Complaints. *Integr Med (Encinitas)*. 2016 Jun;15(3):34-9.
- Heger M, Ventskovskiy BM, Borzenko I, et al. Efficacy and safety of a special extract of Rheum raphanistrum (ERr 731) in perimenopausal women with climacteric complaints: a 12-week randomized, double-blind, placebo-controlled trial. *Menopause*. 2006 Sep-Oct;13(5):744-59.
- Kaszkin-Bettag M, Beck S, Richardson A, et al. Efficacy of the special extract ERr 731 from rhapontic rhubarb for menopausal complaints: a 6-month open observational study. *Altern Ther Health Med*. 2008 Nov-Dec;14(6):32-8.
- Kaszkin-Bettag M, Ventskovskiy BM, Solskyy S, et al. Confirmation of the efficacy of ERr 731 in perimenopausal women with menopausal symptoms. *Altern Ther Health Med*. 2009 Jan-Feb;15(1):24-34.
- Khatoun A, Husain S, Husain S, et al. An Overview of Menopausal Symptoms Using the Menopause Rating Scale in a Tertiary Care Center. *J Midlife Health*. 2018 Jul-Sep;9(3):150-4.
- Kaszkin-Bettag M, Ventskovskiy BM, Kravchenko A, et al. The special extract ERr 731 of the roots of Rheum raphanistrum decreases anxiety and improves health state and general well-being in perimenopausal women. *Menopause*. 2007 Mar-Apr;14(2):270-83.
- Kennedy DO. B Vitamins and the Brain: Mechanisms, Dose and Efficacy--A Review. *Nutrients*. 2016 Jan 27;8(2):68.
- Available at: <https://www.ncbi.nlm.nih.gov/books/NBK538510/>. Accessed March 11, 2022.
- De Souza MC, Walker AF, Robinson PA, et al. A synergistic effect of a daily supplement for 1 month of 200 mg magnesium plus 50 mg vitamin B6 for the relief of anxiety-related premenstrual symptoms: a randomized, double-blind, crossover study. *J Womens Health Gen Based Med*. 2000 Mar;9(2):131-9.
- Milart P, Wozniakowska E, Wrona W. Selected vitamins and quality of life in menopausal women. *Prz Menopauzalny*. 2018 Dec;17(4):175-9.
- Kaur D, Rasane P, Singh J, et al. Nutritional Interventions for Elderly and Considerations for the Development of Geriatric Foods. *Curr Aging Sci*. 2019;12(1):15-27.
- Young LM, Pipingas A, White DJ, et al. A Systematic Review and Meta-Analysis of B Vitamin Supplementation on Depressive Symptoms, Anxiety, and Stress: Effects on Healthy and 'At-Risk' Individuals. *Nutrients*. 2019;11(9):2232.
- Skarupski KA, Tangney C, Li H, et al. Longitudinal association of vitamin B-6, folate, and vitamin B-12 with depressive symptoms among older adults over time. *Am J Clin Nutr*. 2010 Aug;92(2):330-5.
- Smidt LJ, Cremin FM, Grivetti LE, et al. Influence of thiamin supplementation on the health and general well-being of an elderly Irish population with marginal thiamin deficiency. *J Gerontol*. 1991 Jan;46(1):M16-22.
- Available at: <https://www.ncbi.nlm.nih.gov/books/NBK482360/>. Accessed March 11, 2022.
- Thakur K, Tomar SK, Singh AK, et al. Riboflavin and health: A review of recent human research. *Crit Rev Food Sci Nutr*. 2017 Nov 22;57(17):3650-60.
- Meyer-Ficca M, Kirkland JB. Niacin. *Adv Nutr*. 2016 May;7(3):556-8.
- Available at: [https://pubchem.ncbi.nlm.nih.gov/compound/pantothenic\\_acid](https://pubchem.ncbi.nlm.nih.gov/compound/pantothenic_acid). Accessed March 11, 2022.
- Available at: <https://pubchem.ncbi.nlm.nih.gov/compound/pyridoxine>. Accessed March 11, 2022.
- Zempleni J, Wijeratne SS, Hassan YI. Biotin. *Biofactors*. 2009 Jan-Feb;35(1):36-46.
- Trueb RM. Serum Biotin Levels in Women Complaining of Hair Loss. *Int J Trichology*. 2016 Apr-Jun;8(2):73-7.
- Scaglione F, Panzavolta G. Folate, folic acid and 5-methyltetrahydrofolate are not the same thing. *Xenobiotica*. 2014 May;44(5):480-8.
- Stanger O. Physiology of folic acid in health and disease. *Curr Drug Metab*. 2002 Apr;3(2):211-23.
- Available at: <https://www.ncbi.nlm.nih.gov/books/NBK114318>. Accessed March 10, 2022.
- Quinlivan EP, McPartlin J, McNulty H, et al. Importance of both folic acid and vitamin B12 in reduction of risk of vascular disease. *Lancet*. 2002 Jan 19;359(9302):227-8.
- Kim MW, Ahn KH, Ryu KJ, et al. Preventive effects of folic acid supplementation on adverse maternal and fetal outcomes. *PLoS One*. 2014;9(5):e97273.
- O'Leary F, Samman S. Vitamin B12 in health and disease. *Nutrients*. 2010 Mar;2(3):299-316.
- Nohr D, Biesalski HK. Vitamin B12. *Reference Module in Food Science: Elsevier*; 2016.
- Available at: <https://www.ncbi.nlm.nih.gov/books/NBK114302/>. Accessed March 10, 2022.



## Optimized Ashwagandha EXTRACT

Ashwagandha has been shown to:

- Support a healthy response to everyday stress
- Promote emotional well-being
- Encourage already-healthy levels of cortisol, the stress hormone

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



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

Sensori® is protected under US Patent No. 7,318,938 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](http://www.LifeExtension.com)



# STRONGER BONES STRONGER YOU

Some people require extra support for optimal bone strength and flexibility.

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

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

For full product description and to order **Bone Strength Collagen Formula**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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

Item #01725 • 120 capsules

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



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

# FOR Women OVER 40

HORMONE FREE



**Youthful Woman 40+ with B-Complex** has been formulated for women over 40 to feel their best!

A patented **Siberian rhubarb** extract called **ERr 731®** has been **clinically shown** to improve **11** discomforts including:

- Hot flashes
- Night sweats
- Irritability
- Sleep disturbances
- Exhaustion
- Sexual function
- Joint discomfort
- Bladder problems
- Vaginal dryness

**PLUS: 8 essential B vitamins** to provide support for **energy, mood, and stress.**

**ITEM #02507**

30 enteric coated vegetarian tablets

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

(Just one tablet each day)

For full product description and to order **Youthful Woman 40+ with B-Complex**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**CAUTION:** Consult with your healthcare practitioner if you have, or have a history of, estrogen-dependent tumors. ERr 731® is a registered trademark of Chemisch-Pharmazeutische Fabrik Göppingen Carl Müller Apotheker GmbH & Co.

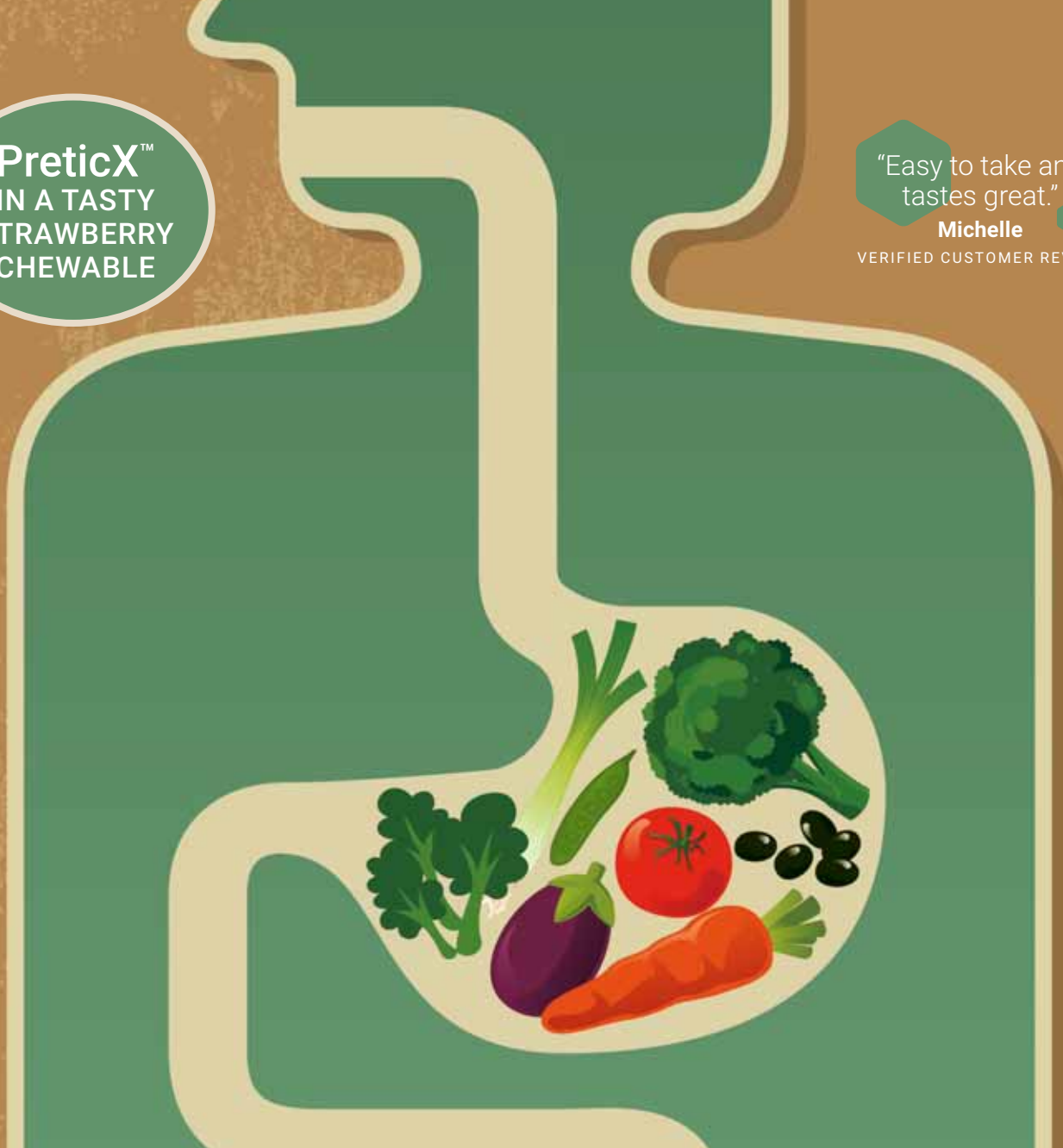
These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

PreticX™  
IN A TASTY  
STRAWBERRY  
CHEWABLE

"Easy to take and  
tastes great."

Michelle

VERIFIED CUSTOMER REVIEW



# RESTORE YOUTHFUL GUT BALANCE

With Strawberry Flavored  
**FLORASSIST® Prebiotic Chewable**

Item #02203 • 60 vegetarian chewable tablets

1 bottle \$15 • 4 bottles \$13 each



- With age, our **bifidobacteria** levels decline to as little as **5%**, creating gut imbalance.<sup>1</sup>
- *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.<sup>2</sup>*
- **1,000 mg** of **XOS** (xylooligosaccharides) per prebiotic chewable.

#### References

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

PreticX™ is a trademark of AIDP, Inc.

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



# Fish Oil and Brain Health

BY LAURIE MATHENA



**Omega-3** fatty acids are known for cardiovascular benefits, such as lowering triglycerides and reducing inflammation.<sup>1-5</sup>

A meta-analysis found that people with the *highest* consumption of **EPA** and **DHA** (omega-3s in fish oil) have an associated **14% reduction** in risk of **death** from *any* cause, compared to the lowest consumption.<sup>6</sup>

In addition, fish oil's effect on **brain health** continues to make headlines. Here are a few recent highlights.

## Protection Against Neurotoxins

A study published in the journal *Neurology* added to the evidence that omega-3s protect against **neurotoxins**, substances that damage the brain or nervous system.<sup>7</sup>

More than 1,300 elderly women underwent a **brain MRI**. In order to determine how much pollution exposure these women had, researchers used their addresses to assess their exposure to a category of **air pollution** (called **PM<sup>2.5</sup>**) for the three years prior to the MRI. This is known as using a spatiotemporal model.

PM<sup>2.5</sup> is known to have **neurotoxic** effects. Exposure is associated with **smaller white matter volumes**, which have been linked to strokes, cognitive decline, and dementia.<sup>8,9</sup>

The researchers examined the association between omega-3 blood levels and PM<sup>2.5</sup> exposure with brain volumes.

Results showed that women with *higher* levels of **omega-3** fatty acids had significantly greater volumes of **hippocampus** (an area of the brain associated with cognition and memory) and **white matter** (which contains the nerve fibers that connect brain cells).

Importantly, higher omega-3 levels **reduced** the negative connection between PM<sup>2.5</sup> exposure and white matter volumes in the total brain and in specific brain areas (frontal, parietal, and temporal).

These results indicate that women with *higher* levels of omega-3 fatty acids were protected against the brain-damaging effects of PM<sup>2.5</sup> exposure.

### Improved Depression Symptoms

In a meta-analysis published in *Translational Psychiatry*, researchers found that taking a daily omega-3 fatty acid supplement with a high ratio of EPA to DHA significantly improved **symptoms of mild to moderate depression** (including depressed mood, sleep problems, and fatigue) in pregnant and postpartum women.<sup>10</sup>

Omega-3 doses of the studies included ranged from **1 gram to 6 grams daily**. These dosages were all well-tolerated.

### Better Stroke Outcomes

Several animal studies have found that **resolvins** (anti-inflammatory mediators the body produces from DHA and EPA) **decreased brain damage** caused by a **stroke**, and **reversed** stroke-induced neurological dysfunction.<sup>11</sup>

### Protecting Brain Structure

**Omega-3** fatty acids are a key structural component of all cell membranes.

**Brain** cell membranes are especially rich in **EPA/DHA**.<sup>12</sup>

Electrical *signals* generated in brain cell membranes play a role in everything from simple movement, to language, reasoning, memory formation, and recall.

These *signals* cannot be conducted properly without **myelin**, which insulates the fibers of nerve cells.<sup>13</sup>

**Omega-3s** are an essential structural component of the **myelin sheaths** that cover nerve fibers.<sup>14</sup>

Preclinical data indicate that omega-3 intake impacts levels of **brain growth factors** that support the survival, development, and adaptability of neurons.<sup>15-17</sup>

A laboratory model study of **Alzheimer's disease** found that even short-term **omega-3** intake improved the **function of brain cells** in animals that had not yet developed **dementia** symptoms.<sup>18</sup> •

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

- O'Mahoney LL, Matu J, Price OJ, et al. Omega-3 polyunsaturated fatty acids favourably modulate cardiometabolic biomarkers in type 2 diabetes: a meta-analysis and meta-regression of randomized controlled trials. *Cardiovasc Diabetol*. 2018 Jul 7;17(1):98.
- Thota RN, Ferguson JJA, Abbott KA, et al. Science behind the cardio-metabolic benefits of omega-3 polyunsaturated fatty acids: biochemical effects vs. clinical outcomes. *Food Funct*. 2018 Jul 17;9(7):3576-96.
- Casanova MA, Medeiros F, Trindade M, et al. Omega-3 fatty acids supplementation improves endothelial function and arterial stiffness in hypertensive patients with hypertriglyceridemia and high cardiovascular risk. *J Am Soc Hypertens*. 2017 Jan;11(1):10-9.
- Miller PE, Van Elswyk M, Alexander DD. Long-chain omega-3 fatty acids eicosapentaenoic acid and docosahexaenoic acid and blood pressure: a meta-analysis of randomized controlled trials. *Am J Hypertens*. 2014 Jul;27(7):885-96.
- Tousoulis D, Plastiras A, Siasos G, et al. Omega-3 PUFAs improved endothelial function and arterial stiffness with a parallel antiinflammatory effect in adults with metabolic syndrome. *Atherosclerosis*. 2014 Jan;232(1):10-6.
- Wan Y, Zheng J, Wang F, et al. Fish, long chain omega-3 polyunsaturated fatty acids consumption, and risk of all-cause mortality: a systematic review and dose-response meta-analysis from 23 independent prospective cohort studies. *Asia Pac J Clin Nutr*. 2017 20170813;26(5):939-56.
- Chen C, Xun P, Kaufman JD, et al. Erythrocyte omega-3 index, ambient fine particle exposure, and brain aging. *Neurology*. 2020 Aug 25;95(8):e995-e1007.
- Alber J, Alladi S, Bae HJ, et al. White matter hyperintensities in vascular contributions to cognitive impairment and dementia (VCID): Knowledge gaps and opportunities. *Alzheimers Dement (N Y)*. 2019;5:107-17.
- Sungura R, Onyambu C, Mpolya E, et al. The extended scope of neuroimaging and prospects in brain atrophy mitigation: A systematic review. *Interdisciplinary Neurosurgery*. 2021 2021/03/01;23:100875.
- Zhang MM, Zou Y, Li SM, et al. The efficacy and safety of omega-3 fatty acids on depressive symptoms in perinatal women: a meta-analysis of randomized placebo-controlled trials. *Transl Psychiatry*. 2020 Jun 17;10(1):193.
- Tulowiecka N, Kotlega D, Prowans P, et al. The Role of Resolvins: EPA and DHA Derivatives Can Be Useful in the Prevention and Treatment of Ischemic Stroke. *Int J Mol Sci*. 2020 Oct 15;21(20).
- Surette ME. The science behind dietary omega-3 fatty acids. *CMAJ*. 2008 Jan 15;178(2):177-80.
- Available at: <https://www.ncbi.nlm.nih.gov/books/NBK10921/>. Accessed December 2, 2021.
- Chen S, Zhang H, Pu H, et al. n-3 PUFA supplementation benefits microglial responses to myelin pathology. *Sci Rep*. 2014 Dec 12;4(1):7458.
- Jiang LH, Shi Y, Wang LS, et al. The influence of orally administered docosahexaenoic acid on cognitive ability in aged mice. *J Nutr Biochem*. 2009 Sep;20(9):735-41.
- Wu A, Ying Z, Gomez-Pinilla F. Docosahexaenoic acid dietary supplementation enhances the effects of exercise on synaptic plasticity and cognition. *Neuroscience*. 2008 Aug 26;155(3):751-9.
- Knochel C, Voss M, Gruter F, et al. Omega 3 Fatty Acids: Novel Neurotherapeutic Targets for Cognitive Dysfunction in Mood Disorders and Schizophrenia? *Curr Neuropharmacol*. 2015;13(5):663-80.
- Jovic M, Loncarevic-Vasiljkovic N, Ivkovic S, et al. Short-term fish oil supplementation applied in presymptomatic stage of Alzheimer's disease enhances microglial/macrophage barrier and prevents neuritic dystrophy in parietal cortex of 5xFAD mouse model. *PLoS One*. 2019;14(5):e0216726.

# TARGETED SLIMMING FOR WAIST AND HIPS

In a clinical trial, a proprietary blend of **Sphaeranthus indicus** flower and **mangosteen** extracts combined with a controlled diet and regular exercise for 16 weeks enabled average reductions in:\*

- Body **weight** by **11.2 pounds**
- **Waist** size by almost **4 inches**
- **Hip** size by more than **4 inches**

**Waistline Control™** contains this patented blend of extracts.†

The dose used in **human** studies is one capsule, twice daily before meals.†



**ITEM #02509**

60 vegetarian capsules

1 bottle **\$24**

4 bottles \$22 each

For full product description and to order **WAISTLINE CONTROL™**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



\* *Lipids Health Dis.* 2016 Aug 24;15(1):136.

† This supplement should be taken in conjunction with a healthy diet and regular exercise program. Results may vary.

MERATRIM® is a Laila Nutraceuticals trademark, registered in USA.

# Regain Your *Youthful Energy*

Energize every cell in your body with  
carnosine, R-lipoic acid, benfotiamine,  
taurine, PQQ, and more.



For full product description and to order  
**Mitochondrial Energy Optimizer**, call  
1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

Item #01868 • 120 capsules  
1 bottle **\$51** • 4 bottles \$45 each



Bio-Enhanced® is a registered trademark of Geronova Research, Inc.

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

# HIGHLY PURIFIED FISH OIL

In addition to ultra-pure fish oil, **Super Omega-3** provides **olive oil polyphenols** and **sesame lignans** to extend the stability of **DHA** in the blood.

HIGHLY CONCENTRATED EPA/DHA + SESAME LIGNANS + OLIVE POLYPHENOLS:



**SUPER OMEGA-3 Fish oil**  
EPA/DHA fish oil, sesame  
lignans and olive extract  
(Small, Easy-to-Swallow softgels)



**SUPER OMEGA-3 PLUS Fish oil**  
EPA/DHA fish oil, krill, astaxanthin,  
sesame lignans, and olive extract



**SUPER OMEGA-3 Fish oil**  
EPA/DHA fish oil, sesame  
lignans and olive extract

ITEM # 01986 • 240 Easy-to-Swallow softgels\*  
1 bottle **\$24.75**  
4 bottles \$22 each

ITEM # 01988 • 120 softgels  
1 bottle **\$34.50**  
4 bottles \$32 each

ITEM # 01982 • 120 softgels\*  
1 bottle **\$24.75**  
4 bottles \$22 each

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

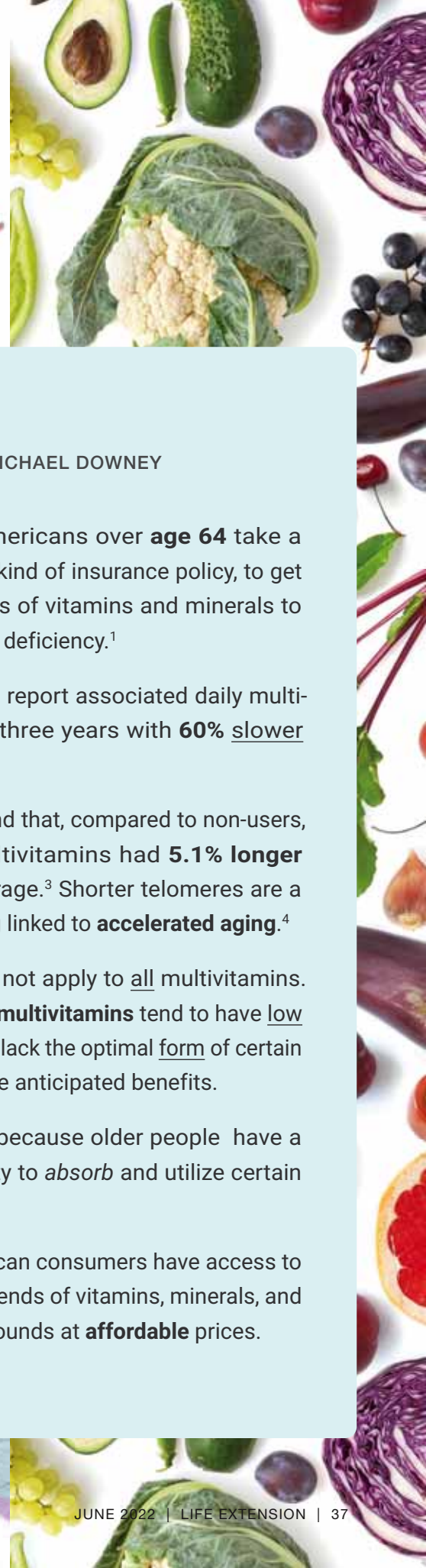
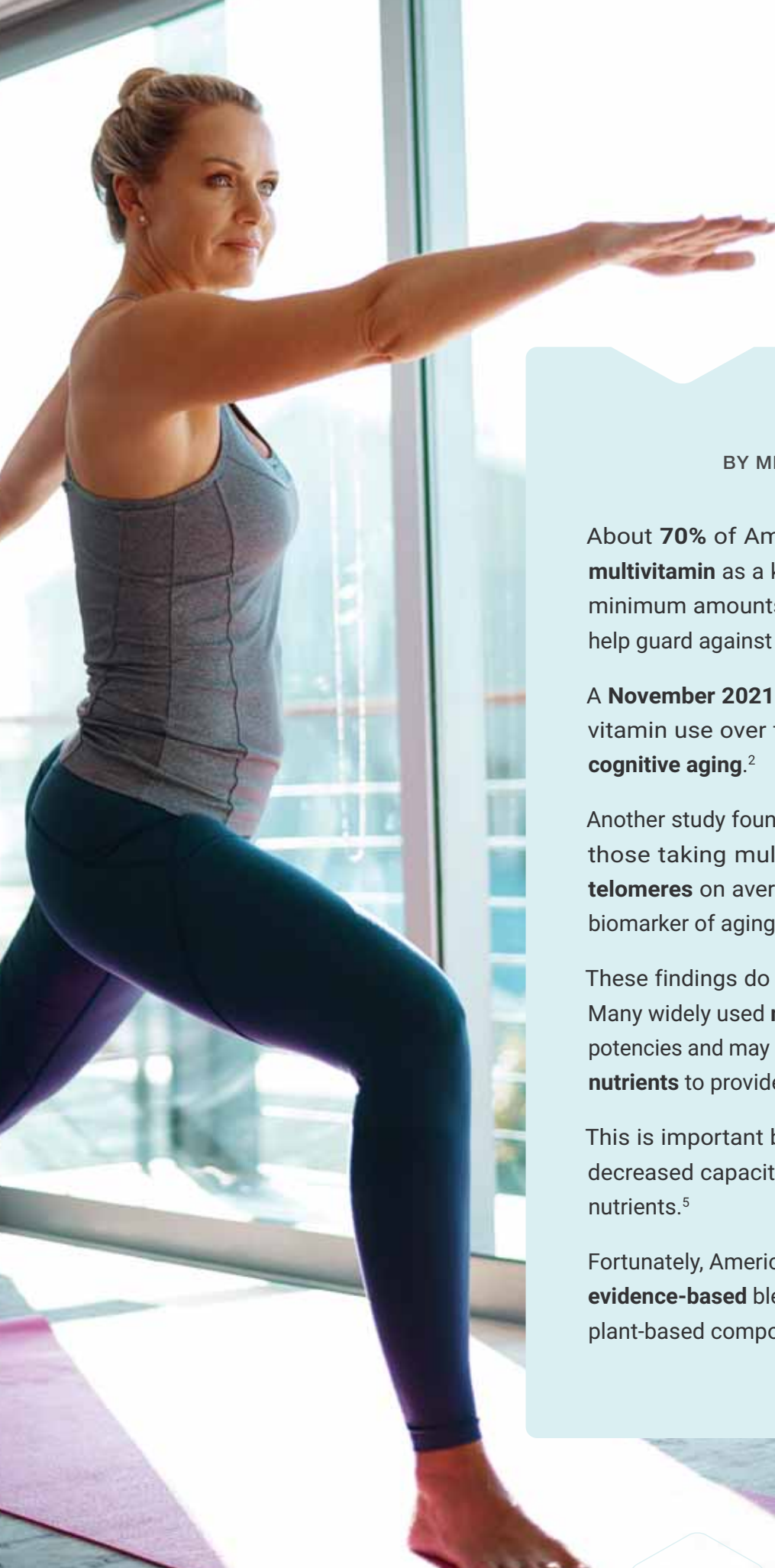
\* Highest Independent 5-star rating, International Fish Oil Society For Over Nine Years.  
IFOS™ certification mark is a registered trademark of Nutrasource Diagnostics, Inc.

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



# What's In Your MULTIVITAMIN FORMULA?





BY MICHAEL DOWNEY

About **70%** of Americans over **age 64** take a **multivitamin** as a kind of insurance policy, to get minimum amounts of vitamins and minerals to help guard against deficiency.<sup>1</sup>

A **November 2021** report associated daily multivitamin use over three years with **60% slower cognitive aging**.<sup>2</sup>

Another study found that, compared to non-users, those taking multivitamins had **5.1% longer telomeres** on average.<sup>3</sup> Shorter telomeres are a biomarker of aging linked to **accelerated aging**.<sup>4</sup>

These findings do not apply to all multivitamins. Many widely used **multivitamins** tend to have low potencies and may lack the optimal form of certain **nutrients** to provide anticipated benefits.

This is important because older people have a decreased capacity to *absorb* and utilize certain nutrients.<sup>5</sup>

Fortunately, American consumers have access to **evidence-based** blends of vitamins, minerals, and plant-based compounds at **affordable** prices.



## Dangers of Deficiencies

Vitamins and minerals are cofactors for **enzymes** throughout the body. These *enzymes* are *required* to **repair DNA**, prevent **oxidative damage**, maintain **cardiovascular** health, and perform many functions essential for a healthy and long life.<sup>6,7</sup>

Up to **70%** of Americans are **deficient** in one or more vital nutrient. Inadequate intake of these essential nutrients may increase the risk of **age-related disease** and **premature aging**.<sup>6</sup>

For example, the continuous creation of cellular **DNA** and **RNA** requires certain **B vitamins** that function as critical coenzymes.<sup>8</sup>

## Higher Dosages

Many multivitamins contain the minimal **dosage** necessary to prevent diseases like scurvy and osteomalacia.

*Larger* amounts of some nutrients are often needed to promote healthy longevity.

Inadequate dosages can be especially problematic for **older** adults who have more difficulty **absorbing** nutrients.<sup>5</sup>

An increasing number of Americans are switching to multinutrient formulas that provide vitamins, minerals, and plant extracts in *higher* dosages and more **bioavailable** forms.

## The Best Forms of Nutrients

**Folate** is a B-vitamin vital cofactor for many enzymatic reactions, including those that detoxify **homocysteine**, a risk factor for vascular disease.<sup>9,10</sup>

Before folate can perform, it must be converted to its active form, **L-methylfolate (5-MTHF)**.

Older individuals are challenged to convert dietary or supplemental **folate** into biologically active **5-MTHF**. This helps explain why homocysteine levels often surge upwards in the elderly.<sup>11,12</sup>

A multivitamin should include folate in its **bioavailable** form, **5-MTHF**. This means it is *already* active and can be easily absorbed and used by tissues immediately.

A superior multivitamin should also include beneficial nutrients not generally found in widely available formulas, such as:

- The mineral **boron**,
- The antioxidant **alpha-lipoic acid**,
- **Plant extracts**, such as the carotenoid **lycopene**, and
- **Mixed tocopherols** (natural forms of vitamin E that each provide different benefits).

## Key Nutrients

Here are just a *few* of the nutrients that adults should look for in a multivitamin.

### ZINC

Zinc supplementation supports a healthy immune system, as well as healthy inflammatory and free-radical defenses.<sup>13,14</sup>

### VITAMIN C

This vitamin stimulates the production and function of **immune cells**.<sup>15,16</sup> Vitamin C is also vital for the formation of **collagen**, the connective tissue found throughout healthy arterial walls, skin, bones, and teeth.<sup>15,17</sup>

### SELENIUM

This mineral supports healthy inflammatory and immune responses and promotes **cardiovascular, thyroid, and brain health**.<sup>18-21</sup> In fact, the thyroid gland is the organ with the highest amount of selenium per gram of tissue.<sup>19</sup> Selenium comes in different forms: high-selenium yeast, Se-methyl L-selenocysteine, and sodium selenite. Each has distinct beneficial properties.

### VITAMIN D

**Vitamin D** promotes **immune** function, as well as healthy cell division, cognitive function, and **bone health**.<sup>22-24</sup> Minimum dosages to achieve what some consider “sufficient” potency are **2,000 IU** daily taken with a meal that contains some fat. Many people today take an additional **1,000-5,000 IU** of **vitamin D3** daily to achieve optimal blood levels.



## VITAMIN A

This vitamin promotes healthy **vision**, formation of thyroid hormones, healthy skin and mucous membranes, the growth of bone, teeth, and soft tissues, and immune functions. Vitamin A is best obtained from *two* separate sources: the fatty acid **retinyl acetate** and the pigment **beta-carotene**.<sup>25,26</sup>

## QUERCETIN

The flavonol quercetin inhibits the release of **pro-inflammatory** substances.<sup>27,28</sup> It also promotes cellular health and function and may support the **cardio-vascular system** by preserving the health and function of cells lining the insides of blood vessels.<sup>29</sup>

## B VITAMINS

The **B vitamins** help break down nutrients the body's cells need to carry out their daily functions.<sup>30</sup> These vitamins work together, which is why a superior multivitamin should contain readily metabolized forms of riboflavin, vitamin B12, vitamin B6, folate, and others.

## MOLYBDENUM

This mineral is required for several **enzyme** activities, including those that detoxify alcohol and metabolize sulfur.<sup>31</sup> Most multivitamins don't contain sufficient potencies of molybdenum.

## MIXED VITAMIN E TOCOPHEROLS

The four forms of **vitamin E tocopherols**—alpha, beta, delta, and gamma—work *together* to optimize health. For example, combining alpha and gamma tocopherols is better for reducing **chronic inflammation** and **oxidative stress** than taking either alone.<sup>32</sup> *All* four should be taken daily. These tocopherols are only available in formulas that utilize natural vitamin E, which is more expensive than synthetic vitamin E used in many commercial formulas.

## ALPHA-LIPOIC ACID

This natural compound helps regenerate the free-radical scavenging properties of **vitamin C** and **glutathione** so they can fight against damaging free radicals.<sup>33-35</sup> Most multivitamins contain *no* alpha-lipoic acid.

A scientifically designed multinutrient formula includes vitamins, minerals and plant extracts in the dosages and forms meant to help optimize their benefits to **health** and **longevity**.

## Better Multivitamins

- A good **multivitamin** should do more than help maintain basic life. It should support the body's critical enzymes, promote health, and reduce the risk of early aging and premature death.
- Widely available formulas provide insufficient dosages and fail to include optimal forms, or the full array of nutrients to optimize health. This is a particular risk to **older adults** who have a decreased capacity to absorb and use many nutrients.
- Multi-nutrient formulas available today provide meaningful potencies of a broad array of health promoting compounds.
- Taken daily, multinutrient formulas can play an important role in promoting overall good **health** and **longevity**.



## Summary

American diets generally provide insufficient vitamins and minerals to support healthy **longevity**.

Most adults could benefit from a good **multivitamin**. Widely advertised commercial formulas omit critical nutrients, may provide insufficient dosages, and do not use optimal forms of some nutrients.

Readers of this publication have long gained access to a blend of vitamins, minerals, and plant extracts that delivers the broadest array of health-promoting nutrients in their optimal dosages and forms. •

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.hopkinsmedicine.org/health/wellness-and-prevention/is-there-really-any-benefit-to-multivitamins>. Accessed March 8, 2022.
2. Available at: <https://www.medscape.com/viewarticle/962772>. Accessed February 28, 2022.
3. Xu Q, Parks CG, DeRoo LA, et al. Multivitamin use and telomere length in women. *Am J Clin Nutr*. 2009 Jun;89(6):1857-63.
4. Vaiserman A, Krasniakov D. Telomere Length as a Marker of Biological Age: State-of-the-Art, Open Issues, and Future Perspectives. *Front Genet*. 2020 2021-January-21;11:630186.
5. Institute of Medicine (US) Food Forum. Providing Healthy and Safe Foods As We Age: Workshop Summary. *National Academies Press (US)*. 2010.
6. Ames BN. Prolonging healthy aging: Longevity vitamins and proteins. *Proc Natl Acad Sci U S A*. 2018 Oct 23;115(43):10836-44.
7. Huskisson E, Maggini S, Ruf M. The role of vitamins and minerals in energy metabolism and well-being. *J Int Med Res*. 2007 May-Jun;35(3):277-89.
8. Available at: <https://www.sciencedirect.com/topics/neuroscience/b-vitamins>. Accessed February 28, 2022.
9. Ganguly P, Alam SF. Role of homocysteine in the development of cardiovascular disease. *Nutr J*. 2015 Jan 10;14:6.
10. Ma Y, Peng D, Liu C, et al. Serum high concentrations of homocysteine and low levels of folic acid and vitamin B12 are significantly correlated with the categories of coronary artery diseases. *BMC Cardiovasc Disord*. 2017 Jan 21;17(1):37.
11. Xu R, Huang F, Wang Y, et al. Gender- and age-related differences in homocysteine concentration: a cross-sectional study of the general population of China. *Sci Rep*. 2020 Oct 15;10(1):17401.
12. Hama Y, Hamano T, Shirafuji N, et al. Influences of Folate Supplementation on Homocysteine and Cognition in Patients with Folate Deficiency and Cognitive Impairment. *Nutrients*. 2020 Oct 14;12(10):3138.
13. Gammoh NZ, Rink L. Zinc in Infection and Inflammation. *Nutrients*. 2017 Jun 17;9(6):624.
14. Wessels I, Maywald M, Rink L. Zinc as a Gatekeeper of Immune Function. *Nutrients*. 2017;9(12):1286.
15. Available at: <https://lpi.oregonstate.edu/mic/vitamins/vitamin-C>. Accessed February 28, 2022.
16. Lykkesfeldt J, Michels AJ, Frei B. Vitamin C. *Adv Nutr*. 2014 Jan 1;5(1):16-8.
17. Copes F, Pien N, Van Vlierberghe S, et al. Collagen-Based Tissue Engineering Strategies for Vascular Medicine. *Front Bioeng Biotechnol*. 2019 07/12;7:166.

## The Fragility of Vitamins

Fruits, vegetables, and other foods can be an excellent source of **vitamins**. But there's a catch: Vitamins easily break down in the presence of heat, air, or oxygen. This means they can be *inactivated* during cooking, storage, or exposure to the air.<sup>36</sup>

That's one reason that **supplemental intake** of a full array of **vitamins** is so important for overall health.

18. Gesing A. The thyroid gland and the process of aging. *Thyroid Research*. 2015;8(Suppl 1):A8-A.
19. Ventura M, Melo M, Carrilho F. Selenium and Thyroid Disease: From Pathophysiology to Treatment. *Int J Endocrinol*. 2017;2017:1297658.
20. Available at: <https://lpi.oregonstate.edu/mic/minerals/selenium>. Accessed March 4, 2022.
21. Solovyev ND. Importance of selenium and selenoprotein for brain function: From antioxidant protection to neuronal signalling. *J Inorg Biochem*. 2015 Dec;153:1-12.
22. Sintzel MB, Rametta M, Reder AT. Vitamin D and Multiple Sclerosis: A Comprehensive Review. *Neurol Ther*. 2018 Jun;7(1):59-85.
23. Christakos S, Hewison M, Gardner DG, et al. Vitamin D: beyond bone. *Ann N Y Acad Sci*. 2013 May;1287:45-58.
24. Wang H, Chen W, Li D, et al. Vitamin D and Chronic Diseases. *Aging Dis*. 2017 May;8(3):346-53.
25. Available at: <https://lpi.oregonstate.edu/mic/vitamins/vitamin-A>. Accessed February 28, 2022.
26. Available at: <https://ods.od.nih.gov/factsheets/VitaminA-HealthProfessional/>. Accessed February 28, 2022.
27. Park HH, Lee S, Son HY, et al. Flavonoids inhibit histamine release and expression of proinflammatory cytokines in mast cells. *Arch Pharm Res*. 2008 Oct;31(10):1303-11.
28. Castellani ML, Kempuraj D, Frydas S, et al. Inhibitory effect of quercetin on tryptase and MCP-1 chemokine release, and histidine decarboxylase mRNA transcription by human mast cell-1 cell line. *Neuroimmunomodulation*. 2006;13(3):179-86.
29. Mirsafaei L, Reiner Z, Shafabakhsh R, et al. Molecular and Biological Functions of Quercetin as a Natural Solution for Cardiovascular Disease Prevention and Treatment. *Plant Foods Hum Nutr*. 2020 Sep;75(3):307-15.
30. Sharma S, Lykstad J. Biochemistry, Water Soluble Vitamins. 2019.
31. Available at: <https://lpi.oregonstate.edu/mic/minerals/molybdenum>. Accessed February 28, 2022.
32. Devaraj S, Leonard S, Traber MG, et al. Gamma-tocopherol supplementation alone and in combination with alpha-tocopherol alters biomarkers of oxidative stress and inflammation in subjects with metabolic syndrome. *Free Radic Biol Med*. 2008 Mar 15;44(6):1203-8.
33. Available at: <https://lpi.oregonstate.edu/mic/dietary-factors/lipoic-acid>. Accessed February 28, 2022.
34. Available at: <https://lpi.oregonstate.edu/mic/dietary-factors/lipoic-acid>. Accessed March 4, 2022.
35. Tibullo D, Li Volti G, Giallongo C, et al. Biochemical and clinical relevance of alpha lipoic acid: antioxidant and anti-inflammatory activity, molecular pathways and therapeutic potential. *Inflamm Res*. 2017 Nov;66(11):947-59.
36. Available at: <https://www.helpguide.org/harvard/vitamins-and-minerals.htm>. Accessed February 28, 2022.

# Lose What's Weighing You Down

A supplement to keep your hunger in check... and a **FREE** app to motivate you to stick to the plan!



To download the Body Trim app, scan the QR code or visit the Apple & Android stores



"Helps me curb mindless snacking and eat responsibly."

**Kim**

VERIFIED CUSTOMER REVIEW

Formulated with **lemon verbena** leaf and **hibiscus flower** extracts to promote satiety and encourage weight loss<sup>†</sup> in just 8 weeks.

Item #02504 | 30 vegetarian capsules | 1 bottle **\$22.50** | 4 bottles **\$20** each

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

Metabolaid® is a registered trademark of MONTELOEDER, S.L.

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

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.

HEALTHY BONES = HEALTHY HEART



# THREE WAYS TO GET VITAMIN



## MEGA VITAMIN K2

Japanese physicians use **high-dose vitamin K2** for those with challenges in maintaining healthy bone density. **Mega Vitamin K2** costs **86 cents** a day, based on the 4-bottle price, and provides in one daily capsule:

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

"I have been using this for bone building, and my bone density tests have improved."

**Dolores**

VERIFIED CUSTOMER REVIEW



**MEGA VITAMIN K2** Item #02417 • 30 capsules  
1 bottle **\$28.50** • 4 bottles \$26 each

## SUPER K ELITE

**Super K Elite** provides 2 additional forms of vitamin K and even **higher** potencies of K1, MK4, and MK7. **Super K Elite** costs **54 cents** a day, based on the 4-bottle price, 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)



**1**  
DAILY

**SUPER K ELITE** Item #02335 • 30 softgels  
1 bottle **\$18** • 4 bottles \$16 each

## SUPER K

**SUPER K** is the best-selling **vitamin K** formula for bone and heart health. It costs only **23 cents** a day, based on the 4-bottle price, 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)



**1**  
DAILY

**SUPER K** Item #02334 • 90 softgels  
1 bottle **\$22.50** • 4 bottles \$20.25 each

For full product description and to order these **VITAMIN K** formulas call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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



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



### Compared to Centrum® Two-Per-Day Provides:

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



"Covers all  
the bases."

**Brian**  
VERIFIED  
CUSTOMER  
REVIEW

## MORE NUTRIENTS HIGHER POTENCIES

# LIFE EXTENSION® TWO-PER-DAY MULTIVITAMIN

### Two-Per-Day Multivitamin Tablets

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

### Two-Per-Day Multivitamin Capsules

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

Each bottle provides a two-month supply.

For full product description and to order **TWO-PER-DAY MULTIVITAMIN**,  
call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



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

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



# Fight Back Against Visible Signs of **AGING**



BY MICHAEL DOWNEY

Visible deterioration of **hair, skin, and nails** used to be unavoidable.<sup>1-3</sup>

But there are ways to stop and even **reverse** this deterioration.

A factor involved with external degeneration is the loss of our **structural foundations**.<sup>4-7</sup>

The most well-known of these structural proteins are:

- **Keratin**, a component of hair, nails, and the outer layer of skin,
- **Collagen**, the principal source of the skin's strength, and
- **Elastin**, which allows tissues to resume their shape after stretching or contracting.

While thousands of dollars are often spent on external treatments, overlooked are **oral compounds** that have been shown to **replenish** these vital **structural proteins** in the hair, nails, and skin.



## A Keratin Breakthrough

There's a longstanding problem with taking oral **keratin** supplements to replace declining keratin levels in the body. The heat and other factors normally needed to process keratin rob it of its biological activity, rendering it all but useless.

But scientists have developed a form of keratin that is **soluble** and **highly bioavailable**.

This **solubilized keratin** is delivered to cells in the **hair, skin, and nails**. There, it replenishes keratin levels depleted in the aging process.<sup>8-10</sup>

Laboratory studies show that **solubilized keratin** stimulates skin cells to proliferate at a rate up to **160%** greater than they otherwise would, helping cells increase their own **production** of diminished **structural proteins**.<sup>10</sup>

## Clinical Keratin Studies

In a series of clinical trials, adult women were given either a daily **placebo** or **500 mg** of **solubilized keratin** with additional vitamins and minerals (biotin, zinc, copper, and vitamins B3, B5, and B6).

After 90 days, clear improvements were seen to hair, skin, and nails, as demonstrated by the following results:

In one study of women with damaged, fragile, and stressed **hair**, the number of hairs lost during washing was reduced by **30%**, hair strength increased by **12%**, and hair appeared **smoother** and shinier.<sup>11</sup>

In another trial, those who took this **keratin** had a:<sup>12</sup>

- **47.1%** subjective improvement in **hair appearance**,
- **47%** reduction in the number of hairs that could be **removed** in a hair-pull test, and
- **9.2%** increase in hair follicles in the **growth** phase.

Those taking novel **keratin** also had the following significant improvement to their **nails**:<sup>12</sup>

- **87.5%** reduction in tendency to **break** (compared with **28.5%** among placebo subjects),
- **50%** increase in nail **hardness**,
- **37.5%** increase in nail **smoothness**, and
- **20.8%** improvement in natural **appearance**.

For women (ages 40-71) with obvious **skin aging**, the same **keratin** formulation reduced the appearance of **lines** and **wrinkles**, resulting in a:<sup>13</sup>

- **30.4%** increase in skin **moisture**,
- **16.8%** improvement in skin **elasticity**,
- **17.9%** improvement in skin **smoothness**, and
- Visible reduction in **wrinkle depth** among **58.3%** of participants.

## Collagen's Vital Role

**Collagen** is a major component of **nails** and **skin**. It normally comprises **70%** of the weight of the **dermis**, the inner layer of the skin.<sup>14</sup>

Collagen provides the **structural** foundation for **elastin fibers**, a key requirement for supple, flexible skin.

Aging *decreases* the number of **collagen fibers** in the dermis and causes elastin fibers to fray and lose elasticity. This deterioration leads to **wrinkled** and **sagging** skin.<sup>15</sup>

Restoring depleted collagen is not as simple as ingesting more collagen. The collagen first needs to be partially broken down through a special process in order to be **bioavailable** (absorbable).

Researchers developed a blend of **bioactive collagen peptides** (short chains of amino acids), derived from **type I collagen**, which is the most abundant form of collagen in the human body.

These highly bioavailable **collagen peptides** provide the building blocks for collagen synthesis and stimulate **collagen** and **elastin** production in the skin.<sup>16</sup>

They also protect the skin by *reducing* the activity of **metalloproteinase 2**, a "protein-melting" enzyme that breaks down collagen and hastens skin aging.<sup>17</sup>

The effect is a dramatic reduction of **skin wrinkles**.

Scientists have also clinically demonstrated that these **collagen peptides** accelerate **nail** growth, reduce nail brittleness, and decrease frequency of nail breakage.<sup>18</sup>

## Collagen's Clinical Benefits

Results from two placebo-controlled trials of female volunteers found that taking **2.5 grams** of **bioactive collagen peptides** once daily for eight weeks resulted in healthier, more supple **skin**.



WHAT  
YOU  
NEED  
TO  
KNOW

Among the improvements were a:<sup>16,19</sup>

- **20.1%** reduction in **wrinkle depth**,
- **65%** increase in the accumulation of **type I pro-collagen** (a precursor of collagen),
- **18%** increase in **elastin** fibers, and
- **7%** improvement in skin **elasticity** (which persisted four weeks after treatment stopped).

A third study found that taking **2.5 grams** of bioactive collagen **peptides** daily for six months reduced **cellulite** in women by **9%** and decreased thigh skin waviness by **11.1%**.<sup>20</sup>

In a trial testing the effect on **nails**, healthy women who took **2.5 grams** of **bioactive collagen peptides** once daily for 24 weeks had a:<sup>18</sup>

- **12%** increase in nail **growth rate**,
- **42%** decrease in the frequency of **broken nails**, and
- **64%** reduction in **brittleness**.

Remarkably, four weeks *after treatment ended*, this reduction in brittleness extended to **88%** of participants. This likely resulted from the effect of the peptides on the nail matrix.<sup>18</sup>

A whopping **80%** of participants agreed that the **collagen peptides** improved their nails' **appearance** and expressed complete satisfaction with the results.<sup>18</sup>

### Biotin For Better Nails

Two other nutrients can act as **catalysts** in helping to rebuild damaged structural tissues: **biotin** and **silicon**.

A water-soluble B vitamin, **biotin** has been shown in animal<sup>21</sup> and human<sup>22-24</sup> studies to improve the hardness and integrity of **nails**.

In one study, taking **2.5 mg** of oral **biotin** daily for an average of 5.5 months increased the **firmness** and **hardness** of aged, damaged nails in **91%** of subjects.<sup>22</sup>

In a similar study on women with brittle, splitting nails, taking **2.5 mg** of biotin daily for at least **one month** improved nail integrity, brittleness, and splitting in **63%** of subjects.<sup>24</sup>

A third study of women with brittle and splitting fingernails showed that **oral biotin** reduced nail splitting and increased **nail thickness** by **25%**.<sup>23</sup>



## Healthier Skin, Hair, and Nails

- Over time, the quality of our **hair, skin, and nails** deteriorates, leading to visible signs of aging.
- This occurs as a result of a decline in the quality and amount of the essential structural proteins **keratin, collagen, and elastin**.
- Taking highly bioavailable forms of **solubilized keratin** and **collagen peptides** can replenish these structural proteins.
- Results from clinical studies show that taking these compounds can reduce skin wrinkle depth by **20.1%** and improve the strength, growth, and appearance of hair and nails.
- Two other nutrients, **biotin** and **silicon**, have been documented to complement these rejuvenation effects.
- Research shows that these oral ingredients can reverse the visible signs of aging that occur in hair, skin, and nails.

## Silicon

**Silicon** also helps keratin and collagen to rebuild the cellular architecture of **hair, skin, and nails**.<sup>25-28</sup>

Scientists have suggested that **hair** strands with higher **silicon** content fall out at a lower rate and display greater brightness, and studies show that silicon use may improve hair strength and strands' resistance to breakage.<sup>28</sup>

It is also associated with the synthesis of **glycosaminoglycans**, molecules that help create the substance that fills the space between **collagen** and **elastin**.<sup>26,28</sup>

Silicon is one of the most abundant minerals in the composition of **nails**.<sup>29</sup> Soft and brittle nails can be an indicator of silicon *deficiency*.<sup>28</sup>

Taken together, **keratin, collagen peptides, biotin, and silicon** show great promise for rejuvenation of skin, hair, and nails, and reversal of visible signs of aging.

## Summary

The loss of the amount and function of **structural proteins** as we age leads to thinning **hair**, sagging and wrinkled **skin**, and brittle, breakable **nails**.

Scientists have developed forms of **keratin and collagen** that are taken orally and help restore **structural proteins** from *within*, helping to maintain youthful structure and function with age.

Two additional nutrients, **biotin** and **silicon**, help restore the architecture that supports healthy hair, youthful-looking skin, and stronger nails.

These compounds can improve the strength, growth, and health of hair and nails, increase skin moisture and elasticity, and significantly reduce skin wrinkles. •

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

- Montemurro B, Gillen MM. Wrinkles and sagging flesh: exploring transformations in women's sexual body image. *J Women Aging*. 2013;25(1):3-23.
- Saxon SV EM, Perkins EA. Physical change & aging: a guide for the helping professions. *Springer Publishing Company*. 2010;5th:520.
- Gupta MA, Gilchrist BA. Psychosocial aspects of aging skin. *Dermatol Clin*. 2005 Oct;23(4):643-8.
- Sherratt MJ. Tissue elasticity and the ageing elastic fibre. *Age (Dordr)*. 2009 Dec;31(4):305-25.
- Available at: <https://www.scientificamerican.com/article/why-does-skin-wrinkle-wit/>. Accessed March 15, 2022.
- Varani J, Dame MK, Rittie L, et al. Decreased collagen production in chronologically aged skin: roles of age-dependent alteration in fibroblast function and defective mechanical stimulation. *Am J Pathol*. 2006 Jun;168(6):1861-8.
- Giesen M, Gruedl S, Holtkoetter O, et al. Ageing processes influence keratin and KAP expression in human hair follicles. *Exp Dermatol*. 2011 Sep;20(9):759-61.
- Marzatico F. In vitro efficacy study: Evaluation of the bioavailability activity of a dietary supplement. *Farcoderm*; 2010.
- Sando L, Kim M, Colgrave ML, et al. Photochemical crosslinking of soluble wool keratins produces a mechanically stable biomaterial that supports cell adhesion and proliferation. *J Biomed Mater Res A*. 2010 Dec 1;95(3):901-11.
- ROXLOR. 2010.
- Quagliani M M, F. Clinical Study: Evaluation of the efficacy of a food supplement to strengthen and support hair growth. *Farcoderm*. 2010.
- Beer C, Wood S, Veghte RH. A clinical trial to investigate the effect of Cynatine HNS on hair and nail parameters. *ScientificWorldJournal*. 2014;2014:641723.
- Beer C, Wood S, Veghte RH. A randomized, double-blind, placebo-controlled clinical trial to investigate the effect of Cynatine(R) HNS on skin characteristics. *Int J Cosmet Sci*. 2013 Dec;35(6):608-12.
- Available at: <https://emedicine.medscape.com/article/1294744-overview#a3>. Accessed March 14, 2022.
- McLafferty E, Hendry C, Alistair F. The integumentary system: anatomy, physiology and function of skin. *Nurs Stand*. 2012 Sep 19-25;27(3):35-42.
- Proksch E, Schunck M, Zague V, et al. Oral intake of specific bioactive collagen peptides reduces skin wrinkles and increases dermal matrix synthesis. *Skin Pharmacol Physiol*. 2014;27(3):113-9.
- Zague V, de Freitas V, da Costa Rosa M, et al. Collagen hydrolysate intake increases skin collagen expression and suppresses matrix metalloproteinase 2 activity. *J Med Food*. 2011 Jun;14(6):618-24.
- Hexsel D, Zague V, Schunck M, et al. Oral supplementation with specific bioactive collagen peptides improves nail growth and reduces symptoms of brittle nails. *J Cosmet Dermatol*. 2017 Dec;16(4):520-6.
- Proksch E, Segger D, Degwert J, et al. Oral supplementation of specific collagen peptides has beneficial effects on human skin physiology: a double-blind, placebo-controlled study. *Skin Pharmacol Physiol*. 2014;27(1):47-55.
- Schunck M, Zague V, Oesser S, et al. Dietary Supplementation with Specific Collagen Peptides Has a Body Mass Index-Dependent Beneficial Effect on Cellulite Morphology. *J Med Food*. 2015 Dec;18(12):1340-8.
- Comben N, Clark RJ, Sutherland DJ. Clinical observations on the response of equine hoof defects to dietary supplementation with biotin. *Vet Rec*. 1984 Dec 22-29;115(25-26):642-5.
- Floersheim GL. [Treatment of brittle fingernails with biotin]. *Z Hautkr*. 1989 Jan 15;64(1):41-8.
- Colombo VE, Gerber F, Bronhofer M, et al. Treatment of brittle fingernails and onychoschizia with biotin: scanning electron microscopy. *J Am Acad Dermatol*. 1990 Dec;23(6 Pt 1):1127-32.
- Hochman LG, Scher RK, Meyerson MS. Brittle nails: response to daily biotin supplementation. *Cutis*. 1993 Apr;51(4):303-5.
- Jugdaohsingh R. Silicon and bone health. *J Nutr Health Aging*. 2007 Mar-Apr;11(2):99-110.
- Seaborn CD, Nielsen FH. Silicon deprivation decreases collagen formation in wounds and bone, and ornithine transaminase enzyme activity in liver. *Biol Trace Elem Res*. 2002 Dec;89(3):251-61.
- Schwarz K. A bound form of silicon in glycosaminoglycans and polyuronides. *Proc Natl Acad Sci U S A*. 1973 May;70(5):1608-12.
- Araujo LA, Addor F, Campos PM. Use of silicon for skin and hair care: an approach of chemical forms available and efficacy. *An Bras Dermatol*. 2016 May-Jun;91(3):331-5.
- Goldblum RW, Derby S, Lerner AB. The metal content of skin, nails and hair. *J Invest Dermatol*. 1953 Jan;20(1):13-8.

# COMBAT BELLY FAT WITH AMPK

Studies show that *increasing AMPK* activity encourages cells to stop storing fat and start *burning* it for energy. So we've created AMPK Metabolic Activator to help trigger AMPK, causing your body to burn unwanted fat—particularly around your abdomen.



"Oh, I love this! I noticed my pants are looser and I can fit in my skinny jeans."

**Adela**

VERIFIED CUSTOMER REVIEW

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

For full product description and to order **AMPK Metabolic Activator**, call 1-800-544-4440 or visit [LifeExtension.com](http://LifeExtension.com)

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

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



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

# Restore Smoother, Youthful- Looking Skin from the Inside Out

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

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

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



**ITEM #02096**

30 liquid vegetarian capsules

1 bottle **\$18.75**

4 bottles \$17.25 each

For full product description and to order **Skin Restoring Ceramides**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)



Contains wheat. Gluten free.

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

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

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

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

Rejuvenating nutrients include:

- **VERISOL® Bioactive Collagen Peptides®**—Stimulates the formation of new collagen and elastin to promote skin suppleness and elasticity<sup>1</sup>
- **Cynatine® HNS Plus**—Provides solubilized keratin, zinc, B vitamins, biotin, and copper to boost production of keratin for strong hair, skin, and nails
- **Biotin**—Supports nail strength and integrity<sup>2</sup>
- **Silicon**—For the formation of collagen and keratin molecules<sup>3</sup>

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

Nancy

VERIFIED CUSTOMER REVIEW

# Revive Hair, Skin, and Nails from Within

For full product description and to order **Hair, Skin & Nails Collagen Plus Formula**, call **1-800-544-4440** or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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



Item #02322 • 120 tablets

1 bottle \$24 • 4 bottles \$22 each

#### References

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

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



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



REDUCE  
JOINT PAIN  
& IMPROVE  
MOBILITY



BY ADAM CRUZ, MMSC

Joint pain affects many adults, even those without arthritis, making daily activities like walking or bending difficult to perform.<sup>1-4</sup>

This reduces quality of life.

Most people suffering from chronic joint pain turn to over-the-counter pain medications for relief. These drugs can have dangerous side effects, including an increased risk of **heart problems**.<sup>5,6</sup>

Two plant extracts, **tamarind** and **turmeric**, have been shown to **safely and effectively** reduce joint pain and increase joint range of motion.

In a clinical trial of adults with non-arthritic **knee joint pain** following exercise, **400 mg** of a blend of these extracts helped sufferers walk an impressive **137 feet farther** in six minutes than those taking a **placebo**.<sup>7</sup>

Those taking **400 mg** of the extracts also had greater **flexibility**, were able to climb stairs faster, and reported a stunning **42.8% decrease** in scores on a joint-pain scale.<sup>7</sup>



TAMARIND



TURMERIC

## What Drives Joint Pain?

Joint pain frequently stems from overuse or aging of the joints, which can lead to deteriorating cartilage, limited mobility, and inflammatory changes.<sup>8-13</sup>

Over time, this results in decreased **range of motion**, lower **quality of life**, and reduced **muscle strength** near the joints.<sup>14,15</sup>

For many suffering from joint pain, conventional pain medication is the only relief available. However, chronic use of these medications can have lasting effects, including **heart damage** and **kidney failure**.<sup>5,6,16</sup>

Researchers searching for safer alternatives found that two plants, **tamarind** and **turmeric**, contain compounds that **block inflammation**, leading to less joint pain and increased mobility.<sup>7</sup>

## Turmeric's Anti-Inflammatory Effects

**Turmeric** has been used in traditional medicine for thousands of years.<sup>17,18</sup>

Many of its health benefits come from use of turmeric's **rhizome** (underground stem), which is an abundant source of polyphenols called **curcuminoids**.<sup>7</sup>

The best-known curcuminoid is **curcumin**, which has powerful **anti-inflammatory** effects.<sup>19,20</sup>



In animal and human studies, **curcumin** has demonstrated a number of benefits, including improvements in cardiovascular health, protection against neurodegenerative diseases, anti-cancer activity, arthritis relief, and more.<sup>21-27</sup>

## Tamarind Targets Pain

**Tamarind** is a plant that produces a fruit used in cooking around the world.

It has **anti-inflammatory** properties that have been shown to alleviate **pain** in the joints, and it has long been used in traditional medicine to treat pain and inflammation.<sup>28,29</sup>

Tamarind is rich in another group of polyphenols called **procyanidins**, which have powerful antioxidant and anti-inflammatory effects.<sup>30,31</sup>

To test their impact on joint-pain relief, scientists **combined** these two anti-inflammatory powerhouses.<sup>7</sup>

## Testing in Humans

A team of researchers from the U.S., Netherlands, and India conducted a randomized, controlled clinical trial to test a blend of extracts of **tamarind seeds** and **turmeric rhizome**.<sup>7</sup>

Ninety **non-arthritic** men and women who experienced **knee joint pain** and **discomfort** after physical activity were divided into three groups.

One received a **placebo**, one received **250 mg** daily of the extract blend (in two **125 mg** doses), and one received **400 mg** daily (in two **200 mg** doses).

The study followed participants for 90 days and measured their progress in a few different ways:

- **Six-Minute Walk Test:** The distance a participant could walk in six minutes.
- **Stair-Climb Test:** The time it took a participant to walk up and down nine steps.
- **Visual Analog Scale:** A measurement of pain as described by each participant.
- **WOMAC (Western Ontario and McMaster Universities Arthritis Index) Scale:** A 24-question assessment of pain, stiffness, and physical limitations.
- **Range-of-Motion Knee Flexion:** The degree at which participants were able to bend their knee.





WHAT  
YOU  
NEED  
TO  
KNOW

## Improved Walking Speed and Distance

In any clinical trial, the **primary endpoint** is the measurement that is assessed to determine if the treatment works.

In this study, the primary endpoint was the **Six-Minute Walk Test**.

After 90 days, on average:

- Those in the **placebo** group were able to walk **18 feet farther** than they could at the start of the study.
- Those taking **250 mg** of the extract blend daily could walk **96 feet farther** than at the start of the study.
- Those taking **400 mg** of the extracts could walk a whopping **137 feet farther** than when the study began.

The **walking speed**, on average, of those taking the extracts also improved over 90 days:

- Those taking a placebo walked just **0.04 mph** faster,
- The **250 mg** group walked **0.18 mph** faster, and
- The **400 mg** group increased their walking speed by **0.24 mph** (from **2.51 mph** to **2.75 mph**).

## Plant Extracts Improve Joint Mobility

- Millions of adults suffer from **joint pain**, which can make daily activities difficult to perform.
- Most **pain medications** only mask the underlying condition and can lead to other health problems, including heart disease.
- **Tamarind** and **turmeric** have been used in traditional medicine for years and have proven **anti-inflammatory** effects.
- In a clinical study of adults with non-arthritic **knee joint pain** following exercise, a blend of these extracts dramatically improved **mobility**, helping sufferers walk *farther* and *faster*. Subjects also had increased range of motion in the knee joint, less stiffness, and reported a **46%** decrease in joint pain.

## Decreased Pain and Stiffness

The **secondary endpoints** in a clinical trial are other measurements of the treatment's effectiveness.

In this study, the secondary endpoints were the **Stair-Climb Test**, the **Visual Analog Scale**, the **WOMAC Test**, and the **Knee Flexion**.

Both doses of the **turmeric-tamarind** combination improved **all** of these measures, with the **400 mg** dosage showing the most significant results.

After 90 days, those taking **400 mg** could walk up and down nine steps **2.4 seconds faster** on average, compared to a **0.3-second** improvement in the placebo group.

This shows a marked improvement in overall mobility *and* an increase in the joints' functionality.

In the subjective Visual Analog scale, those taking **400 mg** reported that their **pain** rating was decreased by **46%**, compared to just **10%** in the placebo group.

Results of the WOMAC scale were nearly as impressive, with the **400 mg** group reporting a **38%** reduction in pain, stiffness, and physical limitations, compared to **7%** in the placebo group.

## Increased Flexibility

A **range-of-motion knee flexion** test measures the angle in degrees that the knee can be bent away from a straightened position.

After 90 days, those taking the placebo had their knee flexibility increased by an average **0.82%** improvement, compared to a **4.34%** improvement in knee flexion from baseline in the **turmeric-tamarind** group. This represented an improvement in knee flexibility more than **five times** that of the placebo group.

The secondary endpoints confirm the results seen in the walk test: This extract blend decreases **joint pain** and stiffness while improving **joint function** and range of motion.

## Blocking Inflammation at the Source

There are two key enzymes involved with **inflammation**:

- **5-LOX**, which transforms arachidonic acid into pro-inflammatory compounds called **leukotrienes**, and
- **COX-2**, which transforms arachidonic acid into pro-inflammatory mediators such as **prostaglandin e2**.

**Tamarind** and **turmeric** inhibit *both* these enzymes that are involved in the production of inflammatory compounds.<sup>17,32-35</sup>

The clinical study described earlier showed that a blend of tamarind and turmeric extracts significantly increased range of motion and reduced joint pain in people with non-arthritic knee joint pain following exercise.<sup>7</sup>





## TAMARIND PLUS TURMERIC

### Summary

Many aging adults experience **joint pain**, which leads to impaired mobility and reduced quality of life.

Researchers have found that extracts of **tamarind** and **turmeric** can improve range of motion and flexibility, and reduce discomfort while also addressing inflammation, without the potentially dangerous side effects of conventional pain medications.

In a study of 90 men and women with non-arthritic **knee joint pain** following exercise, a combination of these extracts led to improved **walking speed** and **distance**, enhanced **range of motion**, and decreased **pain and stiffness** after just three months. ●

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.hopkinsmedicine.org/health/conditions-and-diseases/knee-pain-and-problems>. Accessed August 23, 2021.
2. Pisters MF, Veenhof C, van Dijk GM, et al. The course of limitations in activities over 5 years in patients with knee and hip osteoarthritis with moderate functional limitations: risk factors for future functional decline. *Osteoarthritis Cartilage*. 2012 Jun;20(6):503-10.
3. Feinglass J, Thompson JA, He XZ, et al. Effect of physical activity on functional status among older middle-age adults with arthritis. *Arthritis Rheum*. 2005 Dec 15;53(6):879-85.
4. Rosemann T, Kuehlein T, Laux G, et al. Osteoarthritis of the knee and hip: a comparison of factors associated with physical activity. *Clin Rheumatol*. 2007 Nov;26(11):1811-7.
5. Bally M, Dendukuri N, Rich B, et al. Risk of acute myocardial infarction with NSAIDs in real world use: bayesian meta-analysis of individual patient data. *BMJ*. 2017 May 9;357:j1909.
6. Hsu CC, Wang H, Hsu YH, et al. Use of Nonsteroidal Anti-Inflammatory Drugs and Risk of Chronic Kidney Disease in Subjects With Hypertension: Nationwide Longitudinal Cohort Study. *Hypertension*. 2015 Sep;66(3):524-33.
7. Rao PS, Ramanjaneyulu YS, Prisk VR, et al. A Combination of Tamarindus indica seeds and Curcuma longa Rhizome Extracts Improves Knee Joint Function and Alleviates Pain in Non-Arthritic Adults Following Physical Activity. *Int J Med Sci*. 2019;16(6):845-53.
8. Dainese P, Wyngaert KV, De Mits S, et al. Association between knee inflammation and knee pain in patients with knee osteoarthritis: a systematic review. *Osteoarthritis Cartilage*. 2021 Dec 27.

9. Available at: <https://www.rheumatologyadvisor.com/home/topics/osteoarthritis/association-inflammatory-markers-and-pain-in-knee-osteoarthritis-moderate-evidence/>. Accessed March 10, 2022.
10. Zhu J, Ruan G, Cen H, et al. Association of serum levels of inflammatory markers and adipokines with joint symptoms and structures in participants with knee osteoarthritis. *Rheumatology (Oxford)*. 2022 Mar 2;61(3):1044-52.
11. Available at: <https://www.mayoclinic.org/symptoms/joint-pain/basics/definition/sym-20050668>. Accessed March 10, 2022.
12. Available at: <https://my.clevelandclinic.org/health/symptoms/17752-joint-pain>. Accessed March 10, 2022.
13. Sen R HJ. Osteoarthritis. *StatPearls Publishing*. 2021.
14. Henriksen M, Rosager S, Aaboe J, et al. Experimental knee pain reduces muscle strength. *J Pain*. 2011 Apr;12(4):460-7.
15. Kawano MM, Araujo IL, Castro MC, et al. Assessment of quality of life in patients with knee osteoarthritis. *Acta Ortop Bras*. 2015 Nov-Dec;23(6):307-10.
16. Bindu S, Mazumder S, Bandyopadhyay U. Non-steroidal anti-inflammatory drugs (NSAIDs) and organ damage: A current perspective. *Biochem Pharmacol*. 2020 Oct;180:114147.
17. Aggarwal S, Ichikawa H, Takada Y, et al. Curcumin (diferuloylmethane) down-regulates expression of cell proliferation and antiapoptotic and metastatic gene products through suppression of I $\kappa$ B kinase and Akt activation. *Mol Pharmacol*. 2006 Jan;69(1):195-206.
18. Hatcher H, Planalp R, Cho J, et al. Curcumin: from ancient medicine to current clinical trials. *Cell Mol Life Sci*. 2008 Jun;65(11):1631-52.
19. Chandran B, Goel A. A randomized, pilot study to assess the efficacy and safety of curcumin in patients with active rheumatoid arthritis. *Phytother Res*. 2012 Nov;26(11):1719-25.
20. Chainani-Wu N. Safety and anti-inflammatory activity of curcumin: a component of tumeric (*Curcuma longa*). *J Altern Complement Med*. 2003 Feb;9(1):161-8.
21. Li H, Sureda A, Devkota HP, et al. Curcumin, the golden spice in treating cardiovascular diseases. *Biotechnol Adv*. 2020 Jan - Feb;38:107343.
22. Cox KH, Pipingas A, Scholey AB. Investigation of the effects of solid lipid curcumin on cognition and mood in a healthy older population. *J Psychopharmacol*. 2015 May;29(5):642-51.
23. Tomeh MA, Hadianamrei R, Zhao X. A Review of Curcumin and Its Derivatives as Anticancer Agents. *Int J Mol Sci*. 2019 Feb 27;20(5).
24. Daily JW, Yang M, Park S. Efficacy of Turmeric Extracts and Curcumin for Alleviating the Symptoms of Joint Arthritis: A Systematic Review and Meta-Analysis of Randomized Clinical Trials. *J Med Food*. 2016 Aug;19(8):717-29.
25. Ng QX, Koh SSH, Chan HW, et al. Clinical Use of Curcumin in Depression: A Meta-Analysis. *J Am Med Dir Assoc*. 2017 Jun 1;18(6):503-8.
26. Cicero AFG, Sahebkar A, Fogacci F, et al. Effects of phytosomal curcumin on anthropometric parameters, insulin resistance, cortisolemia and non-alcoholic fatty liver disease indices: a double-blind, placebo-controlled clinical trial. *Eur J Nutr*. 2020 Mar;59(2):477-83.
27. Mousavi SM, Milajerdi A, Varkaneh HK, et al. The effects of curcumin supplementation on body weight, body mass index and waist circumference: a systematic review and dose-response meta-analysis of randomized controlled trials. *Crit Rev Food Sci Nutr*. 2020;60(1):171-80.
28. De Caluwé E, Halamová K, Van Damme P. Tamarind (<italic>Tamarindus indica</italic> L.): A Review of Traditional Uses, Phytochemistry and Pharmacology. *African Natural Plant Products: New Discoveries and Challenges in Chemistry and Quality*. Vol 1021: American Chemical Society; 2009:85-110.
29. Rana M, Sharma P, Mahima R, et al. Proximate and phytochemical screening of the seed and pulp of Tamarind indica. *Journal of Medicinal Plants Studies*. 2018;6(2):111-5.
30. Cardoso Lima Reis PM, Dariva C, Barroso Vieira GÂ, et al. Extraction and evaluation of antioxidant potential of the extracts obtained from tamarind seeds (*Tamarindus indica*), sweet variety. *Journal of Food Engineering*. 2016;173:116-23.
31. Chen L, You Q, Hu L, et al. The Antioxidant Procyanidin Reduces Reactive Oxygen Species Signaling in Macrophages and Ameliorates Experimental Colitis in Mice. *Front Immunol*. 2017 2018-January-05;8:1910.
32. Komakech R, Kim YG, Matsabisa GM, et al. Anti-inflammatory and analgesic potential of Tamarindus indica Linn. (Fabaceae): a narrative review. *Integr Med Res*. 2019 Sep;8(3):181-6.
33. Chun KS, Keum YS, Han SS, et al. Curcumin inhibits phorbol ester-induced expression of cyclooxygenase-2 in mouse skin through suppression of extracellular signal-regulated kinase activity and NF- $\kappa$ B activation. *Carcinogenesis*. 2003 Sep;24(9):1515-24.
34. Kunnumakkara AB, Guha S, Krishnan S, et al. Curcumin potentiates antitumor activity of gemcitabine in an orthotopic model of pancreatic cancer through suppression of proliferation, angiogenesis, and inhibition of nuclear factor- $\kappa$ B-regulated gene products. *Cancer Res*. 2007 Apr 15;67(8):3853-61.
35. Ponnuram S, Mondalek FG, Govind J, et al. Urine and serum analysis of consumed curcuminoids using an I $\kappa$ B-luciferase surrogate marker assay. *In Vivo*. 2010 Nov-Dec;24(6):861-4.



# Sweet DREAMS



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

The nice-tasting, citrus-vanilla flavor enables convenient “drop” dosing of **Fast-Acting Liquid Melatonin** each night or when needed.

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

Item #02234 • 3 mg per 20 drops, 2 fl. oz

1 bottle \$9 • 4 bottles \$8.25 each

FOR OCCASIONAL SLEEPLESSNESS.

For full product description and to order **Fast-Acting Liquid Melatonin**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

**CAUTION:** Do not consume alcohol, drive or operate heavy machinery after taking this product.



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



# share a Longer Life



Selenium promotes the body's production of **glutathione**, a potent cellular antioxidant. It also encourages healthy cell division, thyroid health, and immune function.

**Super Selenium Complex** combines three complementary forms of selenium with vitamin E for additional antioxidant protection.

Item #01778 • 100 vegetarian capsules  
1 bottle \$10.50 • 4 bottles \$9 each

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

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

DUAL-ACTION  
JOINT SUPPORT

# Get Moving!

Joint Mobility is a patent-pending blend  
of tamarind and turmeric extracts.



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 **tamarind-turmeric** 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](http://www.LifeExtension.com)

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

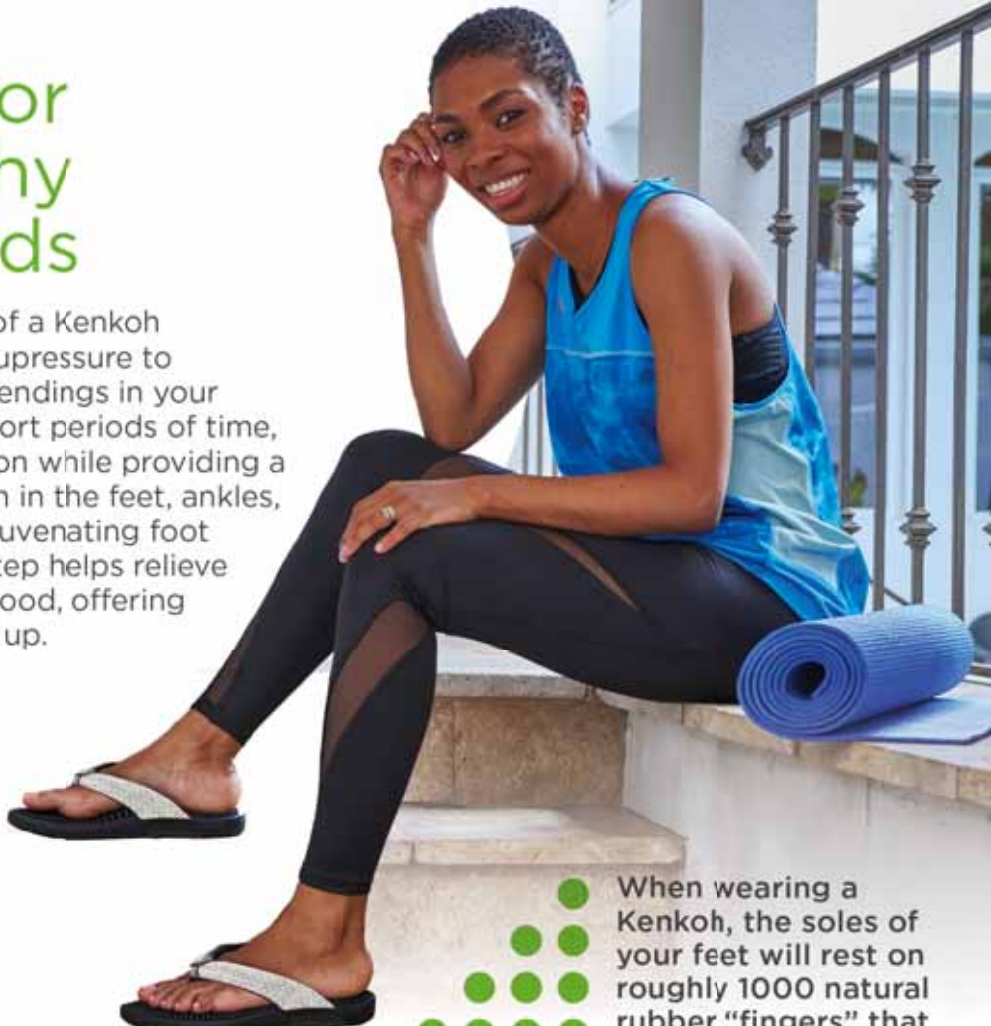
TamaFlex® is a trademark of NXT USA, Inc. Patents pending.



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

# Your source for *all* your healthy footwear needs

The precisely designed footbeds of a Kenkoh Massage Sandal work by using acupressure to revitalize and stimulate the nerve endings in your feet. When worn daily, even for short periods of time, Kenkoh helps to increase circulation while providing a non-intrusive way of reducing pain in the feet, ankles, knees, legs, hips and back. The rejuvenating foot massage you receive with every step helps relieve stress and enhance your overall mood, offering optimal wellness from the ground up.



Spirit Black and White



Spirit Royal Blue



Spirit Brown



Serenity Black



Chai Champagne



Grace Pewter



When wearing a Kenkoh, the soles of your feet will rest on roughly 1000 natural rubber "fingers" that will massage and stimulate key reflex points. This targeted therapy, known as reflexology, has long been practiced in Eastern cultures as a way of reducing pain, stress and anxiety.

*"Massage Improves Circulation..."*

UNIVERSITY OF MIAMI SCHOOL OF MEDICINE

*"Massage aids muscle recovery and speeds recovery times..."*

McMASTER UNIVERSITY, ONTARIO

Relieve pain & improve your health now!

Take the 14 day Kenkoh challenge

LEM.DiscoverKenkoh.com

1-866-442-1384

# Kenkoh®

The Original Massage Sandal

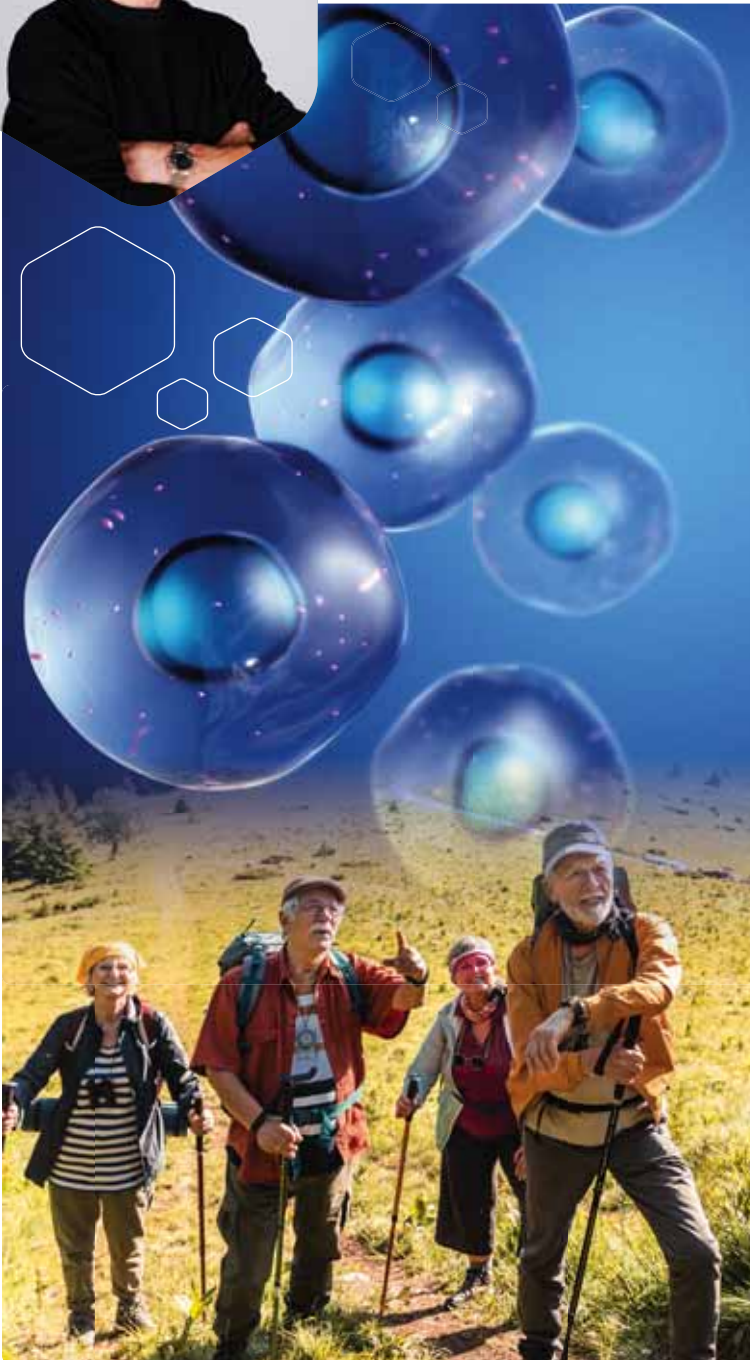


# THE RAPAMYCIN STORY

## Rapamycin, mTOR, Autophagy and Treating mTOR Syndrome



ROSS PELTON,  
THE NATURAL PHARMACIST



As progress in longevity science continues to accelerate, researchers are investigating three innovative strategies that can delay aging, reduce disease, and increase lifespan.

**Rapamycin, mTOR, and autophagy** are at the forefront of the life extension revolution.

In this interview, *Life Extension* discusses these advances with pharmacist Ross Pelton, author of the book, *Rapamycin, mTOR, Autophagy & Treating mTOR Syndrome*.

**LE:** Ross, there's been a lot of "buzz" lately about **rapamycin**, an FDA-approved drug used to prevent organ transplant rejection and treat certain cancers.<sup>1</sup> Why are people so excited?

**Pelton:** What has fascinated the scientific community is rapamycin's ability to *increase median life expectancy* in animal models by up to **60%**. The hope is that *humans* may gain significant improvements in health and increases in lifespan by taking rapamycin.

In addition, a clinical trial in elderly adults 65 years and older revealed that once-weekly dosing of everolimus (a rapamycin derivative with properties virtually the same as rapamycin) strengthened their **immune system**, evaluated by their enhanced response to influenza vaccine of about **20%**.<sup>2</sup> This study is important because the immune system in *all* elderly people has declined significantly compared to the **immune function** of healthy adults in their 20s and 30s. The ability of rapamycin-like drugs to enhance the immune system in elderly adults is a major outcome.

**LE:** You said rapamycin can increase life expectancy by up to **60%** in animals. Can you discuss that in more detail?

**Pelton:** When rapamycin therapy was initiated in **middle-aged** mice, median increases in life expectancy of up to **60%** were observed.<sup>3</sup> When rapamycin therapy was initiated in **elderly** male and female mice that were roughly the equivalent of 60-year-old humans, female mice achieved a **14%** increase in lifespan and males achieved a **9%** increase in lifespan.<sup>4</sup> This may equate to an increase of more than **seven years** of human life.<sup>5</sup>

**LE:** How does rapamycin work?

**Pelton:** Over the past 25 years, research into rapamycin's mechanism of action has resulted in the discovery of a new understanding of cellular biology and the aging process. This research has revealed that **mTOR** and **autophagy** regulate the health and aging process of all living organisms.

Rapamycin *inhibits* mTOR and enables the process of **autophagy** to be *activated*, which restores

youthful metabolic functions. Research reveals that rapamycin delays the onset of many age-related diseases that apply to human health.<sup>6</sup>

In my mind, the **mTOR/autophagy** story is even more important than rapamycin. The understanding of mTOR and autophagy is revealing how we can delay the onset of age-related diseases and achieve significant increases in lifespan and healthspan.

**LE:** Can you explain what **mTOR** is for our readers?

**Pelton:** When calories are available to a cell, the protein mTOR sends signals that activate cellular metabolism, telling the cell to use the available calories to build new proteins, new enzymes, fat stores, and other cellular components. When mTOR is *activated*, it initiates anabolic (building) processes of cell growth and proliferation.

**LE:** And what is **autophagy**?

**Pelton:** Autophagy is the process in which damaged proteins, excess fat, and other worn cellular components are broken down for reuse or

elimination. Autophagy has been referred to as the cellular house-keeping process or cellular trash removal. The problem is that chronically *activated* mTOR (caused by relentless calorie ingestion) precludes healthy **autophagy**.

**LE:** Is that a serious problem?

**Pelton:** Very. Throughout **99.9%** of mankind's evolution, people did not eat three meals per day. However, these days, refrigeration and the widespread availability of processed and packaged foods have resulted in food being easily available all the time. Modern humans spend far more time eating compared to our ancient ancestors.

This results in constant *over-activation* of mTOR and *insufficient* functioning of autophagy. This imbalance is a major contributing factor underlying today's epidemic of health problems, such as cancer,<sup>7</sup> obesity,<sup>8</sup> and type II diabetes.<sup>9</sup> I've chosen to call this condition "mTOR Syndrome".

**LE:** How can people correct this imbalance? With intermittent fasting?



**Pelton:** Even aggressive fasting does not always induce meaningful reductions in body fat. Many individuals need additional support with compounds that induce beneficial autophagy. **Rapamycin** is a leading candidate. By inhibiting mTOR, rapamycin mimics calorie restriction and fasting.

**LE:** Does that mean rapamycin can help with weight loss?

**Pelton:** Yes. Research indicates that rapamycin may reduce fat mass and body weight as seen in cell and animal studies.<sup>10</sup> And favorable findings from pilot studies in older people have prompted formal **clinical trials** to evaluate the anti-aging effects of rapamycin, including the ability to improve **cardiac function**<sup>11</sup> and reduce **visceral adiposity**.<sup>12</sup>

At this point, clinical trials have not yet been completed to determine how effective rapamycin might be as a drug to induce weight loss in humans. However, I will share my personal experience. In six months of taking rapamycin, I lost **15 pounds** and noticed a substantial reduction in the “love handles” around my waist.

**LE:** What dose is optimal for weight loss?

**Pelton:** There may be up to 1,000 mTOR sites within each cell. When rapamycin is taken, it enters cells and binds to some of the mTOR sites, which results in partial inhibition of mTOR. The degree of mTOR inhibition is dose dependent. This is a critically important point. Some people may need to take *higher* doses of rapamycin to optimize the effect on mTOR and autophagy. One clinical trial is

studying **5 mg** and **10 mg** weekly doses of rapamycin and using imaging scans before and after to measure how much **visceral fat** may be reduced.<sup>12</sup>

**LE:** What is the most common dose being used by those seeking rapamycin’s potential **longevity** benefits?

**Pelton:** Pioneering physicians are discovering that taking **5-6 mg** of rapamycin just once weekly partially inhibits **mTOR**. This enables autophagy to be expressed on a periodic basis, which provides a wide range of health benefits. When mTOR and autophagy are optimally balanced, *every* cell in the body can experience detoxification, renewal, and revitalization. Everything begins to work better.

Taking rapamycin for **life extension** is a very new field of science, so studies to determine the best dosage and frequency have not been conducted. Many life extension enthusiasts are self-experimenting by taking **5-6 mg** once weekly. Eventually, lab tests to determine plasma levels of rapamycin will be readily available, which will help determine the best dose and frequency of taking rapamycin for each individual.

**LE:** At what age do you recommend people start taking rapamycin?

**Pelton:** This is a personal decision for everyone. However, I can offer some guidelines. mTOR is a master regulator of the growth activities in cells. Childhood, adolescence, and even young adulthood are periods of rapid growth. Hence, it would be inappropriate to have young people taking rapamycin. Although there is

no agreed-upon age for people to start taking rapamycin, I don’t think people younger than 30 should.

**LE:** Can elderly people take rapamycin safely?

**Pelton:** Yes, but as the study of mice showed, the increase in life expectancy was greater when rapamycin was initiated in **middle-aged** mice. While we eagerly await results from ongoing human rapamycin studies, delays in suppressing excess mTOR and inducing **autophagy** may diminish the longevity-enhancing benefits.

**LE:** You mentioned that you take rapamycin. When did you start?

**Pelton:** I started taking **6 mg** of rapamycin once weekly in June 2021. I had blood drawn for routine lab work in November 2021 and discovered that I was anemic. My red blood cell count, hemoglobin, and iron levels were below normal and my lymphocyte count was slightly low, which is an indicator of immune status. Based on my lab values, I reduced my rapamycin intake to **6 mg every other week**. I rechecked my labs a month later and everything had returned to normal.

Why was **6 mg** of rapamycin too high a dose for me? In addition to rapamycin, I engage in intermittent fasting most days, I exercise regularly, I take metformin twice daily and I take **Life Extension® Senolytic Activator®**. Based on the multiple components of my life-extension program, I discovered that taking **6 mg** of rapamycin every other week is the best dose *for me*.

**LE:** Are there natural ways that people can inhibit mTOR and increase the expression of autophagy?

**Pelton:** Yes, there are. Remember, autophagy is activated when calories are unavailable. Intermittent fasting and time-restricted eating refer to eating protocols in which all your daily food is consumed within a shorter period of time. One of the most popular versions is the **16:8 protocol**, in which all your food is consumed within an eight-hour period, say from noon to 8 p.m. This leaves 16 hours (from 8 p.m. until noon the following day) of fasting, which enables autophagy to be activated.

**LE:** Do you go into greater detail about all this in your new book?

**Pelton:** Yes. I want to emphasize that decades of research on rapamycin's mechanisms of action have resulted in a revolutionary new understanding of cellular metabolism, health, and the aging process.

My book, **Rapamycin, mTOR, Autophagy & Treating mTOR Syndrome**, reviews the history and scientific studies that explain rapamycin's ability to improve health and delay the onset of age-related diseases. It also discusses alternatives to rapamycin for those who cannot find a physician willing to write them a prescription for rapamycin, and for people who want to wait for the results of clinical trials before initiating this medication.

My book also provides practical guidance on how to improve the mTOR/autophagy ratio, which holds the promise of increasing both healthspan and lifespan.

**LE:** Is there any new research that documents rapamycin's effectiveness as a life extension drug?

**Pelton:** Yes, I want to report the exciting results from a study

conducted by Dr. Vera Gorbunova, who is Co-Director of the Rochester Aging Research Center. Long-lived animals are known to have genes in common that negatively and positively affect lifespan. Dr. Gorbunova examined 10 prominent life extension therapies in mice and assessed how each intervention affected the genes associated with maximum lifespan. The interventions evaluated were rapamycin, 17-alpha-estradiol, pituitary-specific positive transcription Factor 1 (Pit1), growth hormone, rilmenidine, ascorbyl-palmitate, acarbose, calorie restriction, methionine restriction and protandim.

**RAPAMYCIN WINS:** Rapamycin had the greatest effect in reducing the activity of **genes** that have a negative effect on maximum lifespan AND, rapamycin also had the greatest effect at promoting the activity of genes that have a positive effect on **maximum lifespan**. This study provides powerful confirmation that rapamycin is a life extension drug that is ushering in a revolution in life extension and healthy aging. •

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

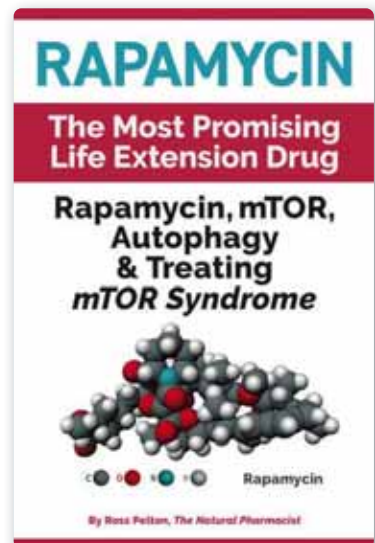
1. Available at: <https://www.uptodate.com/contents/pharmacology-of-mammalian-mechanistic-target-of-rapamycin-mtor-inhibitors>. Accessed March 14, 2022.
2. Mannick JB, Del Giudice G, Lattanzi M, et al. mTOR inhibition improves immune function in the elderly. *Sci Transl Med*. 2014 Dec 24;6(268):268ra179.
3. Bitto A, Ito TK, Pineda VV, et al. Transient rapamycin treatment can increase lifespan and healthspan in middle-aged mice. *Elife*. 2016 Aug 23;5:e16351.
4. Harrison DE, Strong R, Sharp ZD, et al. Rapamycin fed late in life extends lifespan in genetically heterogeneous mice. *Nature*. 2009 Jul 16;460(7253):392-5.
5. Blagosklonny MV. Rapamycin for longevity: opinion article. *Aging (Albany NY)*. 2019 Oct 4;11(19):8048-67.
6. Selvarani R, Mohammed S, Richardson A. Effect of rapamycin on aging and age-related diseases-past and future. *Geroscience*. 2021 Jun;43(3):1135-58.
7. Hua H, Kong Q, Zhang H, et al. Targeting mTOR for cancer therapy. *J Hematol Oncol*. 2019 Jul 5;12(1):71.
8. Yang SB, Tien AC, Boddupalli G, et al. Rapamycin ameliorates age-dependent obesity associated with increased mTOR signaling in hypothalamic POMC neurons. *Neuron*. 2012 Aug 9;75(3):425-36.
9. Yang L, Zhang Z, Zhang D, et al. Targeting mTOR Signaling in Type 2 Diabetes Mellitus and Diabetes Complications. *Curr Drug Targets*. 2022 Jan 11.
10. Ro SH, Jang Y, Bae J, et al. Autophagy in Adipocyte Browning: Emerging Drug Target for Intervention in Obesity. *Front Physiol*. 2019;10:22.
11. Available at: <https://clinicaltrials.gov/ct2/show/NCT04996719>. Accessed March 15, 2022.
12. Available at: <https://clinicaltrials.gov/ct2/show/NCT04488601>. Accessed March 15, 2022.

**Ross Pelton** is a pharmacist, a clinical nutritionist and the author of 12 books on topics on a variety of health topics.

Ross' website, bio and blog are at: [www.naturalpharmacist.net](http://www.naturalpharmacist.net)

For full description and to order *Rapamycin, mTOR, Autophagy and Treating mTOR Syndrome*, call 1-800-544-4440 or visit [www.LifeExtension.com/rapa](http://www.LifeExtension.com/rapa)

**Item # 34189 • \$14.95**



# FISETIN

## The Longevity Flavonoid



**Fisetin**, a flavonoid found in strawberries and apples, is currently being studied for its effectiveness as a **senolytic** in humans.<sup>1</sup>

In preclinical studies, fisetin:

- Mimics effects of **calorie reduction**<sup>2</sup>
- Targets longevity pathways<sup>2-6</sup>
- Extends lifespan of mice by about **10%**<sup>7</sup>
- Removes **senescent** cells through **senolytic** action<sup>7</sup>
- Suppresses excess **mTOR** activation<sup>8</sup>

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

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

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

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

"I believe this product is another arrow in my quiver of products I use to be my best."

**Raymond**

VERIFIED CUSTOMER REVIEW

#### References

1. Available at: <https://www.mayo.edu/research/clinical-trials/clis-20438802>. Accessed June 22, 2020.
2. *Life Sci.* 2018 Jan 15;193:171-9.
3. *Mini Rev Med Chem.* 2018;18(13):1151-7.
4. *Nutr Res Pract.* 2017 Oct;11(5):430-4.
5. *Biochem Biophys Res Commun.* 2015 Nov 27;467(4):638-44.
6. *Int Immunopharmacol.* 2017 Apr;45:135-47.
7. *EBioMedicine.* 2018 Oct;36:18-28.
8. *J Nutr Biochem.* 2013 Aug;24(8):1547-54.
9. *Manufacturer's study (in press for future publication).* 2020.

**Item #02414** • 30 vegetarian capsules

1 bottle **\$11.25** • 4 bottles \$10 each



GLUTEN FREE



NON-GMO  
LE CERTIFIED

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

# 45 Times Greater Bioavailability CURCUMIN



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](http://www.LifeExtension.com)

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

# New Book!



ITEM #34189 • \$14.95

When middle-aged mice were given **rapamycin**, their median **life expectancy** was increased by up to **60%**.<sup>1</sup> Elderly mice taking rapamycin lived **9%-14%** longer (equivalent of about **seven** human years).<sup>2</sup>

Typical aging Americans suffer unwanted **weight gain** and metabolic disorders. Much of these pathologies relate to over-expression of **mTOR** and insufficient removal of cellular waste via **autophagy**.

*"From extending lifespan to bolstering the immune system, rapamycin's effects are only just beginning to be understood."*

*The Scientist: March 1, 2018*

This new book describes multiple ways to achieve a healthier **mTOR/autophagy** balance.

This fully referenced, multi-color publication provides dynamic incentives to improve one's healthy longevity.

***Rapamycin, mTOR, Autophagy and Treating mTOR Syndrome***

*By Ross Pelton, The Natural Pharmacist*

**References** 1. *Elife*. 2016 Aug 23;5:e16351. 2. *Nature*. 2009 Jul 16;460(7253):392-5.

For full description and to order **Rapamycin, mTOR, Autophagy and Treating mTOR Syndrome**, call **1-800-544-4440** or visit **[www.LifeExtension.com/rapa](http://www.LifeExtension.com/rapa)**

ACTIVATE CELLULAR

# Autophagy

Help Your Cells Remove  
Internal Debris



**GEROPROTECT® Autophagy Renew** stimulates the body's natural "cellular cleanup" process essential to youthful cellular function and overall health.

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

This new longevity formula contains **luteolin** and **piperlongumine** to:

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

Activating **autophagy** supports healthy cellular function and longevity.

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



†Developed in collaboration with Insilico Medicine, Inc.

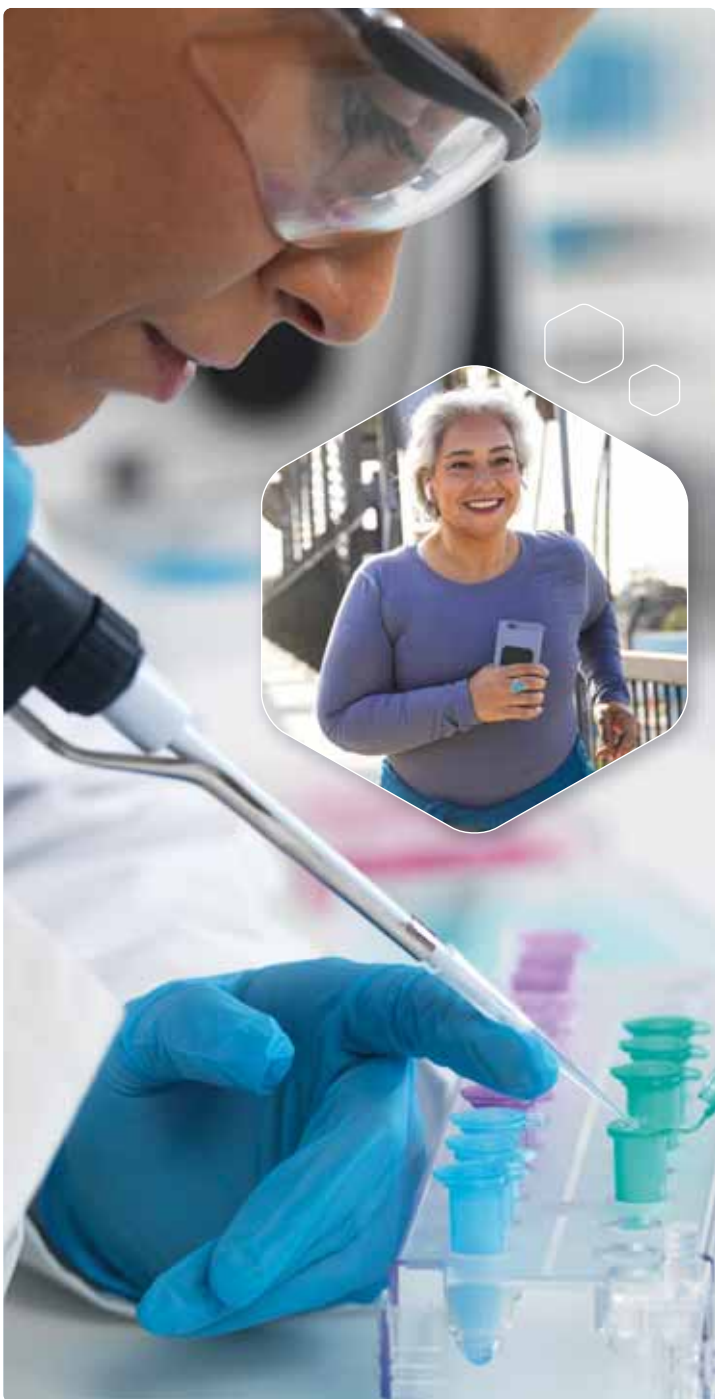
For full product description  
and to order **GEROPROTECT®**  
**Autophagy Renew**,  
call 1-800-544-4440 or  
visit [www.LifeExtension.com](http://www.LifeExtension.com)

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.



# New Tests to Guide Your Health Plans

BY DR. SCOTT FOGLE, ND



New **lab tests** can help determine if we need to increase intake of *specific* compounds and whether certain diets might be best for our bodies.

In this interview, Dr. Scott Fogle, ND, discusses testing for heavy metals, along with genetic testing that can assist with weight management and nutrient intake.

**LE:** What new tests are coming out for this year's **annual lab test sale**?

**Dr. Fogle:** We have three exciting new tests. One looks at **toxic metals** and **nutritional minerals**. The other two are innovative genetic tests that can reveal beneficial data about yourself that you may not have known.

**LE:** Is it important to test for toxic metals?

**Dr. Fogle:** Yes, very. Our world is increasingly toxic, and toxic metals are some of the worst offenders when it comes to affecting your body in slow, insidious ways. These toxins build up in the body easily and affect different tissues, organs, metabolic enzymes, and more.

**LE:** Are certain metals more of a problem than others?

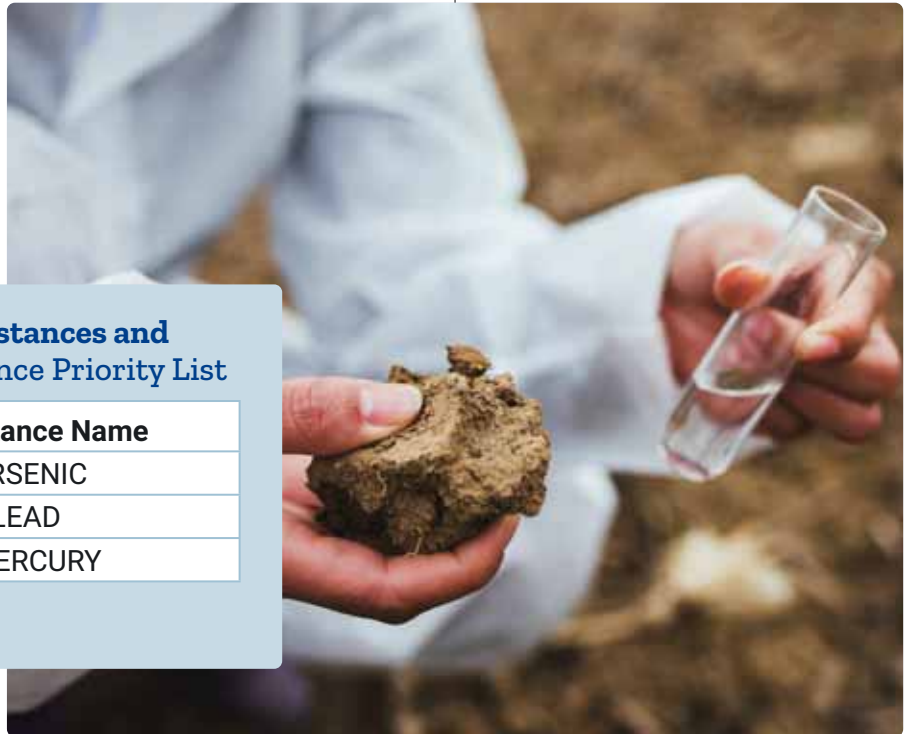
**Dr. Fogle:** **Arsenic, lead, and mercury** are some of the most toxic, and they are far too common. The **Agency for Toxic Substances and Disease Registry** creates a Substance Priority List that is updated every few years.

The top three items on their most recent list of **275** toxic substances are arsenic, lead, and mercury, in that order. This list is based on a combination of the toxins' frequency, toxicity, and potential for human exposure.

**The Agency for Toxic Substances and Disease Registry 2019 Substance Priority List**

2019 Rank	Substance Name
1	ARSENIC
2	LEAD
3	MERCURY

Source: <https://www.atsdr.cdc.gov/SPL/>



Given their toxicity and that you may be exposed and not know it, it makes sense to check your levels periodically. The **Blood Metals Panel Blood Spot Test Kit** tests for all three.

**LE:** Why is arsenic number one on the Agency for Toxic Substances and Disease Registry list?

**Dr. Fogle:** It is highly toxic in its inorganic form and quickly deposits in the liver, kidney, spleen, skin, bone, and muscle. It is found in some water sources and irrigation water used for food crops. Other sources are smoking tobacco, rodent poison, contaminated shellfish, treated lumber for outdoor use, fungicides, pesticides, fireworks, and leather tanning.

**LE:** What other toxic metals does the test include?

**Dr. Fogle:** It looks for two other problematic metals, **cadmium** and **antimony**. Inhalation of cigarette smoke is a major source of

cadmium exposure. It is also found in some metal hardware like nuts and bolts, batteries, paints, and other common industrial and household sources. Following exposure, cadmium concentrates in the liver, kidneys, and other tissues. It is thought to exert toxicity by disrupting zinc activity and has a very slow elimination rate from the body.

Antimony is a toxic element widely used in metal alloys found in industrial and household products. It likely interferes with cellular metabolism and accumulates in the liver.

**LE:** You mentioned that this test also checks levels of **nutritional minerals**?

**Dr. Fogle:** It does, and that's one of the reasons I like this test so much. Not only do you get five **toxic** metals checked, but it also tests three minerals that support detox, immune health, tissue healing, and tissue integrity. Those are **zinc**, **selenium** and **copper**.

With a lot of people taking zinc to support a healthy immune system nowadays, it is a good idea to check its level *and* to make sure zinc is not getting out of balance with copper. This test provides a helpful **copper-to-zinc ratio**.

Selenium is such an important mineral, and one of its abilities is to generate one of the most powerful detoxifiers the body has, **glutathione**. This detoxifier is like a bodyguard against toxins, binding to them and escorting them out of the body. Mercury is so toxic that it takes two glutathione molecules to escort a single mercury molecule out of the body. And selenium appears to protect other tissues from mercury and arsenic as well, by increasing excretion and inhibiting mercury accumulation.

**LE:** **Mercury** can be found in multiple forms. Which form does this test measure?

**Dr. Fogle:** This test checks the very toxic **methylmercury** form. Because of our polluted oceans and waterways, mercury is now found in many sea mammals and fish. The fish typically highest in mercury are swordfish, shark, tilefish, king mackerel, bigeye tuna, marlin, orange roughy, and Chilean sea bass.

**LE:** Does having more than one toxic metal present raise additional concerns?

**Dr. Fogle:** Unfortunately, yes. When added together, problems from toxic metals are exponentially worse due to the way these metals interact with each other. It's like a gang of bad guys creating havoc, as opposed to just one bad guy. People with high levels of several toxic metals should seek out a doctor with expertise in toxic metals since detoxing multiple metals can be challenging and stressful on the body.

**LE:** Is this a blood test or urine test?

**Dr. Fogle:** It is a home fingerstick **blood test** kit. It is convenient, quick, and easy, and you don't have to leave the house to do it.

**LE:** Can this test tell you whether you were *recently* exposed to toxic metals?

**Dr. Fogle:** It can. Circulating metals in the blood reflect recent exposure. Checking blood levels is looking at what you have been exposed to more recently.

**LE:** You mentioned two **genetic tests** that are being introduced. Can you tell us about those?

**Dr. Fogle:** One is very broad in scope, and one focuses on weight management. These tests use your genes to help predict what will likely be the most beneficial changes for you to make. They help suggest specific nutritional needs, laboratory recommendations, lifestyle recommendations, and even health precautions, such as avoiding gluten, all based on your individual DNA findings.

**LE:** How does the weight management test work?

**Dr. Fogle:** The **NutriGen™ Genetic Weight Management Panel** is a personalized genetic test for diet, wellness, and weight loss. Using nutrigenomics, it helps identify if genetic coding may be interfering with your weight management goals and provides insight into which dietary choices will have the most health benefits. It is the most complete nutrigenomic analysis on the market related to weight loss, response to exercise, food intolerances, nutritional needs, and more.

**LE:** What does the term **nutrigenomics** mean?

**Dr. Fogle:** It is the study of the complex interaction of nutrition and your genes, especially in relation to prevention and wellness. The genetic variations analyzed with this weight management panel are associated with **15** health and weight management categories: behavioral genetics in food intake, efficacy of exercise, flavor sensitivities, detoxification imbalances, supplementation intolerances, vitamin deficiency risk, matching your diet type, body shape genetics in overweight

predisposition, inflammation, hormones, and metabolism of fats, carbohydrates, lipids, and glucose.

**LE:** How much do genes affect a person's weight?

**Dr. Fogle:** Genetic factors determine between **40%-70%** of an individual's weight.

**LE:** Can the **genetic weight management panel** indicate which diet might work best for someone?

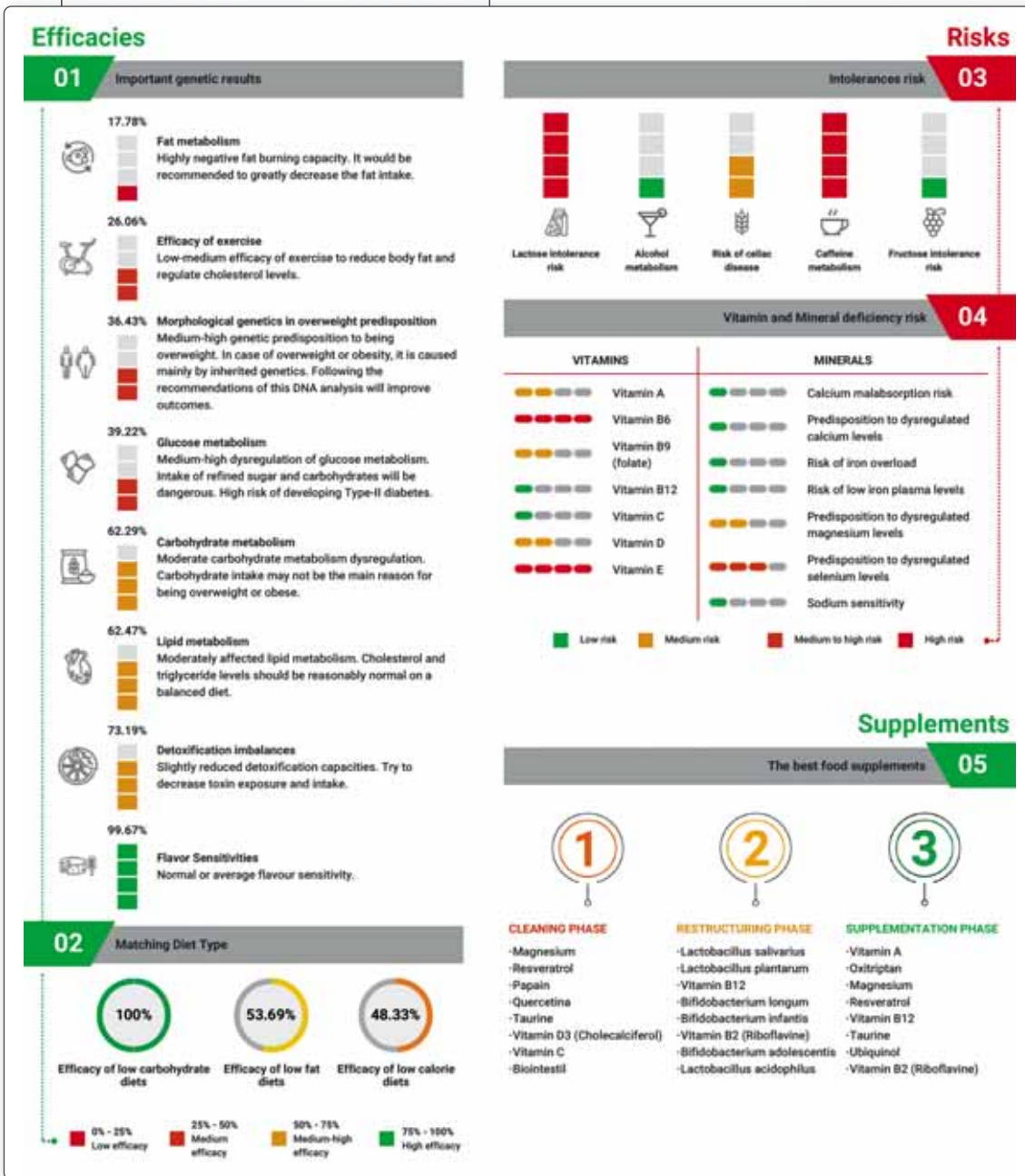
**Dr. Fogle:** Yes. Not everyone should be on the same type of diet. This test uses your genes to reveal the efficiency of the main diet types, such as a low-carb diet, low-calorie diet, and low-fat diet. These genetic differences are why people are constantly trying different ones to see which works best. Now, instead of trial and error, you can use your own genes to show you which diet is best to help you shed those extra pounds.

This test goes beyond suggesting a diet type. It generates a specific **dietary plan** from over 850 foods *and* suggests a daily calorie intake customized to you. It even provides a custom three-phase **supplement plan** based on your individual genetic profile and health concerns.

**LE:** That means it looks at vitamin and mineral needs in relation to weight management?

**Dr. Fogle:** Yes, it assesses your genetic need for vitamins A, B6, folate, B12, C, D, and E. It also looks at calcium malabsorption risk, iron overload and low iron risk, dysregulated magnesium and selenium levels, and sodium sensitivity.

Here's a look at a sample report:



**LE:** What can you tell us about the second genetic test?

**Dr. Fogle:** The **Pro7 Advanced Nutrigenomic Panel** analyzes your genetics in **seven** key areas of health: methylation, neurotransmitter production, mitochondrial function, detoxification, neuroinflammation, inflammation due to environmental and dietary factors, and health precautions. It examines an amazingly wide range of your genetic code, then provides you with

**genetically targeted nutritional suggestions.** Why guess when your genes can show you where and what to focus on?

**LE:** This panel clearly covers a lot of genetic testing. Won't that make it too expensive for most people?

**Dr. Fogle:** Years ago, this test would have been in the \$3,000-\$5,000 range. Fortunately for everyone, genetic testing has come down significantly in price, making this

information more accessible than ever. By partnering with a premier genetic testing company, we are able to offer this panel for **\$299** (and **25%** off this price during the annual lab sale).

**LE:** Can you discuss some of the specific areas this nutrigenomic panel analyzes?

**Dr. Fogle:** It looks at **methylation**, a process that needs to work properly to maintain our overall health

and the health of our DNA. This test examines common gene variants which would indicate higher need for methylfolate and methylcobalamin (vitamin B12).

It also looks at supplements needed for proper **neurotransmitter** production, like B6, taurine, glycine, and methionine, and examines common variants in genes which are involved in the production, conversion, and breakdown of neurotransmitters.

**LE:** What about **mitochondrial dysfunction**, which is closely tied to aging and disease?

**Dr. Fogle:** Nutrients needed for mitochondrial and electron transport-chain function, like coenzyme Q10 (CoQ10), pyrroloquinoline quinone (PQQ), carnitine, and magnesium, are evaluated. So are nutrients needed for **detoxification**, including N-Acetyl-L-Cysteine (NAC), glutathione, lipoic acid, and antioxidants.

Detoxification is important for mitochondrial health because toxins target our mitochondria and nerve tissue first. The reason is that both lack the ability to protect and detoxify themselves. They are reliant on the overall detox capacity of the body to keep them healthy. If you aren't taking in enough nutrients, toxins can overwhelm your mitochondria and nerve tissue and cause problems that will later manifest as disease and accelerated aging.

**LE:** You mentioned the vulnerability of nerve cells. Does this genetic test assess potential risk of inflammation of our nervous system and brain?

**Dr. Fogle:** Yes, genetic potential for **neuroinflammation** is assessed, along with supportive nutrients like curcumin, omegas, resveratrol, and

quercetin. These nutrients are recommended for many people, but if you have a higher genetic potential for neuroinflammation, you should consider higher than standard dosing.

**LE:** More and more people are concerned about gluten and having too much histamine in their bodies. Are these areas also addressed with this test?

**Dr. Fogle:** **Environmental and dietary inflammation** risks like gluten sensitivity, ability to break down histamine, need for probiotics and vitamins D and K, and expected benefits from curcumin are assessed. So are **health precautions** like risk from salt retention, concerning estrogen metabolites, and even hypothyroid risk. It is one of the most comprehensive genetic tests we have ever seen.

**LE:** Are these genetic tests also blood tests?

**Dr. Fogle:** No, these are simple at-home **cheek swab tests** which collect cells for DNA extraction. I hope people take advantage of these and the toxic metals test to take their health and wellness plans to the next level.

At **Life Extension** we have long advocated **annual laboratory testing** as one of the most important ways to optimize and maintain health.

These new diagnostic offerings from **Life Extension**, provide unique information on your personal health assessment.

Our Lab Test Super Sale starts on **March 21, 2022** and ends on **July 11, 2022**. •

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

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



**ACTIVE LIFESTYLE & FITNESS**

- 01529 Creatine Capsules
- 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**

- 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
- 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

**BRAIN HEALTH**

- 01524 Acetyl-L-Carnitine
- 01974 Acetyl-L-Carnitine Arginate
- 02419 B12 Elite
- 02510 Brain Fog Relief
- 01659 CDP Choline
- 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 HCl
- 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**

- 01937 Mega EPA/DHA
- 02218 Mega GLA Sesame Lignans
- 01983 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 softgels
- 01988 Super Omega-3 Plus EPA/DHA Fish Oil, Sesame Lignans, Olive Extract, Krill & Astaxanthin
- 01982 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 softgels

- 01985 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 60 enteric coated softgels
- 01984 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 120 enteric coated softgels
- 01986 Super Omega-3 EPA/DHA Fish Oil, Sesame Lignans & Olive Extract • 240 softgels
- 01812 Provinal® Purified Omega-7
- 01640 Vegetarian DHA

**FOOD**

- 02008 California Estate Extra Virgin Olive Oil
- 02170 Rainforest Blend Decaf Ground Coffee
- 02169 Rainforest Blend Ground Coffee
- 02171 Rainforest Blend Whole Bean Coffee
- 00438 Stevia™ Organic Liquid Sweetener
- 00432 Stevia™ Sweetener

**GLUCOSE MANAGEMENT**

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

**HEART HEALTH**

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

**HORMONE BALANCE**

- 00454 DHEA • 15 mg, 100 capsules
- 00335 DHEA • 25 mg, 100 capsules
- 00882 DHEA • 50 mg, 60 capsules
- 00607 DHEA • 25 mg, 100 vegetarian dissolve in mouth tablets
- 01689 DHEA • 100 mg, 60 veg capsules
- 02368 Optimized Broccoli 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**

- 024115 Day Elderberry Immune
- 00681 AHCC®
- 02302 Bio-Quercetin®
- 02410 Black Elderberry + Vitamin C
- 01961 Enhanced Zinc Lozenges
- 01704 Immune Modulator with Tinofend®
- 02425 Immune Packs with Vitamin C & D, Zinc and Probiotic

- 02005 Immune Senescence Protection Formula™
- 00316 Kyolic® Garlic Formula 102
- 00789 Kyolic® Reserve
- 01681 Lactoferrin (Apolactoferrin) Caps
- 02426 Mushroom Immune with Beta Glucans
- 01903 NK Cell Activator™
- 01394 Optimized Garlic
- 01309 Optimized Quercetin
- 01811 Peony Immune
- 00525 ProBoost Thymic Protein A
- 01708 Reishi Extract Mushroom Complex
- 01906 Standardized Cistanche
- 13685 Ten Mushroom Formula®
- 01097 Ultra Soy Extract
- 01561 Zinc Lozenges

**INFLAMMATION MANAGEMENT**

- 01639 5-LOX Inhibitor with AprèsFlex®
- 02324 Advanced Curcumin Elite™  
Turmeric Extract, Ginger & Turmerones
- 01709 Black Cumin Seed Oil
- 02310 Black Cumin Seed Oil and Curcumin Elite™
- 00202 Boswella
- 02467 Curcumin Elite™ Turmeric Extract • 30 veg capsules
- 02407 Curcumin Elite™ Turmeric Extract • 60 veg capsules
- 01804 Cytokine Suppress® with EGCG
- 02223 Pro-Resolving Mediators
- 00318 Serrafazyme
- 01203 Specially-Coated Bromelain
- 00407 Super Bio-Curcumin® Turmeric Extract
- 01254 Zyflamend™ Whole Body

**JOINT SUPPORT**

- 02404 Arthro-Immune Joint Support
- 02238 ArthroMax® Advanced NT2 Collagen™ & AprèsFlex®
- 01617 ArthroMax® with Theaflavins & AprèsFlex®
- 02138 ArthroMax® Elite
- 00965 Fast-Acting Joint Formula
- 02430 Fast Acting Relief
- 00522 Glucosamine/Chondroitin Capsules
- 02420 Glucosamine Sulfate
- 02424 Joint Mobility
- 01600 Krill Healthy Joint Formula
- 01050 Krill Oil
- 00451 MSM (Methylsulfonylmethane)
- 02231 NT2 Collagen™

**KIDNEY & BLADDER SUPPORT**

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

**LIVER HEALTH & DETOXIFICATION**

- 01922 Advanced Milk Thistle • 60 softgels
- 01925 Advanced Milk Thistle • 120 softgels
- 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
- 02431 Essential Youth - L-Ergothioneine
- 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
- 02500 Testosterone Elite
- 01909 Triple Strength ProstaPollen™
- 02029 Ultra Prostate Formula

**MINERALS**

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

**MISCELLANEOUS**

- 00577 Potassium Iodide
- 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™
- 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
- 02502 Rest & Renew

**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
- 02422 Vegan Vitamin D3
- 02028 Vitamin B5 (Pantothenic Acid)
- 01535 Vitamin B6
- 00361 Vitamin B12 Methylcobalamin
- 01536 Vitamin B12 Methylcobalamin • 1 mg, 60 veg lozenges
- 01537 Vitamin B12 Methylcobalamin • 5 mg, 60 veg lozenges
- 02228 Vitamin C and Bio-Quercetin Phytosome • 60 veg tablets
- 02227 Vitamin C and Bio-Quercetin 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-Iodine™
- 02040 Vitamins D and K with Sea-Iodine™

**WEIGHT MANAGEMENT & BODY COMPOSITION**

- 02479 7-Keto® DHEA Metabolite • 100 mg, 60 veg capsules
- 01807 Advanced Appetite Suppress
- 02207 AMPK Metabolic Activator
- 02504 Body Trim and Appetite Control
- 02478 DHEA Complete
- 01738 Garcinia HCA
- 01908 Mediterranean Trim with Sinetrol™ -XPur
- 01432 Optimized Saffron
- 00818 Super CLA Blend with Sesame Lignans
- 02509 Waistline Control™

**WOMEN'S HEALTH**

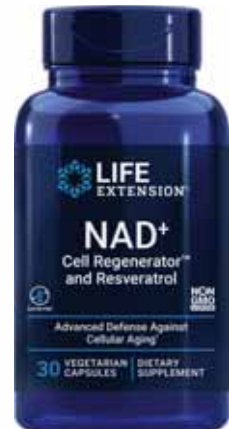
- 01942 Breast Health Formula
- 01626 Enhanced Sex for Women 50+
- 01894 Estrogen for Women
- 01064 Femmenessence MacaPause®
- 02204 Menopause 731™
- 02319 Prenatal Advantage
- 01441 Progesta-Care®
- 01649 Super-Absorbable Soy Isoflavones
- 02507 Youthful Woman 40+ with B-Complex

# Multiple Benefits of **NAD<sup>+</sup>**

- Energy production
- DNA support
- Gene expression (Sirtuin 1-7)
- Immune cell signalling



Item #02344  
300 mg • 30 veg. caps.  
1 bottle\*



Item #02348  
30 veg. caps.  
1 bottle\*

"I love this product. It's helped clear my mind and given me tons of energy."

**Luis**

VERIFIED CUSTOMER REVIEW

For those already taking resveratrol, **NAD<sup>+</sup> Cell Regenerator™** provides 300 mg of nicotinamide riboside chloride.

**Optimized NAD<sup>+</sup> Cell Regenerator™** combines 300 mg of nicotinamide riboside chloride with resveratrol and other plant extracts.

For full product description, pricing and to order **NAD<sup>+</sup> Cell Regenerator™**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

\* For pricing available to readers of this magazine, call 1-800-544-4440 or visit [LifeExtension.com/NAD](http://LifeExtension.com/NAD)

NIAGEN® is a registered trademark of ChromaDex, Inc., Patents see: [www.ChromaDexPatents.com](http://www.ChromaDexPatents.com)

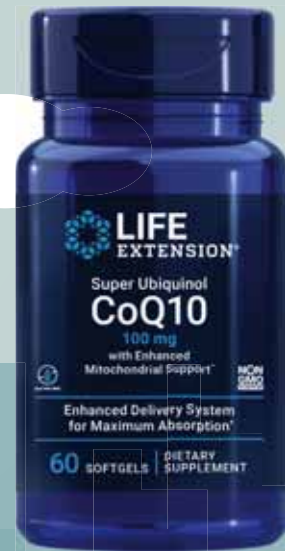


These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

# CoQ10

## Fuel for Heart | Mind | Muscle

Educated consumers often choose the **ubiquinol** form of **CoQ10** because of studies showing it is *absorbed* up to **eight-times** better!



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



For full product description and to order **Super Ubiquinol CoQ10 with Enhanced Mitochondrial Support™**, call 1-800-544-4440 or visit [www.LifeExtension.com](http://www.LifeExtension.com)

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

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



# LIFE EXTENSION®

The Science of a Healthier Life®

PO BOX 407198  
FORT LAUDERDALE, FLORIDA 33340-7198



## IN THIS EDITION OF *LIFE EXTENSION* MAGAZINE®



### 7 MISTAKE MADE BY LONGEVITY ENTHUSIASTS

Observations made over a **45-year** period reveal a mistake made by health enthusiasts that increase their risk of deadly disorders, including **type II diabetes**.



### 20 HOW WOMEN OVER 40 CAN FEEL BETTER FAST

A clinically tested **rhubarb extract** rapidly counteracts common symptoms experienced by women over age **40**.



### 31 FISH OIL AND BRAIN HEALTH

Fish oil helps protect against neurotoxins, improve depression scores, reduce stroke damage, and preserve **cognition**.



### 44 FIGHT BACK AGAINST VISIBLE SIGNS OF AGING

Oral ingestion of **collagen peptides**, **solubilized keratin**, and other nutrients helps restore **skin**, **hair**, and **nails**.



### 52 REDUCE JOINT PAIN & IMPROVE MOBILITY

A clinical trial of two **plant extracts** *improved joint pain*, **walking distance** and **speed**, and **knee range-of-motion**.



### 63 RAPAMYCIN UPDATE

Ross Pelton discusses the **lifespan-enhancing** effects of the drug **rapamycin** and alternative ways of attaining its benefits.

VISIT US ONLINE AT [LIFEEXTENSION.COM](http://LIFEEXTENSION.COM)